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Analytical Outlines
(Основи системної аналітики)

Навчальний посібник з англійської мови

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Навчальний посібник покликаний розвивати професійно орієнтовану англійську комунікативну компетентність через запропонований у ньому студентоцентризований підхід до навчання іноземної мови, який становить основу методики індивідуалізації викладання іноземних мов. Автори пропонують принципово нову структуру посібника, у якому кожен урок побудовано за принципом урахування індивідуальних особливостей студентів.

Для студентів напряму підготовки «Системний аналіз» та суміжних спеціальностей, викладачів іноземної мови у вищих технічних навчальних закладах, та всіх, хто цікавиться проблемами викладання професійно орієнтованої англійської мови.

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2.	Programming	Computer Programming	Function of an Item	Test Case
3.	Expert Systems	Simulating Human Thought	Passive Voice	CV
<i>Module 2. Networking Systems</i>				
4.	Computer Networks	Connecting the Planet	Reported Speech	Letter of Application
5.	The Internet	The Internet and The Web	Questions	Memo
<i>Module 3. Economical System</i>				
6.	Business and Enterprise	Business and its Types	Expressing Activities	Business Letter
7.	Banking	Making Profit from Money	Giving Reasons	E-mail
8.	Market and Competition	Monopolies, Oligopolies and Perfect Competition	Modal Verbs	Report
<i>Module 4. Mathematical Systems</i>				
9.	Arithmetic and Number Theory	Queen of Math	Expressing calculations	Mathematical Problems: Proof/Solution
10.	Discrete Mathematics	Discrete Mathematics	Conditionals	Abstract

PREFACE FOR STUDENTS

The present book aims to help you become a confident English user with well developed communicative and professional competences. As the title suggests, this book is created specifically for future System Analysts in conjunction with programs adopted at tertiary schools. Thus, the book can help you not only in your English study, but also in other courses as well as in your future profession.

What makes this book special is that it adopts and takes into account the fact that every student is a unique individual with his or her own interests, styles of learning, types of thinking and levels of English. It makes it possible to use all these differences as a benefit for creating motivation, stimulating creative and searching activities and encouraging individual progress inside a multi-level group of students.

The materials are designed for you to practise in class and prepare tasks at home with maximal efficacy according to your current level of English. Briefly, each Unit is divided into four parts:

- Whole-Class Activity;
- Differentiated Activity;
- Optional Activity;
- Workbook.

Whole-Class Activity section contains the core information which is essential to learn for everyone in the class. Here you will usually find a basic text, several vocabulary exercises and language function exercises.

Differentiated Activity section is developed according to different levels of English. Most exercises of this section are multilevel and usually consist of three parts in ascending order of difficulty. While choosing the part which you want to accomplish, remember that the best way to study is to do exercises which slightly exceed your current abilities. This section also contains a lot of Pair Work, Group Work and Role Play Activities. These exercises are developed to boost your communicative skills and also to create cooperative and supportive attitude in the class.

Optional Activity section proposes several additional activities for students who want either to exceed the lesson's borders and complete another intricate task or revise simplified version of the Whole-Class Activity material.

Workbook section contains homeworks to do in preparation for the class. It may comprise several multilevel tasks, Project or Internet Search Activities. Having all

done well at home will save classroom time for doing interactive tasks and will certainly influence your progress.

Using this book will not by itself make you a fluent English speaker; for that you need to care about your work at every level: at home, in class and outside the course. The best progress line will be if you do 1st or 2nd Parts of multilevel tasks at the beginning of study, and end up the course doing more complicated 3rd Part or advanced Optional Activity.

For your convenience the book is accompanied by the English-Ukrainian-Russian Glossary that includes all the words which make up active vocabulary.

Learning English requires time and effort. But if you are determined to achieve the goal and are not afraid of overcoming difficulties, your work will certainly be fruitful. We wish you successful learning experience!

The authors

MODULE 1. COMPUTER SYSTEMS



At the end of this module Students will understand:

- the way computer helps to solve complicated problems;
- how programming languages have changed overtime;
- how expert systems can be applied in our lives.



At the end of this module Students will know:

- notions of computer hardware and software, programming and expert systems;
- basic parts of a computer;
- types of programming languages;
- principles of expert systems work.



At the end of this module Students will be able to:

- explain the structure of a typical computer;
- define the functions of computer parts;
- give instructions connected with computer operation;
- write simple user guides, test cases and CVs.

Unit 1. Computer Hardware and Software

Lesson 1

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about computer hardware and software. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. Who invented the first computer and when?
2. How have computers changed over time?
3. What was the most important breakthrough in computer development?

Practical Concern

1. What can we use a computer for?
2. What are the main parts of a computer?
3. What software is the most useful?

Analytical Concern

1. Why was the first computer invented?
2. What would have happened if a computer hadn't been invented?
3. Who benefits most from the existence of a computer?

Creative Concern

1. Why is the "mouse" called that way?
2. How can a computer help to create original things?
3. How can we use a keyboard in an unusual way?

Task 2. Reading

Read the text about computer hardware and software. Explain the meaning of the key words in bold. You have 20 minutes for this activity.

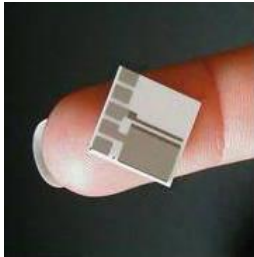
Computer and Its Components

It was probably the worst prediction in history. Back in the 1940s, Thomas Watson, boss of the giant IBM Corporation, forecast that the world would need no more than "about five computers". Six decades later and the global population of computers has now risen to something like one billion machines! To be fair to Watson, computers have changed enormously in that time. In the 1940s, they were giant scientific and

military devices and cost millions of dollars apiece; today, most computers can be found in everything from microwave ovens to cellphones.

A computer is an electronic machine that processes information – in other words, an information processor: it takes in raw information (or data), **stores** it until it's ready to work on it, processes it and then gives out the results. Different parts of a computer are designed to fulfil these functions.

A keyboard and a mouse are examples of **input units** – ways of getting information into your computer. A microphone and voice recognition software may also be used



as another form of input. All the documents and files are stored on a **hard-drive** – a huge storage (memory) device. Smaller, computer-based devices like digital cameras and cellphones use other kinds of storage such as **flash memory cards**. Computer's processor (sometimes known as **the central processing unit** or CPU) is a microchip which works amazingly hard and gets incredibly hot in the process. That's why a computer has a fan to stop it from overheating. Finally, computer output devices may include **LCD screen** capable of displaying high-**resolution** graphics, stereo loudspeakers and an inkjet printer to make a more permanent form of output.

All the physical equipment used in a computer system together with **peripherals** you plug into it make up **computer hardware**. By contrast, computer programs are called software because ability **to run** different software is what makes a computer flexible.

The first computers were gigantic calculating machines made to deal with numbers and solve difficult mathematical problems. Today, computers work on a much wider variety of problems – but they are all still, essentially, **calculations**. Suppose you're looking at a digital photo in a **photo-editing program** and you decide you want a mirror image of it (in other words, flip it from left to right). The photo is made up of millions of **pixels** arranged in a grid pattern. The computer stores each pixel as a number, so to flip a digital photo it simply reverses the sequence of numbers so they run from right to left instead of left to right.

What makes a computer different from a calculator is that it can work all by itself. You just give it your **instructions** and it performs long and complex series of operations all by itself. Back in the 1970s and 1980s, if you wanted a home computer to do something, you had to write your own little program to do it. For example, before you could write a letter on a computer, you had to write a program that would read the letters you **typed** on the keyboard, store them in the memory, and display them on the screen. Writing the program usually took more time than doing what you had originally wanted to do (writing the letter). Pretty soon, people started selling programs like word processors to save you the need to write programs yourself.

Today, most computer users buy, **download**, or share programs like Microsoft Word and Excel. Hardly anyone writes programs any more. Most people see their computers as tools that help them do jobs, rather than complex electronic machines they have to pre-program – and that's just as well, because most of us have better things to do than computer programming.

(The text is borrowed and modified from <http://www.explainthatstuff.com/howcomputerswork.html> as of 18th December 2012)

Task 3. Vocabulary Practice

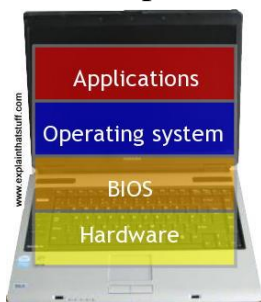
Match the words (1-7) with their definitions (a-g). You have 5 minutes for this task.

1. Computer	a. a peripheral device that accepts data and feeds it into a computer
2. Input device	b. the physical equipment used in a computer system
3. Output device	c. the programs that can be used with a particular computer system
4. CPU	d. a device that processes data according to a set of instructions
5. Hardware	e. devices or units that operate separately from the CPU but are connected to it
6. Software	f. any piece of computer hardware equipment used to communicate the results of data processing
7. Peripherals	g. the part of a computer that performs logical and arithmetical operations on the data

Task 4. Vocabulary Practice

Read the text and fill in the gaps with the words from the list. You should use the scheme below. You have 10 minutes to complete this task.

manufacturer output hardware processing BIOS
chips computer programs operating system



An (1) is the core software in a computer that controls the basic operations of input, (2)....., storage, and (3) You can think of an operating system as the "foundations" of the software in a computer: other (4) (called applications) are built on top of it. The operating system relies on an even more fundamental piece of programming called the (5)(Basic Input Output System), which is the link between the operating system software and the (6) Unlike the operating system, which is the same from one (7)

to another, the BIOS vary from machine to machine according to the precise hardware configuration and is usually written by the hardware (8)The BIOS is not, strictly speaking, software: it's a program semi-permanently stored into one of the computer's main (9)

Task 5. Language in Use

In your profession and everyday life you often feel the need to give instructions. Especially this skill is useful when writing manuals or user guides. Study the box explaining the ways of giving instructions. After that, match purposes of actions with the instructions using the information from the box. You have 10 minutes for this task.

Giving Instructions

1. We make simple instructions using the **infinitive**:
e.g. Open the file.
2. We express the purpose of an action using **“To”, “In order to”**:
e.g. To open the file, double-click the icon.
Double click the icon in order to open the file.
3. We can explain how to perform an action using **“by + V”**:
e.g. Open the file by double-clicking the icon.
4. When we have several instructions, we can put them into order using **“First”, “Then”, “Finally”**:
e.g. First, open the file. Then, copy the text. Finally, insert the text into the address line.
5. We can show that one action follows another using **“Having done”**:
e.g. Having opened the file, copy the text.
6. We can express warnings by using **“Do not + Infinitive”**:
e.g. Do not open the file until the installation is over.

1.	Open a file	a)	double-click on the icon
2.	Select a file	b)	press TAB
3.	Drag an object	c)	click the Start button, then click Power
4.	Type all letters as uppercase	d)	press F1
5.	Move the cursor several spaces forward	e)	point to the object on the screen, press and hold the primary button, move the object to a new location
6.	Display Help for a program or Windows	f)	click its Maximize button or double-click the window's title bar
7.	Make a window fill the entire screen	g)	left-click the icon
8.	Turn off the computer	h)	press CAPS LOCK

Differentiated Activity

Task 6. Group activity

You are going to be divided into several groups to work out topical content of the text from Task 2. After that you will have to report your findings to the class. You have 10 minutes for this task.

Group 1. Your task is to track historical information in the text and fill in the gaps.

Back in 1940 ... predicted that...

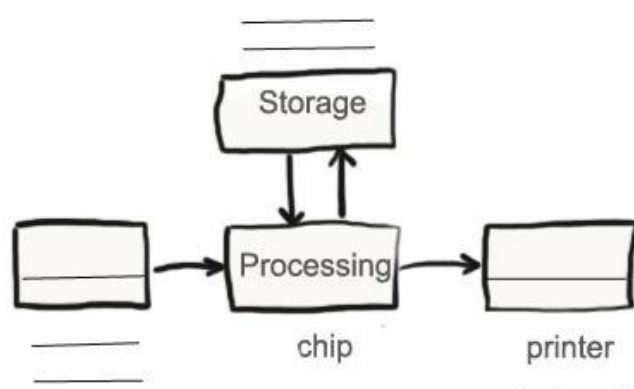
In 1940^{ies} computers were ...

The main task of the first computers was ...

Back in 1970s and 1980s you had to ...

Today, computers are ...

Group 2. Your task is to complete a chart and give commentaries on it using the following expressions:



A computer works in such a way:

at first ...

Then...

Finally...

An example of storage devices are...

Another examples are..

Group 3. Inside your group, discuss the following questions:

Why did Thomas Watson think that the world would need only five computers?

How have computers changed over time?

What is the difference between software and hardware?

Task 7. 📢 Listening

You are going to watch a video about an operating system. Choose whatever part you feel confident to complete or do them all. You have 10 minutes for the task. Use the following link to watch the video:
<http://www.youtube.com/watch?v=76J0dNZ0MZc>.

Part 1. Fill in the gaps:

An operating system is composed of (1) that is necessary to run your computer. Operating system software (2) your computer`s hardware components and all other software being used on your computer.

Traditional operating systems were (3), and usually consisted of (4) and computer responses. Most modern operating systems, such as Windows Vista and Windows XP, have a (5) graphical user interface, or GUI.

When you (6) a piece of application software on your computer, it usually uses the element of the GUI. Elements of a GUI include such things as: windows, (7) , buttons, scroll bars etc. GUIs are easier to use, faster, and accommodate better organization of your (8) and files than traditional operating systems.

Part 2. Decide whether the following statements are true (T) or false (F). Justify your answer.

1. Operating system software controls peripheral hardware.
2. Traditional operating systems, such as DOS, had graphical user interface.
3. When you install a piece of application software on your computer, it usually uses the element of the GUI.
4. Windows, menus, buttons and screen are the elements of a GUI.
5. GUIs are easier to use.

Part 3. Retell the text giving as many details as possible. You may use the text from Part 1 or statements from Part 2 as scaffolds.

Task 8. Pair work

In pairs, give each other instructions on how to perform the following actions using the help box from Task 5:

Start your computer	Uninstall a program
Turn off your computer	View the list of all programs
Drag a file	Find a file
Copy a file	Create a System Image
Delete a folder	Restore files

You may refer to the following site for information:

<http://windows.microsoft.com/en-us/windows-vista/windows-basics-all-topics>.

You have 10 minutes for this task.

Task 9. Role-play. Pair Work

Student 1. Imagine that you have one of the following problems with your computer:

- *PC is running slowly*
- *Internet is slow or not loading*

You have decided to telephone the support service and ask a specialist for help. Describe your problem, give details and answer the questions you may be asked.

Student 2. Imagine that you work in a technical support call centre. You have been asked to help with a particular PC problem. Ask questions about the problem and give instructions on how to solve it. The possible solutions are:

Check Task Manager

Uninstall unnecessary applications

Scan for Viruses

Clean up a PC

Disable and re-enable connection

Change wireless channel

Reset the settings of your browser

Install another browser

After you have done the task, switch the roles and act out a dialogue about the second problem. You have time until the end of the class.

Home Assignment

Do Tasks 1-4 from Workbook section.

Optional Activity

Task 10. Facilitated Task

a) Read an extract from the text. Note, that Present Simple tense is often used in descriptions of objects. Analyse the underlined grammatical forms and deduce the rules of Present Simple formation in singular and plural.

b) Make up your own sentences in Present Simple tense using the words / phrases in bold.

A computer is an electronic machine that processes information. Taking in information is called **input**, storing information is known as memory (or storage), chewing information is also known as **processing**, and giving out results is called **output**.

Keyboard and mouse are input **units** – ways of getting information into your computer that it can process. Computer stores all documents and files on a **hard-drive**: a huge magnetic memory. But smaller **devices** like digital cameras and cellphones use other kinds of storage such as **flash memory cards**. The main part of a computer is a processor. It is also known as **the central processing unit** or CPU. Computer usually has an **LCD screen** capable of displaying **high-resolution** (very detailed) graphics. It may also have other peripheral devices such as stereo **loudspeakers** or an **inkjet printer**.

What makes a computer different from a calculator is that it can work all by itself. You just give it **instructions** (called a program) and it performs a long and complex series of operations all by itself. Today, most computer users buy, **download**, or share programs like Microsoft Word and Excel.

Task 11. Complex Task

Read the article about 3-D printing technology from 'The Economist'. Answer the following questions:

1. What does the author mean by saying that 3-D printing technology 'does the opposite' in the first paragraph?
2. How does a 3-D printer work?
3. What are the advantages and disadvantages of this technology?
4. What historical parallels does the author draw in the article?
5. How do you see the future of 3-D printing? Who will benefit and loose from the new technology?

Print Me a Stradivarius: How a New Manufacturing Technology Will Change The World

The industrial revolution of the late 18th century made possible the mass production of goods, thereby creating economies of scale which changed the economy – and society – in ways that nobody could have imagined at the time. Now a new manufacturing technology has emerged which does the opposite. Three-dimensional printing makes it very cheap to create single items, which may have as profound an impact on the world as the coming of the factory did.

It works like this. First you call up a blueprint on your computer screen and tinker with its shape and colour where necessary. Then you press print. A machine nearby whirrs into life and builds up the object gradually, either by depositing material from a nozzle, or by selectively solidifying a thin layer of plastic or metal dust using tiny drops of glue or a tightly focused beam.

Eventually the object in question – a spare part for your car, a lampshade, a violin—pops out. The beauty of the technology is that it does not need to happen in a factory. Small items can be made by a machine like a desktop printer, in the corner of an office, a shop or even a house; big items – bicycle frames, panels for cars, aircraft parts – need a larger machine, and a bit more space.

At the moment the process is possible only with certain materials (plastics, resins and metals) and with a precision of around a tenth of a millimetre. But 3D printing is spreading fast as the technology improves and costs fall. A basic 3D printer, also known as a fabricator or “fabber”, now costs less than a laser printer did in 1985.

This technological change will reset the economics of manufacturing. Some believe there will be no need for factories when every village has a fabricator that can produce items when needed. Others maintain that even if 3D printing does bring manufacturing back to developed countries, it may not create many jobs, since it is less labour-intensive than standard manufacturing.

The technology will have implications not just for the distribution of capital and jobs, but also for intellectual-property (IP) rules. When objects can be described in a digital file, they become much easier to copy and distribute – and, of course, to pirate. There are sure to be calls for restrictions on the use of 3D printers, and lawsuits about how existing IP laws should be applied. It is unclear whether 3D printing requires existing rules to be tightened (which could hamper innovation) or loosened (which could encourage piracy).

Just as nobody could have predicted the impact of the steam engine in 1750 – or the printing press in 1450, or the transistor in 1950 – it is impossible to foresee the long-term impact of 3D printing. But the technology is coming, and it is likely to disrupt every field it touches.

Lesson 2

Whole-Class Activity

Task 12. Check the results of Tasks 1-2 from your home assignment (10 minutes).

Task 13. Work in pairs. Be ready to report the results of your Internet search to the class. Ask each other questions about the functions of computer systems (10 minutes).

Task 14. Discuss the following questions for 5 minutes. Turn to the help box if necessary:

1. What do you think a manual is?
2. What is the difference between a user guide and a manual?
3. What is the aim of a manual?
4. In what spheres are manuals often used?
5. What sections does a manual usually include?
6. How many languages are manuals written in?
7. How many pages should a manual contain?
8. Does a manual typically include illustrations or screenshots?



A **user guide** or **user's guide**, also commonly known as a **manual**, is a technical communication document

intended to give assistance to people through a set of instructions.

User guides are most commonly associated with electronic goods, computer hardware and software.

The **sections** of a user guide often include:

- A title page
- A preface, containing general description of a product
- A contents page
- A guide on how to use at least the main functions of the system
- A troubleshooting section detailing possible errors or problems that may occur, along with how to fix them
- Warnings
- A FAQ (Frequently Asked Questions)
- Where to find further help, and contact details
- A glossary and, for larger documents, an index

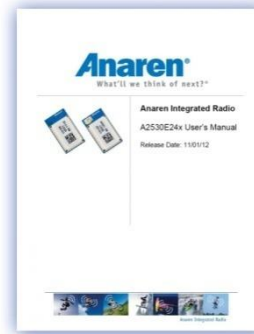
Task 15. Look through the following elements (A-I) and decide which sections of a manual they belong to. Consult the previous exercise if necessary. You have 5 minutes for this task.

A.

Sony Ericsson W300c	
Contents	
Getting Started 4	Connectivity 51
Assembly, SIM card, battery, turning on, startup menu.	Internet and email settings, synchronizing, Bluetooth, infrared, USB cable, update service.
Getting to know your phone 9	More features 57
Phone overview, icons, menu overview, entering letters, file manager.	Alarm clock, calendar, tasks, profiles, time and date, SIM card lock, etc.
Calling 22	Troubleshooting 62
Calls, contacts, voice control, call options.	Why doesn't the phone work the way I want?
Messaging 35	Important information 64
Text messaging, picture messaging, voice messaging, email, My Friends.	Sony Ericsson Consumer Web site, service and support, safe and efficient use, warranty, declaration of conformity.
Imaging 40	Index 73
Camera, video recorder, pictures.	
Entertainment 43	
WALKMAN®, radio, PlayNow™, ringtones, MusicDJ™, VideoDJ™, games and more.	

This is the Internet version of the user's guide. © Print only for private use. 1

B.



- C. • Do not use this product near water.
• Do not place this product on an unstable cart, stand or table.
- D. For technical assistance, contact your local dealer or distributor. You may also access our website for information on how and where to contact the service centres available in your area.
- E. If the computer won't respond or the pointer won't move
• First, make sure the mouse and keyboard are connected.
• Unplug and then plug in the connectors and make sure they are secure.
- F. To use a USB device with your computer, simply connect the device to the computer. Your computer automatically accesses the necessary software whenever you connect a new device.
- G. hard disks 26
headphone outlet 32
headphones, speakers 15
- H. Welcome to the new ProQuest search experience. ProQuest is all-new, powerful, comprehensive, and easy-to-navigate search environment. It's a better way to search, find, use, and share information.
- I. **How do I create a new page?**
There are several ways to create a new page:
• Create a link to the page on another page, then click on the red link which appears.

Task 16. Manual: Writing Techniques

Read the text about writing a manual. Decide which steps of writing you find the most or the least important and why (15 minutes).

Writing a Manual: Steps to follow

In your day-to-day work, you might find that there are times when you need to provide a client with documentation that walks them through a process or instructs

them how to do something they may be unfamiliar with. Writing a manual on an important function at work can demonstrate your abilities to your superiors. It demonstrates your ability to complete a project on your own. A **manual**, also commonly known as a **user guide** or **user's guide**, is a technical communication document intended to give assistance to people using a particular system.

User manuals have a bad reputation. In a recent USA Today poll that asked readers "Which technological things have the ability to confuse you?" user manuals came out top! Increasingly companies are rethinking the way they approach user manuals. Here are some steps to help you create a comprehensive instruction manual.

1. **Decide on your subject.** Be specific in scope and range.
2. **Decide what audience you are writing for.**
 - Are you writing a manual for beginners or experts (or somewhere in between)?
3. **Define exactly what you are going to talk about in the manual.**
 - Example: You are writing a manual "How to Install an Operating System". One section might be about Windows 7. Another section might be about Mac OS. Still another section might be about Linux.
4. **Decide upon a logical order to present your manual.** This is not only about a logical order of actions. Some subject may need to be presented first. For example, tasks that will be included in all parts of the manual should probably be discussed first.
5. **If the manual is going to use technical terminology prepare a glossary.** If it is unlikely the reader will already know the terms, place the glossary immediately after the table of contents.
 - Definitions of terms in the glossary need to be as exact as possible. If the term is an acronym, like "GUI", then fully explain that it means "Graphical User Interface" in the definition.
6. **Decide on an organization for each section you are going to write.**
 - Example: You are writing a manual about a computer. You have a section called "Troubleshooting". You might write part of it about disk space issues. You might write another part about an excessive memory usage.
7. **Organize each section and subsection in a logical order, narrowing the range of the topic.** Use your organization as a guide, but alter it if it doesn't work.
 - Write descriptions of different tasks.
 - Write examples that the reader can follow to gain instruction.
 - Prepare appropriate illustrations.
8. **Proofread, Proofread and proofread again.**

Proofreading should be ongoing. Make notes of errors or omissions. Correct them. Make notes of passages others find confusing. Rewrite the passage to make it easier to read. Have a variety of people read your manual to insure the best possible result.

(The text is borrowed and modified from <http://www.wikihow.com/Write-a-Manual-from-Scratch> as of 16th March 2013)

Task 17. You have found out that someone has been using your computer manual and several pages have dropped and mixed. Read the following extracts from the manual and put them in the correct order (5 minutes).

Setting up your computer

a. Opening the package

Open the package carefully and ensure that all items are present and in good condition. If any of the items are missing or appear damaged, contact your dealer immediately.

b. Starting your computer

After connecting all the peripheral equipment, start your computer according to the steps below:

1. Turn on all peripheral equipment, such as the monitor, printer, speakers, etc.
2. Turn on the system. Once the start up process is complete, you can begin to use your computer.

c. Connecting peripherals

After everything is connected, plug the power cord into the system and insert the other end into a power outlet.

Note: Don't connect the system power cord before connecting all peripherals to the system.

d. Selecting a location

Selecting the optimum location for your computer:

- Do not place the system too close to other electrical equipment.
- Do not place the system in areas where the power cord or other cords may be stepped on.
- Avoid placing the system in any location that is excessively dusty or damp.

Differentiated Activity

Task 18. Tiered task

You are going to watch a video about the ways of creating a table in Word. You have 10 minutes to do and check the tasks after watching it. Use the following link to watch the video:

<http://www.youtube.com/watch?v=Jwbl4Zzd4r8>

Part 1. Fill in the missing information.

You can (1) a spreadsheet in a Word document in a couple of different ways. You can go to (2), 'Insert Table', select the number of (3) and select the number of rows you wish. Click (4) and it will automatically create a table or a spreadsheet inside the Word (5) for you.

The other way to create an Exel (6) in a Word document is by opening up Exel, starting a new (7) and typing your data. Then you can select the (8) of your spreadsheet, right-click, select '(9) , open up Word, create a new blank document and then right-click and (10)..... And your spreadsheet will appear in your Word document.

Part 2. Match the actions with the way of inserting a table in a Word document. Put the actions in the correct order. Give your answer using such words as "to", "so that", "in order to" etc.

1.	To create a table in Word	a.	Go to 'Table', 'Insert table'
		b.	Click 'Ok'
		c.	Open up Word
		d.	Select the cells
		e.	Open up Excel
2.	To insert a spreadsheet from Excel	f.	Right-click and paste
		g.	Go to 'File', 'New blank document'
		h.	Start a new Workbook and type data
		i.	Select the number of columns and rows
		j.	Right-click and copy

Part 3. Explain the difference between the mentioned two ways of creating a table. What is the difference between a table and a spreadsheet?

Task 19. Tiered Task

Style of writing is very important when creating a user manual. Read the tips in the box on how to write appropriate instructions. Then, compare two extracts from a printer user manual and do the following tasks within 10 minutes:

Part 1. Decide which extract is better and why. Point any mistakes that you can find in the extract.

e.g. I think, that Extract ... is better, because it is... It has many mistakes, for example, in step 1 the paragraph is too long and contains unnecessary information...

Part 2. Find mistakes in steps 1-4 and propose your own variant of writing instructions.

e.g. In step 1 the paragraph is too long and contains unnecessary information... It would be better to...

Part 3. Find mistakes in steps 5-8 and propose your variant on how to correct them.

Extract 1

To install the printer driver from the Software and Documentation CD-ROM:

1. Insert the CD-ROM into the computer's CD-ROM drive. If the installer does not launch, do the following:
 - a. Click Start, and then click Run.
 - b. In the Run window, type: <CD drive>:\INSTALL.EXE.
2. Select your desired language from the list.
3. Select Install Printer Driver.
4. Select the installation method you want to use, and then follow the onscreen instructions.



How to give instructions

Many user manuals have instructions that are incomplete or incorrect. Here are some guidelines to help make instructions easy on the user.

1. Provide step-by-step sequences in the correct order.
2. Follow the timing and sequencing of the actual operations.
3. Provide visual stepping stones (e.g. Step 1, Step 2 etc.)
4. Avoid lengthy paragraphs.
5. Use everyday words and terms: avoid jargon.
6. Explain what a function or feature is for (in basic practical terms) as well as "How to" instructions.
7. Do not assume the user has prior experience or product knowledge.
8. Write in the present tense and the active voice.

Extract 2

To print a borderless document:

1. Load the appropriate paper. This could be matte paper, glossy paper or even gloss laminated paper which can be used in cards production.
2. The file that you want to print should be opened.
3. So, you have clicked File, and now all you have to do is just click Print.
4. After having selected the previous options, click Properties, and then click Setup to get into Feature tab.
5. Select the media size from Size drop-down list after the Feature tab has been selected.
6. Borderless check box should be selected.
7. If you are printing photos, select Best from the Print Quality list. Alternatively, select Maximum dpi, which provides up to 4800 x 1200 optimized dpi for optimum print quality. This setting might temporarily use a large amount of hard disc space (400 MB or more) and will print more slowly. To avoid this, you may change other print settings (for more information, see Settings).
8. Initialize document printing procedure.

Task 20. Practical Concern

Work in groups. Look through the manuals / user guides you have brought to the lesson as your home assignment. Do they have the same structure and features as was described in the previous exercises? Analyse your manuals in terms of:

1. Aim of the manual;
2. Contents;
3. Layout;
4. Visual aids;
5. Peculiarities.

You have 5 minutes for this task.

Task 21. Project work

Work in teams. Imagine that your company is going to release a line of peripheral devices. You have been given the task to prepare a manual for one of the following items:

Team 1. Prepare a user manual for an optical mouse.

Team 2. Prepare a user manual for a portative loudspeaker.

Team 3. Prepare a user manual for a USB web camera.

Divide responsibilities inside your team so that one person prepares one part of the manual. Remember that your manual should have the following parts:

- *Preface, where you present the device, give its name and purpose*
- *Guide on how to use the device*
- *Warnings about where and how the device should not be used*
- *Troubleshooting section, where you give possible problems with device and explain how to fix them*
- *FAQ, where you give answers to the questions which may occur while using the device*
- *Section, where you give contact details.*

After completing the manual, discuss it in a whole-group meeting, and choose the best one. You have 20 minutes to perform and check the task.

Home Assignment

Do Task 5 from Workbook section.

Optional Activity

Task 21. Facilitated Task

Read the following extracts from a manual. Choose the correct form out of three written in bold. After doing this, write your own steps to complete the instructions.

- A.**
1. **Click/ Clicking / Clicks** Start button.
 2. **Selecting/ Select/ Selected** the Control panel.
 3. **Click/ Clicking / Clicked** Date and Time settings.
 4.
 5.
- B.**
1. **Shut / Shuts/ Shutting** down the computer completely.
 2. **Unplugged/ Unplug/ Unplugs** the power adapter from the main unit.
 3. **Opens/ Opening/ Open** the case of a computer.
 4.
 5.

Task 22. Complex Task

Analyse the following extract from a manual. What is the purpose of the manual? What software is described? How can Java Control Panel be accessed? Write your own manual for any action in GUI environment.

1. a. **For Windows 7, Vista**
 - Click on the **Start** button and then click on the **Control Panel** option.
 - In the **Control Panel Search** enter **Java Control Panel**.
 - Click on the Java icon to open the Java Control Panel.
- b. **For Mac OS X 10.7.3 and above**
 - Click on **Apple** icon on upper left of screen.
 - Go to **System Preferences**
 - Click on the Java icon to access the Java Control Panel.
2. In the Java Control Panel, click **Settings** under the Temporary Internet Files section. The **Temporary Files Settings** dialog box appears.
3. Click **Delete Files** on the Temporary Files Settings dialog. The **Delete Files and Applications** dialog box appears.
4. Click **OK** on the **Delete Files and Applications** dialog. This deletes all the Downloaded Applications and Applets from the cache.
5. Click **OK** on the **Temporary Files Settings** dialog. If you want to delete a specific application and applet from the cache, click on View Application and View Applet options respectively.

WORKBOOK

Task 1. Tiered Task

Part 1. Insert the following words in the gaps. Translate the sentences into your native language.

Pixels	photo-editing program	stored	flash memory
Upload	word-processing program	LCD screens	unit

1. Data is on the disk until it is ready to use.
2. Nowadays we use instead of CDs.
3. Choose the photo which you want to
4. allows you to create and modify text documents.
5. You can make your photo brighter using
6. The processing carries out arithmetic and logic operations.
7. are used in a wide range of applications.
8. Resolution is the number of distinct in each dimension that can be displayed.

Part 2. Fill in the gaps with one to three words from the unit.

The operating system is the most important program that (1) on a computer. Every general-purpose computer must have an operating system to run other programs. Operating systems (2) basic tasks, such as recognizing (3) from the keyboard, sending (4) to the display screen, keeping track of (5) and directories on the disk, and controlling (6) devices such as disk drives and printers.

As a user, you normally (7) with the operating system through a set of (7) For example, the DOS operating system contains commands such as COPY and RENAME. (8) allow you to enter commands by pointing and clicking at objects that appear on the (9)

(The text is borrowed and modified from http://www.webopedia.com/TERM/O/operating_system.html as of 28th December 2012)

Part 3. Imagine that you work in a technical support office. You have been asked to give written instructions on how to solve problems from Task 9 of the Coursebook (PC is running slowly / Internet is slow or not loading). Write instructions using 100 words.

Task 2. Tiered Task

Read the text about three most popular operating systems and complete any part of the task after reading.

Linux

The Linux operating system is developed on a kernel based on Unix. It is known as one of the most secure platforms, yet Linux is often viewed as more complex. Linux is the result of an open-source project, allowing users and developers to access the source code for free. Because it requires less hardware, Linux is capable of providing exceptional performance even on a smaller hard disk. Large communities of users exist for this system, constantly contributing to the code and making improvements. The server-based concept of Linux has resulted in fewer home users and a lack of multimedia support for the system.

Mac OS X

Mac OS X is Apple's trademark operating system software for their line of Macintosh computers. The system was based in part on Unix and mimics its format with the administrative controls. Mac OS X software requires a low level of maintenance with fewer occurrences of computer worms, viruses and spyware. The Apple operating system does have some disadvantages, primarily in regard to software and hardware compatibility.

Windows

The Microsoft Windows operating system is the most popular choice and currently has a stronghold over the market. This platform has made significant advancements from version 1.0 all the way to the new Windows 8 system. The Windows system is highly compatible, feature-rich and has a much larger selection of software applications. Unlike the Linux kernel, Windows is proprietary software and tends to be more expensive than others. Despite widespread usage, Windows has been heavily associated with the term "insecure" as a number of security vulnerabilities have made it the most targeted system. Frequently exploited by hackers and malicious code writers, it is recommended that any Windows operating system with internet access be protected by some form of security software.

(The text is borrowed and modified from <http://www.spamlaws.com/operating-system-comparison.html> as of 28th December 2012)

Part 1. Decide whether the following statements are true (T) or false (F). Justify your answer.

1. Linux and Mac OS X are both developed on the basis of Unix.
2. Linux is free of charge.
3. Everyone can make improvements to the Linux OS.
4. Most programs are compatible with Mac OS X.
5. Windows OS has the largest number of software applications.
6. Windows OS is the most vulnerable system.

Part 2. Fill in the table with the advantages and disadvantages of the systems.

	Advantages	Disadvantages
Linux	1. <i>One of the most secure platforms</i> 2. ...	1. <i>More complex OS</i> 2. ...
Mac OS X		
Windows		

Part 3. In writing, compare two of the operating systems in terms of:

- popularity;
- complexity;
- price;
- security;
- compatibility;
- software.

You may use the following expressions:

On the one hand...

On the other hand ...

In comparison with ...

Unlike ... ,

Similar to ... ,

What makes ... different, ...

Task 3. Internet Search

Using the sites recommended by your teacher and any sites that you can find yourself, try to find some additional information about computer systems in English. The search should be done in pairs. Be ready to report your findings to the class.

Task 4. Find a user guide for any of your home devices and bring it to the next class.

Task 5. Writing

Having revised the material which you learned during the lesson, complete one of the following parts:

Part 1. Write a short manual (80-100 words) for a wireless optical mouse. You may use the materials which you worked out during the class as an example. Follow the plan:

- *Preface, where you present the device, give its name and purpose*
- *Guide on how to connect the mouse to the computer*
- *Warnings about where and how the device should not be used*
- *Section, where you give contact details.*

Part 2. Write a manual (100-120 words) for an inkjet printer. Use the following plan:

- *Preface*
- *Guide on how to connect the device*
- *Guide on how to install the drivers*
- *Warnings about where and how the device should not be used*
- *Troubleshooting section, where you give possible problems with device and explain how to fix them*
- *Section, where you give contact details.*

Part 3. Write a user guide for an MP3 player, using the following plan.

- *Preface*
- *Guide on how to use the device*
- *Guide on the main functions of a device*
- *Warnings about where and how the device should not be used*
- *Troubleshooting section, where you give possible problems with device and explain how to fix them*
- *FAQ, where you give answers to the questions which may occur while using the device*
- *Section, where you give contact details.*

Unit 2. Programming

Lesson 3

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about programming. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. How did programming look like fifty years ago?
2. What was the main breakthrough in programming?
3. How often is programming used nowadays?

Analytical Concern

1. What classes of programming languages do you know?
2. What are the criteria of such classification?
3. What would have happened if programming had remained on its initial level of development?

Practical Concern

1. What programming languages do you know?
2. Do you have any experience of using programming?
3. Where do we use programming?

Creative Concern

1. Can programming be used in a creative way? Give examples.
2. In what way is programming used in such areas as music and art?
3. How can programming help create computer games?

Task 2. Reading

Read the text about computer hardware and software and answer the quiz questions. You have 20 minutes for this activity.

Computer Programming

Writing software or computer programs means describing how to do something. In its simplest form, programming is breaking a task down into small **steps**. In this respect, writing a computer program can be like composing music, building a house or creating other things. It has been even argued that in its current state, programming is an *Art*, not engineering.

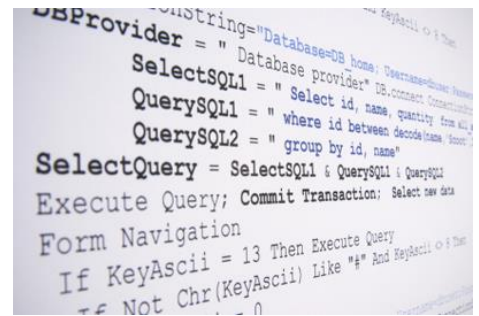


Today, most people don't need to know how a computer works. Most people can simply **turn on** a computer or a mobile phone and point at some graphical image on the display, click button, and the computer does something. Basically, computers **perform** operations on objects. A microprocessor, which is the heart of a computer, is really primitive but very fast. It manipulates groups of **binary**

numbers – numeric values represented in only two symbols: 0 and 1. Microprocessor operates binary numbers, representing parts of objects, and moves them around, **adds** pairs together, **subtracts** one from another, **compares** a pair, etc. As an example, computer display consists of a bunch of objects called pixels. Every pixel has a position which consists of the row and column it is in. Its colour is specified as three numbers – called RGB (Red, Green, Blue) values.

Machine language, or machine code, is represented in 1s and 0s and is **executed** directly by a processor. The pioneers of computers wrote code in machine language, but no one does it these days.

One step above machine language is **assembler language**. In assembler, the operations that the microprocessor performs are given names. Addresses in memory can also be given meaningful names. This is a big step over binary, but still very tedious to do any large software program with. It still has its place for little pieces of software that need to **interact** directly with the microprocessor.



Most software written today is written in **high-level languages**, some of them are quite old. For example, COBOL, FORTRAN, and Lisp were written in the 1950s. Instructions written in high-level languages are converted into machine code with the help of specific software called **compiler**. Thus, high-level languages abstract away the specifics of the microprocessor in your computer and may use natural language elements making the process of **developing** a program simpler and more understandable.

(The text is borrowed and modified from http://www.bfoit.org/Intro_to_Programming/Programming.html as of 12th February, 2013)

1. What is computer programming?
 - A. Convincing the computer to never freeze.
 - B. Speeding up your computer.
 - C. Setting the alarm on a computer.
 - D. The act of instructing computers to perform tasks.
2. The software that translates code into something meaningful which the computer can understand is called ...
 - A. Compiler.
 - B. Converter.
 - C. Transliterator.
 - D. Translator.

3. Basically, computers perform operations on
- Things.
 - Objects.
 - Icons.
 - Stages.
4. In assembler languages, the names are given to...
- Objects.
 - Microprocessor.
 - Operations and addresses.
 - Memory.
5. Microprocessor can understand only commands written in...
- English language.
 - 1s and 0s.
 - Any numbers.
 - Words and symbols.
6. Which class of languages allows for the use of words and commands?
- Machine code.
 - High-level language.
 - Assembler language.
 - Source code

Task 3. Vocabulary Practice

Match the words (1-7) with their definitions (a-g). You have 5 minutes for this task.

1. Programming	a. a set of instructions executed directly by a computer's central processing unit
2. Binary numbers	b. creating a set of instructions that computers use to perform specific operations
3. Machine code	c. a computer program that transforms source code written in a programming language into another computer language
4. Assembler language	d. a program which translates from assembly language to machine language format
5. Compiler	e. representation of numeric values using two symbols: 0 and 1
6. High-level language	f. programming language with strong abstraction from the details of the computer
7. Assembler	g. a low-level programming language in which there is a very strong correspondence between the language and the machine code instructions

Task 4. Vocabulary Practice

Read the following sets of words / phrases and find out how they relate to each other. You have 5 minutes for this task.

E.g. "Program" is a synonym for "software". "Create" is an antonym for "destroy".

Programming, primitive, high-level, divide, convert, stage, turn on, part, execute, language, add, general, whole, complicated, low-level, step, specific, code, perform, change, break down, turn off, instruction, coding, command, subtract.

Task 5. Language in Use

When you deal with computer hardware and software you often need to explain how some items work. Study the table in which the ways of explaining functions of an item are given. After doing so, match the computer parts (1-8) with their functions (a-h) and explain them using the information you have studied. You have 10 minutes for this task.

Function of an Item

The function of an item can be described in the following ways:

1. Used for + V ing
e.g. CDs are used for saving information.
2. Present Simple
e.g. Operating system controls the hardware.
3. The function of is to
e.g. The function of input devices is to get information into computer.
4. be responsible for V ing
e.g. The CPU is responsible for interpreting codes.
5. allows you ..., enables you to ...
e.g. Software allows you perform different operations.

1. Housing	a) interpret every code it receives from the other computer components, and make it usable to operating system
2. Motherboard	b) produce a paper copy of the information on your screen
3. CPU	c) hold all the parts that make the computer operate
4. Hard drive	d) produce sound and music when connected to the computer
5. Mouse	e) process information and perform computations
6. Speakers	f) wire all of the computer parts together
7. Printer	g) point to and select items on your screen
8. Computer	h) store the information

Differentiated Activity

Task 6. Group activity

In groups, work out the topical content of the following text. After that you will have to report your findings to the class. You have 10 minutes for this task.

Software creation

In order to create software you have to do more than just learning a programming language. A quick overview of the process includes the following stages:

1. Writing a program

This means writing the steps needed to perform the task, using the programming language you know. Set of instructions which you type to create a program is usually called source code.

2. Compiling the program

When you write a program using programming language, it's not yet in a form that the computer can use. In order to use a program, you usually have to convert it into machine code first. This conversion process is called compiling, or compilation. A program called a compiler does the compiling.

3. Running the program

After compiling the program into a form that the computer can use, next step is to make the computer perform the steps that you specified. This is called running the program, or executing it.

4. Debugging the program

The term “debugging” came about because the earliest computers were huge building-sized machines, and real-life insects sometimes flew into the machinery, so first computer engineers had to physically "debug" the computers. Nowadays the term refers purely to fixing errors and problems in source code of the program.

5. Repeating the whole process until the program is finished

This stage includes improving the program until it satisfies the demands of software engineers and customers. This stage can be quite long and demanding. Programmers commonly release a new version of their program every day for a couple of weeks after the initial release.

Group 1. Your task is to track information in the text and give definitions to the following terms:

Compilation, source code, program executing, compiler, initial release, debugging.

Group 2. Your task is to create a scheme of the process with details and examples for each stage, if possible.

Group 3. Inside your group, give detailed explanation for every stage of software creation. Decide, what stage is the most important. Are there any other stages, which were not mentioned in the text?

Task 7. 🎧 Listening

You are going to watch a video about the development of object-oriented programming. Choose whatever part you feel confident to complete or do them all. You have 10 minutes for the task. Use the following link to watch the video: <http://bigthink.com/videos/why-i-created-c>

Part 1. Fill in the gaps:

In the really old days, people had to write their (1)..... directly to work on the (2) You could do pretty good work with that, but it was very (3) Then they figured out that you could build languages fit for humans for specific areas, and they built FORTRAN for engineers and (4) and COBALT for (5)

And then a group of Norwegian programmers thought about creating a language that is fit for humans for all domains, not just linear (6) and business. And they built language called SIMULA. And that's where they introduced the (7) as the thing you have in the program to represent a (8) in your application world. And they went a little bit further and represented (9) between classes. This became known as (10) or data abstraction.

Part 2. Decide whether the following statements are true (T) or false (F). Justify your answer.

1. In the old days people wrote code using hardware.
2. FORTRAN and COBALT fit for specific areas.
3. SIMULA was created in the mid -`16s.
4. Class represents a concept in an application world.
5. Matrix, personnel record and dial buffer might become a class.
6. SIMULA failed to represent relationships between classes.
7. Vehicle is a kind of car.
8. Object-oriented programming is also called data abstraction.

Part 3. Retell the text giving as many details as possible. You may use the text from Part 1 or statements from Part 2 as scaffolds.

Task 8. Pair work

Work in pairs. Using the help box from Task 5, ask each other and explain the functions of the following keys:

Shift, Caps Lock, Tab, Alt, Ctrl, End, PgDn, Prt Sc

You have 10 minutes to complete this task.

Task 9. Role-play. Pair Work

Student 1. Imagine that you are running a website which sells unusual programs. You work as a call operator and your task is to explain to the clients the functions of programs and propose different software. Look at Chart A for information.

Student 2. You are interested in creative and simple software to install on your mobile device. Your friend gave you the list of recommended funny programs. Ask the operator about their functions. Turn the page and look at Note B for information.

You have time until the end of the class.

Chart A

Virtual Music Composer 4.0	Virtual Music Composer produces its own completely new musical themes.	\$19,95
Face Off Max 3.4.	Face Off Max is software that enables you to create funny photos by transplanting any face to any body and share the fun with your friends.	\$20,00 \$10,00
SpoofKit 1.0	Spoofkit lets you send your family or friends, joke/spoof emails. You will be able to send your brother an email from the Queen or a letter from Arnold Swarchenegger. Now available for use in social networks!	\$17,85
Horse Racing Predictor 1.5	With the help of advanced algorithms based on neural networks this revolutionary software will predict horse racing results with great accuracy	\$19,95
Personality type test 1.0	This test determines your psychological state and personality type.	\$13,25
Free Spy Message 1.0.	The SpyMessage is easy-to-use tool for protecting important information that you don't want others to see. With SpyMessage you can encrypt and hide your text message into image without changing size.	\$15,50

Note B

1. *Personality type – best option!*
(ask if it is compatible with your OS)
2. *Face off – useful in Facebook*
(and maybe it is still at a discounted price)
3. *Spoofkit made me laugh many times*
(I heard the latest version has some additional features)
4. *Don` t ever try Horse Racing Predictor!!*
(I actually lost money because of it)

Home Assignment

Do Tasks 1-3 from Workbook section.

Optional Activity

Task 10. Facilitated Task

a) Read the following extract and compare it with the text from Task 2. Note that Past Simple tense is used to describe actions or events which happened in the past. Analyse the underlined grammatical forms and answer the following questions:

- Why was Past Simple used in this extract?
- How is Past Simple formed?
- Make Past Simple forms for the verbs “to be”, “to have”, “to write”. Why are they different from the usual Past Simple forms?

b) Make up your own sentences in Past Simple tense using the words in bold.

Some years ago, a **microprocessor**, which was the heart of a computer, was really primitive but very fast. It manipulated groups of **binary numbers** – numeric values represented in only two symbols: 0 and 1. Microprocessor operated binary numbers, representing parts of objects, and moved them around, added pairs together, subtracted one from another, compared a pair, etc. As an example, computer **display** consisted of a bunch of coloured points called pixels. A pixel was an object. It had a position which consisted of the row and column it was in. Its colour was specified as three numbers – called RGB (Red, Green, Blue) values. The pioneers of computers wrote code in **machine language**, but no one does it these days.

Task 11. Complex Task

Read the article about one of the trends in programming. Answer the following questions:

1. What does the author mean by saying “programming is no longer the sole preserve of an engineering priesthood”?
2. What is the problem of the current approach to the software development?
3. Why is such an approach dangerous?
4. How can we paraphrase the statement “a way to hit reset”?
5. How can the current situation be changed?

The Future of Programming

Programming is changing. The PC era is coming to an end, and software developers now work with an explosion of devices, job functions, and problems that need different approaches from the single machine era. In our age of exploding data, the

ability to do some kind of programming is increasingly important to every job, and programming is no longer the sole preserve of an engineering priesthood.

Nevertheless, it's worth examining the house of cards we're building with our current approach to software development. The problem is simple: the brain can only fit so much inside it. To be a programmer today, you need to be able to execute the program you're writing inside your head.

When the problem space gets too big, our reaction is to write a framework that makes the problem space smaller again. And so we have operating systems that run on top of CPUs, libraries and user interfaces that run on top of operating systems, application frameworks that run on top of those libraries, web browsers that run on top of those, JavaScript that runs on top of browsers, JavaScript libraries that run on top of JavaScript. And we know it won't stop there.

We're like ambitious waiters stacking one teacup on top of the other. Right now, it looks pretty wobbly. We're making faster and more powerful CPUs, but getting the same kind of subjective application performance that we did a decade ago. Security holes emerge in frameworks that put large numbers of systems at risk.

Why should we use computers like this, simultaneously building a house of cards and confining computing power to that which the programmer can fit in their head? Is there a way to hit reset on this view of software?

(The text is borrowed and modified from <http://radar.oreilly.com/2013/01/the-future-of-programming.html> as of 20th March 2013)

Lesson 4

Whole-Class Activity

Task 12. Check the results of Tasks 1-2 from your home assignment (10 minutes).

Task 13. Be ready to report the results of your Internet search (Task 3). Ask each other questions about programming prodigies (10 minutes).

Task 14. In groups, discuss the following questions. Consult the information box if necessary (5 minutes):

1. What are the steps of software creation?
2. At what step of software creation can a test case be used?
3. What is the purpose of a test case?
4. What can be checked using a test case?
5. What are the sections of a test case?
6. What sections of a test case are the most important?
7. What additional sections may also be included?



A **test case** in software engineering is a set of conditions or variables under which a tester will determine whether an application or software system is working correctly.

A test case is usually a single step, or a sequence of steps, to test the correct behaviour/functionality, features of an application. An expected result or expected outcome is usually given.

The sections of test case often include:

- test case ID
- test case description
- related requirements (equipment, environment)
- author
- test step or order of execution number
- expected result
- actual result
- pass/fail
- remarks

Task 15. Read the following style guide on writing a test case. Judging from the content of the text and Task 14, decide which parts are essential and which are optional in the test case (15 minutes).

Test Case Style Guide

A good test case is one which has higher probability of finding defect(s) that are not already discovered. Writing good test cases is very important for testing to be successful. There are four main fields in a test case:

- 1) **Test case name.** This field is the main way to identify a test case. It is a short, direct description about what the test is intended for.

Examples:

- [ADM0110] Create an account

2) **Description.** This field should explain what the test case is about, in order to complement the Name.

Examples:

- Test case: [ADM0110] Create an account

Description: Creation of an account with rights to perform basic operations.

3) **Steps.** Steps are probably the most important field of a test case. It describes in a detailed sequence what have to be done in order to achieve the test case results. Steps need to be precise, nonambiguous and easy to follow.

Example:

- Login with Openbravo user
- Go to General setup->Application->Instance Activation
- Check that Subscription status is Inactive
- Click in “Register Online” button
- Select Testing as “Main Purpose”
- Click Ok

4) **Expected results.** As a consequence of the execution of the test cases, something has to be observed in the application. That will lead test executor to decide whether execution was successful or not.

Example:

- A “Process completed successfully” message is displayed.
- The Subscription Status is now Active.

Remember that test cases should be as detailed as possible and should not be written at high level. Writing detailed test steps is very important.

Write test cases in simple plain English that can be understood by anybody who is reading it, do not try to use words or sentences that can lead to ambiguity. This point is very important as your test cases might be reviewed or executed by your counter parts who can be from a different country. Remember, intelligence lies in making complicated things look simple and not in making simple things look complicated.

(The text is borrowed and modified from <http://www.softwaretestingsoftware.com/test-case-example/> and http://wiki.openbravo.com/wiki/Test_Case_Writing_Guidelines as of 17th May 2013)

Task 16. Analyse the following test case and answer the questions (5 minutes):

- What ID and name does the test case have?
- What is the purpose of the test case?
- Who is the test case written by?
- What equipment and environment are needed to perform the test case?
- How many steps does the test case have?

- What should be done in the first step of the test case?
- What is the expected result of the second step?
- What should happen after the third step is complete?

Test case ID:	GTH5678	
Test case name:	Save a file: test for invalid characters in filename	
Author:	Test Engineer 4	
Test equipment/environment	PC with word processing software installed	
Test setup		
Step number	Description	Expected result
1	Left-click on the Save File icon	Word processor displays the Save As window
2	In the Filename field: enter a file name consisting of < 254 characters with one of the following characters somewhere in the filename: “Greater than” sign (>) “Less than” sign (<) Quotation mark (“) Colon (:) Semicolon (;) Left-click the <Save> button	Error message: “The filename, location or format is not valid. Type the filename and location in the correct format”
3	Left-click the <OK> button on the error message. Press <Escape> key to exit the Save function	Return to document screen

(The text is borrowed and modified from <http://www.codentest.com/manualTestCases.php> as of 19th May 2013)

Differentiated Activity

Task 17. Tiered Task

Choose and complete any part of this task. You have 10 minutes to do this task and check the results.

Part 1. Having analysed the test cases from Tasks 16 and 18, make up a template for a test case.

Part 2. Compare test cases A and B and answer the following questions:

What is the purpose of these test cases?

What do they have in common and what is different?

What is the result of each test case?

A.

Test case ID: 001				
Author: Test Engineer 1				
Description: Test "Save" button with valid values in mandatory fields				
Test steps:		Expected Result	Actual Result	Status
Step 1	Enter valid values in "Name"	The information should be saved	The information is saved	Pass
Step 2	Enter valid values in "Email"			
Step 3	Click "Save"			

B.

Test case ID: 002				
Author: Test Engineer 1				
Description: Test "Save" button with invalid values in mandatory fields				
Test steps:		Expected Result	Actual Result	Status
Step 1	Enter invalid values in "Name"	The information should not be saved. System should request the user to enter valid values.	The information is not saved. System does not request the user to enter valid values.	Fail
Step 2	Enter invalid values in "Email"			
Step 3	Click "Save"			

Part 3. Compare test cases C and D and answer the following questions:

What do these test cases have in common and what is different?

Which test case is better and why?

What sections can be added to the form of these test cases?

C.

Step #	Step Description	Expected Result
Step 1	Login to test application with valid user ID/Password	Home page is displayed
Step 2	Click "Logout" link on home page	Login page is displayed

D.

Step #	Step Description	Expected Result
Step 1	Open URL http://www.example.com/login.asp	Login page is displayed and contains the below fields: a) "User Name" text field b) "Password" text field c) "Submit" button
Step 2	Once Login page is displayed, enter valid user ID/password a) Enter "User1" in "User Name" text field b) Enter "1111" in "Password" text field	a) Verify "User Name" is populated with text "User1" b) Verify text entered in "Password" field is masked and is not readable
Step 3	Click "Submit" button	Verify application "Home" page is displayed a) Verify "Home" page displays "Welcome User1" message on top left navigation Menu b) Verify left Navigation menu contains links "Directory", "Submission", "Latest Links", "Logout"
Step 4	Click "Logout" link on the left menu	Verify user is successfully logged out of the application and application login page is displayed

(The texts are borrowed and modified from <http://www.softwaretestingsoftware.com/test-case-example/> as of 17th May 2013)

Task 18. Listening

You are going to watch a video about writing effective test cases. Choose any part of the task you feel confident to complete or do them all (10 minutes).

Use the following link to watch the video:

<http://www.youtube.com/watch?v=7BKUn5TzAIE>

Part 1. Insert the words into the gaps:

Writing effective test cases will help whoever is (1)..... the test case. To start off, you should have (2)..... steps in a test case. If you only have a couple of test steps, use a checklist instead. When you write a test case, you don't need to specify the (3) result for each test step, if the result is obvious. However, when testers report (4) based on the test case, they should indicate which test step (5) This will make (6) easier. If your test case has too many (7) you should break it up into smaller sets. Long test cases may be confusing for the developer who has to fix the (8) as well as future testers who would have to (9) all the steps to test it. Lastly, only use pre-conditions if you need

them. For example, if you have to load a set of customers into the (10) before testing begins then you need pre-condition. If not, leave the field it blank.

(The text and the record are borrowed and modified from <http://www.youtube.com/watch?v=7BKUn5TzAIE> as of 22d May, 2013)

Part 2. Answer the following questions:

1. Who can an effective test case help?
2. How many steps should a test case have?
3. What doesn't need to be done for each test step if the result is obvious?
4. What can make troubleshooting easier?
5. What should be done if a test case has too many steps?
6. When should pre-conditions be used?

Part 3. Name four tips for writing a successful test case which were mentioned in the record. Make notes while listening if necessary.

Task 19. Tiered task

Choose any part of the task you feel confident to complete or do them all. You have 10 minutes for this activity.

Part 1. Insert the words in the gaps.

- (1).....: B 001
 Test Description: verify bold formatting to the text
- (2).....: Thomas Jackson
 Function to be tested: bold formatting to the text
 Environment: (3)
- Test Execution:
1. Open (4)
 2. Open new document
 3. (5) any text
 4. Select the text to make(6)
 5. Click **Bold**
- (7) Result: Applies bold formatting to the text
- (8) Result: **pass**

Part 2. Deduce and insert the missing parts of the test case.

Test Case #: 2.2

Test Case Name: (1).....

Designed by: ABC

Short Description: Test the ATM Change PIN service

Pre-conditions

- The user has a valid ATM card
- The user has accessed the ATM by placing his ATM card in the machine
- The current PIN is (2)
- The system displays (3)

Step	Action	Expected System Response	Pass /Fail	Comment
1	(4)	The system displays a message asking the user to enter the new PIN		
2	Enter '5555'	The system displays a message asking the user to confirm (re-enter) the new PIN		
3	(5)	The system displays a message of successful operation The system asks the user if he wants to perform other operations		
4	Click 'YES' button	(6)		

(The text is borrowed and modified from http://faculty.ksu.edu.sa/ghazy/CSC342_Tools/Test%20Case%20Template.pdf as of 22d May, 2013)

Part 3. Write a short test case to ensure that application behaves correctly if a printer is not available.

Task 20. Project work

Imagine that your company is going to release a new browser game this month. You have been divided into three teams in order to test the game for the following:

Team 1. Prepare a test case to ensure that the game starts properly.

Team 2. Prepare a test case to ensure that the game shows “Save” window when exiting the game.

Team 3. Prepare a test case to ensure that audio settings of the game work properly.

Divide responsibilities inside your team so that everyone is involved. Remember that your test case should have the following parts:

- *Test ID*
- *Test name*
- *Pre-conditions*
- *Steps descriptions*
- *Expected result*
- *Actual result (pass / fail)*

After completing the test case, pass it to the other team for peer-checking. You have 15 minutes to perform and check the task.

Home Assignment

Do Task 4 from Workbook section.

Optional Activity

Task 21. Facilitated Task

Read the following test case. Some parts have been removed from their places. Restore the original form of the test case by placing the extracts 1-8 into the gaps (a-h).

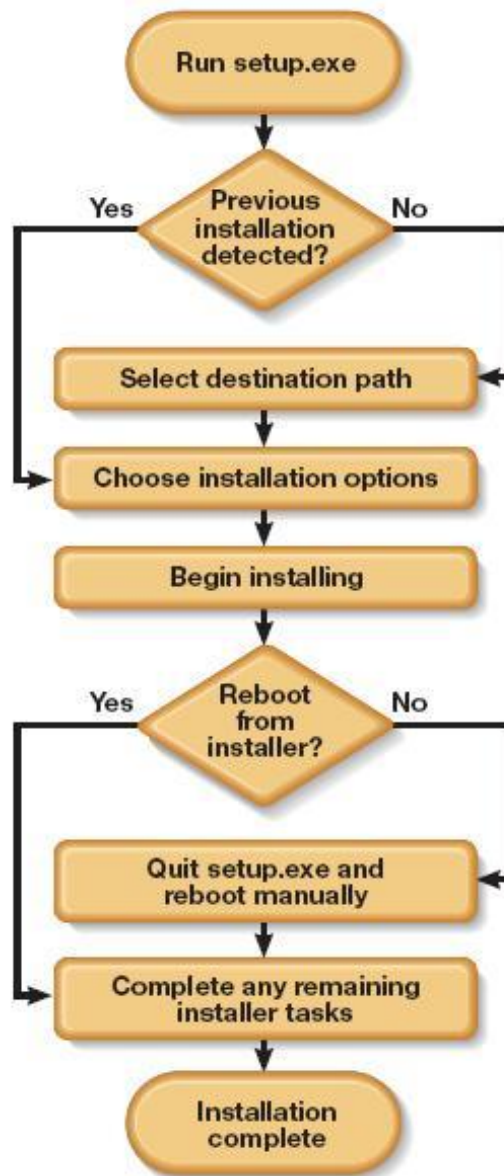
1. Enter Valid username and invalid password, click on Sign In button
2. The error message is displayed below username text field saying “Enter the correct password above”
3. The welcome page is opened
4. The error message is displayed saying “Enter your email address and password”
5. Enter only valid password and click on Sign In button
6. Enter valid username and password and click on Sign In button
7. Enter invalid username and password and click on Sign In button
8. The welcome page is opened

Step #	Step Description	Expected Result	Status
1	Open the browser and enter www.gmail.com in the URL and either double click or hit Go button on the browser	(a).....	
2	(b).....	The Inbox page is opened	
3	Logout from the session	(c).....	
4	Enter only valid password and click on Sign In button	(d).....	
5	(e)	The error message is displayed below username text field saying “Enter your email address”	
6	Directly click on Sign In button	(f)	
7	(g)	The error message is displayed below password text field saying “Enter the correct password above”	
8	(h)	The error message is displayed below username text field saying “Enter your email address and password”	

(The text is borrowed and modified from <http://www.docstoc.com/docs/55162489/Sample-Test-Case-Writing> as of 4th April, 2013)

Task 22. Complex Task

Look at the following flowchart describing the procedure of software installation. On the basis of this flowchart, write your test case using the templates from this unit as examples.



(The picture is borrowed from <http://www.softwaretestinghelp.com/software-installationuninstallation-testing/> as of 4th April, 2013)

WORKBOOK

Task 1. Tiered Task

Part 1. Insert the following words / phrases in the gaps. Translate the sentences into your native language.

perform	compare	machine language	interact
subtract	convert	high-level language	develop

1. While easily understood by computers, is almost impossible for humans to use because it consists entirely of numbers.
2. It is very important to user-friendly interface and make software easy to use.
3. If you 2 from 7, the answer is 5.
4. CPU can various operations very fast which makes it a useful tool in many human activities.
5. Programs written in are translated into assembly language by a compiler.
6. GUI allows users to with electronic devices using images rather than text commands.
7. When you a file, the copy of it will appear on the desktop.
8. It is hard to modern programming languages with machine code.

Part 2. Replace the words in bold with their synonyms.

1. The process of software development includes such **stages** as program writing, compiling, running and debugging.
2. Unlike modern devices, the earliest computers were **huge** building-sized machines.
3. Several versions of the program were launched after the **initial** release.
4. Today, most people don't need to know how a computer **works**.
5. In assembler, the operations that the microprocessor **performs** are given names.
6. **Instructions** written in high-level languages are converted into machine code with the help of compiler.
7. Nowadays the term refers purely to fixing **bugs** and problems in source code of the program.
8. Programming is **breaking** a task **down** into small steps.

Part 3. Fill in the gaps with the derivatives of the words in capitals.

A programming language is used to write computer programs and 1) A program is written as a series of human	APPLY
---	-------

2) computer commands that can be read by a	UNDERSTAND
3) and translated into machine code so that a computer can run it. From the moment you turn on your computer, it is running programs and carrying out 4)..... Each and every	COMPILE
5).....that your computer performs has instructions that someone had to write in a 6)language. Nowadays such languages, as Java and C++ with C# are continuing to gain7)..... There have been many attempts to automate this process, and have computers write computer programs but the 8)is such that for now, humans still write the best computer programs.	INSTRUCT OPERATE PROGRAM
	POPULAR
	COMPLEX

(The text is borrowed and modified from <http://cplusplus.about.com/od/introductiontoprogramming/p/programming.htm> as of 4th April, 2013)

Task 2. Tiered Task

Read the text and do at least one part of the task after reading.

The Tower of Babel – A Comparison of Programming Languages

These days, programming languages are becoming more and more general and all-purpose, but they still have their specializations, and each language has its disadvantages and advantages. Here is the comparison of the most popular programming languages.



C++ is well-suited for large projects because it has an object-oriented structure. People can collaborate on one program by breaking it down into parts and having a small group or even one individual work on each part. The object-oriented structure also allows code to be reused a lot, which can cut down development time. C++ is also a fairly efficient language – although many C programmers will disagree.

C is a popular language, especially in game programming, because it doesn't have the extra packaging of the object-oriented C++. Programmers use C because it makes programs faster and smaller than programs written in C++. You might wonder, however, whether it's worth giving up the reusability of C++ to get the small increase in performance with C, especially when C++ can, where necessary, be written in a C programming style.

Pascal is primarily a teaching language. Few industrial programs are written in Pascal. Pascal tends to use keywords instead of braces and symbols, so it is a bit easier for beginners to understand than languages like C++. Still, not everyone thinks Pascal is just for the schools. Borland, the huge compiler software company, has been

pushing Delphi, which is an object-oriented version of Pascal, as an industrial strength programming language.

Fortran is a number-crunching program, and it is still used by scientists because the language allows variables of any size up to the memory limit of the machine. Fortran is especially convenient for engineers, who have to mathematically model and compute values to high precision. Fortran, however, isn't nearly as flexible as C or C++. Programming in Fortran is rigid and has strict rules, which sometimes makes reading Fortran programs difficult.



Java is a multi-platform language that is especially useful in networking. Of course, the most famous usage of Java is on the web, with Java applets, but Java is also used to build cross-platform programs that stand alone. Since it resembles C++ in syntax and structure, learning Java is usually quite easy for most C++ programmers. Java offers the advantages provided by object-oriented programming, such as reusability; on the other hand, it can be difficult to write highly efficient code in Java, and Swing, its primary user interface, is notoriously slow. Nevertheless, Java has increased in speed in recent years, and version 1.5 offers some new features for making programming easier.

(The text is borrowed and modified from <http://www.cprogramming.com/langs.html> as of 14th April, 2013)

Part 1. Compare C++ with other programming languages and tick the language which is better in the following aspects. Justify your answer.

		C ++	C
1.	Efficacy		✓
2.	Performance		
3.	Reusability		
	-----	C ++	Pascal
4.	Easiness		
5.	Prevalence		
	-----	C ++	Fortran
6.	Flexibility		
	-----	C ++	Java
7.	Speed		
8.	Easiness		

Part 2. Fill in the table with the information from the text.

#	Programming language	Sphere of Use	Advantages	Disadvantages
1	C ++	Large projects	Reusability, ...	Less efficient than C

2	C			
3	Pascal			
4	Fortran			
5	Java			

Part 3. Write your own short description of any programming language, which wasn't mentioned in the text.

Task 3. Internet Search

Visit the following link http://www.youtube.com/watch?v=DBXZWB_dNsw, or find any other source of information about prodigy programmers and be ready to retell their story. Mention the following information:

1. Name, country;
2. Age, education;
3. Field of interests;
4. Personality;
5. Story of programming success.

Task 4. Writing

Imagine that you are offered to test a better version of a new online game.

Part 1. Create a test case to ensure that you can log in a system.

Part 2. Create a test case to ensure that you can create an account in the system.

Part 3. Create a test case to ensure that you can receive a reminder of your password if you have forgotten one.

Remember that your test case should contain the following parts:

- case ID;
- test case description;
- related requirements (equipment, environment);
- author;
- test step or order of execution number;
- expected result;
- pass / fail.

Unit 3. Expert System

Lesson 5

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about expert systems. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. What kind of complicated tasks can a computer perform?
2. Is it rational to trust a computer in the sphere of health care?
3. In what areas is computer analysis better than human expertise?

Practical Concern

1. What does the term “expert system” mean?
2. In what way are expert systems connected with artificial intelligence (AI)?
3. Where can AI devices be applied?

Analytical Concern

1. What are the advantages of computer expert systems?
2. What are the disadvantages of computer analysis?
3. In what spheres is it possible to use computer analysis only?

Creative Concern

1. How did sci-fi writers see the possibilities of AI technologies?
2. What home appliance would benefit from the use of AI the most?
3. How will AI technologies look like in 20 years?

Task 2. Reading

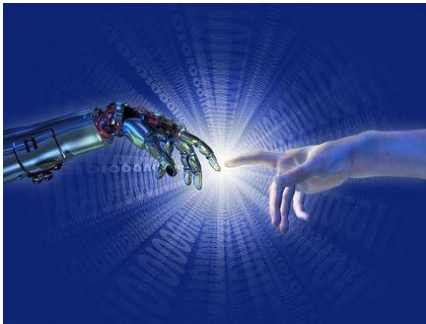
Read the text about expert systems and answer the questions. You have 20 minutes for this activity.

1. What is an expert system?
2. What structure does an expert system have?
3. What is knowledge base expressed with?
4. What is an inference engine?
5. What are the ways to run an inference engine?
6. In what spheres are expert systems used?

Simulating Human Thought

There is a class of computer programs, known as **expert systems** that aim to simulate human reasoning. The methods and techniques used to build these programs are the outcome of efforts in a field of computer science known as Artificial Intelligence (AI).

An expert system has a unique structure, different from traditional computer programming. It is divided into two parts: one fixed – the inference engine and one variable – the knowledge base. To run an expert system, the engine reasons about the knowledge base like a human. In the 80s a third part appeared: a dialog interface to communicate with users.



In expert system technology, the **knowledge base** is expressed with natural language rules IF ... THEN ... For example:

"IF it is living THEN it is mortal"

"IF his age = known THEN his year of birth = current year - his age in years"

This formulation has the advantage of speaking in everyday language which is very rare in computer science (a classic program is coded). Nevertheless, there exist other formulations of rules, which are not in everyday language, understandable only to computer scientists. Each rule style is adapted to an engine style.

The **inference engine** is a computer program designed to produce a reasoning on rules. In order to produce a reasoning, it should be based on logic. With logic, the engine is able to generate new information from the knowledge contained in the rule base and data to be processed.

The engine has two ways to run: batch or conversational. In batch, the expert system has all the necessary data to process from the beginning. For the user, the program works as a classical program: he provides data and receives results immediately. Reasoning is invisible. The conversational method becomes necessary when the developer knows he cannot ask the user for all the necessary data at the start, because the problem is too complex. The software must "invent" the way to solve the problem, request the missing data from the user, gradually approaching the goal as quickly as possible. The result gives the impression of a dialogue led by an expert.



Expert systems have been built to diagnose disease, find mineral deposits, translate natural languages and solve complex mathematical problems. Other spheres of its use include interactive or conversational applications, voice server, fault

diagnosis, decision support in complex systems, process control, interactive user guide, educational and tutorial software, logic simulation of machines or systems etc.

A strong interest in using expert systems is that this kind of software is able to give the user clear explanation of what it is doing (the “Why?”) and what it has deduced (the “How?”). Nevertheless, expert systems still remain supplements, rather than replacements, for human experts.

(The text is borrowed and modified from <http://www.perfectlogic.com/articles/AI/ExpertSystems/ExpertSystems.html> and http://en.wikipedia.org/wiki/Expert_system as of 1st June, 2013)

Task 3. Vocabulary Practice

Match the terms (1-8) with their definitions (a-g). You have 5 minutes for this task.

1. Expert system	a. a set of digitized facts, rules, cases, and models
2. Knowledge base	b. computer program designed to produce a reasoning on rules
3. Inference engine	c. a class of computer programs that aim to simulate human reasoning
4. Batch method	d. way of inference engine work, when the software request the missing data from the user, gradually approaching the goal
5. Conversational method	e. a process of finding faults arising in systems
6. Fault diagnosis	f. a computer program which purpose it is to assist users in learning something
7. Tutorial software	g. way of inference engine work, when the expert system has all the necessary data to process from the beginning

Task 4. Vocabulary Practice

There are several suffixes in English which help to form nouns from verbs. Study the following examples of these suffixes and after doing so, make up derivatives from the words in brackets. You have 5 minutes for this task.

- tion** (generate – generation, calculate – calculation)
- ment** (judge – judgment, punish – punishment, move – movement)
- ing** (draw – drawing, code – coding, debug – debugging)
- ence** (differ – difference, present – presence)
- er, -or** (manage – manager, develop – developer, create – creator)

Expert systems are computer (**apply**) that combine computer (**equip**), software, and specialized (**inform**) to imitate expert human (**reason**) and advice. As a branch of artificial intelligence, expert systems provide discipline-specific (**maintain**), advice and (**explain**) to their (**use**). While artificial intelligence is a broad field covering many aspects of computer-generated (**think**), expert systems are more narrowly focused. Typically, expert systems function best with specific activities or problems and specific database of facts and rules. Expert systems are used widely in commercial and industrial (**set**), including medicine, finance, (**manufacture**), and sales.

(The text is borrowed and modified from <http://www.referenceforbusiness.com/encyclopedia/Ent-Fac/Expert-Systems.html> as of 1st June, 2013)

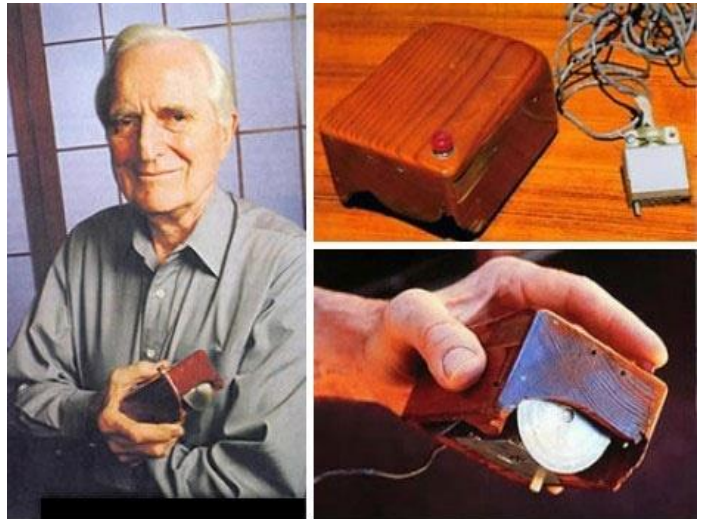
Task 5. Language in Use

Passive voice is often used in the field of scientific and professional communication. Study the table below where the grammatical peculiarities of Passive voice are explained. After doing so, transform the active sentences into passive ones. You have 10 minutes for this task.

Passive Voice		
<p>Passive voice is a specific grammatical form of Verbs. Passive voice is used when the focus is on the action and it is not important or not known who or what is performing the action. Passive voice is formed with the help of the verb <i>be</i> in appropriate tense form and <i>past participle</i>. When changing active sentence into passive sentence note that:</p> <ul style="list-style-type: none"> • the object of the active sentence becomes the subject of the passive sentence • the subject of the active sentence becomes the object of the passive sentence (or is dropped) 		
Tense	Voice	Example
<u>Present Simple</u>	Active	Developers create expert systems to diagnose disease.
	Passive	Expert systems are created (by developers) to diagnose disease.
<u>Past Simple</u>	Active	Developers created expert systems to diagnose disease.
	Passive	Expert systems were created to diagnose disease.
<u>Present Perfect</u>	Active	Developers have created expert systems to diagnose disease.
	Passive	Expert systems have been created to diagnose disease.
<u>Past Perfect</u>	Active	Developers had created expert systems to diagnose disease.
	Passive	Expert systems had been created to diagnose disease.

<u>Future Simple</u>	Active	Developers will create expert systems to diagnose disease.
	Passive	Expert systems will be created to diagnose disease.
<u>Present Continuous</u>	Active	Developers are now creating expert systems to diagnose disease.
	Passive	Expert systems are being created to diagnose disease.
<u>Past Continuous</u>	Active	Developers were creating expert systems to diagnose disease.
	Passive	Expert systems were being created to diagnose disease.
Modal verbs	Active	Developers can create expert systems to diagnose disease.
	Passive	Expert systems can be created to diagnose disease.

1. Konrad Zuse developed the first electro-mechanical computer in 1939.
2. Hackers release over 6,000 new computer viruses every month.
3. Dough Engelbart constructed the first computer mouse in 1964.
4. People register over 1 million domain names every month.
5. People created the first hard drive which could hold 5 MB of data in 1979.
6. An average video card uses 200 million transistors.
7. Artificial intelligence system can compose music in the style of the composers of the past.
8. People released first web browser Mosaic in 1993.
9. People consider Alan Turing to be the father of AI.
10. People will use more than 2 billion computers in 2015.



Differentiated Activity

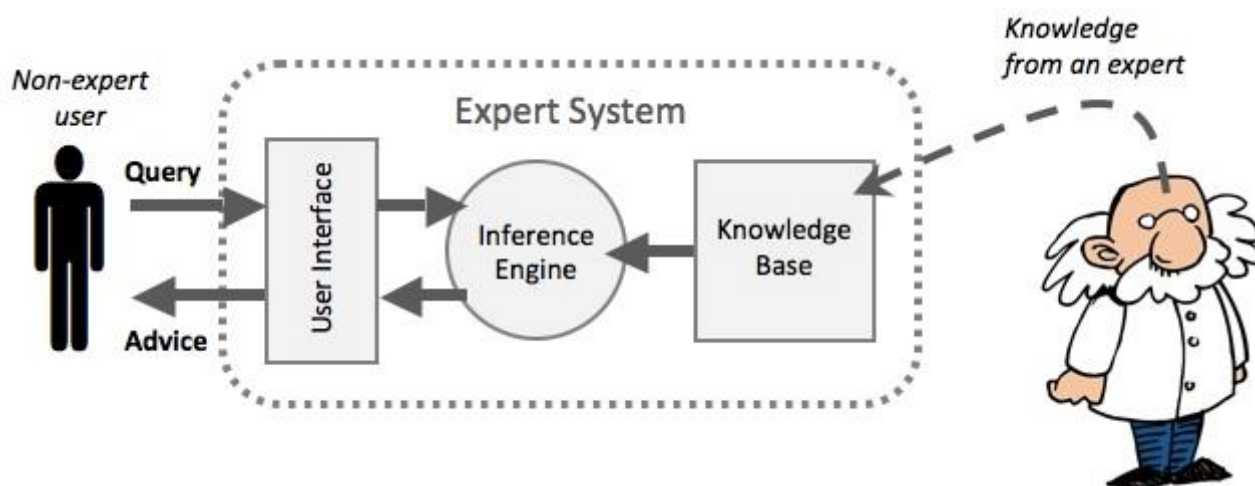
Task 6. Group activity

In groups, study the content of the text from Task 2 once more and accomplish one of the following tasks. Report your findings to the class. You have 10 minutes for this task.

Part 1. Make up synonyms or give an explanation to the following words from the text. Explain their meaning to your group mates, so that they can guess what word you are talking about.

Simulate, outcome, field, to reason, rare, conversational, provide, complex, fault, to deduce, supplement, replacement.

Part 2. Explain the following scheme. Choose the appropriate title for it.



Part 3. Make a list of the fields where an expert system can be used and explain how. From the list you have made, choose the sphere where an expert system is most needed and the sphere, where it is not demanded.

Task 7. 🎧 Listening

You are going to watch a video about an expert system. Choose whatever part you feel confident to complete or do them all. You have 10 minutes for the task. Use the following link to watch the video: <http://vimeo.com/43587551>.

Part 1. Fill in the gaps with the missing information.

COGITO is 1) semantic intelligence platform. It is a technology that takes any kind of text 2) in any kind of format and 3) a deep linguistic analysis by going through all the different steps which lead up to the semantic 4)

..... . The system is then able to understand the meaning of words based on their 5) The outcome of the analysis is the 6) , basically, a structured representation of the content, which is then used to run different kinds of 7) from semantic searchers, to automatic categorization, to competitive intelligence 8) , to natural language interfaces – all which enable a very 9) , fast and precise automatic management of 10) information.

Part 2. Complete the sentences and make up definitions of the terms.

1. COGITO is ...
2. Semantic analysis enables system to ...
3. Conceptual map is basically ...
4. The first feature of COGITO is ...
5. The second important feature is ...

Part 3. Explain the two important features of the COGITO system using the sentences given in the text as examples.

Task 8. Pair work

Write down 5 sentences with Active verbs on a separate piece of paper. After doing so, switch papers with your partner and rewrite the received sentences using Passive Voice. You have 10 minutes for this task.

Task 9. Team work

You are going to be divided into 2-3 teams. Each team chooses the captain and the name of the team.

In every team, you have to make a list of advantages and disadvantages of the use of artificial intelligence devices. Try to make your lists as long as possible. You have 5 minutes for this task. After that teams read the points from the lists they have made one by one and discuss them if necessary. The team, which has the longest list of advantages or disadvantages wins.

You have time until the end of the class for this activity.

Advantages

Disadvantages

.....

.....

Home Assignment

Do Tasks 1-3 from Workbook section.

Optional Activity

Task 10. Facilitated Task

a) Read the following text. The underlined verbs belong to Future Simple tense and denote things which will happen in future. Analyse these grammatical forms and deduce the rules of forming Future Simple tense.

An expert system is a program running on a computer. Like a human expert, it knows a lot about a subject. People can ask the expert system a question. The **expert system will use** a set of rules and give answers to the question. This method of automatic reasoning belongs to a field of computer science called artificial intelligence.

Different groups of people can have different kinds of access to an expert system. The people managing the network of computers have different needs than the office worker or secretary.

Expert systems are made of a set of facts, rules and principles, a set of data that is solved using its expertise and a user interface.

When they are asked a question, **they will filter** the data with the rules they have. After that **they will give back** a result, or ask an additional question.

b) Rewrite the text in Future Simple tense.

Task 11. Complex Task

Read The New York Times article about the advances in AI. Answer the following questions:

1. What is “deep learning”?
2. What examples of advances in AI are given in the article?
3. Which example is most striking in your opinion?
4. In what sphere has computer outperformed human?
5. What are the possibilities of using AI at conferences?
6. What does the phrase “There’s no looking back now” from the last paragraph mean?

Scientists See Promise in Deep-Learning Programs

The advances in artificial intelligence have led to widespread enthusiasm among researchers who design software to perform human activities like seeing, listening and thinking. They offer the promise of machines that converse with humans and perform tasks like driving cars and working in factories, raising the spectre of automated robots that could replace human workers.

The technology, called deep learning, has already been put to use in services like Apple’s Siri virtual personal assistant. But what is new in recent months is the

growing speed and accuracy of deep-learning programs, often called artificial neural networks or just “neural nets” for their resemblance to the neural connections in the brain.

In October (2012), for example, a team of graduate students studying with the University of Toronto computer scientist Geoffrey E. Hinton won the top prize in a contest sponsored by Merck to design software to help find molecules that might lead to new drugs. From a data set describing the chemical structure of thousands of different molecules, they used deep-learning software to determine which molecule was most likely to be an effective drug agent.

Advances in pattern recognition hold implications not just for drug development. Deep-learning systems have recently outperformed humans in certain limited recognition tests. Last year, for example, a program created by scientists at the Swiss A. I. Lab at the University of Lugano won a pattern recognition contest by outperforming both competing software systems and a human expert in identifying images in a database of German traffic signs. The winning program accurately identified 99.46 percent of the images in a set of 50,000; the top score in a group of 32 human participants was 99.22 percent, and the average for the humans was 98.84 percent.

Deep learning was given a particularly audacious display at a conference last month in Tianjin, China, when Richard F. Rashid, Microsoft’s top scientist, gave a lecture in an auditorium while a computer program recognized his words and simultaneously displayed them in English on a large screen above his head.

Then, in a demonstration that led to stunned applause, he paused after each sentence and the words were translated into Mandarin Chinese characters, accompanied by a simulation of his own voice in that language, which Dr. Rashid has never spoken.

In conclusion, we`d like to quote the words of Dr. Hinton referring to the rapid deep-learning advances made possible by greater computing power, and especially the rise of graphics processors:

“The point about this approach is that it scales beautifully. Basically you just need to keep making it bigger and faster, and it will get better. There’s no looking back now”.

(The text is borrowed and modified from http://www.nytimes.com/2012/11/24/science/scientists-see-advances-in-deep-learning-a-part-of-artificial-intelligence.html?_r=4&pagewanted=all& as of 1st June, 2013)

Lesson 6

Whole-Class Activity

Task 12. Check the results of Tasks 1-2 from your home assignment (10 minutes).

Task 13. Report the results of your Internet search to the class. Ask each other questions about your experience of having a conversation with Cleverbot (10 minutes).

Task 14. Discuss the following questions for 5 minutes. Turn to the help box if necessary:

1. What is a CV?
2. What does "CV" stand for?
3. What is the aim of a CV?
4. What is the necessary length of a CV?
5. What sections does a CV include?
6. How often should a CV be updated?
7. How important is a CV in the process of job search?
8. What style of language is used in a CV?
9. What is the most important information in a CV?



A **curriculum vitae (CV)** is a document which provides an overview of a person's experience and other

qualifications.

In some countries, a CV is typically the first item that a potential employer encounters regarding the job seeker and is typically used to screen applicants, often followed by an interview.

A CV is short (usually a maximum of two sides of A4 paper), and therefore contains only a summary of the job seeker's employment history, qualifications and some personal information. It is often updated to change the emphasis of the information according to the particular position for which the job seeker is applying.

A CV commonly includes the following sections:

- Personal information (name, address, phone number)
- Profile
- Skills and competences
- Work experience
- Education
- Interests

Task 15. Look through the following elements (1-13) and decide which sections of a CV they belong to. Place the elements into the template. You have 5 minutes for this task.

1. **SUMMARY OF QUALIFICATIONS**
2. **TECHNICAL SKILLS**
3. **PROFESSIONAL EXPERIENCE**
4. **EDUCATION**
5. *Talented Systems Analyst with expertise in requirements, testing, and implementation*
6. **ABC co., New York**
2007-Present
System Analyst for IT firm with 1, 500 employees
7. **JACOB REYNOLDS**
534 Dice Way | Tucson, AZ 857443
| 800-030-0030 |
jacob.reynolds@dice.com
8. Bachelor of Science in Information Systems
University of Arizona, Tucson, AZ (2000)
9. **DEF Inc, Washington**
2003-2007
System analyst/ Quality Assurance for major manufacturer with 2, 000 employees
10. **Programming:** SQL, Java, HTML/XML, C++, C, UNIX, Perl, Sybase
Applications: Microsoft Office Suite, Visio, MS Project, SAP, COBOL, Rational Rose
Databases: Access, Oracle, ASCII, DB2
Platforms: Microsoft Vista/XP/2003, Mac, Linux, Solaris
Networking: Ethernet, TCP/IP, VPN, LAN/WAN
11.
 - 8 years of experience as Systems Analyst with focus in business software and systems;
 - strong background working with clients, designers, and programmers to identify requirements, provide cost analysis, assist with creating user interfaces;
 - in-depth understanding of project lifecycle, including all phases of system and software development;
 - proven track record in testing, quality assurance, and networking;
 - superior communication, presentation, and interpersonal skills.
12.
 - Tested applications and resolved complex problems throughout software development life cycle (SDLC), including preparing detailed program specifications.
 - Played key role in design and development activities to ensure software requirements were met.
 - Participated in design analysis and pre- and post-installation reviews.

a.	<input type="checkbox"/>
b.	
c.	
d.	
e.	
f.	
g.	
h.	
i.	
j.	
k.	
l.	
m.	

13. – Maintained and supported systems for data warehouse.
- Performed data analysis, testing, debugging, audits, disaster recovery, and problem resolution.
 - Researched and evaluated technology solutions and presented recommendations for improved system operations.

Task 16. CV: Writing Techniques

Read the text about writing a CV. Answer the questions (15 minutes).

1. What sections of a CV are the most important?
2. What sections of a CV may be tailored according to a specific job?
3. What are the common mistakes / difficulties in writing a CV?

How to write a successful CV before applying for a job

A good curriculum vitae – or CV – is vital when looking for work, especially when there are numerous candidates for the same job, so what should it contain?



There is no perfect template, and each sector may require a different emphasis on a different aspect of the content, such as career history or qualifications.

However, experts suggest there are some basic rules on how a CV should be written and the information that should be included.

Overall, a CV should be neat and typed if possible. It should also be short, usually no more than two sides of A4. It should be positive, stressing achievements and strengths, and make a good impression in a clear and positive way.

The basic format for a CV includes:

- Personal details, including name, address, phone number, email address and possibly any professional social media presence;
- Career history, starting with your most recent job first. Include dates and temporary or voluntary jobs if appropriate;
- A personal profile which sells yourself and your qualities, tailored towards the job you are applying for;
- Achievements from previous jobs that are relevant;
- Qualifications and training from previous jobs, with the most recent first;
- Interests, if they are relevant and especially if the skills or teamwork concerned are relevant for the job;
- Any extra information, such as reasons for a career change or reasons for gaps in career history, such as caring duties;

- References, ideally two or more and including a recent employer.

Corinne Mills is a managing director of Personal Career Management, which offers careers coaching. She says that a straightforward font and formatting is required - and the spelling must be checked and checked again.

“Poor spelling is the quickest way of getting a rejection,” she says.

She adds that people should check five or six adverts for a particular job and then use the common requirements to mould their CV.

“Many people think that one CV will fit all applications, but it needs to be a very targeted document for the role they are going for. Do some research so you understand what employers are looking for.”

(The text is borrowed and modified from <http://www.bbc.co.uk/news/business-15573447> as of 16th March 2013)

Task 17. When writing a CV you will often feel the need to explain what kind of work you can do or what you have already done. Study the table and fill in the column with the words / phrases from the box. (5 minutes).

working with clients, cost analysis, testing, quality assurance, networking, data warehouse, data analysis, debugging, audits, disaster recovery, problem resolution, data verification methods, complex problems, detailed program specifications, design analysis, updating technical documentation, user account profiles and passwords.

Responsible for	
Assist	
Create and maintain	
Conduct	
Test	
Resolve	
Play key role in	
Participate in	
Perform	
Prepare	

Differentiated Activity

Task 18. Tiered task

You are going to watch a video about the most important tips in writing a CV. You have 10 minutes to do it and complete the tasks after listening. Use the following link to watch the video:

<http://www.youtube.com/watch?v=D2RHfzBLRzg>

Part 1. Fill in the missing information.

The best way to start your CV is with a (1) statement. Use a short (2) statement that grabs (3) and really sells you to the recruiter. This gets them interested and wanting to read more about you.

When (4) an overview of your (5) history, all you need to give are employers' names, dates and (6) Don't waste valuable time going into (7) with full job descriptions or specific (8); you can do this at the interview (9) A brief summary of your (10) is important too especially for younger people as most of your (11) comes from your time in education.

Including your (12) is very important as they demonstrate a commitment to delivering an (13), as well as an ability to work hard in pursuit of a goal. Finally, and probably most importantly, give your (14) to let your employer get in touch with you and offer the (15).....

Part 2. Answer the following questions.

1. What qualities should a profile statement have?
2. What shouldn't be done when providing an employment history?
3. Why is education summary important for young people?
4. What should be shown when writing about training courses?
5. How many interests may be provided in a CV?

Part 3. Give as many writing tips as possible to the suggested parts of a CV.

Profile statement	
Employment history	
Education	
Qualifications	
Training	
Interests	
Contact details	

Task 19. Tiered Task

As you have already got to know, only the most relevant information should be included into a CV. Read the following tasks and write a correct CV. You have 15 minutes for this task:

Part 1. Read the article about John Backus, filter the necessary for a CV information and compile his CV. You may add the missing information.

John Warner Backus was born in Philadelphia, Pennsylvania and grew up in nearby Wilmington, Delaware. He studied at the The Hill School in Pottstown, Pennsylvania, and was apparently not a diligent student. After entering the University of Virginia to study chemistry, he quit and was conscripted into the U.S. Army.

After moving to New York City he trained initially as a radio technician and became interested in mathematics. He graduated from Columbia University with a Master's degree in mathematics in 1949, and joined IBM in 1950. During his first three years, he worked on the Selective Sequence Electronic Calculator (SSEC); his first major project was to write a program to calculate positions of the Moon. In 1953 Backus developed the language Speedcoding, a high-level language created for an IBM computer.

In 1954 Backus assembled a team to define and develop Fortran for the IBM 704 computer. Fortran was the first high-level programming language to be put to broad use.

Backus spent the latter part of his career developing FL (from “Function Level”). FL was an internal IBM research project, and development of the language essentially stopped when the project was finished. Backus retired in 1991.

Backus was named an IBM Fellow in 1963, and was awarded a degree “honoris causa” from the Henri Poincaré University in Nancy (France) in 1989 and a Draper Prize in 1993.

(The text is borrowed and modified from http://en.wikipedia.org/wiki/John_Backus as of 16th September 2013)

Part 2. Look through the following CV and find mistakes. Rewrite the CV so that it would become more appropriate.

Alexander Rayman
Blackwood Street 65, Mallwill. 0877-456-456, rayman@mallwill.com Marital Status: married, wife – Jane Rayman, two daughters – Lisa and Janet
<i>Excellent system analyst with overwhelming experience in maintenance and support</i>
Qualifications <ul style="list-style-type: none"> - 5 years of experience in the sphere of system analysis - Strong background working with musicians, artists and photographers - In-depth understanding of the relationship in the company - Superior communication and managing skills
Technical Skills HTML / XML, Java, C++

Microsoft Word, Microsoft Exel, Microsoft Powerpoint Confident Internet user	
Professional Experience	
Goodwill Inc, Winstone	2010-Present
System analyst for huge manufacturing company <ul style="list-style-type: none"> - Performed data and process analysis - Researched verification methods and audits - Maintained and supported company software, servers, networks 	
MDN Lim, Mallwill	2008-2010
System Analyst / Content Manager for poor Internet company <ul style="list-style-type: none"> - Created and maintained site selling positions - Assisted development team - Created technical documentation for software and systems 	
Education	
1993-2003 – Mallwill public school “A” grades in Mathematics and Art 2003-2008 – Mallwill Technology Institute Degree in Computer Science	
Interests	
Fishing, power-lifting, modeling, reading, listening to music	

Part 3. Read the following information. On the basis of your experience and having analysed the CV from Task 15, organize the information into a proper CV, keeping in mind the structure and the order of the CV parts.

Alan Miller, 29, Brovenly Street, 23, Festburg

Study: Mallwill public school (1994-2000), Festburg specialized school (2000-2005). Visited school clubs in Math, Art and Football. Captained school football team.

Festbur University of Science (2005-2010). “A” grades in Math, Economy and Art. Degree in Computer Science. Selected as President of University and Sports Representative. Participated in scientific conferences dedicated to economical problems. 1st place in the Math contest of Festburg.

Work experience: Worked as shop assistant in 2009-2010 (“MC” Music Shop). Was responsible for delivering a friendly service, smiling, greeting and making an eye contact with every customer that comes to the store. Created sales reports. Quit because wanted to work as System Analyst.

After receiving a degree, started to work as Quality Assurance/ Tester. My responsibilities included writing test cases and performing tests to ensure the proper work of software.

From 2012 till present work as System Analyst in Golden bank. I maintain and support systems and also perform data analysis. Participate n testing of a software.

Task 20. Pair work

Role-play an interview at a prominent IT company for the position of a System Analyst. You have 15 minutes for this task.

Student A. You are an interviewer. Ask your partner questions about his / her goals, education, work experience and interests. Take notes while doing so.

Student B. You are an applicant. Prepare to answer the questions of your partner.

Switch the roles and after acting out your dialogues and having collected all the necessary information prepare a CV for your partner.

Home Assignment

Do Task 4 from Workbook section.

Optional Activity

Task 21. Facilitated Task

Look at the following CV. The headings of the sections have been removed from their places. Insert the headings into the gaps.

Curriculum Vitae	
(1) _____	Address,
(2) _____: Ann Kovalchuk	Date of birth,
(3) _____: 09/04/1990	Education,
(4) _____: Ukrainian	Working
(5) _____: T.Shevchenka Street 45, app.21, Kyiv	Experience,
(6) _____	Degree,
(7) _____: National Technical University of Ukraine “Kyiv Politechnik Institute”	Interests,
(8) _____: System Analysis	Name,
(9) _____	Nationality,
2010-present	Other skills,
System Analyst at BTM company, Kyiv – perform system analysis of data and support company systems	Personal information,
(10) _____	Establishment
Driving licence, C++ programming certificate	
(11) _____	
Programming, sports, tourism	

Task 22. Complex Task

Sometimes people write strange things on their CVs. Read the following sentences which have been taken from the CVs and find out what is wrong with them. Classify the mistakes and propose your correct variant.

1. Skills: “I can type without looking at the keyboard.”
2. References: “Please do not contact my immediate supervisor at the company. My colleagues will give me a better reference.”
3. Experience: “My father is a computer programmer, so I have 15 years of computer experience.”
4. Objective: “I want to play a major part in watching a company advance.”
5. Experience: “I’m a hard worker, etc.”
6. Languages: “Speak English and Spinach.”
7. Objective: “So one of the main things for me is, as the movie ‘Jerry McGuire’ puts it, ‘Show me the money!’”
8. Skills: “I have technical skills that will take your breath away.”

9. Objective: “I need money because I have bills to pay and I would like to have a life, go out partying, please my young wife with gifts, and have a menu entrée consisting of more than soup.”
10. Qualifications: “Twin sister has accounting degree.”
11. Skills: “Written communication = 3 years; verbal communication = 5 years.”
12. Education: “I possess a moderate education but willing to learn more.”
13. Education: “Have repeated courses repeatedly.”
14. Salary requirements: “The higher the better.”
15. Bad traits: “I am very bad about time and don’t mind admitting it. Having to arrive at a certain hour doesn’t make sense to me. What does make sense is that I do the job. Any company that insists upon rigid time schedules will find me a nightmare.”
16. References: “Bill, Tom, Eric. But I don’t know their phone numbers.”
17. Objective: “Student today. Vice president tomorrow.”
18. Experience: “Any interruption in employment is due to being unemployed.”
19. Interests: “Gossiping.”
20. Skills: “being bi-lingual in three languages”
21. Education: “I have a bachelorette degree in computers.”
22. Objective: “My dream job would be as a professional baseball player, but since I can’t do that, I’ll settle on being an accountant.”
23. Educational background: “High school was an incredible experience.”
24. Awards: “National record for eating 45 eggs in two minutes.”

(The text is borrowed and modified from <http://jobmob.co.il/blog/funniest-resume-mistakes/#ixzz2iFCS6Y2I> as of 16th September 2013)

WORKBOOK

Task 1. Tiered Task

Part 1. Insert the following words in the gaps. Translate the sentences into your native language.

expressed	based	translate	provides
reasons	adapted	simulate	

1. Expert systems aim to human reasoning
2. To run an expert system, the engineabout the knowledge base like a human.
3. The knowledge base iswith natural language rules
4. Each rule style is to an engine style
5. In order to produce a reasoning, an inference engine should beon logic.
6. Expert systems have been built to find mineral deposits andnatural languages.
7. The user data and receives results immediately.

Part 2. Fill in the gaps.

Expert system is a computer program that uses artificial (1) to solve problems within a specialized domain that ordinarily requires human expertise. The first expert system was (2) in 1965 by Edward Feigenbaum and Joshua Lederberg of Stanford University in California, U.S. Dendral, as their expert system was later known, was designed to (3) chemical compounds. Expert systems now have commercial (4) in fields as diverse as medical diagnosis, petroleum engineering, and financial investing.

In order to accomplish feats of apparent intelligence, an expert system relies on two (5): a knowledge base and an inference (6) A knowledge base is an organized collection of (7) about the system's domain. An inference engine (8) the facts in the knowledge base in order to provide an answer. Typical tasks for expert systems involve (9), diagnosis, monitoring, design, scheduling, and planning for specialized endeavours.

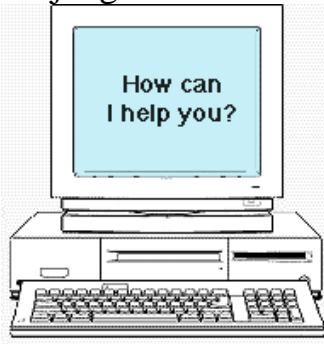
(The text is borrowed and modified from <http://www.britannica.com/EBchecked/topic/198506/expert-system> as of 1st June, 2013)

Part 3. Write a short description (5-6 sentences) of the way an expert system works. You may use the scheme from Task 6 as a scaffold.

Task 2. Tiered Task

Read the text and do at least one part of the task after reading.

In 1950, Alan Turing published his famous article "Computing Machinery and Intelligence", which proposed what is now called the Turing test as a criterion of intelligence. This criterion depends on the ability of a computer program to act as a human in a real-time written conversation with a human judge, sufficiently well that the judge is unable to distinguish reliably between the program and a real human. The



notoriety of Turing's proposed test stimulated great interest in Joseph Weizenbaum's program ELIZA, published in 1966, which seemed to be able to fool users into believing that they were conversing with a real human.

ELIZA's key method of operation (copied by chatbot designers ever since) involves the recognition of cue words or phrases in the input, and giving the output of corresponding pre-programmed responses that can move the conversation forward in a meaningful way (e.g. by responding to any input that contains the word 'MOTHER' with 'TELL ME MORE ABOUT YOUR FAMILY'). Thus an illusion of understanding is generated, even though the processing involved has been merely superficial. The key technique here is the production of responses that are sufficiently vague that they *can be understood* as "intelligent" in a wide range of conversational contexts.

Another example of a chatbot is **Cleverbot** – a web application that uses an artificial intelligence algorithm to converse with humans. It was created in 1997 by AI scientist Rollo Carpenter, who also created Jabberwacky, a similar web application.



Unlike other chatbots, Cleverbot's responses are not programmed. Instead, it "learns" from human input. Humans type into the box and the system finds all keywords or an exact phrase matching the input. After searching through its saved conversations, it responds to the input by finding how a human responded to that input when it was asked, in part or in full, by Cleverbot. Cleverbot participated in a formal, Turing Test at the 2011 Technische festival. Out of the 334 votes cast, Cleverbot was judged to be 59.3% human, compared to the rating of 63.3% human achieved by human participants. A score of 50.05% or higher is often considered to be a passing grade.

Chatbots are often integrated into the dialog systems of, for example, automated online assistants, giving them the ability of, for example, small talking or engaging in casual conversations. Large companies such as Lloyds Banking Group, Royal Bank of Scotland, Renault and Citroën are now using automated online assistants instead of call centres with humans to provide a first point of contact.

(The text is borrowed and modified from <http://en.wikipedia.org/wiki/Cleverbot> and <http://en.wikipedia.org/wiki/Chatterbot> as of 1st June, 2013)

Part 1. Answer the following questions.

1. What is the aim of the Turing test?
 - a. To test the ability of a computer to participate in written communication.

- b. To test the ability of a computer to act as a human.
 - c. To distinguish reliably between a computer and a human.
2. Joseph Weizenbaum's program ELIZA...
 - a. seemed to perform well at the Turing test.
 - b. wasn't able to converse with people.
 - c. was fooling people all the time.
 3. What is ELIZA's key method of operation?
 - a. Creation of an intelligent conversation.
 - b. Production of endless responses.
 - c. Recognition of the cue words and giving pre-programmed responses.
 4. Rollo Carpenter created Jabberwacky, which is...
 - a. another example of a chatbox.
 - b. application simulating the web.
 - c. AI science.
 5. How does Cleverbot create its responses?
 - a. It gives pre-programmed responses.
 - b. It searches through previous human responses and gives the matching phrase.
 - c. It creates the response using a complicated algorithm.

Part 2. Compare the two chatboxes – ELIZA and Cleverbot using the table below:

Name	ELIZA	Cleverbot
Date of creation		
Developer		
Turing test performance		
Key method of operation		

Part 3. In writing, give your own definition of a chatbot. How have the principles of a chatbot operation changed over time? Where can a chatbot be used? Give your own examples and ideas.

Task 3. Internet Search

Visit a Cleverbot site (<http://www.cleverbot.com/>) or any other chatbot and prepare to tell about your conversation. How would you rate the chatbot according to Turing test scale (%)? What are the weak and strong points of a conversation?

Task 4. Writing

Write your own CV for a System Analyst position. Keep in mind all the requirements you have learned and discussed in class.

Part 1. In your CV include the following information:

- Personal information;
- Profile;
- Skills and competences;
- Education;
- Interests.

Part 2. In your CV include the following information:

- Personal information;
- Profile;
- Summary of qualifications;
- Technical skills;
- Work experience (you may make up your previous job positions if you don't have any);
- Education;
- Interests.

Part 3. In your CV include the following information:

- Personal information;
- Profile;
- Summary of qualifications;
- Technical skills;
- Work experience (you may make up your previous job positions and your responsibilities there if you don't have any);
- Education;
- Interests;
- Notable achievements.

MODULE 2. NETWORKING SYSTEMS



At the end of this module Students will understand:

- how computer networks work;
- the principles of search engine operation;
- the difference between types of routers and their functions;
- the influence that the Internet has on professional and everyday life.



At the end of this module Students will know:

- notions of Computer Networks, the Internet and the World Wide Web;
- components of computer networks and their functions;
- types of computer networks;
- difference between the Internet and the World Wide Web.



At the end of this module Students will be able to:

- explain the structure of a networked system;
- define the functions of network components;
- relate some else`s words and make questions in professional communication;
- write a letter of application and a memo.

Unit 4. Computer Networks

Lesson 7

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about computer networks. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. What impact do computer networks have on our lives?
2. What are the benefits of computer networks?
3. What are the drawbacks of computer networks?

Practical Concern

1. What computer networks do you use?
2. What are the characteristics of computer networks?
3. What skills are needed to use computer networking technology?

Analytical Concern

1. What is the future of computer networks?
2. What aspects should be taken into account when establishing home network?
3. What are the risks of having your own computer network?

Creative Concern

1. What concepts are associated with computer networks?
2. How would you illustrate the work of computer networks?
3. Why are computer networks called that way? What other names can you suggest?

Task 2. Reading

Read the text about computer networks mark the statements as true (T) or false (F). Justify your answer. You have 20 minutes for this activity.

1. Computer networks allow computers to change data.
2. The Internet is the best-known computer network.
3. Computer networking is in the scope of computer science only.
4. Every user may access the information stored on other networked computers.
5. Hackers may use computer networks to spread viruses.

6. Power line communications does not interfere with radio communications. □
7. Computer networks stimulate the development of computer hardware and software. □

Connecting the Planet

A **computer network** or **data network** is a telecommunications network that allows computers to exchange data. In computer networks, networked computing devices pass data to each other along data connections. The connections between nodes are established using either cable media or wireless media. The best-known computer network is the Internet.



Network computer devices that originate, route and terminate the data are called network nodes. Nodes can include hosts such as servers and personal computers, as well as networking hardware. Two devices are said to be networked when a device is able to exchange information with another device.

Computer networking may be considered a branch of electrical engineering, telecommunications, computer science, information technology or computer engineering, since it relies upon the theoretical and practical application of the related disciplines. A computer network has the following properties:

- Facilitates interpersonal communications.
People can communicate efficiently and easily via email, instant messaging, chat rooms, telephone, video telephone calls, and video conferencing.
- Allows sharing of files, data, and other types of information.
Authorized users may access information stored on other computers on the network. Providing access to information on shared storage devices is an important feature of many networks.
- Allows sharing of network and computing resources.
Users may access and use resources provided by devices on the network, such as printing a document on a shared network printer.
- May be insecure.
A computer network may be used by computer hackers to deploy computer viruses or computer worms on devices connected to the network, or to prevent these devices from accessing the network (denial of service).
- May interfere with other technologies.



Power line communication strongly disturbs certain forms of radio communication, e.g., amateur radio.

- May be difficult to set up.

A complex computer network may be difficult to set up. It may be costly to establish an effective computer network in a large organization.

Today, computer networks are the core of modern communication. Telephony increasingly runs over the Internet Protocol, although not necessarily the public Internet. The scope of communication has increased significantly in the past decade. This boom in communications would not have been possible without the progressively advancing computer network. Computer networks continue to drive computer hardware, software, and peripherals industries. The expansion of related industries is mirrored by growth in the numbers and types of people using networks, from the researcher to the home user.

(The text is borrowed and modified from http://en.wikipedia.org/wiki/Computer_network as of 18th January 2013)

Task 3. Vocabulary Practice

Match the types of networking terms with their definitions. You have 5 minutes for this task.

1. repeater	a. connects and filters traffic between two network segments
2. hub	b. is used to connect network nodes via wire not originally designed for digital network traffic, or for wireless
3. network bridge	c. an electronic device that receives a network signal, cleans it of unnecessary noise, and regenerates it
4. network switch	d. an internetworking device that forwards packets between networks by processing the routing information included in the packet
5. router	e. a repeater with multiple ports
6. modem	f. a network device for controlling network security and access rules
7. firewall	g. a device that forwards and filters datagrams between ports based on the addresses in the packets

Task 4. Vocabulary Practice

Read the text and fill in the gaps (1-10) with the words (a-d). You have 10 minutes to complete this task.

A computer (1) is a group of computer systems and other computing hardware devices that are (2) together through communication (3) to facilitate (4) and resource-sharing among a wide range of (5) One of the earliest (6) of a computer network was a network of communicating computers that (7) as part of the U.S. military's Semi-Automatic Ground Environment. In 1969, several universities of the USA were (8) as part of the Advanced Research Projects Agency Network (ARPANET) (9) It is this network that (10) to become what we now call the Internet.

(The text is borrowed and modified from <http://www.techopedia.com/definition/25597/computer-network> as of 20th January 2013)

- | | | | | |
|-----|------------------|---------------|------------------|-----------------|
| 1. | a. link | b. network | c. hardware | d. station |
| 2. | a. made | b. tied | c. bound | d. linked |
| 3. | a. channels | b. holes | c. media | d. works |
| 4. | a. participation | b. dialogue | c. communication | d. interference |
| 5. | a. users | b. resources | c. actions | d. computers |
| 6. | a. cases | b. variants | c. problems | d. examples |
| 7. | a. established | b. functioned | c. made | d. acted |
| 8. | a. tied | b. united | c. connected | d. bound |
| 9. | a. work | b. case | c. project | d. topic |
| 10. | a. stopped | b. originated | c. was | d. evolved |

Task 5. Language in Use

In your professional activities you will sometimes face the need to relate someone's words. These skills are necessary to report someone's orders, suggestions, refer to someone else's ideas or render the words of researches. Study the box explaining the rules of using Reported Speech. After doing so, transform the quotations of famous people into reported speech. You have 10 minutes for this task.

Reported Speech

Reported speech, unlike direct speech, is not the exact words someone used, but words which only relate the same meaning:

e.g. 'I want to set up a network,' he said. – Direct speech

He said that he wanted to set up a network. – Reported speech

If the introductory verb is in a past tense, we change verb tenses and time expresses in reported speech as follows:

1. present simple → past simple:

'I want to set up a network,' he said. → He said that he wanted to set up a network.

2. present continuous → past continuous:

'I am using a computer right now,' she said. → She said that she was using a computer at that time.

3. present perfect → past perfect:
'I have sent an e-mail,' Tom said. → Tom said that he had sent an e-mail.
4. past simple → past simple or past perfect
'I made a report on the topic,' Jane said. → Jane said that she made (had made) a report on the topic.
5. past continuous → past continuous or past perfect continuous
'I was still working at six o'clock yesterday,' he said. → He said that he was (had been) still working at six o'clock the previous day.
6. Will → would
'I will complete the task tomorrow,' she promised. → She promised to complete the task the following day.

The verb tenses may remain the same in reported speech when reporting a general truth or laws of nature.

1. Computers are useless. They can only give you answers (Pablo Picasso).
2. I think it's fair to say that personal computers have become the most empowering tool we've ever created. They're tools of communication, they're tools of creativity, and they can be shaped by their user. (Bill Gates)
3. I do not fear computers. I fear the lack of them. (Isaac Asimov)
4. Personally, I rather look forward to a computer program winning the world chess championship. Humanity needs a lesson in humility. (Richard Dawkins)
5. The real danger is not that computers will begin to think like men, but that men will begin to think like computers. (Sydney J. Harris)
6. We're entering a new world in which data may be more important than software. (Tim O'Reilly)
7. Access to computers and the Internet has become a basic need for education in our society. (Kent Conrad)
8. Supercomputers will achieve one human brain capacity by 2010, and personal computers will do so by about 2020. (Ray Kurzweil)
9. People are mostly focused on defending the computers on the Internet, and there's been surprisingly little attention to defending the Internet itself as a communications medium. (W. Daniel Hillis)
10. We've seen computers play chess and beat grand masters. We've seen computers drive a car across a desert. But interestingly, playing chess is easy, but having a conversation about nothing is really difficult for a computer. (Hod Lipson)

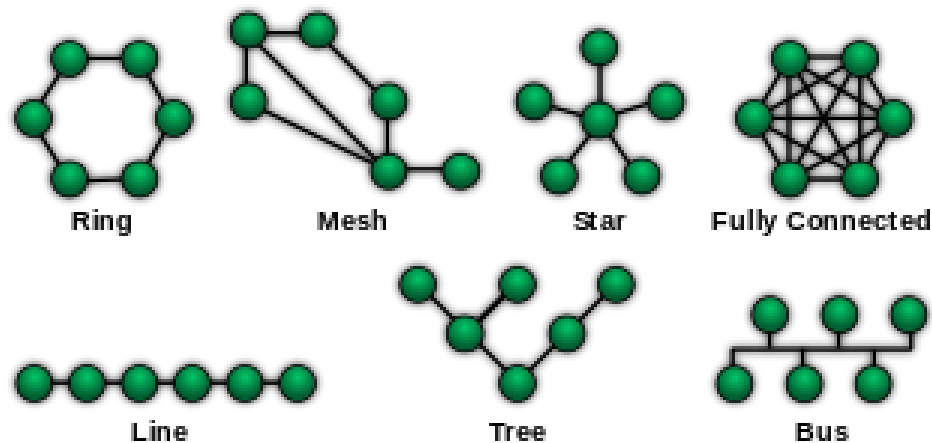
(The text is borrowed and modified from http://www.brainyquote.com/quotes/topics/topic_computers.html as of 20th January 2014)

Differentiated Activity

Task 6. Tiered Task

Work in groups. Choose and complete any part of the task suggested below. Prepare to report your results to the class. You have 10 minutes for this task.

Group 1. Look at the following scheme representing common network topologies. Explain how nodes are connected in each case to the class.



(The picture is borrowed from http://en.wikipedia.org/wiki/Computer_network as of 20th January 2014)

Group 2. Read the following text. Explain the differences between organizational types of network to the class. Draw a classification scheme.

An **intranet** is a set of networks that are under the control of a single administrative entity. The administrative entity limits use of the intranet to its authorized users. Most commonly, an intranet is the internal LAN of an organization. A large intranet will typically have at least one web server to provide users with organizational information.

An **extranet** is a network that is also under the administrative control of a single organization, but supports a limited connection to a specific external network. For example, an organization may provide access to some aspects of its intranet to share data with its business partners or customers. These other entities are not necessarily trusted from a security standpoint.

An **internetwork** is the connection of multiple computer networks via a common routing technology using routers. The Internet is the largest example of an internetwork. It is a global system of interconnected governmental, academic, corporate, public, and private computer networks.

(The text is borrowed and modified from http://en.wikipedia.org/wiki/Computer_network as of 20th January 2014)

Group 3. Read the keywords describing different types of computer networks. Rank them from the smallest to the largest. Explain the geographical types of the networks and their characteristics to the group.

Wide Area Network WAN – spans over a large physical distance; a collection of LANs through a router; collective ownership and management.

Metropolitan Area Network MAN – spans over a city; smaller than a WAN but larger than a LAN; owned and operated by single entities (government bodies, corporations).

Local Area Network LAN – connects network devices over a relatively short distance; a networked office building, home or school; group of nearby buildings; usually owned by one organisation.

Campus Area Network CAN – spans over multiple LANs; smaller than a MAN; connects universities or local business campuses.

(The text is borrowed and modified from <http://www.computernetworksit.com.au/blog/underestimating-support-2/> as of 20th January 2014)

Task 7. Listening

You are going to watch a video about computer routers. Choose any part you feel confident to complete or do them all. You have 10 minutes for the task. Use the following link to watch the video:

http://www.youtube.com/watch?v=9LhKW_dkZvU

Part 1. Decide whether the following statements are true (T) or false (F). Justify your answer:

1. Router is essential device in establishing a computer network.
2. Computer network consists of a number of computers.
3. Transmitting between the computers is done by a scheme called Ethernet.
4. There is only one type of routers.
5. Wired routers transmit data using cable.
6. Wireless router also needs cable to be provided with the information.

Part 2. Fill in the gaps with one to three words:

Computer (1)..... is a device that you must have in order to establish a (2) A network consists of a (3) of computers that are connected together to share information or work on common (4) or projects. A computer router is used to take the data that is being (5) between the computers and make sure that it gets routed to the right computers. This is done by a (6) called (7) These days we use (8), which allows the data to flow over a cable and go between computers.

There are (9) types of routers – wired routers and (10) routers. Wired router will only transmit data if you have an (11) cable. On a wireless router you could (12)either a cable or just use (13) that come out of a wireless router. However, wireless routers have to be (14) with the information through a (15) and then they transmit it out by radio waves.

Part 3. Give definitions to the following terms according to the text:

1. Router
2. Network
3. Addressing
4. Wired router.....
5. Wireless router.....

Task 8. Pair work

Work in pairs. Read the following dialogue on setting up a network between a customer and a consultant. Turn the dialogue into reported speech. Use such introductory words as **ask, inquire, say, explain, suggest, assure, answer**. Don't forget to begin the reported question with *if / whether* when the direct question begins with modal or auxiliary verb. You have 10 minutes for the task.

Customer: I'm trying to set up a home network. Is there a way to do it without stringing Ethernet cable?

Consultant: Sure. You may consider setting up wireless network.

Customer: What hardware is required to build a wireless network?

Consultant: Strictly speaking, no hardware other than wireless adapters is required to build a small wireless LAN (WLAN).

Customer: How many computers can share one Wi-Fi network?

Consultant: The exact number of devices that can connect and effectively share a WiFi varies but is probably larger than you think.

Customer: Can two routers be used on the same home network?

Consultant: Installing two routers on the same home network can be useful when building a hybrid wired and wireless network or generally expanding the existing capability.

Customer: How Does Wi-Fi Use Affect Computer Battery Life?

(The text is borrowed and modified from <http://compnetworking.about.com/od/wirelessfaqs/> as of 21st January 2014)

Task 9. Pair Work

Act dialogues between a customer and a consultant about setting up a network. You have time until the end of the class.

Student A. As a customer, you need to explain your needs and ask questions about setting up a network.

Student B. As a consultant, you need to suggest the most suitable network type to your customers.

Switch the roles and act the next dialogue.

Customer 1.

You need to establish a small LAN over your apartment. You have only two desktop PCs and need a low-cost option.

Customer 2.

You have a small house and need to connect your several laptops, smart phones and PC over a fast and reliable network.

Customer 3.

You are a representative of a small IT company and you need to set up a network over three-storage building with lots of computers.

Home Assignment

Do Tasks 1-3 from Workbook section.

Optional Activity

Task 10. Facilitated Task

Read the text about computer networks.

- a) Choose the correct word from the options in italics;
- b) Give definitions to the words in bold.

A **computer network** is a *circle / group* of computers *connected / tied* to each other electronically. This means that the computers can “talk” to each other and that every computer in the *network / web* can send information to the others. Usually, this means that the *quality / speed* of the connection is fast – faster than a normal connection to the Internet. Some basic types of computer networks *include / suggest*:

- A **local area network** (often called a LAN) connects two or more computers, and may be called a corporate network in an office or business setting.
- An “**internetwork**”, sometimes called a Wide Area Network (because of the wide *distance / range* between networks) connects two or more smaller networks together. The largest internetwork is called the Internet.

Computers can be part of *one / several* different networks. Networks can also be parts of bigger networks. The local area network in a small business is usually connected to the corporate network of the larger company. Any connected machine at any level of the organization may be able to *access / get* the Internet, for example to demonstrate computers in the store, display its catalogue through a *TCP / web* server, or convert received orders into shipping instructions.

(The text is borrowed and modified from http://simple.wikipedia.org/wiki/Computer_network as of 21st January 2014)

Task 11. Complex Task

Read the article about famous Wi-Fi company and answer the questions to the text.

1. What was the goal of Ruckus Wireless Company back in 2004?
2. Who has been the target audience of Ruckus for the past two years?
3. Who are the main rivals of Ruckus?
4. What are competitive benefits of Ruckus?
5. What are the perspectives of Wi-Fi market?

Ruckus CEO Lo on Boosting Wi-Fi, Chasing Cisco and Going Public

Selina Lo remembers how it wasn't so long ago that Wi-Fi was trashed as an unsecure, unstable technology for connecting computers to wireless networks and the Internet. Ruckus Wireless, the Wi-Fi networking company she helped start in 2004, set out to change that, working to show that Wi-Fi could stand up to the demands of everyone from enterprise customers to broadband service providers.

For the past two years, Ruckus has turned its attention to carriers who are overwhelmed by mobile users checking email, weather and Facebook and are looking for ways to offload 3G and 4G traffic from their cellular networks. They're not the only one who see that opportunity: Cisco, with its own service provider Wi-Fi business, estimates that 36 percent of Internet traffic is being delivered over Wi-Fi today. By 2015, Wi-Fi could be responsible for 46 percent of traffic, with less than 10 percent being delivered over cellular networks. And Ericsson bought BelAir Networks for an undisclosed sum in February for its carrier-grade Wi-Fi equipment.

Ruckus is winning deals – in part because its solutions cost as little as one-third the price of rivals', says Chris DePuy, an analyst with networking market researcher the Dell'Oro Group. While Ericsson was the revenue market leader in the service provider Wi-Fi market in 2011, Ruckus has been in the lead in for the past two quarters, putting it ahead of Ericsson and Cisco. The market totaled about \$150 million last year, and it's expected to double to nearly \$300 million in 2012, DePuy said. And while that's just a small part of the overall enterprise Wi-Fi market – which is expected to grow to \$5 billion by 2016 – DePuy says service provider Wi-Fi is one of the fastest growing segments.

(The text is borrowed and modified from <http://www.forbes.com/sites/connieguglielmo/2012/07/12/ruckus-ceo-lo-on-boosting-wi-fi-chasing-cisco-and-going-public/> as of 21st January 2014)

Lesson 8

Whole-Class Activity

Task 12. Check the results of Tasks 1-2 from your home assignment (10 minutes).

Task 13. Report the results of your Internet search. Ask each other questions related to the topic of your report (10 minutes).

Task 14. Discuss the following questions for 5 minutes. Turn to the help box if necessary:

1. What is a letter of application?
2. What is another name of a letter of application?
3. What is the purpose of a letter of application?
4. What does effective application letter do?
5. What structure does an application letter have?
6. How should an application letter be started and ended?
7. What points should be mentioned in the body of a letter?

Task 15. Letter of Application: Writing Techniques

Read the article about writing a letter of application.

Discuss which advice you think to be the most important. What other advice may be useful to follow when writing a letter of application? (15 minutes).



A **letter of application**, also known as a cover letter, is a document sent with your resume to provide additional information on your skills and experience.

A letter of application typically provides detailed information on why are you are qualified for the job you are applying for. Effective application letters explain the reasons for your interest in the specific organization and identify your most relevant skills or experiences.

When writing an application letter you should include:

- Greeting
Begin your letter greeting with "Dr./Mr./Ms. Last Name."
- Body of Letter
 - Mention the job you are applying for and where you found the listing.
 - Mention why your skills and experience are a good fit for the job.
 - Say thank you to the hiring manager for considering you and note how you will follow up.
- Signature
End your cover letter with your signature, handwritten, followed by your typed name.

(The text is borrowed and modified from <http://jobsearch.about.com/od/jobsearchglossary/g/letterofapplication.htm> as of 24th January 2014)

Writing Job Applications

Employers may receive hundreds of applications for a job, so it's vital to make sure that the letter or e-mail you send with your CV / résumé creates the right impression. It's your opportunity to say why you want the job and to present yourself as a candidate for the post in a way that impresses a prospective employer and makes you stand out as a prospective employee.

Before you start

You should read the advert closely so that you can tailor your application to the requirements of the job. It is also advisable to research the organization: this will show prospective employers that you really are interested in them.

Composing the letter or email

Keep your letter brief. You don't need to give a lot of detail. What you are aiming for is a clear and concise explanation of your suitability for the job.

Begin your letter or email 'Dear Mr / Mrs / Ms Name' if you know the person's name, or 'Dear Sir or Madam' if

you don't know their name. . If your letter starts with Sir / Madam, end it with "Yours faithfully". If you start with a person's name, end "Yours sincerely".

Avoid inappropriate language such as slang or technical jargon.

Use brief, informative sentences and short paragraphs.

Check your spelling, grammar, and punctuation carefully. Some employers routinely discard job applications that contain such mistakes.

Structure

The usual order of a job application letter or email is:

- The position applied for: refer to the title of the job in the first sentence of your letter. You should also mention where you saw the job advert or where you heard about the vacancy.
- Skills and responsibilities: pick up on the job requirements outlined in the advert and focus on any of your current skills or responsibilities that correspond to those requested.
- Your reasons for wanting the job: be clear and positive about why you want the job. Outline the qualities and skills that you believe you can bring to the job or organization.
- Closing paragraph: in the final paragraph you could say when you'd be available to start work and thank the manager for considering you as a candidate for the position.
- Signature: if you are sending a letter rather than an email, always remember to sign it and to type your name underneath your signature.



Task 16. Analyse the following sample of an application letter and decide whether it is a good one. Answer the following questions. You have 10 minutes for this task.

- What position does the author apply for?
- Why does the author want to get this position?
- What relevant skills for the position in question does the author have?
- How does the author end his / her letter?

Dear Mrs Smith,

I saw the advertisement for the position of IT system analyst on JobSearch website and would like to express my interest in such a challenging role. I am passionate about technology and its use at a systems level within businesses and organisations and wish to use my skills further in this field within a reputable company such as yours.

You will see from my CV that I have worked as a systems analyst with DEF Company for the last three years. I specialised in reviewing the IT systems and technology capabilities in medium-sized firms, particularly in the retail sector, and now wish to use my skills in a different environment. I have significant experience of software and hardware installation and resolving compatibility issues to ensure that each client's IT systems work as efficiently as possible.

I update my knowledge on new technology continuously and use this to provide the optimum solutions at all times. My interpersonal, organisational and planning skills are excellent and I can efficiently manage multiple deadlines.

I would appreciate the opportunity to discuss the position in person. I would be delighted to attend for interview at your convenience.

I look forward to hearing from you.

Yours sincerely,
John Brown

(The text is borrowed and modified from <http://icover.org.uk/cover-letter-for-an-it-systems-analyst/> as of 24th January 2014)

Task 17. Look at the following paragraphs from an application letter. Put them in the correct order to restore the composition of the letter (5 minutes).

(a) My responsibilities included the development and management of the site's editorial style, the editorial calendar, and the daily content programming and production of the web site. I worked closely with health care professionals and medical editors to help them provide the best possible information to a consumer audience of patients.

(b) Dear Mr. Wilson,

(c) Experience has taught me how to build strong relationships with all departments at an organization. I have the ability to work within a team as well as cross-team. I can work with web engineers to resolve technical issues and implement technical enhancements, work with the development department to implement design and functional enhancements, and monitor site statistics and conduct search engine optimization.

(d) Joah Baker

(e) I'm writing to express my interest in the Web Content Specialist position listed on JobSearch.com. I have experience building large, consumer-focused content sites. While much of my experience has been in the business world, I understand the social value of the non-profit sector and my business experience will be an asset to your organization.

(f) I am available for an interview at any time but would appreciate two days notice. Thank you for your consideration.

Differentiated Activity

Task 18. Tiered Task

Read and complete at least one part of the Task (10 minutes).

Part 1. Make up collocations using the words in bold. After doing so, make up sentences with these collocations.

Apply, gain, enclose, look, be, have, study, work

..... for three yearsexperience in
..... a copy of a CVforward to meeting
..... full timeavailable for the interview
.....for the position the opportunity

Part 2. Look at the following sentences and find grammatical mistakes in each of them. Correct the mistakes.

1. I saw the advertisement for the post for system analyst at last week newspaper.
2. I eager to try myself in the field of information technology.
3. I specialize of expert systems and am able to create and maintain software, tailored to specific purposes.
4. I have valuable experience with development of networking systems and their support.
5. I'm currently work as a software developer at ABC Company.
6. For the last two years I am responsible for project management and support.
7. I am available for an interview on Tuesday and can be contact on Monday.
8. Look forward to hear from you.

Part 3. Read the following letter of application. What style is used in the letter? Correct stylistic mistakes and rewrite the letter.

Dear Kristen,

I saw your listing on Craigslist.com for a website designer for your tee-shirt company. I'm attaching my resume even though it doesn't list my extensive tee-shirt folding experience. 😊

Your site has some very imaginative animation/movement, especially the Sluggo! I look forward to talking with you about how I may be of help.

Lillian Black

(The text is borrowed and modified from <http://susaniireland.com/cover-letters/hiring-manager/website-designer/> as of 27th January 2014)

Task 19. Pair work

Once again, revise what paragraphs an application letter should include. Discuss in what paragraph the following common expressions / sentences may be used (10 minutes).

Paragraph 1 – Position applied for

Paragraph 2 – Skills and responsibilities

Paragraph 3 – Reasons for wanting the job

Paragraph 4 – Closing

- (1) *I would like to apply for the post of ... as advertised in today's issue of ..*
- (2) *Although I have been studying full time, I have had a number of summer jobs which have helped me to gain experience in ...*
- (3) *I can be contacted on / at ...*
- (4) *With reference to your advertisement in ... on ...,*
- (5) *As you can see from my enclosed CV, I have worked in my present position ...*
- (6) *As requested in the advertisement, I enclose a copy of my resume together with a recent photograph.*
- (7) *I have gained invaluable experience in ...*
- (8) *I am writing to apply for the position of ...*
- (9) *I look forward to meeting with you to discuss my application further.*
- (10) *I am currently a student at studying ...*
- (11) *I look forward to hearing from / meeting you soon.*
- (12) *I am due to graduate in...*
- (13) *I feel that my ability to ... will help / enable me to ...*
- (14) *My experience over the past two years has been at, where I have had responsibility for ...*
- (15) *I am available for interview at any time and I can be contacted at / on ...*
- (16) *I am currently working as a*
- (17) *The reason for my seeking a new position is that I wish to....*
- (18) *For the last two years I have been working as...*
- (19) *I believe that the experience I have gained in ... has given me the qualities you are looking for ...*
- (20) *I am available ... and can be contacted on/at ...*
- (21) *I will be able to bring with me my experience of ... which I believe would be useful in this position ...*
- (22) *I would like to have the opportunity to talk to you further about my application.*
- (23) *I believe I would be an asset to your company.*
- (24) *I am available for an interview at any time but would appreciate two days notice.*

Task 20. Pair work

Work in pairs. Each student should choose one of the following advertisements and write a letter of application for the position advertised. After doing so, exchange the letters and conduct a peer-check. You have time until the end of the class.

(The texts are borrowed and modified from <http://jobs.theguardian.com/jobs/it/2/as> of 27th January 2014)

Website Administrator / Online Content Writer

We are looking for a Website Administrator / Online Content Writer to join an innovative start-up online property auction business based in Newbury on a three month contract.

Multi-Skilled Developer

This is a fantastic opportunity for creating and supporting applications that form our web site and intranet. You'll work closely with internal customers and project teams, business partners and third-party suppliers.

Database Executive

A Stratford based charity is looking for an interim Database Executive for a 3 month role. The job will involve providing technical database support to deal with a backlog of data and system management tasks.

Home Assignment

Do Task 4 from Workbook section.

Optional Activity

Task 21. Facilitated Task

Read the following letter of application for the position of a Senior Programmer Analyst. Fill in the gaps with the words from the box:

experience	speaking	analysis	development	opportunity
candidate	understanding	interest	reached	things
documentation	applications	testing	service	include

Dear Hiring Manager,

This letter is to express my (1) in discussing the Senior Programmer Analyst position posted on the Company website. The (2) presented in this listing is very appealing, and I believe that my strong technical (3) and education will make me a very competitive (4) for this position.

The key strengths that I possess for success in this position (5), but are not limited to, the following:

- I have successfully designed, developed, and supported live use (6)
- Eager to learn new (7)
- Strive for continued excellence.
- Provide exceptional contributions to customer (8) for all customers.

With a MS degree in Information Systems Management I have a full (9) of the full life cycle of a software (10) project. I also have experience in learning and excelling at new technologies as needed. My experience includes:

- Customer service and support
- Programming both new applications and maintenance work
- Problem isolation and (11)
- Software quality (12)
- Application and requirement analysis
- Process improvement and (13)

Please see my resume for additional information on my experience.

I can be (14) anytime via my cell phone, 555-555-5555 or via email at name@gmail.com. Thank you for your time and consideration. I look forward to (15) with you about this employment opportunity.

Sincerely,

Benjamin Johnson

Task 22. Complex Task

Write a letter of application for the position you dream of. Include relevant experiences and skills you possess to be suitable for the post. Your letter should have the following structure:

Paragraph 1 – Greeting

Paragraph 2 – Position applied for

Paragraph 2 – Your skills and responsibilities

Paragraph 3 – Reasons for wanting the job

Paragraph 4 – Closing

WORKBOOK

Task 1. Tiered Task

Part 1. Read the sentences and choose one appropriate word from the options. Explain the difference.

1. Computer networks allow computers to data.
 - a. change
 - b. split
 - c. exchange
2. Computer devices that originate, route and terminate the data are called
 - a. servers
 - b. nodes
 - c. hosts
3. Computer networks interpersonal communications.
 - a. complicate
 - b. facilitate
 - c. substitute
4. People can communicate effectively via messaging.
 - a. instant
 - b. moment
 - c. quick
5. Users may access and use resources provided by devices on the network.
 - a. split
 - b. divided
 - c. shared
6. Computer networks may be because they may be used by hackers.
 - a. insecure
 - b. protected
 - c. violent
7. A complex computer network may be difficult to
 - a. start
 - b. set up
 - c. make
8. Power line communication strongly certain forms of radio communication.
 - a. burden
 - b. damage
 - c. disturb

Part 2. Put the words in the correct order and make up sentences.

1. networks / exchange / computer / allow / to / computers / data.
2. hosts / hardware / nodes / and / include / can / networking.
3. networks / interpersonal / facilitate / computer / communication.
4. may / information / on / authorized / access / stored / other / users / computers.
5. network / by / hackers / computer (x2)/ may / used / deploy / be / to / viruses.
6. be / set / computer / may / up / complex / network / difficult / to.

Part 3. Fill in the gaps with the words from the Unit.

Networks are (1) of computers, software, and hardware that are all connected to help their (2) work together. A network (3) computers by means of (4) systems, specialized software, and devices that (5) data traffic. A network enables users to (6) files and resources, such as printers, as well as (7)..... messages electronically (e-mail) to each other. Computer networks (8) two main types: client / server networks and peer-to-peer networks. A client/server network uses one or more dedicated machines (the

(9) to share the files, printers, and (10) A peer-to-peer network (11) any user to share files with any other user and doesn't (12) a central, dedicated server.

The most common networks are (13) Area Networks or LANs for short. A LAN connects computers within a single geographical location, such as one office building, office suite, or home. By contrast, (14)..... Area Networks (WANs) span different cities or even countries, using (15) or satellite links.

(The text is borrowed and modified from <http://tecschange.org/classic/networks/network-syllabus.html> as of 22nd January, 2014)

Task 2. Tiered Task

Read the text and do at least one part of the task after reading.

Firewall Security

In computing, a firewall is a software or hardware-based network security system that controls the incoming and outgoing network traffic by analysing the data packets and determining whether they should be allowed through or not, based on applied rule set. A firewall establishes a barrier between a trusted, secure internal network and another network (e.g., the Internet) that is not assumed to be secure and trusted.

Many personal computer operating systems include software-based firewalls to protect against threats from the public Internet. Many routers that pass data between networks contain firewall components and, conversely, many firewalls can perform basic routing functions. There are different types of firewalls depending on where the communication is taking place, where the communication is intercepted and the state that is being traced.

Network layer firewalls, also called packet filters, operate at a relatively low level of the TCP/IP protocol stack, not allowing packets to pass through the firewall unless they match the established rule set. The firewall administrator may define the rules; or default rules may apply.

Application-layer firewalls work on the application level of the TCP/IP stack (i.e., all browser traffic, or all telnet or ftp traffic), and may intercept all packets traveling to or from an application. They block other packets (usually dropping them without acknowledgment to the sender).

On inspecting all packets for improper content, firewalls can restrict or prevent the spread of networked computer worms and trojans. The additional inspection criteria can add extra latency to the forwarding of packets to their destination.

A proxy server (running either on dedicated hardware or as software on a general-purpose machine) may act as a firewall by responding to input packets (connection requests, for example) in the manner of an application, while blocking other packets. A proxy server is a gateway from one network to another for a specific network application, in the sense that it functions as a proxy on behalf of the network user.

(The text is borrowed and modified from <http://www.wisegeek.com/what-is-a-competitive-marketing-strategy.htm> as of 20th January, 2014)

Part 1. Mark the statements as true (T) or false (F).

1. Firewall is a hardware-based network security system that controls the incoming and outgoing network traffic.
2. A firewall establishes a barrier between a secure internal network and another network.
3. Firewalls are not able to perform basic routing functions.
4. Packet filters, operate at a high level.
5. Packet filters allow packets to pass through the firewall if they match the established rule set.
6. Application-layer firewalls may intercept all packets travelling to or from an application.
7. Firewalls cannot restrict the spread of networked computer worms.
8. A proxy server is a gateway from one network to another for a specific network application.

Part 2. Answer the following questions:

1. What is a firewall?
2. What functions does it perform?
3. What are the criteria of firewalls` classification?
4. How does a network layer firewall operate?
5. How does an application-layer firewall operate?
6. What is a proxy server?

Part 3. In writing, explain the difference between different level firewalls` operation.

Task 3. Internet Search

Search through the Internet for information about the history of computer networks development. Stress the milestones and key reasons for technological advances.

Task 4. Writing

In the previous Unit you have already written your CV. Now, read the following job advertisement and write an application letter for the position of a System Analyst. Your application letter should include:

- *Paragraph, where you explain what position you are interested in and where you have seen the advertisement*
- *Paragraph, where you present your skills and responsibilities*

- *Paragraph, where you present your reasons for wanting the job*
- *Closing paragraph*

Computer System Analyst

BNC Company is looking for a Computer Systems Analyst to join our team in our Newbury office. The ideal candidate will serve as an engineer on the Service Operations Team on a classified government contract. The individual selected to serve in this position will have a strong IT background and an aptitude to learn quickly. The ideal candidate will be able to solve problems rapidly and will have excellent communication skills for dealing with a wide array of diverse and demanding customers.

(The text is borrowed and modified from
<https://sjobs.brassring.com/TGWebHost/jobdetails.aspx?partnerid=25037&siteid=5010&AReq=281280BR&codes=in-indeed> as of 20th January, 2014)

Unit 5. The Internet

Lesson 9

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about the Internet. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. What is the Internet?
2. When and where was the Internet created?
3. How has the society benefited from use of the Internet technologies?

Practical Concern

1. What do you usually use the Internet for?
2. What is your favourite site?
3. What professions are closely connected with the use of the Internet?

Analytical Concern

1. How has the Internet changed over the last decade?
2. What activities has the Internet reshaped or replaced?
3. What is the future of the Internet?

Creative Concern

1. How can the Internet be used in entertainment?
2. How can the Internet be used to promote art?
3. How has the Internet changed modern art?

Task 2. Reading

Read the text about the Internet and the World Wide Web. Explain the meaning of the key words / phrases in bold. You have 20 minutes for this activity.

The Internet and The Web

The Internet is a global system of interconnected **computer networks** that use the standard Internet protocol suite (TCP / IP) to serve several billion users worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are **linked** by a broad array of electronic, wireless, and optical networking technologies. The Internet carries an extensive range of information resources and services, such as

the inter-linked **hypertext** documents of the World Wide Web (WWW), the infrastructure to support email, and peer-to-peer networks.

Most traditional communications media including telephone, music, film, and television are being reshaped or redefined by the Internet, giving birth to new services such as voice over Internet Protocol (**VoIP**) and Internet Protocol television (**IPTV**). Newspaper, book, and other print publishing are adapting to website technology, or are reshaped into blogging and web feeds. The Internet has enabled and accelerated new forms of human interactions through instant messaging, Internet forums, and social networking. Online shopping has boomed both for major retail outlets and small traders.

Though the Internet has been widely used by academia since the 1980s, the commercialization of what was by the 1990s an international network resulted in its popularization and incorporation into virtually every aspect of modern human life. In 2012, more than 2.4 billion people – over a third of the world's human population – have used the services of the Internet; approximately 100 times more people than were using it in 1995.



Many people use the terms Internet and **World Wide Web**, or just the Web, interchangeably, but the two terms are not synonymous. The World Wide Web is only one of hundreds of services used on the Internet. The Web is a global set of documents, images and other resources, logically interrelated by hyperlinks and referenced with Uniform Resource Identifiers (URIs). URIs symbolically identify services, servers, and other databases, and the documents and resources that they can provide. Hypertext Transfer Protocol (**HTTP**) is the main access protocol of the World Wide Web.

World Wide Web **browser** software, such as Microsoft's Internet Explorer, Mozilla Firefox, Opera, Apple's Safari, and Google Chrome, lets users **navigate** from one web page to another via hyperlinks embedded in the documents. These documents may also contain any combination of computer data, including graphics, sounds, text, video, multimedia and interactive content that runs while the user is interacting with the page.



Through keyword-driven Internet research using **search engines** like Yahoo! and Google, users worldwide have easy, instant access to a vast and diverse amount of online information. Compared to printed media, books, encyclopaedias and traditional libraries, the World Wide Web has enabled the decentralization of information on a large scale.

(The text is borrowed and modified from <http://en.wikipedia.org/wiki/Internet> as of 27th January 2014)

Task 3. Vocabulary Practice

Match the words (1-7) with their definitions (a-g). You have 5 minutes for this task.

1. Internet	a. a software application for retrieving, presenting and traversing information resources on the Web
2. WWW	b. application protocol for distributed, collaborative, hypermedia information systems
3. VoIP	c. global system of interconnected computer networks
4. HTTP	d. a software system that is designed to search for information on the World Wide Web
5. browser	e. a reference to data that the reader can directly follow by clicking or that is followed automatically
6. search engine	f. a global set of documents, images and other resources, logically interrelated by hyperlinks
7. hyperlink	g. group of technologies for the delivery of voice communications and multimedia sessions over Internet Protocol

Task 4. Vocabulary Practice

Read the text and fill in the gaps with the words from the list. You have 10 minutes to complete this task.

connects	public	networks	digital	transform
interconnect	sales	accessible	chat	capability
applications	revolutionized	purpose	emerged	transmission

Internet, a system architecture that has (1) communications and methods of commerce by allowing various computer (2) around the world to (3) Sometimes referred to as a “network of networks,” the Internet (4) in the United States in the 1970s but did not become visible to the general (5) until the early 1990s. The Internet provides a (6)so powerful and general that it can be used for almost any (7) that depends on information, and it is (8)..... by every individual who (9) to one of its constituent networks.

It supports human communication via electronic mail (e-mail), “(10) rooms,” newsgroups, and audio and video (11) and allows people to work collaboratively at many different locations. It supports access to (12) information by many (13), including the World Wide Web. The Internet has proved to be a ground for a large and growing number of “e-businesses” that

carry out most of their (14) and services over the Internet. Many experts believe that the Internet will dramatically (15) business as well as society.

(The text is borrowed and modified from <http://www.britannica.com/EBchecked/topic/291494/Internet> as of 27th January 2014)

Task 5. Language in Use

The ability to ask proper questions is closely connected with the ability to receive important information. That's why making questions is very important in every sphere of human life including professional activities. Study the box explaining the ways of making questions. Then read the extracts about the Internet and ask as many questions as you can (10 minutes).

Making Questions

1. To form simple questions, which are followed by yes/no answers, we put an auxiliary or modal verb before the subject of the sentence.
Note, that auxiliary verb corresponds to the tense of the main verb in the sentence:
e.g. Do you use the Internet for study? – Yes, I do.
Have you visited this site? – No, I have not.
Did you find the information? – Yes, I did.
2. We start Wh- questions with a question word (e.g. what, where, when etc.). We also put auxiliary or modal verb before the subject:
e.g. When did you open your site? – A month ago.
How often do you visit this site? – I visit it very day.
Note that if we use the words **who**, **what**, **which**, **whose** to ask about the **subject** of the sentence, the verb remains in the affirmative form:
e.g. Who created this website? (NOT: ~~Who did create...~~)
Which costs more – Wi-Fi or Ethernet network?
3. We may use question tags if we want to confirm something. Question tags are formed with the auxiliary/modal verb of the main sentence and the appropriate pronoun. A positive statement is followed by a negative question tag and vice versa:
e.g. This is a good site, isn't it?
You have used the Internet, haven't you?
You don't have Wi-Fi, have you?

The Internet is a global network connecting millions of computers. More than 100 countries are linked into exchanges of data, news and opinions. According to Internet World Stats, as of December 31, 2011 there was an estimated 2,267,233,742 Internet users worldwide. This represents 32.7% of the world's population.

There are a variety of ways to access the Internet. Most online services offer access to some Internet services. It is also possible to gain access through a commercial Internet Service Provider (ISP)

(The text is borrowed and modified from <http://www.webopedia.com/TERM/I/Internet.html> as of 29th January 2014)

Differentiated Activity

Task 6. Listening

You are going to watch a video about the influence of the Internet on English language. Choose whatever part you feel confident to complete or do them all. You have 10 minutes for the task. To watch the video, use the following link: <http://www.youtube.com/watch?v=OPItpdu9KGM>

Part 1. Decipher the following abbreviations. What other abbreviations are often used on the Internet in English and in your native language?

1. IMHO
2. BTW.....
3. LOL
4. UG2BK

Part 2. Fill in the gaps:

In 1972, the first (1)..... was sent. Soon, the Internet (2), a free global space to (3)..... information, ideas and amusing pictures of cats. Before the Internet, English (4) through people speaking it, but the *Net* brought (5) back into (6) and hundreds of cases of repetitive strain injury. Nobody had ever had to (7) anything before, let alone use a (8)....., and the only time someone set up a (9), it ended with a massive insurance claim and a huge pile of charred (10) Conversations were getting (11) than the average attention span. Why bother (12) a sentence when an (13) would do and leave you more time? Some changes even passed into (14) English.

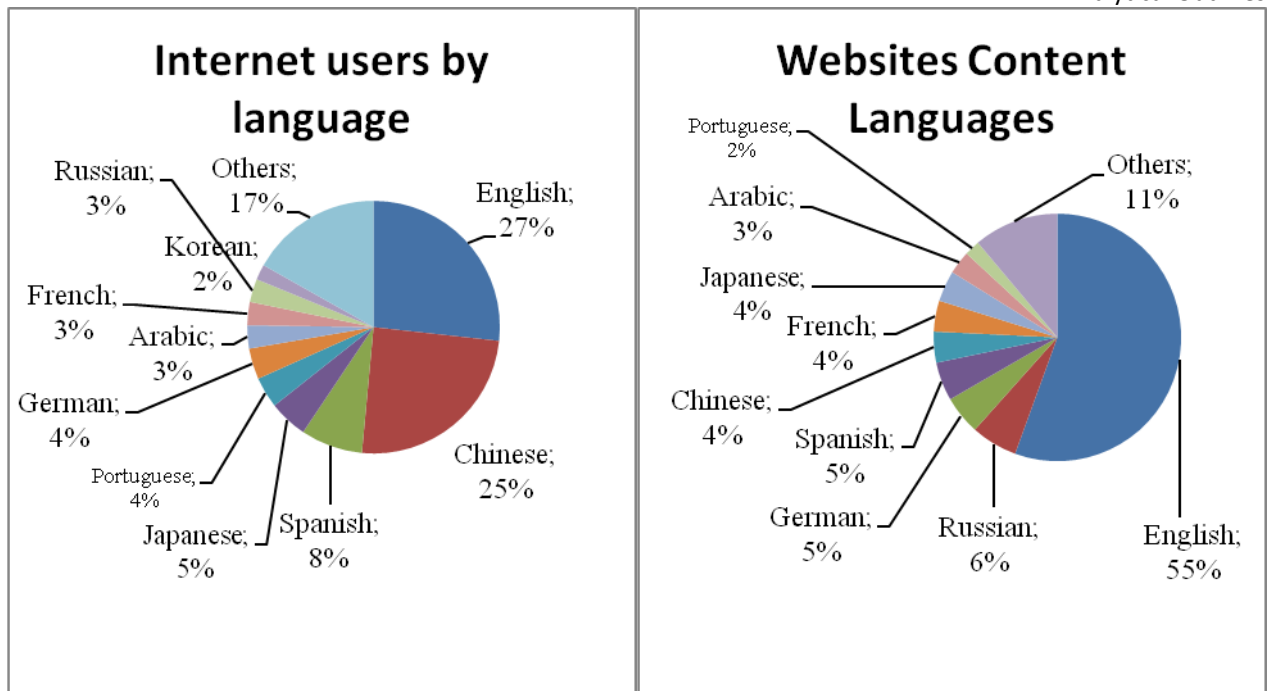
Part 3. In your own words, explain the meaning of the following words / phrases which are connected with computers and the Internet. Tell if they have different meaning in other spheres of use.

The Net, download, toolbar, firewall, wallpaper, blog, hard drive, fail.

Task 7. Group activity

You are going to be divided into several groups with a special task for each group. Be ready to report the results of your work to the class. You have 10 minutes for this task.

Group 1. Comment on the following charts. Explain how they correlate with each other.



Group 2. Inside your group, analyse how the Internet has changed the following spheres of human life:

- Business
- Agriculture
- Cinema
- Literature
- Education
- Industry

Group 3. Inside your group, discuss how the Internet can be used in everyday life. Classify the main ways of its use into the types.

Task 8. Pair work

Using the help box from Task 5, ask each other questions on one of the following topics:

- *The use of the Internet;*
- *Your favourite website;*
- *Internet and job.*

Task 9. Team Work

In teams, think of the ways people of the professions depicted can use the Internet during their work. Make a list of your ideas. The team which suggests the largest number of ideas wins.

A.



B.



C.



Home Assignment

Do Tasks 1-3 from Workbook section.

Optional Activity

Task 10. Facilitated Task

- a) Read the text and try to explain the meaning of the words in bold.
- b) Make up sentences with these words.

The Internet is a global system of **interconnected** computer networks. The Internet is used to send information quickly between computers around the world. It has millions of smaller **domestic**, academic, business, and government networks and websites, which together carry many different kinds of information (facts and details) and services. So in other words, the Internet is a **network** of networks.

The Internet is used for many things, such as **electronic mail**, online chat, file transfer, and the interlinked web pages and other documents of the World Wide Web. The most used service on the Internet is the **World Wide Web** (which is also called the "Web"). The Web contains websites, **blogs**, and also wikis like Wikipedia. Webpages on the Web can be seen and read by anyone (unless the page needs a password, or it is blocked).

The second major use of the Internet is to send and receive e-mail. E-mail is private and goes from one user to another. **Instant messaging** (such as AIM or ICQ) is similar to email, but allows two or more people to **chat** to each other much faster.

(The text is borrowed and modified from <http://simple.wikipedia.org/wiki/Internet> as of 29th January 2014)

Task 11. Complex Task

Read an article from "The Economist" magazine about the Internet of things. Explain the meaning of the phrases in bold.

Formulate the problem which the article deals with. Which conclusion does the author draw?

Spam in the fridge: When the internet of things misbehaves

"The internet of things" is **one of the buzziest bits of jargon** around in consumer electronics. The idea is to put computers in all kinds of products – televisions, washing machines, thermostats, refrigerators – that have not, traditionally, been computerised, and then connect those products to the internet.

If you are in marketing, this is a great idea. Being able to browse the internet from your television, switch on your washing machine from the office or have your fridge e-mail you to say that you are running out of orange juice is a good way to sell more televisions, washing machines and fridges. If you are a computer-security researcher, though, it is a little worrying. For, as owners of desktop computers are all too aware,

the internet is a two-way street. Once a device is online, people other than its owners may be able to connect to it and persuade it to do their bidding.

Proofpoint, a computer-security company, said it had seen exactly that happening. It reported the existence of **a group of compromised computers** which was at least partly comprised of smart devices, including home routers, burglar alarms, webcams and a refrigerator. The devices were being used to send spam and “phishing” e-mails, which contain malware that tries to steal useful information such as passwords.

Many of the computers identified by Proofpoint seem to have been hacked by trying the factory-set usernames and passwords that buyers are supposed to change. (Most never bother.) The computers in smart devices are based on a small selection of cheap **off-the-shelf hardware** and usually run standard software. This means that compromising one is likely to compromise many others at the same time. And smart devices lack many of the protections available to desktop computers, which can run antivirus programs and which receive regular security updates from software-makers. Ross Anderson, a computer-security researcher at Cambridge University, has been worrying about the risks of smart devices for years. Spam e-mails are bad enough, but worse is possible. Smart devices are **full-fledged computers**. That means there is no reason why they could not do everything a compromised desktop can be persuaded to do- for example, hold websites hostage by flooding them with useless data. And it is possible **to dream up even more serious security threats**. “What happens if someone writes some malware that takes over air conditioners, and then turns them on and off remotely?” says Dr Anderson. “You could bring down a power grid if you wanted to.”

That may sound paranoid, but in computer security **today’s paranoia is often tomorrow’s reality**. For now, says Dr Anderson, the economics of the smart-device business mean that few sellers are taking security seriously. Proper security costs money, after all, and makes it harder to get products promptly to market. He would like legislation compelling sellers to ensure that any device which can be connected to the internet is secure. That would **place liability for hacks squarely on the sellers’ shoulders**. For now, he has had no luck. But Proofpoint’s discovery seems unlikely to be a one-off.

(The text is borrowed and modified from <http://www.economist.com/news/science-and-technology/21594955-when-internet-things-misbehaves-spam-fridge> as of 29th January 2014)

Lesson 10

Whole-Class Activity

Task 12. Check the results of Tasks 1-2 from your home assignment (10 minutes).

Task 13. Work in pairs. Be ready to report the results of your Internet search. Ask each other questions about interesting Internet websites. (10 minutes).

Task 14. Discuss the following questions for 5 minutes. Turn to the help box if necessary:

1. What is a memo?
2. What is the origin of the word “memo”?
3. What structure does a memo have?
4. What does a memo have in common with a common letter?
5. What is the difference between a letter and a memo?
6. What are the features of a good memo?
7. Where are memos typically used?



A **memorandum** (abbrev.: **memo**) originates from the Latin verbal phrase *memorandum est*, which means "It must be remembered (that)...". It is therefore a note, document or other communication that helps the memory by recording events or observations on a topic, such as may be used in a business office.

A memorandum can have only a certain number of formats; it may have a format specific to an office or institution.

Memos typically have the following structure:

- **Date** – the month, day, and year of writing
- **To** – the name of the reader
- **From** – the name of the sender
- **Subject** – the topic and focus of writing
- **Body** – which typically includes introduction, main body and conclusion

Task 15. Look at the following example of an internal memo. Discuss its structure and answer the questions. You have 5 minutes for this task.

- What structure does the memo have?
- What is the topic of the memo?
- Who is the memo intended for?
- What does the letter inform about?
- What feedback is expected from the reader(s)?



Good to be Green.com Internal Memo

To: Jason Sedgewick
From: Abe Forte
RE: March 12 Sales Meeting

The quarterly sales meeting will be held on March 12 at the Radisson City Center. You are cordially invited to participate in the interactive planning session at 10:00 a.m. Your insights will be extremely valuable as the sales team frames the plan for the next year.

Please confirm your attendance by Friday by calling me at 223x233x4 or by e-mailing me at aforte@gtb.com.

Thanks in advance for your participation.

CC: Alen Adamonth, Justin Kovalsky

(The text is borrowed and modified from <http://www.web-books.com/eLibrary/NC/B0/B67/26MB67.html> as of 30th January 2014)

Task 16. Memo: Writing Techniques

Read the text about writing memos. Put the headings (A-G) into the gaps (1-7). You have 15 minutes for this task.

- A. Consider who the audience should be.
- B. Suggest ways to address the issue in the summary segment.
- C. Close the memo with a friendly ending that restates what actions you want the reader to take.
- D. Write the heading segment.
- E. Review and edit your memo to make sure that it is clear, concise, persuasive, and free of errors.
- F. Introduce the problem or issue to your readers in the opening segment.
- G. Support your course of action in the discussion segment.

Successful Memo Writing

(1) _____

Specify who the memo is for and who sent it. The heading segment should also include the complete and exact date the memo was written, and the subject matter (what the memo is about).

(2) _____

In order to get people to read and respond to the memo, it's important to tailor the tone, length, and level of formality of the memo to the audience who will be reading it. Doing this effectively requires that you have a good idea of who the memo is intended for.

(3) _____

Briefly give them the context behind the action you wish them to take. This is somewhat like a thesis statement, which introduces the topic and states why it matters. Include only as much information as is needed, while still being convincing that a real problem exists. As a general guideline, the opening should take up about $\frac{1}{4}$ of the total length of the memo.

(4) _____

What you are summarizing here are the key actions you would like your readers to take. This can also include some evidence to back up your recommendations.

(5) _____

Be persuasive. State how the readers will benefit from taking the action you recommend, or be disadvantaged through lack of action.

- Give evidence and logical reasons for the solutions you propose.
- Start with the most important information, then move to specific or supporting facts.
- The general guideline for length is that the summary and discussion segments combined should comprise about $\frac{1}{2}$ of the memo.

(6) _____

You might want to include a statement like, "I will be glad to discuss these recommendations with you later on and follow through on any decisions you make." This should generally take about $\frac{1}{8}$ of the total length of the memo.

(7) _____

Check that you are consistent in the type of language that you use, and eliminate unnecessary scholarly words or technical jargon.

- Review for spelling, grammar, and content errors. Pay particular attention to names, dates, or numbers.
- Check that it is not excessively long, and cut out any extraneous material.

(The text is borrowed and modified from <http://www.wikihow.com/Write-a-Memo> as of 30th January 2014)

Task 17. Read the following memo. Some words have been removed from the text. Fill in the words in the gaps to restore the original memo. (5 minutes).

(1) _____: Michael Marsh, Store Manager

(2) _____: Daniel Lipton, Assistant Manager

(3) _____: June 18, 2010

(4) _____: Dress Code Issues

A number of our clients have expressed their concern over the way certain sales associates are dressed. (5) _____complain their clothing does not reflect our store's good image and quality of service, and instead makes them look trashy and unprofessional. (6) _____it is necessary for us to establish and enforce a dress code for all our store (7) _____. Some of the items that can no longer be considered appropriate are excessively baggy pants and T-shirts, low cut blouses, and any garment that exposes the chest and back.

(8) _____to discuss this issue with you at your convenience, and also answer any questions you may have. (9) _____contact me at XXX-XXXX.

(The text is borrowed and modified from http://www.epcc.edu/tutorialservices/valleverde/Documents/Write_a_Memo.pdf as of 30th January 2014)

Differentiated Activity

Task 18. Tiered Task

You are going to watch a video (3 min) which gives advice on how to write a memo. After watching the video, complete any part of the task or do them all. You have 5 minutes for this activity. Use the following link to watch the video: <http://video.about.com/esl/Learn-ESL--Tips-for-Writing-a-Business-Memo.htm>

Part 1. Fill in the missing information.

"Memo" is a short form of the word "memorandum." Generally speaking, a memo is an inter-office or internal written communication for a (1) It is prepared by a (2)

Before writing a business memo you need analyse two questions:

What is the (3)of the business memo that I plan to write?

Who is the (4)

Keep in mind that a memo is not a (5) nor does it follow its format.

Rather, it needs to be written in (6), succinct sentences so that the points you need to make are made (7)

Part 2. Explain the difference between a letter and a memo as stated in the video.

Memo is not a business letter, nor

Rather,

As a memo is not a letter,.....

Part 3. In your own words, retell what should be written in the heading, the main body and the closing of the memo.

Task 19. Tiered Task

Read the following memos and complete at least one part of the task. You have 10 minutes for this task.

Part 1. Read the following memo. Choose the correct option from the words in bold.

To: Users of Athena Network

From: MBN Information Systems

(1) **Date / Time:** January 31, 2014

(2) **Subject / Topic:** Shorter URLs on WEB.MIT.EDU

MBN Information Systems has come up with a scheme for shorter URLs for files (3) **saved / stored** on the Athena network and accessed through the WEB (4) **file / server**, web.mbn.edu. (5) **Since / Because** electronic publishers at MBN can now (6) **make/use** and publicize shorter URLs for their documents, addresses will be (7) **easier / easy** to (8) **reference / link** and remember.

Please, (9) **ask / note** that from now on, Technology Review (10) **home / house** page can be (11) **clicked / accessed** through <http://web.mbn.edu/techreview>.

If you have any questions, (12) **find / contact** us through <http://web.mbn.edu/help>.

(The text is borrowed and modified from <http://www.mhhe.com/mayfieldpub/tsw/l-tech.htm> as of 31st January 2014)

Part 2. Fill in the gaps with the words from the unit.

- (1) _____: Heads of Departments and Agencies
- (2) _____: Tom Jackson, Deputy Director for Management
- (3) _____: January 31, 2014
- (4) _____: Protection of Sensitive Agency Information

In an effort to properly safeguard our (5) _____ assets while using information technology, it is (6) _____ for all departments to know their baseline of activities.

I am (7) _____ all departments and agencies to (8) _____ the following actions:

1. Encrypt all data on mobile computer / devices which carry agency data.
2. Allow remote access only with two-factor authentication.
3. Log all computer-readable data extracts from databases and verify each extract has been erased within 90days.

Most (9) _____ and agencies have these (10) _____ already in place. Please (11) _____ these safeguards have been reviewed and are in place (12) _____ the next 45 days.

(The text is borrowed and modified from <http://www.docstoc.com/docs/2222489/memo-examples> as of 31st January 2014)

Part 3. Look through the following memo. Find and correct any mistakes in the lines. Put a tick (V) if there are no mistakes. The first line has been done for you.

To: All employees

From: John McWane, CEO of ABC Company

Subject: Responsible Use of Electronic Communications

Electronic mail provide an immediate and convenient means of communication. A single message can program to send to any number of persons, at any time of the day. Nevertheless, before we send the	1 provides
	2 _____
	3 _____

letter, we should consider what our intended messages may end up.	4 _____
The negative repercussion of unintentional distribution is illustrated recently when an office employee sended one of our internal reports to a number of our clients. This story shows a lack of discretion from the part of the writer, what didn't consider the sensitive nature of the message. We should learn from this mistake.	5 _____
	6 _____
	7 _____
	8 _____
	9 _____
We should remember that companys e-mails belong to official correspondence. They reflect your professionalism and present an image of ABC Company. Let make certain that image is positive one.	10 _____
	11 _____
	12 _____

(The text is borrowed and modified from <http://www.airforcewriter.com/officialmemorandum.htm> as of 6th January 2014)

Task 20. Pair Work

Each student should choose one of the following topics and write a memo. Peer-check your memos after you complete the task and show your memos to the teacher. You have time until the end of the class.

Student A. You are a CEO of a large international VMS Company. Write a memo to the heads of departments in which you inform them about an upcoming annual meeting. The meeting is to take place on March 17, at 10 a.m.

Student B. You are a Human Resources Manager at VMS Company. Write a memo to the employees of your company, in which you inform them about new dress code rules. Stress the importance of proper image of your company.

Home Assignment

Do Task 4 from Workbook section.

Optional Activity

Task 21. Facilitated Task

Look through the following memo. Some sentences have been removed from their places. Match the gaps (1 – 5) with the sentences (A-E) to complete the memo.

<p>To: Heather Jones, Chairman,</p> <p>From: Wilson Gayle, Community Development Department</p> <p>Date: January 12, 2012</p> <p>Subject: (1)</p> <p>(2)..... The agenda of the meeting is to discuss the comprehensive solutions provided by the experts and management to grow the company in this competitive market.</p> <p>(3).....</p> <p>We also like to request you all to present their plans and ideas on the company and team's growth. (4)</p> <p>The management is also attaching all the information and details related to the meeting along with this memo.</p> <p>(5).....</p>	<p>A. This to inform all the project heads and team leaders that management has decided to conduct a meeting on 15.01.2012.</p> <p>B. The administration is also requesting all the project managers to provide a report on the production and services offered by the team on the last month.</p> <p>C. Meeting for the Comprehensive Plans of Company's Growth</p> <p>D. For any doubts or queries, contact us within two working days.</p> <p>E. Therefore, we request you all to attend the meeting without any fail.</p>
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(The text is borrowed and modified from <http://www.foundletters.com/search/sample-memo-letter-to-attend-meeting> as of 1st February 2014)

Task 22. Complex Task

Read the memo and answer the following questions.

1. What is the subject of the memo? Does it fully reflect the main idea of the memo?
2. What kind of changes will the organization undergo?
3. Who initiates the changes? Who participated in the development of the new structure?
4. How will the reorganization influence employees?
5. What further actions will be undertaken?

To: Mayor and Council
From: Liam Bake, City Manager
Subject: Reorganization

Since joining the organization, I have made several observations regarding the effectiveness of our current organizational structure. As you know, this structure has been in place for the past decade, yet during this same period of time, the needs of our community have changed, requiring a higher standard of service and responsiveness. With this in mind, staff has been developing a City organizational structure designed to increase accountability, more evenly distribute workload, and foster collaboration. The combination of these enhancements will ultimately provide improved service to our residents.

One change involves better distribution of responsibilities within the City Manager's Office. I am proposing a new Deputy City Manager position for oversight of internal services, which will allow the Assistant City Manager to focus on external service departments, day-to-day operations of the organization and special projects.

Another significant change is the creation of a new Assets Management Department, which will be responsible for maintenance of all City assets and open spaces as well as custodial services. These functions are now provided in varying degrees by four different departments. This centralized approach will capitalize on existing resources and provide a consistent standard of care across our facilities and open spaces. Changes will occur in other departments to improve our service.

Additional information is provided in the attached document. The specifics of work unit or division reassignments is still to be determined. A steering committee, to be convened soon, will meet with the affected groups to refine the proposed structure and recommend an implementation plan by February. It is anticipated that key components of the plan will be incorporated into next year's budget; others may be phased in over a longer period of time. To the degree possible, I have asked that the changes be cost-neutral and make the best use of existing resources.

This reorganization is not meant to diminish the work currently being performed by our work forces, nor devalue those efforts. Neither is it intended that any employee will lose his or her job because of this restructuring plan. Employees will have an opportunity to provide input and information to the steering committee and the City Manager's Office throughout this process, and a system to monitor and measure these changes will also be developed and put into place.

I will keep you abreast of these changes as we work out the details and develop our implementation plan and timeline.

(The text is borrowed and modified from <http://www.smgov.net/departments/council/agendas/2007/20070106/s2007010604-2-1.pdf> as 1st February 2014)

WORKBOOK

Task 1. Tiered Task

Part 1. Insert the following words in the gaps. Translate the sentences into your native language.

resources	hyperlinks	protocol	engines
services	system	browser	blogging

1. The Internet is a globalof interconnected computer networks.
2. The standard Internet suite (TCP/IP) is used to serve several billion users worldwide.
3. The Internet carries an extensive range of informationand services, such as the inter-linked hypertext documents of the World Wide Web.
4. Print publishing can either adapt to website technology, or be reshaped into and web feeds.
5. The Web is a global set of documents, images and other resources, logically interrelated by and referenced with Uniform Resource Identifiers.
6. The Internet research is usually done using keyword-driven search
7. Wide Web software, such as Microsoft's Internet Explorer, Mozilla Firefox, Opera, Apple's Safari, and Google Chrome, lets users navigate from one web page to another.
8. Over a third of the world's human population – have used the of the Internet.

Part 2. Fill in the gaps with the words from the Unit.

The World Wide Web, or simply Web, is a way of accessing (1) over the medium of the Internet. It is an information-sharing (2) that is built on top of the Internet. The Web uses the HTTP (3), only one of the languages spoken over the Internet, to transmit data. Web services, which use HTTP to allow applications to (4) in order to exchange business logic, use the the Web to (5) information. The Web also utilizes (6), such as Internet Explorer or Firefox, to access Web documents called Web pages that are linked to each other via (7) Web documents also contain graphics, sounds, text and video.

The Web is just one of the (8) that information can be disseminated over the Internet. The Internet, not the Web, is also used for e-mail, which relies on SMTP, Usenet news groups, instant (9) and FTP. So the Web is just a portion of the Internet, albeit a large portion, but the two terms are not (10) and should not be confused.

(The text is borrowed and modified from http://www.webopedia.com/DidYouKnow/Internet/Web_vs_Internet.asp as of 1st February 2014)

Part 3. Fill in the gaps with the words derived from the words in capitals.

<p>The (1) of the World Wide Web was begun in 1989 by Tim Berners-Lee and his colleagues at CERN, an international scientific (2) based in Geneva, Switz. They created a protocol, Hyper Text Transfer Protocol (HTTP), which (3) communication between servers and clients. Their text-based Web (4) was made available for general release in January 1992. The World Wide Web gained rapid acceptance with the (5) of a Web browser called Mosaic, which was developed in the United States in September 1993. Mosaic allowed people using the Web to use the same sort of “point-and-click” (6)..... (7) that had been available in personal computers for some years. In April 1994 Andreessen cofounded Netscape Communications Corporation, whose Netscape Navigator became the (8) Web browser soon after its release in December 1994. By the mid-1990s the World Wide Web had millions of active (9)</p>	<p>DEVELOP</p> <p>ORGANIZE</p> <p>STANSARD</p> <p>BROWSE</p> <p>CREATE</p> <p>GRAPH</p> <p>MANIPULATE</p> <p>DOMINATE</p> <p>USE</p>
--	---

(The text is borrowed and modified from <http://www.britannica.com/EBchecked/topic/649051/World-Wide-Web-WWW> as of 1st February 2014)

Task 2. Tiered Task

Read the text about the most popular websites and complete at least one part of the task.

Part 1. Look at the list of top 10 most popular websites and fill in the gaps (1-10) with the names of the websites from the following table:

- | | | | | |
|---------------------|----------------------|--------------------|--------------------|------------------|
| <u>facebook.com</u> | <u>wikipedia.org</u> | <u>msn.com</u> | <u>youtube.com</u> | <u>bing.com</u> |
| <u>amazon.com</u> | <u>google.com</u> | <u>twitter.com</u> | <u>ebay.com</u> | <u>yahoo.com</u> |

Part 2. Classify the sites into the following categories:

- Search:
- Social Networking:
- Video-Sharing:
- Commerce:
- Reference:

Part 3. Create your own top 5 list of your favourite websites. In short, describe each website in terms of their aim, category, audience etc.

Top 10 Most Popular Websites

Here are the 10 Most Popular Sites (*English Language*) as derived from *eBizMBA Rank* which is a constantly updated average of each website's Global Traffic Rank of February 2014.

1 _____

Enables users to search the world's information, including webpages, images, and videos. Offers unique features and search technology.



2 _____

A way to get your videos to the people who matter to you. Upload, tag and share your videos worldwide!

3 _____

A social utility that connects people, to keep up with friends, upload photos, share links and videos.



4 _____

A major internet portal and service provider offering search results, customizable content, chatrooms, free e-mail, clubs, and pager.

5 _____

A customer-centric company, where customers can find and discover anything they might want to buy online, and endeavours to offer its customers the lowest possible prices. Site has numerous personalization features and services including one-click buying, extensive customer and editorial product reviews, gift registries, gift certificates, wish lists, restaurant and movie listings, travel, and photo processing.

6 _____

A free encyclopaedia built collaboratively using wiki software. (Creative Commons Attribution-ShareAlike License).

7 _____

International person to person auction site, with products sorted into categories.

8 _____

Social networking and microblogging service utilising instant messaging, SMS or a web interface.

9 _____

Search engine developed by Microsoft. Features web, image, video, local, news, and product search.

10 _____

Portal for shopping, news and money, e-mail, search, and chat.



(The text is borrowed and modified from <http://www.ebizmba.com/articles/most-popular-websites> and <http://www.alexa.com/topsites/countries/US> as of 2nd February 2014)

Task 3. Internet Search.

Using the Internet, find the information about any sites and Internet resources you find interesting. Describe the site you like in terms of topic, design, functions, audience. Be ready to report your findings to the class.

Task 4. Writing

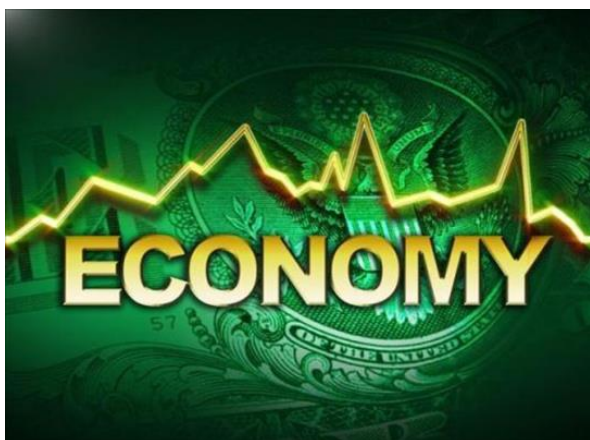
Having revised the material which you learned during the lesson, complete one of the following parts of the task:

Part 1. Imagine that you are the CEO of LJS Company. Write a memo to the Heads of Departments, in which you inform them about the upcoming Company Strategy Meeting. Write about the place and time of the meeting.

Part 2. Imagine that you are the Human Resources Manager of LJS Company. Write a memo to all employees, in which you inform them about an upcoming conference “The Future of Information Technology”. In your memo, write about the time, place and agenda of the conference.

Part 3. Imagine that you are the CEO of LJS Company. Write a memo to all employees, in which you inform them about a reorganization of your company. Describe the changes that will be made and explain the importance of these measures.

MODULE 3. ECONOMICAL SYSTEMS



At the end of this module Students will understand:

- the difference between types of business ownership;
- the ways banks earn profit and conduct operations;
- the forces which act at a marketplace.



At the end of this module Students will know:

- the notions of business and enterprise, banking, market and competition;
- the types of businesses and enterprise structure;
- the types of banks, banking operations and accounts;
- the types of market structure, the notions of supply and demand.



At the end of this module Students will be able to:

- express different activities connected with business and banking operations;
- give reasons for making decisions;
- use modal verbs in professional spheres of communication;
- write a business letter, an e-mail and a report.

Unit 6. Business and Enterprise

Lesson 11

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about enterprises and business. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. What company would you like to work for – a large corporation or small family business? Why?
2. What are the benefits of running your own business?
3. Would you like to be a freelancer or an employer with fixed salary? Why?

Practical Concern

1. What is the most important industry of your country?
2. What are the cons of being a sole proprietor?
3. What skills are needed to become a businessman?

Analytical Concern

1. What are the pros and cons of being a freelancer?
2. What aspects should be analysed before setting up your business?
3. What are the most dangerous risks of running your own business?

Creative Concern

1. If you had a company, what would it produce?
2. What creative industries do you know?
3. What is the best business advertisement that you have seen?

Task 2. Reading

Read the text about enterprise and mark the statements as true (T) or false (F). Justify your answer. You have 20 minutes for this activity.

1. 'A business', 'an enterprise' and 'a firm' are synonyms.
2. The word 'business' has only one meaning.
3. A sole proprietorship is owned by a group of people.
4. Limited Liability Company protects its owner from financial claims.
5. Corporation is a large organization with shareholders.

Business and its Types

A **business**, also known as an **enterprise** or a **firm**, is an organization involved in the trade of goods, services, or both to **consumers** or to other businesses. Businesses are prevalent in capitalist economies, where most of them are **privately owned** and provide goods and services to customers for profit. Businesses may also be **not-for-profit** or **state-owned**. A business owned by multiple individuals may be also referred to as a company.



The etymology of “business” stems from the state of being busy, doing commercially profitable work. The term “business” has at least three usages, depending on the scope in which it is used. In the singular usage business means a particular organization; a more generalized usage refers to a particular market sector, e.g. “the music business”. Compound forms such as “agribusiness” represent the word's broadest meaning and mean all activity by all **suppliers of goods and services**. There are three common types of business ownership:

Type One: Sole Proprietor

A sole proprietor is simply a business owned and managed by a single person, where there is no legal difference between the individual and the business – even though you could use a trade name other than your own name for the business. In a sole proprietorship you receive all the **profits** and have all responsibility for losses and **debts**. For practical purposes this means that your business’s profits or losses are passed through to your personal income **tax** form and taxed accordingly.

If there are more than one of you sharing ownership and management of the business, then you would be a general partnership – which is similar to a sole proprietorship. It just describes a business with multiple owners rather than just one and essentially has the same pros and cons as the sole proprietorship.

Type Two: Limited Liability Company (LLC)

A LLC is not a corporation, just a form of company that provides **liability** protection for its owners. It handles the financial side of things the same as a sole proprietorship or partnership would (in terms of how it deals with taxes), but, as the name suggests, it’s intended to provide limited liability protection from legal and financial claims.



Type Three: Corporation

Simply put, a corporation is a **legal entity** that is separate from its owners, employees and **shareholders**. It means that when you incorporate you create a

wholly new legal personality that takes on the burden of liability and financial responsibility for the business instead of you. When we think of corporations we often think of large organizations. They don't have to be, but most corporations do have shareholders, and **boards of directors**, and rules of governance and reporting – and hence a lot of reporting requirements.

(The text is borrowed and modified from <http://en.wikipedia.org/wiki/Business> and <http://www.freshbooks.com/blog/2013/08/21/business-structure-choose-the-best-one-for-you/#sthash.eLCBFCSp.dpuf> as of 18th December 2012)

Task 3. Vocabulary Practice

Match the types of businesses (1-9) with their functions (a-i). You have 5 minutes for this task.

1. Agriculture and mining businesses	a. generate profits primarily from the sale of intellectual property and include movie studios, publishers and internet and software companies
2. Financial businesses	b. produce public services such as electricity or sewage treatment, usually under a government charter
3. Information businesses	c. offer intangible goods or services and typically charge for labor or other services provided to government, consumers, or other businesses
4. Real estate businesses	d. produce raw material, such as plants or minerals
5. Service businesses	e. deliver goods and individuals to their destinations for a fee
6. Transportation businesses	f. sell, rent, and develop of properties including land, residential homes, and other buildings
7. Utilities	g. include banks and other companies that generate profits through investment and management of capital
8. Manufacturers	h. act as middlemen and get goods produced by manufacturers to the intended consumers, and make their profits by marking up their price
9. Retailers	i. produce products, from raw materials or from component parts, then sell their products at a profit

Task 4. Vocabulary Practice

Read the text and fill in the gaps with the words / phrases from the table below. You have 10 minutes to complete this task.

A (1)..... is a voluntary association of people formed for the (2).....of doing some (3)..... The company can sue and it can be (4) It has its own name and is a separate (5), distinct from its members who constitute it. A company has its own property; the members – (6) cannot claim the

property of the company as their own property. The (7) of the members of the company is (8)..... to the amount of shares they hold. Shares of a company are easily transferable. It means the business can be (9)..... from one hand to another without attracting (10)..... and duties.

- | | | | | |
|-----|--------------------|-----------------|--------------|------------------|
| 1. | a. sole proprietor | b. legal entity | c. company | d. business |
| 2. | a. reason | b. purpose | c. action | d. profit |
| 3. | a. money | b. deed | c. action | d. business |
| 4. | a. sued | b. suit | c. suited | d. said |
| 5. | a. physical entity | b. legal entity | c. structure | d. budget |
| 6. | a. moneyholders | b. team-mates | c. investors | d. shareholders |
| 7. | a. liability | b. opportunity | c. variety | d. possibilities |
| 8. | a. cut | b. depend | c. limited | d. named |
| 9. | a. run | b. transferred | c. thrown | d. driven |
| 10. | a. laws | b. sues | c. taxes | d. judges |

Task 5. Language in Use

Every professional needs to talk or write about his / her working activities. These skills are especially useful in professional discussions and in writing applications or business letters. Study the box explaining the ways of expressing activities. After doing so, insert the words in the appropriate form in the passages. You have 10 minutes for this task.

Expressing Activities

We can express activities using the **gerund**:

1. After certain verbs and expressions:

admit, appreciate, avoid, consider, delay, enjoy, finish, imagine, involve, postpone, propose, risk, stop, suggest

e.g. *The department manager **postponed launching** the new line of a product.*

*The job **involves analysing** changing processes.*

2. After prepositions:

after, before, by, when, while, without

e.g. *The company expanded **without analysing** the risks.*

3. After verbs and expressions followed by prepositions:

to be good at, to be interested in, to be for/against, to be used to, instead of, to think about, to look forward to, to succeed in, to approve of, to insist on, to object to

e.g. *I am **interested in participating** in the project.*

*I am **looking forward to hearing** from you.*

We can also express activities by using the **infinitive**:

1. After certain words:

afford, agree, choose, decide, help, forget, hope, learn, manage, offer, plan, promise, refuse, seem, tend, threaten

e.g. *I hope to find a job in banking.*

I decided to quit this position.

2. After modals:

**can, could, may, might, must, shall, should, will, would
have to, ought to, used to**

e.g. *You might have problems with the Internet connection today.*

You should come to an interview tomorrow.

A. build put make set up bring transform

John S. Pemberton invented Coca-Cola in 1886. His partner suggested

(1)_____an advertisement for the drink in the Atlanta Journal that very

year. In 1888, Asa Candler bought the Coca-Cola business and decided

(2)_____ the product known through signs, calendars and clocks.

The company began (3)_____its global network when Robert

Woodruff was elected president of the company in 1923. He succeeded

in (4)_____Coca-Cola into a truly international product by

(5)_____a foreign department, which exported Coca-Cola to the

Olympic Games in Amsterdam in 1928. During World War II, he

promised (6)_____Coca-Cola to every soldier in every part of the world.



B. decide appear reflect create

Coca-Cola's advertising has always attempted (1)_____ changing contemporary

lifestyles. (2)_____an international advertising campaign requires the talents of

professionals in many areas, and extensive testing and research are always done

before (3)_____which advertisements will finally be used. Celebrity endorsements

have featured heavily – Cary Grant, Ray Charles and Whitney Houston are just three

of the big name stars who have agreed (4)_____in Coca-Cola commercials.

C. return expand drink change launch

After (1)_____ Diet Coke in 1982, the company saw its sales grow quickly. The

drink is now the third most popular in the world. In 1985, the company tried (2)

_____ the secret formula of Coca-Cola, but realised that Americans were very

attached to the original recipe. The company listened to its consumers and quickly

responded by (3)_____ the original formula to the market as “Coca-Cola

Classic”. Today, people in more than 160 countries around the globe enjoy

(4)_____Coca-Cola. It is asked for more than 524 million times a day in more

than 80 languages. The company intends (5)_____ its global presence even

further in the twenty-first century, particularly in developing markets.

(The text is borrowed and modified from <http://www-it.fmi.uni-sofia.bg/BEC/classroom/unit5/Ingtask1.htm>
as of 18th December 2012)

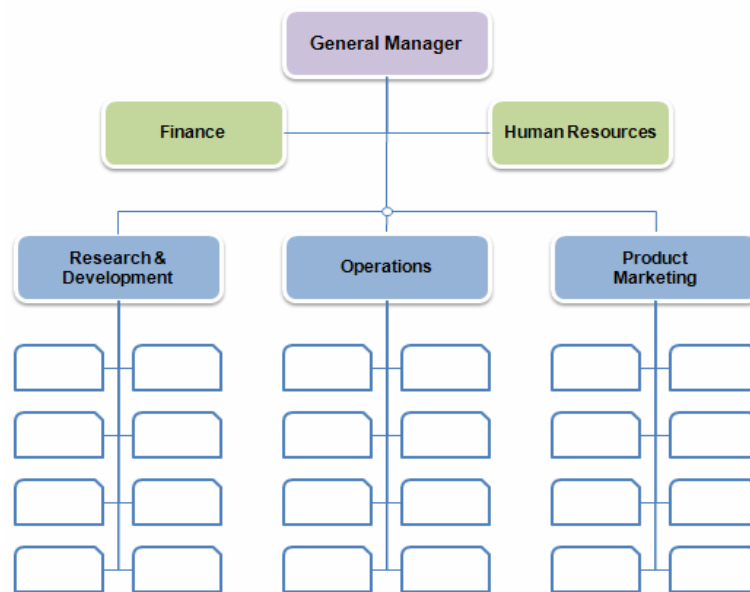
Differentiated Activity

Task 6. Tiered Task

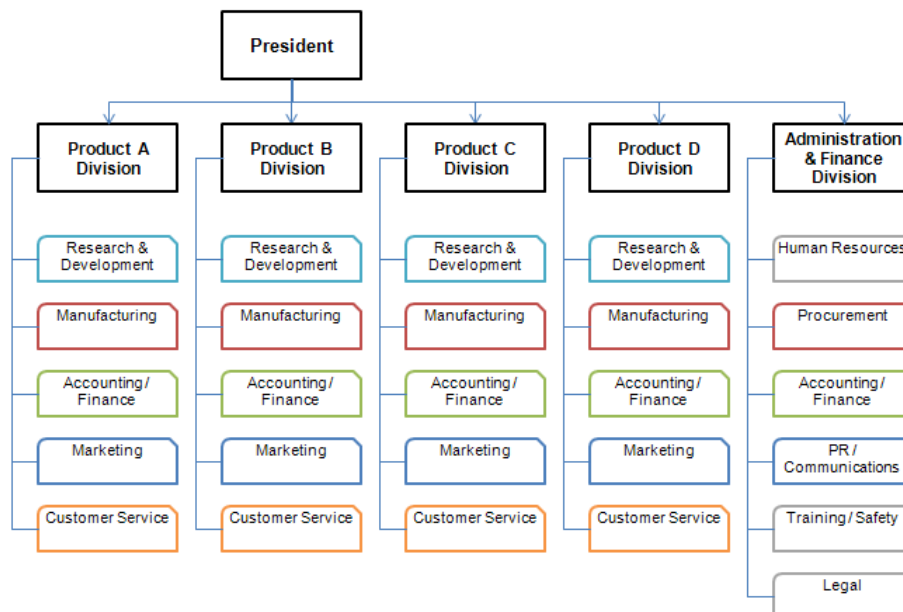
Choose and complete any part of the task suggested below. Prepare to report your results to the class. You have 10 minutes for this task.

Part 1. Look at the charts representing typical company organizational structures. Explain them and analyse pros and cons of each type of structure.

Functional Organizational Structure



Sample Divisional Organizational Structure



(The pictures are borrowed from <http://www.dougsguides.com/organized> as of 18th October 2013)

Part 2. Read an internal email from Microsoft chief executive officer Steve Ballmer to employees regarding changes in the company. Explain what organizational structure the company has taken and draw its scheme (you may look at Part 1 of this task as an example).

From: Steve Ballmer

To: Microsoft – All Employees

Date: July 11, 2013, 6 a.m.

Subject: One Microsoft

Today, we are announcing a far-reaching realignment of the company that will enable us to innovate with greater speed, efficiency and capability in a fast changing world.

We are rallying behind a single strategy as one company – not a collection of divisional strategies. Although we will deliver multiple devices and services, the single core strategy will drive us to set shared goals for everything we do. We will see our product line holistically, not as a set of islands. All parts of the company will share and contribute to the success of core offerings, like Windows, Windows Phone, Xbox, Surface, Office 365 and our EA offer, Bing, Skype, Dynamics, Azure and our servers.

How we organize our engineering efforts will also change to reflect this strategy. We will pull together disparate engineering efforts today into a united set of our high-value activities. This means we will organize the company by function: Engineering (including supply chain and datacentres), Marketing, Business Development, Advanced Strategy and Research, Finance, HR, Legal, and COO (including field, support, commercial operations and IT). Each discipline will help drive our overall strategy. Each discipline will also be charged with improving our core capabilities in its area. We must improve in all aspects of the business.

Lots of change. But in all of this, many key things remains the same. Our incredible people, our spirit, our commitment, our belief in the power of technology to make the world a better place for billions of people around the world.

Let's go.

Steve

(The text is borrowed and modified from <http://www.microsoft.com/en-us/news/press/2013/jul13/07-11onemicrosoft.aspx> as of 20th October 2013)

Part 3. Read the extract from the “Forbes” article and answer the questions:

Why are reorganizations risky? How often are they successful?

What are the examples of successful and unsuccessful reorganizations?

What is the aim of successful reorganization?

What was the reason of ABB near-failure? What was done to prevent it?

What type of organizational structure has ABB taken?

The Key To Successful Corporate Reorganization

New chief executives often feel compelled to reorganize their companies. In fact, nearly half launch some kind of reorganization during their first two years on the job. But corporate reorganizations are risky investments of time, energy and resources, and many do little to improve the business. Chrysler restructured its organization three times in the three years preceding its bankruptcy and eventual combination with Fiat. None of those reorgs had much effect. A recent Bain & Company study of 57 major reorganizations found that fewer than one third produced any meaningful improvement in performance.

What do the few successful reorganizers know that so many others don't? The reorganizations that work best don't just reshuffle the boxes and lines on an org chart. Rather they improve a company's ability to handle its most important decisions. They speed up decision making and increase the proportion of effective decisions.

An example is ABB, the big Zurich-based power technology and automation company, which came close to bankruptcy in late 2002. One reason for its near-failure: Key decisions about big power-project bids involved negotiations among dozens of different ABB units, each with its own profit goals and incentives, and the process dragged on. A new CEO, Jürgen Dormann, analysed the decision failures and then cut through the tangled web by consolidating divisions and centralizing profit-and-loss accountability. The reorg worked – it restored ABB's ability to generate fast, competitive bids – because Dormann's team knew that the purpose of the new structure was to support and smooth the progress of those decisions and others that were equally important.

(The text is borrowed and modified from <http://www.forbes.com/2010/07/30/corporate-reorganization-abb-ford-leadership-managing-bain.html> as of 20th October 2013)

Task 7. Listening

You are going to listen to the news about Microsoft Corp. Choose any part you feel confident to complete or do them all. You have 10 minutes for the task. Use the following link to watch the video:

<http://www.youtube.com/watch?v=MXQheBSTGt0>

Part 1. Decide whether the following statements (1-5) are true (T) or false (F). Justify your answer.

1. Microsoft Corporation has announced large restructuring.
2. Microsoft leading position is under threat because consumers turn to mobile devices.
3. Gamers are satisfied with the new Xbox head.
4. The reorganization Microsoft is unveiling is biggest in 20 years.
5. The changes will shift the duties of many executives.

Part 2. Fill in the gaps:

The (1)..... of Microsoft Corp represents the most sweeping re-structuring of the world's largest (2).....company since 2008. The move is (3).....to better align Microsoft's operations, with (4)..... Steve Ballmer's stated goal of becoming a "devices and (5)....." company. Microsoft's stronghold of (6)..... software for PCs is under threat as (7)..... and corporations increasingly turn to mobile (8)....., such as smart phones and (9), and to Web-based software. Microsoft will unveil its biggest (10)..... reorganization in at least five years, to better (11) in a world of mobile devices and Web-based services. The changes will shift the duties and (12) of many top Microsoft (13)..... and are intended to eliminate overlap within the 98,000- (14) company.

**Part 3. Answer the following questions:**

1. What is the reason of Microsoft Corp reorganization?
2. Why is the leading position of Microsoft Corp under threat?
3. Why are customers not satisfied with the new Xbox head?
4. How will the changes influence Microsoft executives?

Task 8. Pair work

Act a dialogue between a CEO and the head of Business Development department about risks of restructuring. In your dialogue, use the following words in bold. You have 5 minutes for this task.

Avoid, consider, involve, suggest, decide, help, manage, plan, propose.

Task 9. Group Work

Read the below given profile of Optima corp. Imagine that you are the shareholders of Optima corp. and look through the list of candidates for the CEO position. Discuss the advantages and disadvantages of each of them and decide who will be the most suitable candidate for the position. You have time until the end of the class.

Optima profile. Optima, a large European retailing chain, is having serious financial difficulties. Its CEO, Johan Dvark has not been able to lead company to success for the last two years. The company's profit has drastically fallen and share value decreased in half. The board of directors together with shareholders have decided to have a meeting and appoint a new person for CEO position.

Mark Wales, successful CEO of a chain of department stores who was losing money since the restructuring of his company. His main idea is to cut growth targets by half. He believes in slow but steady progress. His strategy will mean a short-term fall in profits. He expects a high share stake and a salary of €700, 000.

Mary Benks, current COO. He plans to increase the dividends at once by successful restructuring of company organization. He argues that newcomers lack the knowledge of the company and its staff. His current salary is €600,000 and he wants a substantial increase plus proposes not to replace himself as COO and do both jobs.

Phillip Johnson, CEO of famous and successful European company. He claims that he can succeed in 200 days through dramatic overall changes. He is the most expensive candidate at €800,000. He wants at least 10-year contract and substantial pension.

Home Assignment

Do Tasks 1-3 from Workbook section.

Optional Activity

Task 10. Facilitated Task

Read the text about business and enterprise. Give definitions to the words / phrases in bold.

A **business** or enterprise is a method to organize work. In a business, one or more people work together to make and sell products or services. Other people, called **consumers**, buy the products and services. The business owner (**employer**) is the person who hires people for work. Sometimes a company hires people called **employees** for work. A business can earn a profit for the products and services it offers.

Some businesses are created to get more money (**profit**) for the owner of the business. Other businesses are created to give a service without getting more money. Businesses can be big or small. For example, one person can open a small barber-shop. If there is one owner of an enterprise, he is called a **sole proprietor**. A big business, like Microsoft, employs thousands of people all over the world. This kind of ownership is called a **corporation**.

(The text is borrowed and modified from <http://simple.wikipedia.org/wiki/Business> as of 20th October 2013)

Task 11. Complex Task

Read the article about cultural peculiarities of doing business from “The Economist”. Replace the words / phrases in bold with their synonyms. Explain what was the reason of Walmart`s failure and what could have been done in order to prevent it.

Fish Can't See Water: How National Cultures Can Make or Break Your Corporate Strategy

By Kai Hammerich and Richard Lewis

In the 1990s Walmart decided to advance into German territory. It was the biggest **retailer** in the world, with 3,800 stores in America alone and a **huge pile of cash to spend**. And Germany's retail sector was in a **lamentable** state. The Arkansas giant bought two German chains – Wertkauf (with 21 stores) and Interspar (with 74) – and immediately began Americanising them. There were greeters at the door to wish shoppers a good day and strict instructions to smile at customers.

The result was a **disaster**. The have-a-nice-day stuff **went down** like a lead Zeppelin with employees and shoppers alike. And Walmart **compounded** its mistakes by putting an American expat **in charge of** the German operations (he insisted on

everybody speaking English). The company lost \$150m a year and soon decided to sell out to a German rival, Metro.

Coping with cultural differences is becoming a **valued** skill. The advance of globalisation, particularly the rise of powerful emerging countries such as Brazil and China, means that companies have to deal with business and consumers from a wider range of backgrounds. And the shift from a manufacturing to a service-based economy means that companies have to manage complicated ideas rather than relatively simple production processes. Western managers must understand **consumers** in São Paulo and Beijing. They also need to know how to tap into knowledge centres halfway across the world.

Yet many companies are bad at understanding culture. No serious business would dream of spending hundreds of millions buying a **subsidiary** without doing a thorough audit of its books. But Walmart **advanced** into the German market without bothering to make even the most rudimentary inquiries about German culture.

In “Fish Can’t See Water” Kai Hammerich, a Danish headhunter, and Richard Lewis, a British linguist, try to teach company directors to see the water that they are swimming in. They not only **argue** that “the biggest **obstacle** to successful globalisation is the inability of most companies to understand the world view and aspirations of partners and competitors.”

But they also try to bring casual cultural observation into the world of management theory. They argue that world civilisation can be divided into three **global archetypes**: linear-active, multi-active and reactive. Linear-active culture stresses timekeeping and getting-to-the-point and dominates in North America and northern Europe. Multi-active stresses emotion and sociability and dominates in southern Europe and Latin America. Reactive stresses “face” and harmony and dominates in Asia. But different countries stand in different positions on these various continuums: India is halfway between reactive and multi-active and Canada halfway between linear-active and reactive.

(The text is borrowed and modified from <http://www.economist.com/news/business-books-quarterly/21587760-why-culture-should-be-cool-crossing-divide> as of 20th October 2013)

Lesson 12

Whole-Class Activity

Task 12. Check the results of Tasks 1-2 from your home assignment (10 minutes).

Task 13. Report the results of your Internet search. Ask each other questions about the details of business success of a chosen company (10 minutes).

Task 14. Discuss the following questions (5 minutes). Turn to the help box if necessary:

1. What is a business letter?
2. Who writes business letters?
3. What are common purposes of business letters?
4. What style of language is used in a business letter?
5. What are its characteristics?
6. What should be omitted in business letters?
7. What are the necessary components of a business letter?
8. What is the optimal length of a letter?



A **business letter** is a formal way of communicating between two or more parties. It is usually used when writing from one company

to another, or for correspondence between such organizations and their customers, clients and other external parties.

Reasons to write a business letter include: to request direct information or action from another party, to order supplies from a supplier, to identify a mistake that was committed, to reply directly to a request, to apologize for a mistake etc. A business letter is useful because it produces a permanent written record, is confidential, and formal.

A business letter, disregarding of its purpose should have the following components:

- Writer`s address
- Date
- Reader`s address
- Salutation
- Text
- Complimentary close
- Signature
- Typed name

Task 15. Analyse the following sample of a business letter. What is the purpose of the letter? Look through its elements (1-8) and decide which parts of a business letter they constitute. Make up a template for a business letter. You have 5 minutes for this task.

(1) _____

Hyper Soft Company
12187 West Hardware,
Fairfax, VA 22030

May 16, 2013 _____ (2)

Julie Brands
15456 Pyramid Way
College Park, FL 33133 _____ (3)

Dear Ms Brands, _____ (4)

Thank you for your letter requesting information about our Hyper Soft service center. The following clarifies services what we offer:

- **Support & Maintenance** for any software on laptops, desktops, and smart phones.
- **Antivirus Software** – installation and activation of antivirus software for safeguarding your computer and data from viruses and worms.
- **Encryption Software** – providing whole-disk encryption to protect sensitive data on laptops and external hard drives.

With our expert maintenance, your software will be secured from flaws and guarantee high performance of your computer. If you purchase a visit to our center by the end of this month, we will offer you a 10% discount. Please contact our service representative at 455-4534. _____ (5)

Sincerely, _____ (6)

Becky Sandars, _____ (7)

Becky Sandars, customer service manager _____ (8)

Task 16. Business Letter: Writing Techniques

Read the article from the “Forbes” magazine about effective business writing. Choose the appropriate headings to each paragraph thus creating a list of effective communicative characteristics of a business letter (15 minutes).

A. Analyse Your Audience

D. Provide Evidence

B. Make It Clear and Concise

E. Deal with Their Objections

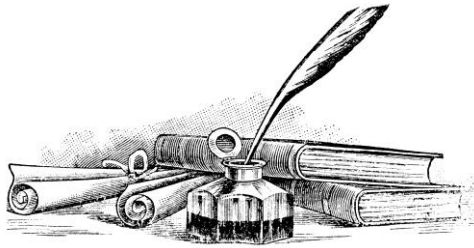
C. Structure Your Writing

F. Establish Your Purpose

6 Steps to Influence Others with Your Business Writing

Business writing used to be simply about getting information across to others. But nowadays, in order to succeed in your aim, you have to *influence*, not just communicate, with your writing. Not only advertisements, sales material or proposals

need to influence. Whether you are competing for business or competing for career advancement in your organization, everything you write should be designed to influence the readers. Follow these six steps to make your business writing effective and influencing:



1. _____

Everything you write needs to have a purpose, otherwise why would you bother writing it? For example, when you write a letter to a customer, you want them to agree with your position, buy more from you or simply feel good enough about their interaction with you that they'll become a repeat

customer. By understanding the purpose of what you are writing, you can then develop the strategy you need to achieve the influence you want.

2. _____

To be influential, you need to know what will actually influence your audience. Then, you can write in a way that is tailored to what matters to them instead of what matters to you. Do this by targeting your message and your arguments to their interests.

3. _____

Possible objections of your audience are something you need to specifically deal with. Unlike a conversation or a sales call, you won't have the opportunity to clarify what you write or respond to their questions while they are reading.

Think about questions they might ask or objections they might raise and answer them in the first place.

4. _____

Quite simply, facts sell. Don't be general when you talk about issues — provide evidence and facts that they can relate to, which means not just giving them raw numbers, but putting them in context. This is particularly important in a sales letter, proposal or other material you use for selling, but it is also important for internal memos, reports and business cases.



5. _____

No one has time to read long, fancy writing that makes the writer look like a scholar but quickly loses the reader. Your readers don't have the time to absorb long documents or complex sentences and paragraphs. Your goal isn't to impress the reader with your writing skills; your goal is to influence them. Keep your sentences as short as possible and don't write long, blocky paragraphs. Break them up to make them easier to read and absorb.

6. _____

Along with writing that's clear and concise, structure what you write to make it easy to read and to see the important information, arguments and points.

Use headings to introduce paragraphs and switch some paragraphs into bulleted lists, which will be easier to read. Use tables to present information, such as pros and cons, options or anything that you are comparing.

(The text is borrowed and modified from <http://www.forbes.com/sites/allbusiness/2013/07/01/6-steps-to-influence-others-with-your-business-writing/> as of 1st November 2013)

Task 17. There are several types of business letters depending on their purpose: letter giving information, letter of request, letter of complaint, letter of apology etc. Look through the following extracts from the letters (1-12) and decide which type of a letter they belong to. (5 minutes).

Informational letter	1.	We would appreciate if you would bring this announcement to your attention.
	2.	I sincerely hope this is a one-time incident, and this will not happen again.
	3.	I am planning a vacation to you area this summer and would like to get some information on about Williamsburg.
Letter of request	4.	Unfortunately, after viewing the components that came with the product, I discovered that four of the parts were missing.
	5.	Because of this serious mistake, and as a testament to our appreciation of you as our customer, we are going to provide you with your first three months of service free of charge.
	6.	Can you also send me a list of events taking place around that time.
Letter of complaint	7.	As our new letterhead indicates, we have recently changed the name of our business.
	8.	The purpose of this letter is to convey my sincere apology for any inconvenience you may have experienced last month.
	9.	Let me assure you that what happened in your case is not typical of our customer service.
Letter of apology	10.	I am writing to request replacements for the missing parts of the product.
	11.	We may also take some side trips during the week, so any information you may have on other locations around your area would also be helpful.
	12.	Thank you for being one of our valued customers.

Differentiated Activity

Task 18. Group work

You have already analysed four types of business letters. There are still lots of other different and important types of them, each holding their own peculiarities and aims.

Look at following analysis of Letter of Application and find out what questions should be answered before writing this type of letter. After doing so, in small groups prepare similar analyses of the other types of business letters and report your findings to the class. You have 10 minutes for this task.

Type of Letter	Introduction	Body	Conclusion
Letter of Application	Question: Why are you writing? Answer: In response to a job advertisement Question: What are you writing about? Answer: Name the specific job opening.	Question: What exactly do you want to say? Answer: The reasons why you are qualified for the job.	Question: What is next? Answer: When can you meet with the personnel director to discuss this job opening?
Group 1 Sales Letter	Question: Why are you writing? Question: What are you writing about?	Question: What exactly do you want to say?	Question: What is next?
Group 2 Letter of Request	Question: Why are you writing? Question: What are you writing about?	Question: What exactly do you want to say?	Question: What is next?
Group 3 Apology Letter	Question: Why are you writing? Question: What are you writing about?	Question: What exactly do you want to say?	Question: What is next?
Group 4 Order Letter	Question: Why are you writing? Question: What are you writing about?	Question: What exactly do you want to say?	Question: What is next?

Group 5 Letter of Invitation	Question: Why are you writing? Question: What are you writing about?	Question: What exactly do you want to say?	Question: What is next?
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Task 19. Group work

Look at the following list of common expressions which can often be found in business letters. Decide in what part of a letter (introduction, body or conclusion) they may be used. In group, discuss, what other expressions may be written in the mentioned parts of a letter. You have 5 minutes for this task.

I am writing to request...

Looking forward to hearing from you

If you have any questions, feel free to contact me at ...

Moreover,

We appreciate your cooperation in this matter.

I received your June 16th letter requesting...

Let me know if you have any further questions...

First,

Additionally,

The purpose of this letter is to

Consequently,

Thank you for your prompt attention on this matter

As you may know,

In closing, I believe that...

This is in response to your request...



Task 20. Tiered Task

Formal style of writing is very important in business letters. It helps to create appropriate course of communication and achieve the final goal of mutual benefit. Read the following letters which contain inappropriate sentences and complete at least one part of the task. You have 15 minutes:

Part 1. Read the following letter and replace inappropriate sentences in bold (1-6) with the suggested options (a-f).

(1) Hello Mr. Hamilton, I received the catalogue that you sent today. (2) I liked the way you dealt with my request. It has all the details that I wanted for the jewelry designing. (3) It	a. Yours sincerely, b. If I require some more designs, I will contact you in a week.
---	---

<p>surprised me how quickly you sent me the catalogue. This will help me in fulfilling my professional commitments.</p>	<p>c. I appreciate your prompt service to my requirements.</p>
<p>I have sent your payment for the catalogue. (4) Check your bank account in a day or two. Once again, thanks a lot for your quick service. (5) I'll certainly let you know if I need more designs. If you don't receive the payment, you can call me and I will look into the matter.</p>	<p>d. I am pleased about the delivery in such a short span.</p>
<p>(6) Best wishes Marie Jennings</p>	<p>e. Dear Mr. Hamilton f. You will be receiving it within two days.</p>

Part 2. Look through the business letter and rewrite the sentences in italics so that they become more appropriate.

(1) *Hello Mr. Kent,*

I am returning with this letter a recent shipment of 300 imprinted t-shirts (order #234A5) along with a copy of our original purchase order.

(2) *I have certainly told you that the logo must be reproduced in colour.* (3) *You have made a terrible mistake and sent me them printed in black!*

(4) *I will sue your company if you don't send another shipment of 300 t-shirts (with the correct logo colours) by the 10th of March. We need them for a company event that starts on the 20th of March.*

(5) *Give this matter prompt attention and correct the mistake immediately.*

(6) *Bye,*

Miss Brandon

Part 3. Find and correct stylistic mistakes in the following letter.

Good afternoon Mr. Moriarity,

The Board of Directors we wants you to come and to be the Closing Keynote Speaker at the upcoming 2015 IDCRI Conference.

The conference will be about "Latest Breakthrough in IT". It will probably be at Mountainview Conference Facility, in Montpelier, Vermont from December 3 to 5, 2015.

We want to let you know that Susan Crutchlow from Business & IT will be the opening Keynote Speaker. She'll be talking about "The Perspective of IT in Business Sphere". Please check your e-mail for a draft of conference program in a couple of weeks. It will give you an idea of the specific subjects that will be covered by the other speakers.

Its gonna be a lot of visitors this year – about 2,000 delegates and 150 speakers. People will come from our new European Chapter that is based in Geneva.

In closing, it will be great if you agree to be our closing speaker at the 2006 ICDRI Conference. I will call you in a week or so to follow up on this.

Yours sincerely,
Richard Bagnall

Task 21. Pair work

Write each other a letter on one of the following topics. After doing so, exchange the letters and assess each other`s works according to the criteria given in the table below. You have time until the end of the class.

Student A. You have ordered MGPr234 portable tablet in Buyonline Internet shop. But soon after the purchase you have found out that the tablet came without driver installation disk and headphones. Write a letter of complaint to the manager of the Internet shop and ask for replacement of the missing parts.

Student B. You are the manager of Buyonline Internet shop. You have received a letter of complaint from your customer. In the letter it is stated that the customer has received incomplete order. Write a letter of apology and assure your customer that he / she will receive the replacement as soon as possible.

	Questions	Yes	No
1	Has the student provided the eight letter essentials?		
2	Does the student`s Introduction explain why he or she is writing and what he or she is writing about?		
3	Does the Body explain what exactly he / she wants or plans to do?		
4	Does the Conclusion explain what`s next, specifying when there should be a follow-up action and why that date / time is important?		
5	Is the letter clear, answering reporter`s questions and specifying?		
6	Is the letter concise, limiting sentence length and paragraph length?		
7	Does the letter provide an accessible document design, using highlighting techniques effectively?		
8	Does the letter achieve audience recognition?		
9	Does the letter achieve audience involvement by personalizing through pronoun usage?		
10	Is the letter accurate, abiding by all grammatical conventions?		

Home Assignment

Do Task 4 from Workbook section.

Optional Activity

Task 22. Facilitated Task

Look at the following business letter. Some sentences have been removed from their places. Fill in appropriate sentences from the right column into the gaps.

<p style="text-align: right;">Kenneth Lee Customer Service Manager LG World 2310 West Kimberly Road, Davenport, IA, United States(563) 388-6082</p> <p>May 08, 2008</p> <p>Patricia Davis 404 Arrowhead Drive, Denison, IA,United States (712) 263-2012</p> <p>Dear Ms. Davis,</p> <p>(1)..... ... My company is late in fixing your air conditioner. I just saw the request that you had sent on May 1.</p> <p>(2)..... There were many changes in the company during last week and therefore your request was ignored.</p> <p>(3) You had to wait for a week so I will make sure that it is fixed as soon as possible.</p> <p>(4) In the next two months, you also don't have to pay any charge for the servicing that we provide for your air conditioner.</p> <p>(5)..... ... I assure you that such a thing will not happen in future. We will be providing good service for all the products that you have bought from our company. We are committed to give best service to our customers. (6)</p> <p>..... You can contact me on phone at (563) 388-6082 for any further requirements. (7)</p> <p>(8)</p> <p>Kenneth Lee</p>	<p>You need not pay any charges for the service that we provide today.</p> <p>Once again, I am sorry for the trouble.</p> <p>I am writing this letter to convey my apologies for the inconvenience.</p> <p>You have been a valuable customer for us.</p> <p>I am always there to serve you.</p> <p>I have reviewed your request and will be sending the person to fix your air conditioner by today evening.</p> <p>Yours sincerely</p> <p>I was not in the office and have just returned from a week long holiday.</p>
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Task 23. Complex Task

A letter of complaint is truly one of the most difficult letters to deal with. In order to answer them, one needs to be highly qualified, polite and understanding. Read the following letter of complaint and write an answer to it. Ensure that you provide an apology and assure your customer in better service in future.

Anthony Thomson
G Soft Consultancies
6330 Brooklyn Boulevard,
United States

Date: February 12, 2009

Nancy Adams
Eve's Training Academy
231 Pillsbury Drive Southeast,
United States

Dear Ms. Adams,

One of our employees, Sarah Parker attended your two day work shop on "Credit and Risk Management" on February 10 in Minneapolis. She was disappointed with the teaching methodology of the trainer and the content of the session. The outline of the course given on your brochure was altogether different than what was dealt with in the training.

Your course outline gave four topics under the heading Risk Management but in the training only one hour was spent on what is the concept of risk management. Other points were not dealt in depth. The trainer was not in a position to answer the queries due to sheer lack of practical knowledge.

Sarah travelled all the way to attend your session. She did not gain anything out of it. Your academy should refund half the amount paid as she did not attend the entire two day workshop. We need refund of \$ 250 paid as a registration fee. With this letter, we are enclosing the photocopy of the registration for your perusal.

We had high expectations from the training. But nowadays, the quality of your trainers and the entire management of your academy are degrading. You have to seriously look into it.

If you need to discuss anything with me or Sarah, you can contact us on phone at (763) 503-3534 or gsoft@gmail.com. We look forward for your reply.

Yours truly,
Anthony Thomson

(The text is borrowed and modified from <http://ru.scribd.com/doc/44436972/Types-of-Business-Letter> as of 16th September 2013)

WORKBOOK

Task 1. Tiered Task

Part 1. Match the words (1-6) with the pictures (a-f).

1. corporation

2. consumer

3. sole proprietor

4. profit

5. partnership

6. board of directors

a.



b.



c.



d.



e.

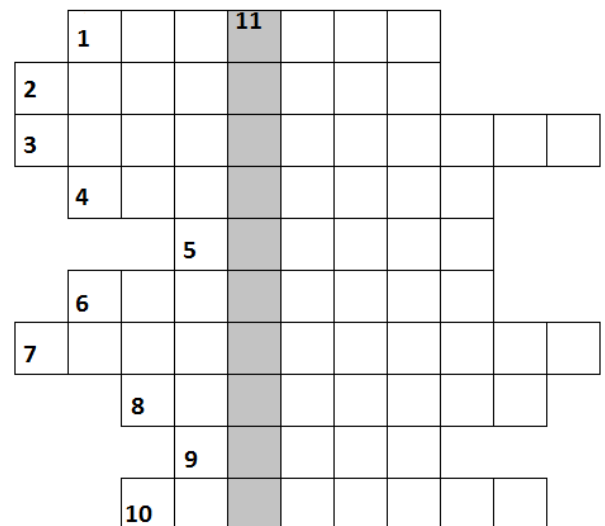


f.



Part 2. Solve the clues and complete the puzzle.

1. A business organization that makes, buys, or sells goods or provides services in exchange for money.
2. Legal right to the possession of a thing.
3. A large company or group of companies authorized to act as a single entity.
4. A person or company that provides goods /or services to other companies
5. A financial gain, benefit.
6. A commercial activity.
7. An owner of shares in a company.
8. A merchant who sells goods in small quantities
9. Commodities, wares or products.
10. A head of a company.
11. Owner of a business, or a holder of property.



Part 3. Fill in each gap with one suitable word.

Samsung Electronics Co., Ltd. is a South Korean (1)..... electronics (2)..... headquartered in Suwon, South Korea. It is the flagship (3)..... of the Samsung Group and has been the world's largest information technology company by revenues since 2009. Samsung Electronics has assembly plants and sales (4) in 88 countries and (5) around 370,000 people. For 2012 the (6)..... is Kwon Oh-Hyun.

Samsung has long been a major (7) of electronic components such as lithium-ion batteries, semiconductors, chips, flash memory and hard drive devices for clients such as Apple, Sony, HTC and Nokia.

In recent years, the company has diversified into (8)..... electronics. It is currently one of the world's largest manufacturers of mobile phones and smartphones fueled by the popularity of its Samsung Galaxy (9)..... of devices. The company is also a major (10)..... of tablet computers, particularly its Android-powered Samsung Galaxy Tab collection.

(The text is borrowed and modified from http://en.wikipedia.org/wiki/Samsung_Electronics as of 20th October, 2013)

Task 2. Tiered Task

Read the text and do at least one part of the task after reading.

The Disadvantages of Information Technology in Business

Information technology has changed the way that the world does business. Correspondence that once took weeks to get from one organization to another is now delivered instantly with the push of a button. Advances in telecommunication allow associates from all point of the globe to confer in a virtual environment, minimizing the need for business travel. Although the benefits of integrating information technology in business are many, there are also disadvantages to its use.



Every business must consider startup costs when implementing any type of information technology system. In addition to the cost of hardware and software, some technology vendors require businesses to purchase user licenses for each employee that will be operating the system. Businesses must examine the cost of training employees in unfamiliar technology. Although basic information technology systems may be user friendly, advanced programs still require formal instruction by an expert consultant.

In addition to the startup expenses, information technology systems are expensive to maintain. Systems malfunction, and when they do, businesses must engage skilled technicians to troubleshoot and make the necessary repairs. These expenses present a major disadvantage of information technology in business, particularly to businesses that are entering the technology era for the first time.

Implementing information technology into business operations can save a great deal of time during the completion of daily tasks. Paperwork is processed immediately, and financial transactions are automatically calculated. Although businesses may view this expediency as a boon, there are untoward effects to such levels of automation.

As technology improves, tasks that were formerly performed by human employees are now carried out by computer systems. For example, automated telephone answering systems have replaced live receptionists in many organizations. This leads to the elimination of jobs and, in some cases, alienation of clients. Unemployed specialists and once-loyal employees may have difficulty securing future employment.

The ability to store information in an electronic database facilitates quicker, more efficient communication. In the past, an individual would sift through stacks of paper records to retrieve data. With properly implemented technology, information can be recovered at the touch of a button.

Although information technology systems allow business to be conducted at a faster pace, they are not without their flaws. Information technology systems are vulnerable to security breaches, particularly when they are accessible via the Internet. If appropriate measures are not in place, unauthorized individuals may access confidential data. Information may be altered, permanently destroyed or used for unsavoury purposes.

(The text is borrowed and modified from <http://smallbusiness.chron.com/disadvantages-information-technology-business-4020.html> as of 20th October, 2013)

Part 1. Make up a plan of the text. For each paragraph, write a sentence which illustrates its main idea.

Part 2. Make a list of advantages and disadvantages of IT in business which were mentioned in the text.

Advantages

Disadvantages

.....

.....

Part 3. Write your own list of advantages and disadvantages of IT in business which were not mentioned in the text. Name at least 3-5 points.

Task 3. Internet Search

Search through the Internet for information about a story of business success of any IT company. Prepare to report your findings to the class.

Task 4. Writing

Read the following situations and write the suggested letter of one of the parts.

Part 1. Letter of Appreciation

Congratulations! You completed your degree and got a well-paid job in your field. One of your instructors played an important role in your study and was especially helpful during searching for job period. He wrote an excellent recommendation letter and thus contributed into your obtaining of position.

Write a letter thanking your instructor. Remember to make your thanks specific and meaningful.

Part 2. Information Request

Your company, SmartAnalysis.com, has recently changed its headquarters and wants to hold company meeting in a new location. The CEO has asked you to find a suitable conference location for 100 employees and guests. He wants a company to host a three-day combination of open conference / advertising campaign at some prestige place in the city centre. He suggests you to start your investigation with Business Palace Compey. You've checked its website and decided to write to its manager to get some details.

You estimate that apart from large conference hall your company needs to book about 80 rooms for guests. You will also require three small conference rooms, technical facilities and catering service. The CEO plans to have a banquet for about 200 guests the last day of event. Although the planned period of conference is at off-peak time (January 14-20), you wonder wheter there will be enough room for the event. The CEO wants a report from you by November 23.

Write a well-organized information request to Mr. Jack Corns, Manager, Business Palace Compey, 24 High Road, Bronx, 34525.

Part 3. Winning back your customer

As the marketing manager of Hardware.com, you handle customer claims. Ms. Jenny Woodstrike is returning a monitor HR3453, a high-end, fully functional device, tailored specifically for graphic design works. She claims that the device has a scratch on the back panel and lacks special CD with drivers. She is very dissatisfied and wants all her money back plus costs for shipping.

You suppose that the monitor was damaged during shipping because it was in a perfect condition when it was shipped. Nevertheless, the policy of your company is to comply with customer wishes.

Try to persuade Ms. Jenny Woodstrike to give your company another chance. Explain the reasons for the situation. Suggest that she can have the monitor with a large discount of 25%. If that doesn't suit her, propose a replacement of a monitor with another one of the same or different model.

Write to Ms. Jenny Woodstrike, Goodwill Street, 45, Bronx, HT234. Assure her that this situation will never happen again. Supply any necessary information.

Unit 7. Banking

Lesson 13

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about banking. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. How can we define a bank?
2. How do banks earn money? Name as many ways as possible.
3. What are the risks of online banking?

Practical Concern

1. What are the names of national and international banks of your country?
2. What are the most popular banks of your country?
3. What types of bank accounts do you know?

Analytical Concern

1. What are the advantages and disadvantages of having a saving account in a bank?
2. What should be analysed before choosing a bank?
3. What are the pros and cons of online banking?

Creative Concern

1. How should a perfect bank look like?
2. What atmosphere can make people feel good at bank?
3. What kind of advertising campaign can a bank run to attract more clients?

Task 2. Reading

Read the text about the ways in which banks make profit. After doing so, explain the meaning of the words in bold to the class. You have 20 minutes for this activity.

Making Profit from Money

Banks are companies (normally listed on the **stock market**) and are therefore owned by, and run for, their shareholders. As any other company, banks need to make enough money to pay their employees, maintain the buildings and run the business.

There are three main ways banks make money: by charging **interest** on money that they lend, by charging **fees** for services they provide and by trading financial instruments in the financial markets.

Retail and commercial banks need lots of customers to deposit their money with them, as the banks use these **deposits** to earn enough money to stay in business. To encourage people to keep their money in a bank, the bank will pay them a small amount of money (interest). This interest is paid from the money the bank earns by lending out the deposited money to other customers.



The banks **lend** money to customers at a higher **rate** than they pay to depositors. The difference, known as the **margin or turn**, is kept by the bank. For example, if a bank pays 1% interest on deposits, they may charge 6% interest on loans. Lending takes the form of **overdrafts**, bank loans, **mortgages** (loans secured on property) and credit card facilities. Loans approved by banks will vary in size, and may have fixed or variable interest rates.



Deposits are the banks' **liabilities**. If everyone was to demand their money back at once, the bank would not be able to pay. Because they lend money out, banks are required to carry a cushion of capital so they have sufficient money to pay those customers likely to withdraw their money at any time.

Another way banks make money is through charging fees. Most retail and commercial banks will charge for specific services, for example, for processing cheques, for other **transactions** and for unauthorised borrowing e.g. if a client exceeds an **overdraft limit**.

Investment banks earn huge fees for advising large companies and public institutions on issuing **bonds** and shares (securities), and from **underwriting** these issues. Investment banks also make their money by trading **securities** in the secondary markets. Their aim is to sell these securities for more than they pay for them or purchase them for less than they sold them. The difference, called the turn, is kept by the bank.

Banks also buy and sell currencies of all the nations of the world, trying to take advantage of the different prices of these currencies against each other, which are changing all the time.

(The text is borrowed and modified from http://www.risksandrewards.org.uk/background_banks_151.html as of 4th November 2013)

Task 3. Vocabulary Practice

Look at the table showing variety of bank types. Match the types of banks (1-8) with their descriptions (a-h). You have 5 minutes for this task.

1. Savings Banks	a. these banks are not for the general public or community. They serve entirely for private personnel's assets and transactions alone
2. Commercial Banks	b. these banks are specialized in providing mortgage loans alone. In order to sell loans they depend solely on the secondary market
3. Mortgage Banks	c. these banks are suited for employees with a monthly salary. Low waged people may open an account in this kind of bank
4. Federal or National Banks	d. these banks specialize in large organization's investments across the industry. They provide advice in the investments and promote corporate transactions
5. Private Banks	e. These bank collects money from people in various sectors and gives it as a loan to businessmen
6. Internet Bank	f. these banks have a wide spectrum of financial assistances to provide. Insurances to stocks, they promote everything across all countries around the globe
7. Investment Banks	g. provides banking facilities only via internet. There will be no physical contact with the bank
8. Universal Banks	h. these banks control the principles and policies of other banks across the country. These banks are managed and run by the government

(The text is borrowed and modified from <http://typesofbanks.org/as> of 4th November 2013)

Task 4. Vocabulary Practice

Read the text and fill in the gaps with the words in bold. You have 10 minutes to complete this task.

Credit, payment, cheque, account, balance, debit, cash, deposit, debit card, transactions, account statement.

Dear Mr Bodler,

The purpose of this is to clarify the matter with my bank account # 34568790.

I opened a(n) (1) with your bank on 12th October with a cash (2) of £500. On 15th October I took out £40 in (3) from ATM. On 17th October I wrote a (4) for £67 and it appeared as a (5) on the bank statement the next day. On 25th October the bank also debited £48 from my account for a(n) (6)..... I made using my (7) On 30th October I received my monthly

salary directly into my account and it appeared as a(n) (8).....of £1700,87. Although no further (9) were made on my account, I finished the month with a (10) of £2024.31. As you may see, the sum of £21,55 is missing and it has not appeared on the (11) I am afraid it has been some kind of mistake and I would like if you give this matter your consideration.

Yours sincerely,
James Blake

Task 5. Language in Use

Giving reasons is very important not only in everyday life, but also in professional sphere. The ability to explain why you make certain choices gives your opinion additional value and objectivity. Study the box explaining the ways of giving reasons (5 minutes)

Giving Reasons

We can give reasons using different words and expressions:

because, due to, so that, as, in order to, since, the reason ... is to.

1. *I've decided to withdraw my saving account **because** I need money for travel*
2. *The transaction was cancelled **due to** customer's request.*
3. *I need to go to the bank **so that** I can open an account.*
4. ***As** we are going to expand, we need to analyse the risks.*
5. *I couldn't make transaction **since** the bank was closed.*
6. *We have printed account statement in order to see the record of all transactions.*
7. ***The reason** we want to reduce the price **is to** increase sales.*

Match the situations with the reasons. Compose sentences using appropriate expressions. You have 5 minutes for the task.

- | | |
|--------------------------|--------------------------------|
| 1. Meeting cancelled | wrong password |
| 2. Bank closed on Monday | company had low profit |
| 3. Access denied | earn profit |
| 4. Interest rate changed | the end of deposit period |
| 5. Share price fell | poor weather conditions |
| 6. Banks lend money | continually going in overdraft |
| 7. Bank account closed | public holiday |
| 8. Money withdraw | raise money from deposits |

Differentiated Activity

Task 6. Listening

You are going to watch a video about online banking. Choose any part of the task you feel confident to complete or do them all. You have 10 minutes for the task. To watch the video, use the following link:
<http://www.youtube.com/watch?v=ddqh7D4EGdQ>

Part 1. Look through the following statements and say which of them were mentioned in the text.

1. The Internet has dramatically changed the way of banking operation.
2. You can create banking account in real-time.
3. Typing URL manually ensures you are visiting the true site.
4. Never enter personal information in a pop-up screen
5. Use firewalls to prevent fishing attacks.
6. Typing “https” will take you to the secured site.
7. Be careful with email spam that can endanger your computer.
8. Create strong password to secure your site.
9. Don’t conduct operations on public computer.
10. Never email personal or financial information
11. Don’t use laptop to log into the site.
12. Check your online accounts and bank statements regularly
13. Always remember to log out the system.
14. If possible, avoid viewing your account statement online.

Part 2. Insert the words into the missing gaps

Banking used to be a tremendous hassle. The Internet has made banking extremely (1) You can check your (2), transfer (3)....., and even monitor your (4) and investments in real-time. But with that convenience comes (5)..... Here are some simple tips to remember to help keep you – and your money – safe.

Always type in the URL of your (6) Typing in your bank's URL (7) ensures you are visiting the true site.

Use the (8)..... connection to your financial institution. Most banks automatically take you to their secured (9) If not, try using (10) when typing in the URL.

Create strong, unique (11) for each of your online (12)

Don't conduct online banking at a (13) computer. Use your home desktop or laptop to make your (14) or check balances.

And finally, and perhaps the simplest tip of all, remember to (15) when you're finished.

Part 3. Name and explain all the preventative measures which were suggested in the record. Tell which one is the most important and why. Suggest your own tips on how to make online banking safe.

Task 7. Tiered Task

Choose and complete any part of the task suggested below. Prepare to report your results to the class. You have 10 minutes for this task.

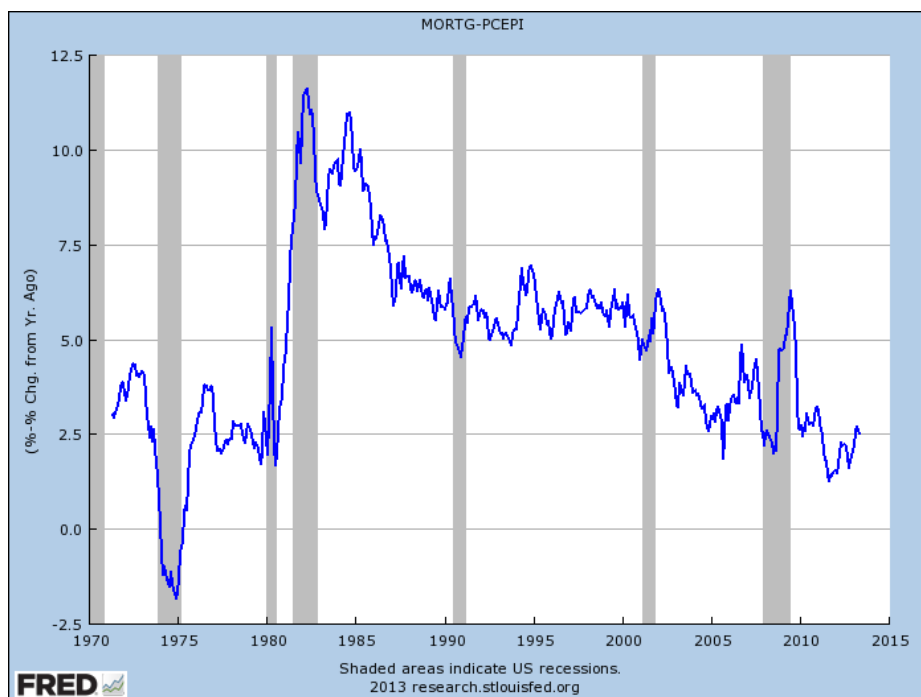
Part 1. Work out the topical content of Task 2 and Task 3. Create a scheme of banking system, which should contain such blocks as types of banks, ways of banks `raising money etc.

Part 2. Read the text form Task 2 once again and give definitions to the following terms:

stock market, interest, fees, securities, lend, margin, overdrafts, mortgages, transactions, bonds, deposits, liabilities, underwriting, overdraft limit.

Part 3. Look at the following chart depicting the relation of recession and mortgage rates. Analyse the chart and answer the questions:

1. How do mortgage rates relate to recession?
2. How have rates changed overtime?
3. What are the highest and the lowest rates during past 45 years?
4. What is the average mortgage rate?



(The chart is borrowed from <http://www.jparsons.net/housingbubble/> as of November 1, 2013)

Task 8. Pair work

Act an interview with a bank representative explaining the principles of bank operation. You have 10 minutes for this task.

Interviewer. You have received a task to make an interview about causes of some bank operations. You have made notes of several questions you want to ask. However, you may come up with more questions during the interview.

1. Why do banks charge higher rates on loans than they pay on deposits?
2. What is the reason for banks to have a “cushion of capital”?
3. Why are banks interested in trading securities?
4. What causes the interest rate fluctuation?

Bank representative. You are going to give an interview and explain the reasons of some bank operations. You may turn to Task 2 and Task 5 for help.

Task 9. Group Work

You are the members of the credit committee of ABC Bank. You are responsible for assessing the credit standing and ability to repay debt of prospective borrowers. Today you have to discuss four asks for credit from different parties. Analyse their ability to repay debt, risks and sums of lending and make decision on whether to give loan or not. You have time until the end of the class.

Mr. John Mc Blake. Asks for credit of £10, 000 to set up sole proprietorship specialized in sewing and clothing design. Mr. John Mc Blake worked as tailor for ten years, currently unemployed. No credit history. Mr. Mc Blake claims to repay the debt in one year, agrees to receive a loan against property.

Buyonline. A startup business specialized in online retail asks for a loan of £ 30, 000. Buyonline plans to expand its business and open a subsidiary in another city. Buyonline has good credit standing; it successfully repaid the loan of £ 10, 000 previous year. Current annual revenue of a company is estimated as £ 20, 000.

Venture LLC. A large company specializing in automobile trade asks for £ 10 million loan against assets for business development. The company is currently experiencing difficulties; its annual revenue fell by £30 million or 15% from the previous year. Venture LLC has existing loan of £7,5 million in another bank.

H&R general partnership. Ms. Jane Holins asks for a loan of £ 250, 000 to buy the part of business belonging to her partner Mr. Ben Covy. The annual revenue of the business is £ 30,000. Good credit standing: 3 repaid loans of £ 5,000, £ 10,000 and £ 20,000 respectfully.

Home Assignment

Do Tasks 1-3 from Workbook section.

Optional Activity

Task 10. Facilitated Task

Read the text about banks. Find the words of the following categories and group them into the table:

Establishments	Types of money	Assets	People	Actions
<i>bank</i>	<i>loan</i>			
...	...			

A bank is a place where money can be saved or loaned out from. Someone's money can be placed in the bank for safe keeping, or the bank can give out loans to people for an agreement to pay the bank back at a later time, usually with interest. The people who run a bank are called bankers.

Banks also can use the money they have from deposits to invest in businesses in order to make more money.

In most of the modern world a bank settled by the government but independent of the state administrators controls how much money appears at a time. Such kind of bank is called a national bank. A national bank ordinarily issues bills and/or coins. In some countries issuing money is the task of the government.

(The text is borrowed and modified from <http://simple.wikipedia.org/wiki/Bank> as of 10th November 2013)

Task 11. Read the article about modern bank robberies from “Forbes”. Answer the questions:

1. How has bank robbery changed overtime?
2. What is a KVM and what opportunities for robbery does it give?
3. What options does physical access provide to criminals?
4. What is the major source of security vulnerability?
5. What measures can be undertaken to secure access to money?

Classical Bank Robbery With A Cyber Twist

By John Nugent

Once upon a time, bank robbery was a swashbuckling trade – thieves would either hold up tellers at gunpoint or concoct elaborate break – in schemes that inspired a whole genre of Hollywood fantasy. But the game has changed considerably. Modern-day bandits in developed countries are far likelier to use keyboards than guns. It's big business, but not a very compelling screenplay.

Screenwriters might be heartened, then, by a pair of attempted heists earlier this year that married old-fashioned artistry with new-fangled technology. In each case, thieves entered London-based bank branches posing as IT technicians and attempted to

install a wireless-equipped keyboard video mouse (KVM) switch onto bank computers. A KVM switch is a piece of hardware that enables third-party control of a computer; when coupled with a wireless modem a KVM switch allows control of the computer from a remote location. Attaching such an apparatus to a banking terminal can facilitate the remote transfer of funds from a bank's own computers. The bandits who tried this scheme at a Barclays branch made off with \$2.1 million—though 11 of them were eventually tracked down and arrested. The thieves who carried out a similar plot at a Santander branch were sniffed out and arrested before they could access any funds.

As organizations become increasingly aware of the need to safeguard their networks from external attackers, the fundamentals of physical site security continue to be the bedrock of any plan to protect vital information. Physical access provides criminals and insiders a range of options. They can plug laptops into open ports or use a company's unprotected Wi-Fi to access corporate networks directly; they can access unlocked computers and download data to removable drives; or, as in the banking cases, they can install hardware or software that grants them remote access. Many companies already conduct regular network penetration tests; the risks posed by physical access suggest that these tests should be complemented by physical equivalents.

Data is only as secure as the weakest link within an organization and, as with other security threats, employees are a major source of vulnerability. Many cases of data loss can be traced back to employees' negligence or lack of security awareness; and the most costly incidents of IP theft are believed to involve corporate insiders. Indeed, in a joint study of data breaches the Ponemon Institute and Symantec found that 35% of cases could be attributed to the 'human factor' – employee or contractor fallibility.

So what is a company to do? Information security training for employees is a good start. Of course, these measures should be complemented by a strong regimen of defence measures against cyber attacks – including encryption of hardware and software – and robust set of building access controls.

(The text is borrowed and modified from <http://www.forbes.com/sites/riskmap/2013/11/08/classical-bank-robbery-with-a-cyber-twist/as> of 11th November 2013)

Lesson 14

Whole-Class Activity

Task 12. Check the results of Tasks 1-2 from your home assignment (10 minutes).

Task 13. Report the results of your Internet search. Ask each other questions related to the topic of your reports (10 minutes).

Task 14. Discuss the following questions (5 minutes). Turn to the help box if necessary:

1. What is e-mail?
2. What are the common spheres of use of e-mail?
3. What are the differences between official and private e-mail?
4. What is the difference between a traditional and an electronic business letter?
5. What are the necessary parts of an e-mail letter?
6. What is the required length of an electronic letter?



Electronic mail, most commonly referred to as **email** or **e-mail** since 1993, is a method of exchanging digital messages from an author to one or more recipients. Modern email operates across the Internet or other computer networks.

Internet email messages consist of two major sections:

- *Header* – Structured into fields such as From, To, CC, Subject, Date, and other information about the email.
- *Body* – The basic content sometimes containing a signature block at the end. This is exactly the same as the body of a regular letter.

The header is separated from the body by a blank line.

Task 15. E-mail: Writing Techniques

Read the article about writing a formal e-mail. Choose the appropriate headings to each paragraph thus creating a list of tips for effective e-mail writing (15 minutes).

- A. Use a proper salutation
- B. Write the actual message
- C. Sign with your full name.

- D. Start with the main idea in the first paragraph
- E. Use the correct form of leave-taking.
- F. Use a short and accurate subject header.
- G. Use a neutral e-mail address



How to Write a Formal E-mail

In business, e-mails have replaced letters in much communication. The style is similar, but there are some differences. To write a formal email, follow these guidelines.

- (1) _____ Your e-mail address should be a variation of your real name, not a username or nickname. If you can, don't use extra numbers or letters.
- (2) _____ Avoid saying too much in the subject header, but make sure it reflects the content of your email to a person unfamiliar with you. If possible, include a keyword that will make the email content easier to remember and/or search for in a busy inbox.
- (3) _____ Addressing the recipient by name is preferred. Use the person's title (Mr. Mrs. Ms. or Dr.) with their last name, followed by a comma or a colon. Optionally, you can precede the salutation with "Dear...". Using a last name is more formal and should be used unless you are on first-name terms with the recipient. If you don't know the name of the person you're writing to, use "Dear Sir/Madam" or "Dear Sir or Madam"
- (4) _____ Even though the purpose of the e-mail is summarized in the subject line, the purpose should be restarted in the first sentence. Busy readers want to know immediately why they are reading a message. Most messages should begin directly.
- (5) _____ Provide more information about the reason for writing in the body. Be sure to get your point across without rambling; if it's fluffed up, the reader may glance over the important details. Try to break up the message into paragraphs by topic to make your message more logical and digestible.



- The email should be no more than 5 paragraphs long and each paragraph should be no more than 5 sentences long.
- Insert a line break between each paragraph;
- Be sure to avoid informal writing.

(6) _____ This will depend on your level of intimacy with the recipient. Usual variants include “Yours sincerely”, “Respectfully” etc.

(7) _____ If you have a job title, include that in the line after your name, and write the company name or website in the line after that. If you do not have a job title but you have your own blog or website related to the content of the e-

mail, include a link to that below your name. If the e-mail is about a job, only include a career-related website or blog, not hobbies or interests.

(The text is borrowed and modified from <http://www.wikihow.com/Write-a-Formal-Email> as of 18th November 2013)

Task 16. Analyse the following samples of e-mails and decide what variant is better. Compare them and try to name all the flaws and good points of the samples. (5 minutes).

Sample A.

To: Keith Milton <keith.milton@apex.com>
From: Madeleine Espinoza <best_assistant @apex.com>
Subject: Problems
Cc:
Attached:
<p>Pursuant to your request, I am responding. Your inquiry of April 29 suggested that you wanted to know how to deal with the database problems.</p> <p>In my opinion the biggest problem is that it all contains a lot of outdated information, including customers who haven't purchased anything in five or more years. Another problem is that the old database is not compatible with the new software that is being used by our mailing service, and this makes it difficult to merge files. After much thought, I think I can solve both problems by starting a new database. This would be the place where we put the names of all new customers. And we would have it keyed using Access software. The problem with outdated information could be solved by finding out if the customers in our old database wish to continue receiving our newsletter and product announcements. Finally we would rekey the names of all active customers in the new database. Does this make sense?</p> <p>Maddy</p>

Sample B.

To: Keith Milton <keith.milton@apex.com>
From: Madeleine Espinoza <madeleine.espinoza @apex.com>
Subject: How to Improve Our Customer Database
Cc:
Attached:
<p>Dear Ms Milton,</p> <p>As you requested, I am submitting my recommendations for improving our customer database. The database has two major problems. First, it contains many names of individuals who have not made purchases in five or more years. Second, the format is not compatible with the new Access software used by our mailing service.</p>

The following three steps, however, should solve both problems:

1. Start a new database. Effective immediately, enter the names of all customers database using Access software.
2. Determine the status of customers in our old database. Send out a mailing asking whether recipients wish to continue receiving our newsletter and product announcements.
3. Rekey the names of active customers. Enter the names of all responding customers in our new database so that we have only one active database.

These changes will enable you, as team leader, to send mailings only to active customers. Please let me know by May 10 whether you think these recommendations are workable. If so, I will investigate costs.

Maddy
 Madeleine Espinoza
 Senior marketing Manager
 E-mail: madeleine.espinoza @apex.com
 Office: (987) 234-56-78

Task 17. A direct opening is important in writing an e-mail. Compare the following sets of message openers. Identify the one which illustrates a direct opening. Discuss the weaknesses and strengths of each. (5 minutes).

1. **Inquiring to respond to questions:**
 - a. Our company has lately been experiencing some difficulties connected with poor operation of our customer service site. We feel that the only way to improve our service and stay in touch with our customers is to renew the site. Thus, we would like you to answer several questions which may help us.
 - b. Please answer the following questions about our site operation, which we hope will help us in increasing the quality of our service.
2. **Announcing the meeting:**
 - a. For the past few years it has been the tradition of our company to hold annual meeting dedicated to improvement of company strategy. This year is not an exception and everyone who is interested in discussing our policy is welcome to attend the meeting on October 4.
 - b. We would like to invite employees interested in improvement of our company strategy to attend our annual meeting which will be held on October 4.
3. **Announcing the changes:**
 - a. It has come to our attention that increasing number of our staff members are using e-mail as means of effective communication. We would like to announce some changes in operation of our e-mail server.
 - b. The following new procedures connected with our e-mail server operation will come in force since Monday.

Differentiated Activity

Task 18. Group work

Read the task and complete the assignment of your group (10 minutes).

Group 1. Apart from being convenient in many ways, electronic mail has a lot of disadvantages. Make a list of pros and cons of an e-mail and be ready to report your findings to the class.

Pros and cons of electronic mail

<i>Speed – the letter is delivered almost instantly</i>	<i>Control – requires companies to establish usage rules</i>
...	

Group 2. Having learned how to write traditional and electronic business letters, compare them and report your findings to the rest of group.

	Traditional letter	Electronic letter
Common Features	<i>Style – formal, polite ...</i>	
Different Features		

Group 3. *Netiquette (network etiquette)* is a philosophy of effective internet communication that utilizes common conventions and norms as a guide for rules and standards. In your group, discuss the following list of netiquette rules and suggest your own rules. Be ready to report your findings to the rest of your group.

1. *Care about tone – your words and writing style affect the reader*
2. *Don't forward without permission and beware of long threads – obtain approval before forwarding a message.*
3. *Acknowledge receipt – if you can't reply immediately, tell when you can.*
4.

Task 19. Pair work

Look at the following list of e-mail features. Decide which of them belong to good and bad writing techniques. In pairs, justify your opinion and propose your other characteristics of a good e-mail (5 minutes).



GOOD WRITING

- Sending e-mail randomly to someone in the company saying “I’m not sure if you are the right person, but I figured you could forward this...”
- Electronic thank-you notes
- Clear and appropriate content of e-mail
- Using alias and extension like “gamenerd777@whatever.net”
- Blank subject line
- Clear and short subject line like “Application for system analyst position”
- Writing first and last names in greeting line (“Dear Mr. Jack Tomphson”)
- Writing “Dear Sir or Madam” if the name isn’t supplied
- Writing “Ms” if the marital status is unknown
- Starting by saying why you’re writing
- Starting by introducing yourself and small talk questions
- Using stylized fonts
- Using all capitals
- Giving full name and full contact information, including mailing address and phone number in signature block
- Including your job title in signature block
- Naming attachments by numbers (l1tr2343)
- Sending a content-empty e-mail with attachment



BAD WRITING

Task 20. Tiered Task

After you have learnt and discussed the good and bad writing techniques of an e-mail, choose any part of this task and revise the suggested letter. Analyse its good and bad points. You have 10 minutes for this task:

Part 1.

Dear Sally, Judy and Rebecca,

As most of you know, communication with clients is very important for most Client Services Managers. Several staff members came to me and announced

their interest in learning effective communication skills. A seminar entitled “Effective communication for Business” will be held December 12. I am allowing the following managers to attend the seminar: Rebecca White, Judy Desley, Sally Fincey.

Best wishes, Frank

Part 2.

Hi, Jenny

Our company is moving towards new strategy of communication with clients. As you know, our department has started to run a new website and we are now on the stage of filling information. In connection to this, our task is to upload some instructions on how to write us e-mail into our site.

To write information for a Web site, there are three important tips to follow. For one thing, you should make the formatting as simple as possible. Another thing you must do is ensure the use of visual aids. Pictures and illustrations will make it easy for sure! And finally, you should limit directions that are not needed. Write only important ones!

Hope this will help.

Judy

Part 3.

Jim,

I was thinking about the meeting and I started to wonder about a few things. I'm not sure if you're interested, but I hope this might help. I looked back through the paperwork and found a few old documents from Terry. Do you remember her? Anyway, I wondered about spreadsheet for a new product line. This one that Terry did made zero sense to me then, but now I think she was on to something. In column D, we could include a spot for the subtotals like she did. Maybe I'm nuts, but it might just work.

Hey, I also wondered which version of the logo you needed for next month's trade show. We have two or three, but I think Mary is doing another one if we need it.

Oh, and could you give me the title of the movie we were talking about. I really want to check it out.

Larry

Task 21. Pair work

Write each other a letter on one of the following topics. After doing so, exchange the letters and assess each other's works according to the criteria given in the table below. You have time until the end of the class.

Student A. You are the CEO of BNC company. This year your company has changed its policy and you are going to keep working during some holidays. Write an e-mail to Human Resources manager and ask him / her to write suggestions on how to organize floating holiday plan in your company.

Student B. You are the Human Resources manager at BNC company. You have received an e-mail from your CEO informing you that your company is going to keep working during some holidays. Propose your variant of organization of floating holiday plan, where each employee will be able to take a day-off after the holidays. Also suggest that working hours during holidays should be restricted to 9:00-14:00.

	Questions	Yes	No
1	Has the student provided the e-mail identification lines (Date, To, From, Subject)?		
2	Does the Subject line provide clear and concise topic?		
3	Does the Introduction explain why the letter is written and what the author is writing about?		
4	Does the Body explain what exactly the author wants or plans to do?		
5	Does the Conclusion explain what's next, specifying when there should be a follow-up action and why that date/time is important?		
6	Is the e-mail clear, answering the reporter's questions?		
7	Is the e-mail concise, limiting sentence length and paragraph length?		
8	Does the e-mail provide an accessible document design, using highlighting techniques effectively?		
9	Does the e-mail achieve audience recognition?		
10	Is the e-mail accurate, abiding by all grammatical conventions?		

Home Assignment

Do Task 4 from Workbook section.

Optional Activity

Task 22. Facilitated Task

Look at the following e-mail. Some sentences have been removed from their places. Put the appropriate sentences from the right column into the gaps. Find and identify the constituent parts of an e-mail:

- *Header* – Structured into fields such as From, To, CC, Subject etc.
- *Body* – The basic content structured into introduction part, main body part, conclusion part and signature block.

<p>(1) john_clement@corp.com From: steve_nordec@corp.com Subject: (2) Cc: Attached:</p> <p>(3), Thank you for purchasing the starter pack of Agel. We will send your monthly account statements to provide you with the full transactions on your account with us.</p> <p>(4) Please call me directly at 777-5649 if you need further information or assistance.</p> <p>(5)..... Steve Nordec,</p> <p>(6)</p>	<p>Sincerely,</p> <p>Dear Mr. Clement</p> <p>We value your business and will do our best to respond fast to your business needs.</p> <p>Client Services Manager</p> <p>To:</p> <p>Thank you for buying Agel</p>
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Task 23. Complex Task

Read the article from “The Economist” about e-mail security. Answer the following questions:

1. Why was the prediction of Bill Gates “nearly right”?
2. What measures have been done to stop spam mail?
3. What does the phrase “it is moot whether the link is e-mailed, tweeted or liked” mean?
4. Why is the spam a social problem?
5. What measures does the author suggest to make online operations safe?

Dealing with Spam: Confidence Game

Bill Gates was nearly right in 2004 when he predicted the end of spam in two years. Thanks to clever filters unsolicited e-mail has largely disappeared for most on the internet. But spam is still a menace: blocked at the e-mail inbox, spammers post messages as comments on websites and increasingly on social networks. The criminal businesses behind spam are competitive and creative.

The anti-spam industry has done its work in saving e-mail. But it is always one step behind. When filters blocked spam with tell-tale words such as “Rolex”, spammers misspelled them (“R0lex”). When filters blocked mail from suspect network addresses, the spammers used botnets (networks of hijacked computers) instead. In the end, the software industry's interest is in making money from the problem (by selling subscriptions to regular security updates) rather than tackling it at its source.

In any case, the real problem is not the message, but the link. Sometimes an unwise click leads only to a website that sells counterfeit pills. But it can also lead to a page that infects your computer with a virus that then steals your passwords or other information. Spam was never about e-mail; it was about convincing us to click. To the spammer, it is moot whether the link is e-mailed, tweeted or liked.

The police are doing what they can, and software companies keep on tightening security. But spam is not just a hack or a crime; it is a social problem, too. If you look beyond the computers that lie between a spammer and his mark, you can see all the classic techniques of a con-man: buy this stock, before everyone else does. Buy this watch cheaper than anyone else can. The spammer plays upon the universal human desire to believe that we are smarter than anyone, and that things can be had for nothing. As in other walks of life, people become wiser and take precautions only when they have learned what happens when they don't.

That is why the spammers' new arena – social networks – is so effective. People follow Twitter feeds from people they would like to know and make “friends” on Facebook whom they do not know at all. Hijack one such account, and you can exploit a whole network of trusting and trusted contacts.

A few fiddles might help, such as tougher default privacy settings on social networks. But the real problem is man, not the machine. Public behaviour still treats the internet like a village, in which new faces are welcome and anti-social behaviour a rarity. A better analogy would be a railway station in a big city, where hustlers gather to prey on the credulity of new arrivals. Wise behaviour in such places is to walk fast, avoid eye contact and be brusque with strangers. Try that online.

(The text is borrowed and modified from <http://www.economist.com/node/17522616?zid=292&ah=165a5788fdb0726c01b1374d8e1ea285> as of 16th November 2013)

WORKBOOK

Task 1. Tiered Task

Part 1. Find the words from Unit 5 in the crossword puzzle. Translate the words into your native language.

O	V	E	R	D	R	A	F	T	L	O	A	N
V	E	F	E	E	Y	N	I	U	T	A	B	O
D	T	R	V	P	N	G	T	R	A	D	E	U
I	W	N	E	O	T	B	A	N	K	E	R	N
T	R	A	N	S	A	C	T	I	O	N	I	D
N	G	S	U	I	C	U	R	N	M	D	N	E
A	E	F	E	T	S	R	E	T	A	I	L	R
U	L	I	M	I	T	R	N	E	R	T	E	W
B	O	N	D	N	I	E	D	R	G	A	N	R
U	A	A	E	T	L	N	S	E	I	L	D	I
Y	N	N	B	R	K	C	M	S	N	I	T	T
W	R	C	I	O	B	Y	S	T	A	B	Y	E
F	E	E	T	D	E	G	C	R	E	D	I	T

Part 2. Read the sentences and choose one appropriate word from options in bold. Explain the difference.

- As I needed money to buy a car, I decided to **borrow** / **lend** it from a bank.
- Mary has opened a(n) **discount** / **account** with ABC Bank.
- The salary appears as **credit** / **debit** on the bank statement.
- Banks usually charge **percent** / **interest** on money they lend.
- Mortgage** / **overdraft** is a loan secured against property.
- Investment banks can earn money by **underwriting** / **guaranteeing** company`s assets.
- If a company has low annual revenue, its share prices may **raise** / **fell**.
- By trading **coins** / **currencies** banks can take advantage and earn money on exchange rates.
- Mortgage banks are specialized in providing mortgage **loans** / **debts**.
- Investment banks provide advice on investment and promote corporate **operations** / **transactions**.

Part 3. Fill in each gap with one suitable word.

The very beginning of modern internet (1) was back in the 1980s, when banking services were available over electronic (2)..... for the first time. If you had a terminal, monitor and a phone line you could (3) the banking system. You could also use a numeric keypad to send messages down the phone lines to your bank.

The early system (4) bank customers to view their (5) and their bill payments online. If you wanted to make a (6) or pay a (7), you would need to send a written set of instructions to the National Banks of Scotland which would then set up the details for you.

The internet continued to (8) and evolve during the 1990s and more people than ever were buying home computers and getting online with dial-up (9) in their own homes. The first bank to (10) the modern style of online internet banking services through a web (11) , like we are used to today, was the Stanford Federal Credit Union in 1994.

In 2001, the Bank of America was the first bank in the world to reach 3 million online banking (12) Over the next ten years, online banking grew exponentially, and some banks appeared which only existed online! These banks were able to offer better (13) rates, more features, and other services because they had the of not (14) having to maintain the expenses of brick and mortar bank buildings.

(The text is borrowed and modified from <http://www.tech2date.com/the-history-of-internet-banking.html#sthash.CMieyS2I.dpuf> as of 10th November, 2013)

Task 2. Tiered Task

Read the text and do at least one part of the task after reading.

Types of Bank Accounts

A bank account can be defined as a financial account between a financial institution and a bank customer. It is a channel through which a customer can entrust a bank with his/her funds and make withdrawals when need be. Banks usually offer different types of banking accounts to their customers without restricting their choice for a particular account type. The following are basic banking account types offered by a majority of banking institutions worldwide.

Chequing Accounts

This is an account that offers you comfortable and secure access to your account, especially if you need some money to cater for your transactional needs on a daily basis. It is a primary instrument used by majority of people for withdrawing their funds. With this type of a bank account, you can transfer funds from your chequing

account to another bank account in a different banking institution. Majority of people consider it as the most economical bank account type because it lacks monthly service fees.

Savings Accounts

The savings account is another bank account type that allows the account holder to amass interest on the funds deposited for future use. Interest is compounded on weekly, daily, annual and monthly basis. However, a savings account is not as flexible as the checking account because holders of savings account are limited to the amount of deposits and withdrawals they can make on monthly basis. Banking institutions do not allow holders of this bank account type to access their funds with cheques. However, they are allowed to withdraw and deposit money through their ATMs.



Certificates of Deposit Accounts (CDs)

A CDs account is in most cases referred to as Time deposit account. As the name suggests, a CDs account provides you with a platform to only invest your funds at a pre-set interest rate within a pre-set of time period. This means that you should agree to leave your funds in the account for a specific amount of time. The best thing with CDs accounts is that they have relatively higher interest rates compared to the traditional savings account. However, it is not one of the best bank account types you should open if you would like to access your money any time.

Money Market Bank Accounts

This bank account has a few similarities with savings account but it requires you to hold a certain minimum amount of money, otherwise you will be charged a monthly fee. This minimum is also required for your money to earn interest which is normally higher than that imposed on checking and savings accounts. Majority of money market accounts allow its holders to cash in cheques against their funds but on fixed basis.



Individual Retirement Accounts (IRA)

This type of a bank account lets you to save on your own for retirement. It is the best alternative if your employer doesn't provide a retirement benefits scheme or if you would like to save some more money for your retirement. Individual retirement account comes in two other types namely; Roth IRA and traditional IRA. However, the former is more popular because cash withdrawals can be done tax-free.

(The text is borrowed and modified from <http://typesofbanks.org/types-of-bank-accounts/> as of 20th October, 2013)

Part 1. Match the types of bank accounts (1-6) with their definitions (a-f).

1. Bank account	a. an account type that allows the account holder to amass interest on the funds deposited for future use
2. Chequing account	b. an account that provides you with a platform to only invest your funds at a pre-set interest rate within a pre-set of time period
3. Saving account	c. an account that requires you to hold a certain minimum amount of money, otherwise you will be charged a monthly fee
4. CDs	d. a channel through which a customer can entrust a bank with his / her funds and make withdrawals when need be
5. Money Market Bank Account	e. an account that lets you to save on your own for retirement
6. IRA	f. such an account offers you comfortable and secure access to your account, especially if you need some money to cater for your transactional needs on a daily basis

Part 2. Compare different types of bank accounts by making a list of their advantages and disadvantages.

Bank account type	Advantages	Disadvantages
Chequing account	<i>comfortable and secure access to your account</i>	
Saving account		
Certificates of Deposit Account		
Money Market Bank Account		
Individual Retirement Account		

Part 3. In writing, suggest who may use each of the mentioned types of accounts and why. Stress the benefits of the account type to the particular customers.

Task 3. Internet Search

Search through the Internet for information on one of the following topics:

- interesting types of banks (e.g. Islamic banks) which were not discussed at the class;
- famous bank robberies;
- cash machines around the world.

Prepare to report your findings to the class.

Task 4. Writing

Read the following situations and write a suggested e-mail.

Part 1. Call for meeting

Write an internal e-mail on behalf of Mr. George Fillis, CEO of SmartAnalysis LTD to managers of your company. Inform the managers that your company will be holding a conference “IT breakthrough in XXI century” on 15-20 January at Business Palace Compey. Call for managers to attend a special meeting dedicated to conference organization process on Friday, November 15th, at 10:00, Meeting Room #3. Ask for confirmation of their presence.

Part 2. Invitation

On behalf of your company, SmartAnalysis LTD, write an external e-mail to Mr. John Malbur, PhD. Invite him to give an opening speech at the conference “IT breakthrough in XXI century” which will be held on 15-20 January at Business Palace Compey. Specify that during the conference there will be a lot of master classes, theoretical and practical seminars and after the conference your company plans to organize a banquet. Ask Mr. Malbur to confirm his visiting the conference if he agrees to take part.

Part 3. Acceptance of invitation

You have received an e-mail from manager of SmartAnalysis LTD with an invitation to give an opening speech at the conference “IT breakthrough in XXI century”. You are going to accept the invitation and you want to ask whether the topic “Advances in speech recognition systems” will be suitable for an opening speech. Unfortunately, you cannot stay in Business Palace Compey until the 20th of January as you have to be present at your company annual meeting. You also want to inquire if you may take a guest – Mr. Ikira Tobisumi – a representative of THS company with you.

Write your answer to Mr. Daniel Carthwool, manager of SmartAnalysis LTD.

Unit 8. Market and Competition

Lesson 15

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about market structures. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. What is competition?
2. How does competition influence the market?
3. What can happen if there is no competition?

Practical Concern

1. What criteria do you take into account before buying any product?
2. What will determine your choice between two similar products?
3. What makes a market monopolistic?

Analytical Concern

1. What factors determine the winner in a competition?
2. What are the features of a competitive market?
3. Which industries are perfectly competitive?

Creative Concern

1. What part does advertising play in making buying decisions?
2. What kind of advertising strategy is effective nowadays?
3. If you had company, what would you do to attract customers?

Task 2. Reading

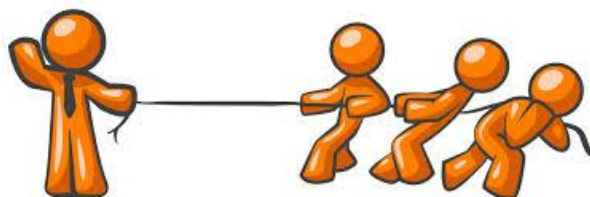
Read the text about basic market structures. After doing so, explain the meaning of the words in bold to the class. You have 20 minutes for this activity.

Monopolies, Oligopolies and Perfect Competition

Economists assume that there are a number of different buyers and sellers in the marketplace. This means that we have **competition** in the market, which allows price to change in response to changes in **supply** and **demand**. Furthermore, for almost every product there are substitutes, so if one product becomes too expensive, a buyer can choose a cheaper substitute instead. In a market with many buyers and sellers, both the consumer and the supplier have equal ability to influence price.

In some industries, there are no **substitutes** and there is no competition. In a market that has only one or few suppliers of a good or service, the producer(s) can control price, meaning that a consumer does not have choice, cannot maximize his or her total utility and has very little influence over the price of goods.

A **monopoly** is a market structure in which there is only one producer/seller for a product. In other words, the single business *is* the industry. Entry into such a market is restricted due to high costs or



other hurdles, which may be economic, social or political. For instance, a government can create a monopoly over an industry that it wants to control, such as electricity. Another reason for the barriers against entry into a monopolistic industry is that oftentimes, one entity has the exclusive rights to a natural resource. For example, in Saudi Arabia the government has sole control over the oil industry. A monopoly may also form when a company has a copyright or patent that prevents others from entering the market.

In an **oligopoly**, there are only a few firms that make up an industry. This select group of firms has control over the price and, like a monopoly, an oligopoly has high **barriers** to entry. The products that the oligopolistic firms produce are often nearly identical and, therefore, the companies, which are competing for market share, are interdependent as a result of market forces. Assume, for example, that an economy needs only 100 widgets. Company X produces 50 widgets and its competitor, Company Y, produces the other 50. The prices of the two brands will be interdependent and, therefore, similar. So, if Company X starts selling the widgets at a lower price, it will get a greater market share, thereby forcing Company Y to lower its prices as well.

There are two extreme forms of market structure: monopoly and, its opposite, **perfect competition**. Perfect competition is characterized by many buyers and sellers, many products that are similar in nature and, as a result, many substitutes.



Perfect competition means there are few, if any, barriers to entry for new companies, and prices are determined by supply and demand. Thus, producers in a perfectly competitive market are subject to the prices determined by the market and do not have any leverage. For example, in a perfectly competitive market, if a single firm decides to increase its selling price of a good, the consumers can just turn to the nearest competitor for a better price, causing any firm that increases its prices to lose market share and profits.

Task 3. Vocabulary Practice

Look at the table showing economical terms. Match the terms (1-8) with their definitions (a-h). You have 5 minutes for this task.

1. Monopoly	a. the amount of a good or service offered for sale
2. Oligopoly	b. market structure where no participants are large enough to have the market power to set the price of a homogeneous product
3. Supply	c. a market structure in which a market or industry is dominated by a small number of sellers
4. Demand	d. a party that offers goods or services
5. Competition	e. thing acting or serving in place of another
6. Substitute	f. a person who purchases goods and services for personal use
7. Supplier	g. a situation in which a single company or group owns all or nearly all of the market for a given type of product or service
8. Consumer	h. the desire of purchasers, consumers, clients, employers, etc., for a particular commodity, service, or other item

Task 4. Vocabulary Practice

Read the text and fill in the gaps with the words in bold. You have 10 minutes to complete this task.

Competition, demand, monopoly, structure, profit, industry, marketplace, quality, supplies, consumers, substitute, price

Perfect competition is a theoretical market (1) It is primarily used as a benchmark against which other, real-life market structures are compared. The (2) that most closely resembles perfect competition in real life is agriculture. Perfect competition is the opposite of a (3), in which only a single firm (4) a particular good or service, and that firm can charge whatever (5)it wants because (6) have no alternatives and it is difficult for would-be competitors to enter the (7) Under perfect competition, there are many buyers and sellers, and prices reflect supply and (8) Also, consumers have many (9) if the good or service they wish to buy becomes too expensive or its (10) begins to fall short. New firms can easily enter the market, generating additional (11) Companies earn just enough (12) to stay in business and no more, because if they were to earn excess

profits, other companies would enter the market and drive profits back down to the bare minimum.

(The text is borrowed and modified from <http://www.investopedia.com/terms/p/perfectcompetition.asp> as of 10th November 2013)

Task 5. Language in Use

Study the box explaining the rules of modal verbs use. Rewrite the sentences (1-10) using appropriate modal verbs so that they will have similar meaning (10 minutes).

Modal verbs

Modal verbs are usually followed by bare infinitive and don't take suffixes (-s, -ed, -ing). Modal verbs can express a variety of meanings, such as:

1. **Ability:**

*e.g. If one product becomes too expensive, a buyer **can** choose a cheaper substitute instead.*

*We didn't rise our prices because that **could** lead to decrease of demand.*

2. **Obligation and necessity:**

*e.g. Suppliers **have to** analyze competition before entering the market.*

*We **must** change our price policy to win the larger market part.*

*People **should/ ought to** be careful choosing one product over another.*

3. **Possibility:**

*e.g. A monopoly **may** form when a company has a copyright that prevents others from entering the market*

*The price in a monopolistic market **can** be very high.*

*We **could** have changed the situation in time, but we didn't.*

4. **Logical assumptions:**

*e.g. As it is Sunday, the banks **must** be closed.*

*Because the market is monopolistic, companies **can't** enter it easily.*

5. **Advice:**

*e.g. The market is highly competitive. We **should** analyse our strategy before entering it.*

1. Perhaps the prices will change in the nearest month.
2. I'm sure the CEO has gone on a business trip.
3. Employees are obliged to follow safety rules at the workplace.
4. The company was advised to develop another competitive product line.
5. The bank is able to raise interest rate without customer notification.
6. The guests are supposed to arrive at the conference at 9:00 AM.
7. I'm certain he will not make it at the opening time.
8. It is necessary for companies to meet the customers' expectations.
9. There is a chance that next year we will enter the foreign market.
10. You are to report to the manager as soon as possible.

Differentiated Activity

Task 6. Listening

You are going to watch a video about perfect competition. Choose any part of the task you feel confident to complete or do them all. You have 10 minutes for the task. To watch the video, use the following link:
<http://www.youtube.com/watch?v=9Hxy-TuX9fs>

Part 1. Look through the following statements and say whether they are true (T) or false (F).

1. Cost curves depend on market structure.
2. There exist a lot of market structures.
3. There is no specific number of suppliers in a perfect competition.
4. In perfect competition, you are free to make decisions without worrying about how the competition will react.
5. In perfect competition, suppliers produce different products.
6. It is easy to go in and out the market in perfect competition.
7. Market power is the ability to control the demand.
8. Each individual firm has market power.

Part 2. Insert the words into the missing gaps.

Cost curves are always going to look the same, but other elements, like price, revenue and (1), will differ depending on the (2) structure that the (3) operates in. There is a continuum of market structures, one of which is perfect (4)

If the market is competitive, how many producers are we talking about? A large number of (5) means there is so many competitors that each one is too small to (6) the market. Since nothing you do affects the market, you are free to make (7) without worrying about how the competition will(8)

Besides having a large (9) of sellers, each of those sellers will be producing exactly the same thing. In perfect competition, the (10) is identical, or homogeneous, or non-differentiated, no matter who produces it.

One more characteristic – it`s easy for firms to come and go from the industry, that is, there`s free (11) and exit. Also you have no ability to drive the (12)....., because you`re so small, and everyone else produce exactly the same thing that you do.

Part 3. Answer the following questions:

1. What can be changed depending on the market structure?

2. How many producers are there in a competitive market?
3. What is market power?
4. What are the characteristics of a perfect competition?
5. What will happen if you try to raise the price in a competitive market?

Task 7. Tiered Task

Choose and complete any part of the task suggested below. Prepare to report your results to the class. You have 10 minutes for this task.

Part 1. Read the following quotations of the famous businessmen. Analyse them and work out the rules of successful performance under competition. Suggest your own advice on winning in a competitive market.

“Business is not just doing deals; business is having great products, doing great engineering and providing tremendous service to customers. Finally, business is a cobweb of human relationship.”

Henry Ross Perot

“In business, the competition will bite you if you keep running. If you stand still, they will swallow you.”

Victor Kiam

“If you are not a brand, you are a commodity.”

Robert Kiyosaki

“Don’t try to be all things to all people. Concentrate on selling something unique that you know there is a need for, offer competitive pricing and good customer service.”

Lilian Vernon

“The competitor to be feared is one who never bothers about you at all but goes on making his own business better all the time.”

Henry Ford

“Innovation distinguishes between a leader and a follower.”

Steve Jobs

Part 2. Read the following small business marketing strategies for overcoming competition. Paraphrase and organize them into a set of rules, so that each rule starts with one of the letters constituting the word ‘MARKET’.

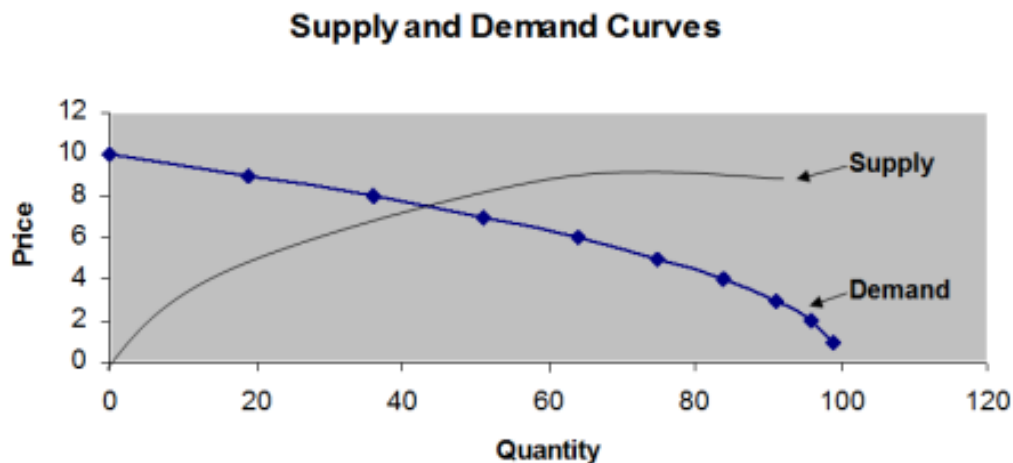
- Identify your competitor; spot out the competitor’s strengths and weaknesses, and plan your strategy based on the information gathered.
- Find a niche market and serve that niche to the best of your effort. Don’t spread your effort, concentrate and don’t try to be everything to everyone; be something to someone.
- To outsmart your competitors, you need to be unique. You need to find your strength, work on it and broadcast it to the world.

- Connecting with your customers entails knowing your customer's need and touching them at the point of that need. If you can successfully do this; you have nothing to fear about competition.
- Focus on how to serve the customers more efficiently; your utmost focus should be to give the customer maximum satisfaction. You must insist on quality and make quality a standard in your business. Insistence on quality at an affordable rate can set you apart from competition.
- Be innovative which simply means being willing to try out new products and techniques to improve the value of your offered services.

(The text is borrowed and modified from <http://www.mytopbusinessideas.com/effective-marketing-strategies/> as of 20th November 2013)

Part 3. Look at the following chart depicting Supply and Demand Curves. Analyse the chart and answer the questions:

1. What does each curve indicate?
2. What happens when two curves intersect?
3. Is the demand curve directly affected by price changes?
4. Why do the curves have such shapes?



(The chart is borrowed from http://www.consumerpsychologist.com/food_Price_and_Competition.html as of November 11th, 2013)

Task 8. Pair work

Act a dialogue between a newcomer employee and a department manager about working conditions. In your dialogue, use modal verbs (turn to Task 5 for help, if necessary). You have 10 minutes for this activity.

Department manager. Introduce the newcomer employee to the rules of work at your department. Tell him / her that employees are obliged to come at work at 9:00, follow the safety dress-code rules, and report to their supervisor at the end of working day. Also inform that smoking at workplace is forbidden.

Employee. You have come to a new department and are unfamiliar with the working conditions here. After the lead-in of your department manager, ask

him whether you are allowed to use a company car and parking facilities, when and for how long you may take a lunch break and whether you can have a day off.

Task 9. Group Work. Role-play

You are the board of directors of one of the suggested below companies. You call a meeting to discuss the strategy of launching a new product line into highly competitive market. Analyse your strengths and weaknesses and propose tactics and overall direction of your strategy. You have time until the end of the class.

Steelbox Corporation. You are the current leader of computer devices industry. You are well-known and have a wide spectrum of devices on the market. You have developed a new tablet to launch in the nearest future. Your product is of high quality and its performance is quick and effective. However, the costs of production and, thus, the price are relatively high. You are concerned about the rising number of competitors on your market and have to develop a strategy to hold your greatest part of the market.

NTS Corporation. You have been in the industry of home appliances for several decades and you certainly have a well-known brand name. However, you are a newcomer in the industry of IT devices and the process of your new tablet introduction may be troublesome. You have to develop a strategy to convince your customers that your company is able to perform well not only in appliances industry.

Small&Nice Company. You are a young developing company with a lot of brand new ideas as to design and functions of popular teenage gadgets. You have decided to launch your new tablet, which goes in a variety of colours and unique prints. It also has pre-installed popular games and a lot of useful widgets. Develop a strategy on how to survive and make profit on the same market with such giants as NTS and Steelbox.

ABC company. Your company has taken the opportunity to enter the foreign market with your new line of tablets. Your primary aim is to enter the market quickly and make a short-run profit. Although you can offer low priced product, its efficacy and operation is low compared to your competitors` products. Develop a strategy to reach your aims and survive on the foreign and competitive market.

Home Assignment

Do Tasks 1-3 from the Workbook section.

Optional Activity

Task 10. Facilitated Task

Read the text about market structures. Give definitions to the words/ phrases in bold and fill in the table.

In economics, **market structure** describes the state of a market with respect to competition. Most market forms given below talk about a **homogeneous product**. This simply means that they all make the same kind of product (like sugar, or soap), and that the individual consumer does not care where he or she buys from. They simply want to get the cheapest one, since all kinds of product look the same anyway.

The major market forms are:

- **Perfect competition:** there are many firms making a homogeneous product.
- **Oligopoly:** A market is dominated by a small number of firms which own more than 40% of the market share.
- **Monopoly:** There is only one provider of a product or service.

The correct sequence of the market structure from most to least competitive is: perfect competition, imperfect competition, oligopoly, and pure monopoly.

The main criteria by which one can distinguish between different market structures are: the number and size of **producers** and **consumers** in the market, the type of goods and services being traded, and the degree to which information can flow freely.

Market Structure	Seller Entry Barriers	Seller Number	Buyer Entry Barriers	Buyer Number
Perfect Competition	<i>No</i>	<i>Many</i>	<i>No</i>	<i>Many</i>
Oligopoly				
Monopoly				

(The text is borrowed and modified from http://simple.wikipedia.org/wiki/Market_forms as of 10th November 2013)

Task 11. Complex Task

Read the article about Apple-Samsung competition from the “Forbes” magazine. Fill in the table with the data from the article.

	Apple	Samsung
Previously owned mobile phone		
Switch to operation system		
Switch to mobile phone		
Switch from basic or non-feature phone		
Retention rate		

Apple Vs. Samsung: Who Could Win The Smartphone War?

Consumer Intelligence Research Partners (CIRP) conducts a quarterly survey of 500 consumers who have bought a mobile phone in the past three months. It analysed the results over the past four quarters from July 2012 to June 2013 to determine where Apple and Samsung got their customers.

It is reported that 42% of iPhone owners had owned an iPhone previously while 43% of Samsung owners had previously owned an Android phone. Apple does a better job of getting Android users to convert to iOS with about 20% of its customers coming from Android vs. only 7% of Samsung customers coming from iOS.

Samsung makes up for not getting iOS customers to switch by having 37% of its customers coming from a basic or non-feature phone while Apple only has 26% of its customers upgrading from these lower functionality phones.

Not many users switch from Apple to Samsung at only 11%. This is critical to Apple's long-term survival since Apple users are sticking with iOS and not defecting to Samsung, the biggest Android player by far. Apple is having about one-third of its users coming from Android with a substantial percentage, about 14% coming from BlackBerry.

Brand loyalty is very important to any manufacturer but is extremely important in the smartphone market due to the quick replacement cycles. Apple has a bit higher retention rate at 42% vs. 38% for Samsung. Apple does a better job of switching Samsung customers at 19% vs. Samsung only converting 7% of its users from Apple. Both Apple, at 79%, and Samsung, at 75%, users tend to keep their phones between one and three years with Apple turning them over slightly sooner than Samsung owners.

While having higher market share of any given market is not necessarily the best strategy, not having a mid-priced smartphone will hamper Apple's ability to get users into the Apple ecosystem. Since its users have a high likelihood of sticking with Apple, the potential September 10 announcement of a more entry level smartphone could have major long-term benefits for Apple.

Apple could be in a better position since it seems to be retaining a higher percentage of its users and doing a better job of getting Android users to convert to iOS. While it is not expected that Samsung will falter anytime soon, if the Android market becomes extremely price competitive and it is not able to make inroads in Apple's install base Samsung's profitability could be negatively impacted. Samsung will need to be at the leading edge of functionality and develop its own ecosystem.

(The text is borrowed and modified from <http://www.forbes.com/sites/chuckjones/2013/08/20/apple-and-samsung-who-could-win-the-smartphone-war/> as of 21st November 2013)

Lesson 16

Whole-Class Activity

Task 12. Check the results of Tasks 1-2 from your home assignment (10 minutes).

Task 13. Report the results of your Internet search. Ask each other questions related to the topic of your report (10 minutes).

Task 14. Discuss the following questions for 5 minutes. Turn to the help box if necessary:

1. What is a report?
2. What are the common spheres of use of a report?
3. What is the aim of a report?
4. Who is the target audience of a report?
5. What are the necessary parts of a report?
6. What is the required length of a report?
7. What are the common characteristics of a report?



A **report** is any informational work made with the specific intention of relaying information or recounting certain events in a widely presentable form.

Written reports are documents which present focused content to a specific audience. Reports are often used to display the result of an experiment, investigation, or inquiry. The audience may be public or private. Reports are used in government, business, education, science, and other fields.

The following common elements can be found in many different reports:

- Title page
- Contents
- Introduction
- Methodology
- Results or findings
- Conclusion and recommendation

Task 15. Report: Writing Techniques

Read the article about writing a report. Choose the appropriate headings to each paragraph thus creating a list of tips for effective report writing (15 minutes).

- | | |
|--|------------------------------|
| A. Gathering and selecting information | D. Understanding the purpose |
| B. Analysing your material | E. Writing the report |
| C. Reviewing and redrafting | F. Organizing your material |

Writing the Report: the Essential Stages

All reports need to be clear, concise and well structured. The key to writing an effective report is to allocate time for planning and preparation. With careful planning, the writing of a report will be made much easier. The essential stages of successful report writing are described below.

Stage One _____

This first stage is the most important. You need to be confident that you understand the purpose of your report. Consider who the report is for and why it is being written. Check that you understand all the instructions or requirements.

Stage Two _____

Once you are clear about the purpose of your report, you need to begin to gather relevant information. Your information may come from a variety of sources, but how much information you will need will depend on how much detail is required in the report. As you read and gather information you need to assess its relevance to your report and select accordingly.

Stage Three _____

Decide what information will be included and in what sequence it should be presented. Begin by grouping together points that are related and form sections or chapters. Choose an order for your material that is logical and easy to follow.

Stage Four _____

Take time to consider and make notes on the points you will make using the facts and evidence you have gathered. What conclusions can be drawn from the material? It is not enough to simply present the information you have gathered; you must relate it to the problem or issue described in the report brief.

Stage Five _____

Having organized your material into appropriate sections and headings you can begin to write the first draft of your report. Aim for a writing style that is direct and precise. Make your points clearly and concisely. Chapters, sections and even individual paragraphs should be written with a clear structure.

- **Introduce** the main idea of the chapter/section/paragraph
- **Explain** and expand the idea, defining any key terms.
- **Present** relevant evidence to support your point(s).
- **Comment** on each piece of evidence showing how it relates to your point(s).
- **Conclude** your chapter/section/paragraph by either showing its significance to the report as a whole or making a link to the next chapter/section/paragraph.

Stage Six _____

Be prepared to rearrange or rewrite sections in the light of your review. Try to read the draft from the perspective of the reader. Is it easy to follow with a clear structure that makes sense? Are the points concisely but clearly explained and supported by relevant evidence? Keep reviewing until you are satisfied with the content and structure of your report.

(The text is borrowed and modified from <http://www2.le.ac.uk/offices/ld/resources/writing/writing-resources/reports> as of 28th November 2013)

Task 16. Analyse the following sample of a report and decide which titles can be chosen to fill the gaps (5 minutes).

- | | |
|------------------------------|---------------------|
| 1. Sources of information. | 4. Recommendations. |
| 2. Results of investigation. | 5. Introduction. |
| 3. Procedures. | |

Survey of Overseas Students at Smartfield University

University Survey Committee, 10th December, 2014

1. _____

The main purpose of the study is to explore ways of attracting more overseas students to study at Smartfield University. An additional purpose is to help to make the existing environment more conducive to study for these students.

2. _____

Our major source of information about the needs and wishes of overseas students at Smartfield University is a questionnaire, aimed at eliciting relevant information from overseas students who have studied here since 2000.

A total of 300 responses were received, 296 of which were usable. Four hundred and seventy two students had been enrolled at Smartfield University during the period in question. The responses, therefore, can be taken to reflect the views of a significant majority of these students.

3. _____

Students were asked if they had received thorough, partial or no information about the university, their chosen program of study, local culture, and travel and visa matters. Results suggest that insufficient information on local culture and traditions was provided to students before they arrived here. In addition, some departments apparently sent information sheets that were insufficient, incomplete or unclear.

Using a scale of dissatisfied, satisfied, or very satisfied, students were also asked to rate five different aspects of their arrival in the country and at the university. Some responses suggest that local food and campus orientation seem to require improvement.

4. _____

This survey of overseas students at Smartfield University over last 13 years show why our university continues to be a popular place of study for students from many countries. However, two main concerns have been highlighted by the survey:

- In some cases, inadequate or erroneous information has been sent to overseas students prior to their arrival at Smartfield University.
- Problems with housing and cuisine have been noted

5. _____

Based on the survey results, the committee makes the following recommendations:

The university should provide information on local culture and traditions as part of the mailing to overseas applicants.

It should identify departments whose departmental brochures and flyers are in need of updating or expansion.

(The text is borrowed and modified from <http://www.ryerson.ca/content/dam/student-services/els/pdf/MODULE%20Academic%20Report.pdf> as of 28th November 2013)

Task 17. Look at the following list of common expressions which may be found in reports. Decide in which part of a report they may be used and insert each into appropriate column of the below given table (10 minutes).

the aim of ... is to ..., was collected, ... was asked to submit ..., it is recommended that..., will outline, was to determine ..., carry out (a research, a task etc.), the purpose of ... is to ..., was used, was requested by, was undertaken, responses were identified, as requested by, should be done, was instructed, before (date), was asked, make appropriate recommendations, by (date), should be done, on (date), with discussions, obtain, the following recommendations..., were surveyed, make questionnaires, should be undertaken.

Aim of investigation	Who requested the report	When the report was requested	Methodology used	Recommendations
<i>The aim of ... is to...</i>				

Differentiated Activity

Task 18. Tiered Task

Read the assignments and complete at least one part of the task. You have 10 minutes for this task.

Part 1. Although reports may be lengthy and cover different points of the subject in question, they need to have a clear structure. Organize the following ideas into a list with headings and sub-headings. The list will become the contents page for a report about strategies for implementing Internet technologies in the school study.

Speaking

Aim

Background

History of Internet Use in School

Listening

Content

Conclusions

Pedagogical Approach

Scope

Introduction

Methodology

Current State of Internet Implementation

Recommendations

Learning Activities

Historical Background

Learning Objectives

Part 2. Linking your ideas is important in writing a report. Use of linking words and expressions will help to build coherent and understandable text. Study the following table of most commonly used linking means. After doing so, insert the appropriate words into the suggested report paragraphs.

To Add or Strengthen	To Express Cause and Effect	To Express Order of Actions	To Contrast	To Clarify
additionally	as a result	first	but	for example
also	due to	next	however	for instance
besides	therefore	finally	on the contrary	in other words
indeed	consequently	before	on the other hand	that is
moreover	so	after	yet	namely
what is more	as	meanwhile	although	thus

A. In recent years, the Internet has become a teaching tool as useful as textbooks, chalk boards and, (1) teachers themselves. (2), as is the case with any medium, online resources have a range of advantages and disadvantages. (3) it is necessary to carefully examine and evaluate web-based resources before choosing to use them.

- B. The report evaluates the on-line resource, focusing on three key factors,
 (4) content, pedagogical approach, and practical considerations.
 (5) the website is divided into several sections, the paper focuses on listening and speaking activities. The material was selected (6) of collaboration between the author and several linguistic teachers.
- C. (7) the web-based material has its limitations, the activities are educational. The material is user-friendly, even for first-time internet users. The learner can easily return to the main menu (8) the text-based navigation tools are always displayed. (9) the simple and consistent format of the web page the teacher can easily navigate the learners through the web page. The content is American based; (10) it can be implemented into any language classroom.

Part 3. A well-written report should demonstrate the information in logical and clear way. That is why it is important to understand what kind of data may be included into separate paragraphs. Read the following typical report structure and create a list of questions which should be answered in each paragraph.

1. Title
2. Introduction
3. Methodology
4. Results of Findings
5. Conclusions
6. Recommendations

Task 19. Pair work

Look at the following list of report features. Decide which of them belong to good and bad writing techniques. In pairs, justify your opinion and propose other characteristics of a good e-mail (10 minutes).



GOOD WRITING

- proper use of subheadings;
- the inclusion of inaccurate or conflicting information;
- use of outdated or irrelevant data;
- appropriate header and footer of a page;
- facts and opinions which are not separated and used altogether;
- use of clear and correct information;



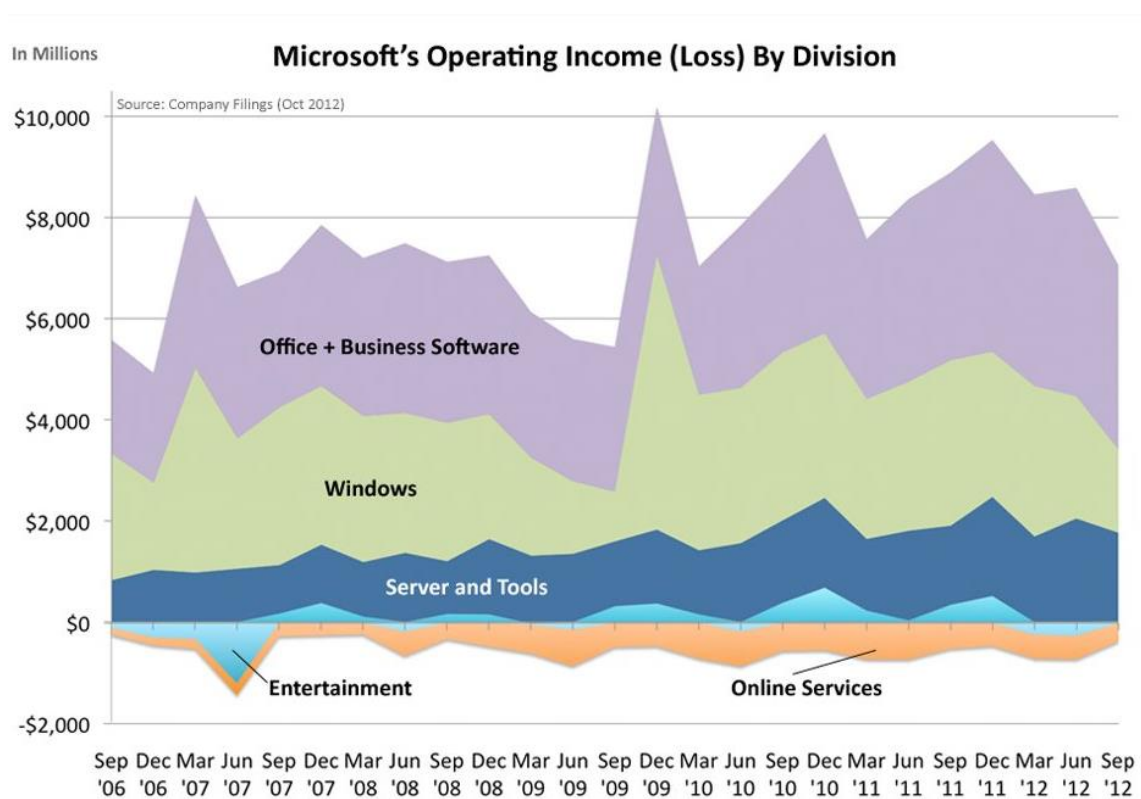
BAD WRITING

- use of informal style of writing;
- use of stylized fonts;
- use of consistent and appropriate formatting;
- use of tables and figures (graphs, illustrations, charts etc);
- separation of parts of the report so that they stand out clearly;
- unsupported conclusions and recommendations;
- use of dot points/ numbers/ letters to separate elements;
- careless presentation and proof-reading;
- formal language;
- too much emphasis on appearance and not enough attention to the content.

(The text is borrowed and modified from <http://www.canberra.edu.au/studyskills/writing/reports> as of 28th November 2013)

Task 20. Group work

You are the team of Research Department at IT company. You have received a chart depicting the operating income of Microsoft Corporation. Your task is to analyse the chart and create a report on Microsoft operation in 2006-2012. Inside your group, divide responsibilities so that each member is responsible for separate report paragraph. Create and present your report to the rest of the class. You have time until the end of a class.



(The chart is borrowed from <http://www.businessinsider.com/chart-of-the-day-microsoft-income-by-segment-2012-10> as of 18th November 2013)

Home Assignment

Do Task 4 from the Workbook section.

Optional Activity

Task 21. Facilitated Task

Look at the following report. Some sentences have been removed from their places. Put the appropriate sentences from the right column into the gaps. Find and identify the constituent parts of a report:

<p style="text-align: center;">Evaluating the Effectiveness of Technology in Our Schools</p> <p style="text-align: right;">Richard J. Noeth Boris B. Volkov</p> <p>(1) _____ <i>Computers and information technologies have visibly revolutionized nearly every aspect of daily life – how and where we get our news, how we order goods and services, and how we communicate.</i></p> <p>(2) _____ This report is intended for use by educational leaders and policymakers who are concerned with making optimal use of technology in the schools.</p> <p>(3) _____ The rapid growth of school technology infrastructure has led to the increased availability and use of computers in schools.</p> <p>(4) _____ <i>But while they may have abundant computers, schools may not use them in the best ways to enhance learning.</i> The important issue in effectiveness for learning is not the sophistication of the technologies, but the ways in which their capabilities aid and motivate users.</p> <p>(5) _____ <i>Summarizing the reviews of research on computers and education, the results indicate that, while not all reviews show outcomes in favour of computer use, the vast majority reach positive conclusions about their efficacy.</i></p>	<p>A. When combined with traditional instruction, the use of computers can increase student learning in the traditional curriculum and basic skills areas.</p> <p>B. Most students now have access to computers and the Internet in their classrooms, nearly all students have access somewhere in their schools, and a majority of teachers report using computers or the Internet for instructional purposes.</p> <p>C. While information is accruing, available evidence indicates that technology generally has demonstrated positive but limited results on improving the educational achievement of all students.</p> <p>D. This report provides useful information and specific recommendations about evaluating the effectiveness of technological applications implemented to enhance teaching, learning, and</p>
---	--

(6) _____ Students learn more quickly and with greater retention when learning with the aid of computers.

(7) _____
The issues involved in evaluating the effectiveness of technology in education are complex. *Yet technology as a primary educational tool and major school expenditure must be held accountable to its promise of enhancing teaching, learning, and achievement.*

(8) _____ Clearly, more information of a more rigorous nature is needed.

(The text is borrowed and modified from

http://www.act.org/research/policymakers/pdf/school_tech.pdf as of 26th November 2013)

achievement.

E. TECHNOLOGY IN OUR SCHOOLS

F. INTRODUCTION

G. RECOMMENDATIONS

H. EVALUATING

EFFECTIVENESS OF

TECHNOLOGY AS AN

INSTRUCTIONAL TOOL

Task 22. Complex Task

Read the report from Task 21. Rewrite the words in italics so that they will contain linking words or phrases from Task 18.

Task 23. Complex Task

Read the article from Task 11 and prepare a report on Apple-Samsung competition.

WORKBOOK

Task 1. Tiered Task

Part 1. Read the sentences and choose one appropriate word from the options. Explain the difference.

1. Economists suppose that there exist a number of market
 - a. systems
 - b. structures
 - c. constructions
2. Price can change in response to changes in supply and
 - a. demand
 - b. request
 - c. need
3. In a competitive market, a buyer can choose a for any product.
 - a. change
 - b. analogue
 - c. substitute
4. In a monopoly only one supplies the product.
 - a. maker
 - b. producer
 - c. consumer
5. A government can create a monopoly over an that it wants to control.
 - a. competition
 - b. country
 - c. industry
6. In an there are only a few firms that make up an industry
 - a. oligopoly
 - b. monopoly
 - c. perfect competition
7. Perfect competition means there are few to entry for new companies.
 - a. charges
 - b. barriers
 - c. fee
8. Perfect competition is characterized by many and sellers.
 - a. producers
 - b. companies
 - c. buyers

Part 2. Put the words in the correct order and make up sentences.

1. Competition / firm / each / homogeneous / perfect / produces / in / product.
2. Entry / the / into / are / barriers / to / market / no / there.
3. Market / no / influence / single / can / firm / the / price.
4. Large / there / of / very / firms / are / numbers / market / in / the / a.
5. Is / government / need / no / for / there / regulation.
6. Only / normal / firms / run / can / profits / in / the / make / long.

Part 3. Replace the words in bold with their synonyms.

A (1) **monopoly** exists when a specific person or (2) **enterprise** is the only (3) **supplier** of a particular (4) **commodity** (this contrasts with oligopoly which (5) **consists of** a few entities dominating an (6) **industry**. Monopolies are thus characterized by a lack of economic competition to (7) **produce** the good or service and a lack of viable substitute goods. The verb “monopolize” refers to the process by which a (8) **company** gains the ability to raise prices or (9) **exclude** competitors. In economics, a monopoly is a single (10) **seller**. In law, a monopoly is a business entity that has (11) **significant** market power, that is, the power to (12) **charge** high prices. Although monopolies may be big (13) **businesses**, size is not a characteristic of a

monopoly. A small business may still have the (14) **power** to raise prices in a small industry (or market).

(The text is borrowed and modified from <http://en.wikipedia.org/wiki/Monopoly> as of 20th November, 2013)

Task 2. Tiered Task

Read the text and do at least one part of the task after reading.

Competitive Marketing Strategy

Whatever product or service any business has to offer in the marketplace, chances are it's going to get competition. Rather than ignoring these competitors, the best way to win in competition is to take a proactive approach and develop a competitive marketing strategy. A competitive marketing strategy is one which objectively assesses the strengths and weaknesses of a product or service and compares them to that of its direct competitors. Marketing methods for the product or service are then determined accordingly, in a way that capitalizes on one company's advantages over the competition and minimizes its weaknesses.



Sizing up the competition to determine their strengths and weaknesses is something that a company can do in-house through pre-existing staff, or can outsource to a research firm along with other components of the competitive marketing strategy. Thanks to the Internet, most competitor information can be gathered online, and a summary can then be created using data from different websites. Most websites or online research firms charge for the disclosure of certain data, such as the hard numbers behind a competitor's financials, while other information, such as proprietary trade secrets may prove impossible to collect altogether.



Once the strengths and weaknesses of the competition have been collected, they should be organized into a chart alongside the company's strengths and weaknesses for easy comparison. The columns should include factors pertinent in the marketplace, such as pricing, annual sales, customer satisfaction, and functionality. The plan of action detailed in the rest of the competitive marketing strategy should then address each of these strengths and weaknesses. For example, if a company is selling technology and has discovered in its research that the competition's technology is slower, the company will want to emphasize how fast its technology is in its advertisements and other marketing material.

In the event that research on the competition indicates that the company is weaker in most areas and possess no competitive edge, its competitive marketing strategy might entail teaming up with the competition. This could mean buying out the competition or vice versa, or it could also mean turning the competition into a client. For example, if a product is hand-made greeting cards and its biggest competition is an established, manufactured card company, one company could offer to become the other company's "custom" arm, which fills its orders for customized cards.

(The text is borrowed and modified from <http://www.wisegeek.com/what-is-a-competitive-marketing-strategy.htm> as of 20th October, 2013)

Part 1. Mark the statements as true (T) or false (F).

1. Any product which a company offers may face competition.
2. A competitive marketing strategy is aimed only at assessment the strengths and weaknesses of a product.
3. Sizing up the competition can be performed by research firm only.
4. The Internet allows a company to gather most competitor information.
5. Most online research firms provide their service free of charge.
6. Strength and weaknesses of a product should be organized into a chart.
7. If company is weaker in most areas, it might team up with the competitor.
8. "Teaming up with the competition" can mean buying your competitor.

Part 2. Make up a plan of the text. For each paragraph, write a sentence which illustrates its main idea.

Part 3. Answer the following questions to the text:

1. What is a competitive marketing strategy?
2. How can the information about competitors be gathered?
3. In what way should strengths and weaknesses of competition be organized?
4. What should be done if the company is weaker in competition?
5. What does "teaming up with competition" mean?

Task 3. Internet Search

Search through the Internet for information about competition cases between famous companies / corporations (for example, Apple vs Samsung, Coca-Cola vs Pepsi, BMW vs Audi etc). Prepare to report your findings to the class.

Task 4. Writing

The company you work at has opened a new office. You were given a task to research the current state of employees` satisfaction with the new location and office facilities. You have conducted a questionnaire of 50 employees

and structured its results into a below given table. Now, you have to write a report to your CEO, Mr. John Thompson, in which you are to interpret the results and suggest your recommendations.

Subject of remark	Number of positive remarks	Number of negative remarks
Location	27	23
Staff	39	11
Equipment	15	35
Atmosphere	17	33
Technical support	36	14
Food	30	20

Part 1. Make the report of three paragraphs using the following subheadings:

1. *Introduction*
2. *Results of findings*
3. *Conclusion and recommendations*

Part 2. Make the report of four paragraphs using the following subheadings:

1. *Introduction*
2. *Purpose*
3. *Results of findings*
4. *Conclusion and recommendations*

Part 3. Make the report of five paragraphs using the following subheadings:

1. *Introduction*
2. *Purpose*
3. *Methodology*
4. *Results of findings*
 - 4.1. *Summary of positive feedback*
 - 4.2. *Summary of negative feedback*
5. *Conclusions and recommendations*

MODULE 4. MATHEMATICAL SYSTEMS



At the end of this module Students will understand:

- the way Arithmetic and Discrete Mathematics relate to professional spheres;
- how Arithmetic and Discrete Mathematic can be applied in solving practical tasks;
- how to comment actions when solving equations and proving theorems .



At the end of this module Students will know:

- the notions of Arithmetic, Number Theory and Discrete Mathematics;
- kinds of Arithmetic operations and their precedence;
- fields of Discrete Mathematics study;
- the notion of a theorem and types of proofs.



At the end of this module Students will be able to:

- express calculations when solving equations;
- use conditional sentences in theorem proofs;
- write mathematical papers, such as proofs, solutions and abstracts.

Unit 9. Arithmetic and Number Theory

Lesson 17

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about Arithmetic. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. What is Arithmetic?
2. When and where did Arithmetic emerge as a branch of science?
3. What are the common arithmetic operations?

Practical Concern

1. What are the common applications of Arithmetic?
2. What was the first purpose of calculations?
3. In what professions is Arithmetic usually used?

Analytical Concern

1. What role does Arithmetic play in the analysis?
2. What arithmetic operations are most often used in business?
3. What are the applications of Number Theory?

Creative Concern

1. What interesting applications of Arithmetic do you know?
2. How is Arithmetic shown in literature?
3. How do you understand the phrase “Arithmetic of Art”?

Task 2. Reading

Read the text about Arithmetic and Number Theory. Choose the titles (A-E) to the paragraphs (1-5). You have 20 minutes for this activity.

- | | |
|------------------|--------------------------|
| A. Applications | D. Integers |
| B. Definition | E. Arithmetic Operations |
| C. Number Theory | |

Queen of Math

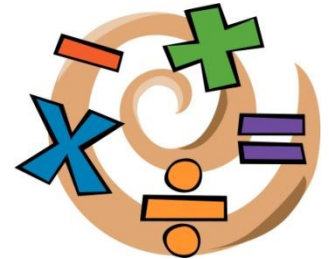
1.	
----	--

Arithmetic or **arithmetics** (from the Greek word *arithmos* “number”) is the oldest and the most elementary branch of mathematics, used very popularly for tasks ranging from simple day-to-day counting to advanced science and business

calculations. It involves the study of quantity, especially as the result of operations that combine numbers. In common usage, it refers to the simpler properties when using the traditional operations of addition, subtraction, multiplication and division with smaller values of numbers. Professional mathematicians sometimes use the term arithmetic when referring to more advanced results related to number theory, but this should not be confused with elementary arithmetic.

2.

The basic arithmetic operations are addition, subtraction, multiplication and division, although this subject also includes more advanced operations, such as manipulations of percentages, square roots, exponentiation, and logarithmic functions. Arithmetic is performed according to an order of operations. Any set of objects upon which all four arithmetic operations (except division by 0) can be performed, and where these four operations obey the usual laws, is called a field.



3.

The term arithmetic also refers to number theory. Number theory (or arithmetic) is a branch of pure mathematics devoted primarily to the study of the integers, sometimes called “The Queen of Mathematics” because of its foundational place in the discipline. Number theorists study prime numbers as well as the properties of objects made out of integers (e.g., rational numbers) or defined as generalizations of the integers (e.g., algebraic integers).



4.

Integers can be considered either in themselves or as solutions to equations. Questions in number theory are often best understood through the study of analytical objects that encode properties of the integers, primes or other number-theoretic objects in some fashion (analytic number theory). One may also study real numbers in relation to rational numbers, e.g., as approximated by the latter.

5.

The number-theorist Leonard Dickson said “Thank God that number theory is unsullied by any application”. Such a view is no longer applicable to number theory. In 1974 Donald Knuth said “...virtually every theorem in elementary number theory arises in a natural, motivated way in connection with the problem of making computers do high-speed numerical calculations”. Elementary number theory is taught in discrete mathematics courses for computer scientists, and on the other hand number theory also has applications to the continuous in numerical analysis. As well as the well-known applications to cryptography, there are also applications to many other areas of mathematics.

(The text is borrowed and modified from <http://en.wikipedia.org/wiki/Arithmetic> as of 21st December 2013)

Task 3. Vocabulary Practice

Match the words (1-7) with their definitions (a-g). You have 5 minutes for this task.

1. Addition	a. a mathematical operation that represents the operation of removing objects from a collection
2. Subtraction	b. splitting into equal parts or groups
3. Multiplication	c. a mathematical operation that represents the total amount of objects together in a collection
4. Division	d. a number which produces a specified quantity when multiplied by itself
5. Square Root	e. a quantity representing the power to which a fixed number (the base) must be raised to produce a given number
6. Exponentiation	f. the operation of raising one quantity to the power of another
7. Logarithm	g. an operation that, for positive integers, consists of adding a number (the multiplicand) to itself a certain number of times

Task 4. Vocabulary Practice

Fill in the gaps with the words in bold. You have 10 minutes to complete this task.

expression **exponents** **parts** **order** **change**
addition **precedence** **multiplication** **right** **brackets**

In mathematics and computer programming, the (1) of operations (sometimes called operator (2)) is a rule used to clarify which procedures should be performed first in a given mathematical (3)

Since the introduction of modern algebraic notation, (4) has taken precedence over addition. When exponents were first introduced in the 16th and 17th centuries, (5) took precedence over both addition and multiplication and could be placed only as a superscript to the (6) of their base. To (7) the order of operations, originally a vinculum (an overline or underline) was used. Today, parentheses or (8) are used to explicitly denote precedence by grouping (9) of an expression that should be evaluated first. Thus, to force (10) to precede multiplication, we write $(2 + 3) \times 4 = 20$, and to force addition to precede exponentiation, we write $(3 + 5)^2 = 64$.

(The text is borrowed and modified from http://en.wikipedia.org/wiki/Order_of_operations as of 21st December 2013)

Task 5. Language in Use

The ability to express common mathematical operations may come in use in many professions. However, mathematicians and theoretical analysts don't restrict themselves to simple 'pluses' and 'minuses'. Study the box explaining the ways of expressing calculations. After that, match the numbers in columns with arithmetic operations to create equations. Make up sentences to express the calculations. You have 10 minutes for this task.

Expressing Calculations

We can express mathematical calculations in many ways. Here are the most often used expressions to denote the basic arithmetic operations:

- To express addition, we use words **“add”, “plus”, “sum”, “total”, “increase”**:
e.g. Two plus two makes four.
The sum of seven and three is ten.
- To express subtraction, we use **“subtract”, “minus”, “less”, “difference”, “take away”, “decrease”, “deduct”**:
e.g. Six minus two makes four.
Fourteen take away six is equal to eight.
- We can express multiplication using **“multiply”, “by”, “times”, “lots of”**:
e.g. Three lots of five is fifteen.
Nine times seven is 63.
- To express division, we may use such words as **“divide”, “go into”, “quotient”**:
e.g. 22 divided by 5 is 4, with 2 left over.
The quotient of 40 by 5 is 8.

e.g. Two by four is eight. Nine minus one is eight.

2		1		8
30	×	2		5
4	÷	3		11
55	+	4	=	54
6	-	5		12
63		6		21
9		7		14

Differentiated Activity

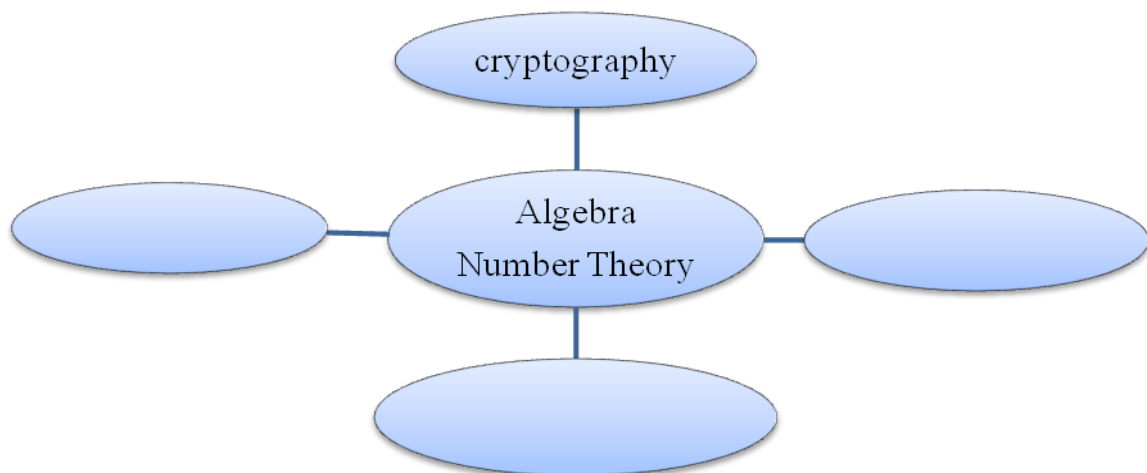
Task 6. Group activity

In groups, work out topical content of the following extract. Report your findings to the class. You have 10 minutes for this task.

Algebra and Number Theory have always been **counted** among the most beautiful mathematical **areas** with deep proofs and elegant results. However, for a long time they were not considered that **important** in view of the lack of real-life **applications**. This has dramatically **changed** with the appearance of new topics such as modern cryptography, coding theory, and wireless communication. Computational and applied mathematics depending on **deep** algebraic and number theoretic methods have become **crucial** for these and other topics of extremely high current interest. Nowadays we find applications of algebra and number theory **frequently** in our **daily** life. We mention security and error detection for internet banking, check digit systems as the bar code on **products** in a supermarket, GPS and radar, pricing options at a stock market, and eliminating noise for mobile phones as examples.

(The text is borrowed and modified from <http://www.ricam.oeaw.ac.at/specsem/specsem2013/> as of 26th December 2013)

Group 1. Read the extract and create a scheme which represents the spheres of use of Algebra and Number Theory.



Group 2. Broaden your vocabulary by suggesting synonyms / antonyms to the words in bold.

Group 3. Inside your group, discuss other possible spheres of use of Algebra and Number Theory. Explain, how the knowledge of Algebra can be applied in practice.

Task 7. Listening

You are going to watch a video about solving linear equations. Choose any part of the task you feel confident to complete or do them all. You have 10 minutes for the task. To watch the video, use the following link: <http://www.youtube.com/watch?v=wShnYemlr28>

Part 1. Answer the questions:

1. Solving what kind of equations is explained in the video?
2. What should be done in the first place to solve such kind of linear equation?
3. What linear equation is given as an example?
4. What is the answer to this equation?

Part 2. Complete the sentences:

1. The first thing to do when solving equations with variables on both sides is to... .
2. The easiest way to avoid negatives when possible is to
3. It's really important to always remember to
4. When the variables are on one side, follow the same steps that you follow to ...
5. Always remember to

Part 3. Write down the equation which was given as an example. Solve it and give your comments to each stage.

Task 8. Pair work

Using the help box from Task 5, give each other quick tasks to perform basic arithmetic calculations. You may also ask each other to explain the solution of a linear equation. Answer questions as quick as possible. You have 5 minutes for this task.

e.g. Student A. How much is five by seven?

Student B. Five by seven makes thirty five.

Task 9. Team Work: Brain Ring

You are going to be divided into three teams. Choose your team name and the captain. The Brain Ring competition consists of two parts:

1. You have to solve and explain the solution of one of the suggested puzzles.

2. You have to prepare the arithmetic puzzle to the rival team and solve theirs.

The team which does both parts of the Brain Ring correctly, wins.

(The puzzles are borrowed from <http://www.mathsisfun.com/puzzles/sam-loyd-puzzles-index.html> as of 30th December 2013)

Puzzle 1.



An old man goes to a bank with a check of \$200 and asks the cashier "Give me some one-dollar bills, ten times as many twos and the balance in fives!".

What will the cashier do?

Puzzle 2.

How much does the baby weigh if the mother weighs 100 pounds more than the combined weight of the baby and the dog, and the dog weighs 60 percent less than the baby?



Puzzle 3.



The five school children in couples weigh 129 pounds, 125 pounds, 124 pounds, 123 pounds, 122 pounds, 121 pounds, 120 pound, 118 pounds, 116 pounds and 114 pounds on a weighing machine.

What was the weight of each one of the five little girls if taken separately?

Home Assignment

Do Tasks 1-3 from Workbook section.

Optional Activity

Task 10. Facilitated Task

- a) Read the extract and try to explain the meaning of the words in bold.
- b) Make up sentences with the words in bold.

Arithmetic is the oldest and branch of mathematics which is used very popularly. The four basic arithmetic operations are **addition, subtraction, multiplication, and division**. These are the first two natural hyperoperations and their inverses. Harder arithmetic includes working with signed numbers, **fractions**, and decimals, and taking **powers** and **roots**. Arithmetic is performed according to an **order of operations**.

The term arithmetic also refers to **number theory**. Number theory is a branch of pure mathematics devoted to the study of the **integers**. Number theorists study prime numbers as well as the properties of objects made out of integers. Elementary number theory is taught in **discrete mathematics** courses for computer scientists. Number theory also has applications to numerical analysis, **cryptography** and many other areas of mathematics.

(The text is borrowed and modified from <http://en.wikipedia.org/wiki/Arithmetic> as of 29th December 2013)

Task 11. Complex Task

Read the article from “Forbes” magazine about Math myopia. Try to explain the meaning of the words in bold. Formulate the problem which the article deals with. State two approaches to the problem mentioned by the author. Which conclusion does the author draw?

Math Myopia

“Ambition, Distraction, Uglification, and Derision” is how Lewis Carroll referred to addition, subtraction, multiplication and division. Although most people **resonate with this repugnance toward computation**, most would also grant its frequent necessity.

This tension underlies the latest **skirmish in the simmering Math War**. The issue is the proper place of computation and algorithms (step-by-step procedures) in the school curriculum. What, in particular, is their relation to such often neglected skills as understanding graphs, interpreting probability, modelling situations, applying mathematical concepts in other domains or estimating and comparing magnitudes?

Textbooks and curriculums that attempt **to foster the skills** mentioned above have been criticized as insufficiently rigorous. When the Department of Education

endorsed some of these new curriculums as “exemplary,” a group of prominent mathematicians published a letter to Education Secretary claiming that many of the recommended books and programs neglect basic algorithms.

This might seem a **parochial controversy** were it not for the social cost of our arithmetical failings – clerks who are perplexed by discounts and sales taxes, medical personnel who have difficulty reckoning correct dosages, quality control managers who don’t understand simple statistics, voters who can’t recognize trade-offs between contrary desiderata and journalists who are sometimes oblivious to serious risks but apoplectic over trivial ones.

Although there is no real opposition between understanding concepts and mastering algorithms, extreme positions are easy to parody. Assigning 500 long-division problems to elementary school students is **a sure way to stultify them**. So is requiring older students to factor 500 polynomials in algebra class or to differentiate 500 functions in calculus class.

On the other hand, the reformist endeavour to tell stories, describe applications, play games and naturally embed mathematical insights and ideas into everyday life can also be mocked. **A mere glimmer of the idea** generally isn’t sufficient to secure numerical answers.

The proper balance depends on the student’s age and background, and the specific algorithm. **There is no royal road to mathematical education**, certainly not one capable of being reduced to a column. Despite common belief, arithmetic is not easy; nor are “higher-level” subjects necessarily difficult. Some “elementary” algorithms, such as those for dealing with fractions, may be **drudgery** if they are not presented well, but they are mathematically significant and essential to real understanding. No stories about combining parts of pies or salaries, for example, can replace the formal rules for finding $2/7 + 3/11$.

We should no more be teaching our children to try to compete with \$5 calculators than we should be training them **to dig ditches with hand shovels**. In arithmetic the stories and applications should set the stage and provide motivation for understanding the algorithms. The many good people on opposite sides of the Math War should **recompute their strategies**.

(The text is borrowed and modified from <http://www.forbes.com/forbes/2000/0124/6502036a.html> as of 29th December 2013)

Lesson 18

Whole-Class Activity

Task 12. Check the results of Tasks 1-2 from your home assignment (10 minutes).

Task 13. Work in pairs. Be ready to report the results of your Internet search. Ask each other questions about famous mathematicians (10 minutes).

Task 14. Discuss the following questions for 5 minutes. Turn to the help box if necessary:

1. What is a theorem?
2. How important are theorems in science?
3. What is the aim of a theorem?
4. In what spheres are theorems often used?
5. What is the proof of a theorem?
6. How should the proof of a theorem be presented?
7. What are the two ways of expressing the proofs?
8. What are the benefits of explicit arguments?

Task 15. Look through the following proofs of the theorem. Guess which theorem is proved and answer the questions. You have 5 minutes for this task.



In mathematics, a **theorem** is a statement that has been proven on the basis of previously established statements, such as other theorems – and generally accepted statements, such as axioms.

The **proof of a mathematical theorem** is a logical argument for the theorem statement given in accord with the rules of a deductive system. The proof of a theorem is often interpreted as justification of the truth of the theorem statement.

Although they can be written in a completely symbolic form, for example, within the propositional calculus, theorems are often expressed in a natural language such as English. The same is true of proofs, which are often expressed as logically organized and clearly worded informal arguments, intended to convince readers of the truth of the statement of the theorem beyond any doubt, and from which a formal symbolic proof can in principle be constructed. Such arguments are typically easier to check than purely symbolic ones – indeed, many mathematicians would express a preference for a proof that not only demonstrates the validity of a theorem, but also explains in some way *why* it is obviously true.

- What structure does the proof have?
- What linking words are used to express logical sequence?

Variation 1. The theorem can be proved algebraically using four copies of a right triangle with sides a , b and c , arranged inside a square with side c as in the top half of the diagram. The triangles are similar with area $\frac{1}{2}ab$, while the small square has side $b - a$ and area $(b - a)^2$. The area of the large square is therefore

$$(b - a)^2 + 4\frac{ab}{2} = (b - a)^2 + 2ab = a^2 + b^2.$$

But this is a square with side c and area c^2 , so

$$c^2 = a^2 + b^2.$$

Variation 2. A similar proof uses four copies of the same triangle arranged symmetrically around a square with side c , as shown in

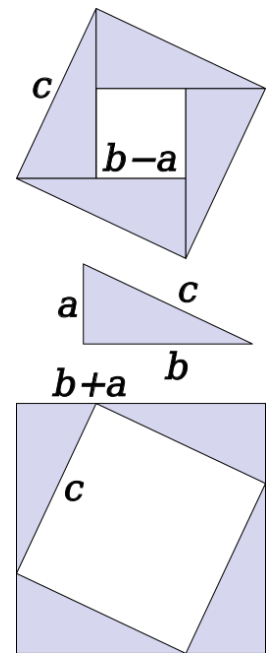
the lower part of the diagram. This results in a larger square, with side $a + b$ and area $(a + b)^2$. The four triangles and the square side c must have the same area as the larger square,

$$(b + a)^2 = c^2 + 4\frac{ab}{2} = c^2 + 2ab,$$

giving

$$c^2 = (b + a)^2 - 2ab = a^2 + b^2.$$

(The text is borrowed and modified from http://en.wikipedia.org/wiki/Pythagorean_theorem as of 29th December 2013)



Task 16. Mathematical Writing Techniques

Read the text about writing applied in Mathematics. Decide which steps of writing you find the most or the least important and why (15 minutes).

MATHEMATICAL WRITING: A BRIEF GUIDE

Writing is a significant and essential part of being a mathematician, and anyone who enters the profession will find their time occupied with the writing of mathematics papers, grant proposals, letters of recommendation, referee reports, and a variety of other items. It is often in graduate school that one first does substantial mathematical writing in the form of papers, a thesis, a research statement for job applications, and possibly also proposals for fellowships or grants. Writing mathematics well is a skill that takes time and practice to learn, and the following list is meant to provide the beginner with aspects of style to consider, conventions to be aware of, and common pitfalls to avoid.

1. Do not use common blackboard abbreviations. For example, write “if and only if” rather than “iff”, and “without loss of generality” rather than “WLOG”.

2. Punctuate equations and mathematical symbols. Mathematical expressions are no different than the words they represent, and they should be punctuated accordingly. This applies even to displayed equations so that, for example, if a displayed equation is at the end of a sentence it should end with a period.

3. Do not use contractions in formal writing. Thus words such as “don’t”, “can’t”, “I’m”, and “we’ve” should be written out.

4. Use the first person plural when writing mathematics papers. It is a convention in the mathematical community to use the first person plural, or “we”, when writing papers.

5. Write all necessary hypotheses in statements of theorems. If at all possible, make the statements of your theorems completely self-contained so that the reader does not have to look throughout your paper to decipher notation or find definitions of special terminology.

6. Use Latin abbreviations correctly. The following table summarizes the meanings of some commonly used Latin abbreviations:

Abbreviation	Latin term	English translation
i.e.	id est	that is
e.g.	exempli gratia	for example
cf.	Confer	compare
n.b.	nota bene	note well (or just note)
q.v.	quod vide	which see
viz.	Videlicet	namely
et al.	et alii	and others

In particular, the abbreviations i.e. and e.g. are often mistakenly interchanged, and cf. is often misused to mean “see” when it actually means “compare”. Also note that there is no period after “et” since it is not an abbreviation.

7. Do not start a sentence with a variable or symbol. Although it is perhaps technically correct, it is considered bad style to do so. Usually this can be avoided by simply rewording the sentence; e.g., rather than “ n points are on the interior” one would write “The interior contains n points”. (There are, of course, some exceptions to this rule. In particular, most people would consider it acceptable to start a sentence with a mathematical term that contains a symbol, especially if it is an uppercase symbol. For example, one should feel free to start a sentence with the word C -algebra or the word K -theory.)

(The text is borrowed and modified from <http://www.math.uh.edu/~tomforde/MathWriting.pdf> as of 23d December 2013)

Task 17. Read the following proof of a theorem. The linking words have been removed from the text. Insert the words to restore the logical sequence of the proof (5 minutes).

Hence (x2)	gives	Since (x2)	yields
then	conclude	Assume	However
So	implies	Therefore	

Theorem: The square root of 2 is irrational, $\sqrt{2} \notin \mathbb{Q}$

Proof:

(1) for the sake of contradiction that $\sqrt{2} \in \mathbb{Q}$. (2) $\sqrt{2} = \frac{a}{b}$ holds for some a and b that are coprime.

This (3) that $2 = \frac{a^2}{b^2}$. Rewriting this (4) $2b^2 = a^2$.

(5) the left-hand side of the equation is divisible by 2, (6) so must the right-hand side, i.e., $2|a^2$. (7) 2 is prime, we must have that $2|a$.

(8) we may substitute a with $2A$, and we have that $2b^2 = 4A^2$.

Dividing both sides with 2 (9) $b^2 = 2A^2$, and using similar arguments as above, we (10) that $2|b$. (11) , we assumed that $\sqrt{2} = \frac{a}{b}$ such that a and b were coprime, and have now found that $2|a$ and $2|b$; a contradiction.

(12) , the assumption was false, and $\sqrt{2}$ cannot be written as a rational number. (13) , it is irrational.

(The text is borrowed and modified from http://en.wikibooks.org/wiki/Famous_Theorems_of_Mathematics/%E2%88%9A2_is_irrational as of 23d December 2013)

Differentiated Activity

Task 18. Tiered Task

You are going to watch a video which explains the proof of a logarithm theorem. You have 10 minutes to do and check the tasks after watching it. To watch the video, use the following link:

<http://www.youtube.com/watch?v=vi7tnxKU4SI>

Part 1. Fill in the missing words.

Let's say that log to the base a of M times N (1) the log to the base a of M plus log to the base a of N .

(2) differently, the logarithm of the product of two (3) is equal to the sum of the logarithms of the numbers.

To (4) this, let's say that log to the base a of M is x , and log to the base a of N is y .

Then, by (5), if the log to the base a of M is x , then a to the (6) of x is M . Writing it as an exponential, a to the power of y is N .

Then, let's multiply these two (7) So, we get a to the power of x times a to the power of y is M (8) N .

And multiplying the (9) a to the power of x times a to the power of y is a to the power of x plus y equals M times N .

Now, we have an exponential, (10) can be written as a (11) So, log to the base a of M times N equals x plus y . And once we have this (12) we put x and y back into it, (13) x is log to the base a of M , and y is log to the base a of N .

(14) , log to the base a of M times N is log to the base a of M plus log to the base a of N , and we have (15) the theorem.

Part 2. As you listen to the record, try to write down step-by-step equations which prove the theorem. Be ready to read them.

Part 3. Write down all the necessary information and repeat the proof of the theorem, using the words that stipulate the logical order of the proof.

Task 19. Tiered Task

When writing a proof of the theorem, it is very important to ensure that every sentence and word is written correctly. Read the following theorems and their proofs and complete at least one part of the task. You have 10 minutes for this task.

Part 1. Read the following proof of the theorem. Choose one of the words in bold.

Theorem: If an integer is (exactly) divisible by 6, it must be even.

Proof:

Assume / Propose that $n = 6d$.

Since / Therefore, $n = 2(3d)$.

So, **if / unless** we let $r = 3d$, we see **that / which** $n = 2r$ **to / for** some integer r , **so/which** means **that/what** n is even.

Part 2. For gaps 1-10 choose the correct word (a-d).

Theorem: The sum of two even integers is always even.

Proof:

(1) two even integers x and y .

(2) they are even, they (3) be written (4) $x = 2a$ and $y = 2b$, respectively, (5) integers a and b .

(6) the sum $x + y = 2a + 2b = 2(a+b)$.

(7) $x+y$ has 2 as a factor and, by (8), is even.

(9) the sum of (10) two even integers is even.

1.	a. think	b. consider	c. suppose	d. let
2.	a. because	b. why	c. since	d. hence
3.	a. can	b. must	c. want	d. ought to
4.	a. like	b. what	c. that	d. as
5.	a. to	b. as	c. until	d. for
6.	a. then	b. after	c. because	d. for
7.	a. because	b. let	c. therefore	d. suppose
8.	a. example	b. definition	c. chance	d. order
9.	a. let	b. since	c. hence	d. because
10.	a. no	b. any	c. every	d. very

Part 3. Find and correct the mistakes in every line of the proof.

Theorem: $\sqrt{2}$ is an irrational number.

Proof:

<ol style="list-style-type: none"> 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 	<p>Supposing that $\sqrt{2}$ were a rational number, so by definition $\sqrt{2} = \frac{a}{b}$ where a and b are non-zero integers with no common factor. This, $b\sqrt{2} = a$. Squaring both sides yield $2b^2 = a^2$. Since 2 divides the left hand side, 2 must also divide the right hand side (as they are equal and both integers). If a^2 is even, which implies that a must also be even. So we must write $a = 2c$, where c is also an integer. Substitution into an original equation yields $2b^2 = (2c)^2 = 4c^2$. Dividing every sides by 2 yields $b^2 = 2c^2$. But then, by the same argument as before, 2 divides b^2, so b must be even. However, unless a and b are both even, they share a factor, namely 2. This contradicting our assumption, so we are force to conclude that $\sqrt{2}$ is an irrational number.</p>
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(The text is borrowed and modified from http://en.wikipedia.org/wiki/Mathematical_proof as of 6th January 2014)

Task 20. Pair Work

Try to solve famous Sam Loyd's puzzle known as Covent Garden problem. Write down your solution to the puzzle using linking words. Peer check your answers after doing so. You have time until the ends of the class.

Covent Garden Problem

Mrs. Smith and Mrs. Jones had equal number of apples but Mrs. Jones had larger fruits and was selling hers at the rate of two for a penny, while Mrs. Smith sold three of hers for a penny.

Mrs. Smith was for some reason called away and asked Mrs. Jones to dispose of her stock. Upon accepting the responsibility of disposing her friend's stock, Mrs. Jones mixed them together and sold them of at the rate of five apples for two pence.

When Mrs. Smith returned the next day the apples had all been disposed of, but when they came to divide the proceeds they found that they were just seven pence short, and it is this shortage in the apple or financial market which has disturbed the mathematical equilibrium for such a long period.

Supposing that they divided the money equally, each taking one-half, the problem is to tell just how much money Mrs. Jones lost by the unfortunate partnership?

(The text is borrowed and modified from http://en.wikipedia.org/wiki/Mathematical_proof as of 7th January 2014)

Home Assignment

Do Task 4 from Workbook section.

Optional Activity

Task 21. Facilitated Task

Look at the table depicting the steps of solving $5x - 6 = 3x - 8$ equation. Match linking words with the equations and steps description to make a proper solving.

Firstly,	1.	$x = -1$	a.	Add 6 to both sides of the equation
Next,	2.	$2x - 6 = -8$	b.	Subtract $3x$ from both sides of the equation
Finally,	3.	$2x = -2$	c.	Divide both sides by 2

Task 22. Try to solve famous Sam Loyd's puzzle. Write down your solution to the puzzle using linking words and words of logical sequence.

Guess the Boy's Age

It appears that an ingenious or eccentric teacher being desirous of bringing together a number of older pupils into a class he was forming, offered to give a prize each day to the side of boys or girls whose combined ages would prove to be the greatest.

Well, on the first day there was only one boy and one girl in attendance, and, as the boy's age was just twice that of the girl's, the first day's prize went to the boy.

The next day the girl brought her sister to school, and it was found that their combined ages were just twice that of the boy, so the two girls divided the prize.

When school opened the next day, however, the boy had recruited one of his brothers, and it was found that the combined ages of the two boys were exactly twice as much as the ages of the two girls, so the boys carried off the honors of that day and divided the prizes between them.

The battle waxed warm and on the fourth day the two girls appeared accompanied by their elder sister; so it was then the combined ages of the three girls against the two boys, and the girls won off course, once more bringing their ages up to just twice that of the boys'. The struggle went on until the class was filled up, but as our problem does not need to go further than this point, to tell the age of that first boy, provided that the last young lady joined the class on her twenty-first birthday. Now, guess the first boy's age.

(The text is borrowed and modified from <http://www.mathsisfun.com/puzzles/guess-the-boy-s-age-solution.html> as 8th January 2014)

WORKBOOK

Task 1. Tiered Task

Part 1. Insert the following words in the gaps. Translate the sentences into your native language.

**division
relation**

**Properties
Counting**

**operations
applied**

**discrete
logarithmic**

1. Arithmetic is used in day-to-day , advanced science and business calculations.
2. Traditional arithmetic operations include addition, subtraction, multiplication and
3. Advanced arithmetic operations are manipulations of percentages, square roots, exponentiation, and functions.
4. Arithmetic is performed according to an order of
5. Number theorists study prime numbers as well as the of objects made out of integers.
6. Real numbers may be studied in to rational numbers.
7. Elementary number theory is taught in mathematics courses for computer scientists.
8. Number theory may be to cryptography.

Part 2. Fill in the gaps with the words from the Unit.

Arithmetic is a branch of mathematics usually (1) with the four **operations** (adding, subtracting, multiplication and division) of positive (2) Arithmetic will include **concepts** like (3) , identifying numbers and amounts, learning the **basic** mental math facts. It is the basic **day to day** math. Arithmetic is the (4) of math.

The (5) between arithmetic and algebra that **underscores** the use of letters is valid on an elementary level. Elementary arithmetic does not (6) symbols other than numerals and those of basic (7) and equality. Elementary algebra, a **step** ahead of arithmetic, does use letters for **formulating** and (8) problems and to **annunciate** properties of the arithmetic operations in a general form. However, in Higher Arithmetic, which is another **name** for (9) Theory, letters are used **extensively** as they are in the (10) of mathematics.

(The text is borrowed and modified from <http://www.cut-the-knot.org/WhatIs/WhatIsArithmetic.shtml> and <http://math.about.com/od/glossaryofterms/g/The-Definition-Of-Arithmetic.htm> as of 8th January 2014)

Part 3. Complete the previous part of the Task and suggest your synonyms to the words in bold.

Task 2. Tiered Task

Read the text about mathematical proofs and complete at least one part of the task.

Mathematical Proof

In mathematics, a proof is a deductive argument for a mathematical statement. Proofs are examples of deductive reasoning and are distinguished from inductive or empirical arguments; a proof must demonstrate that a statement is always true, rather than enumerate many confirmatory cases. An unproven statement that is believed true is known as a conjecture. Proofs may be viewed as aesthetic objects, admired for their mathematical beauty. There exist several methods of proofs:

Direct proof

In direct proof, the conclusion is established by logically combining the axioms, definitions, and earlier theorems. This proof uses the definition of even integers, the integer properties of closure under addition and multiplication, and distributivity.

Proof by mathematical induction

In proof by mathematical induction, a single “base case” is proved, and an “induction rule” is proved, which establishes that a certain case implies the next case. Applying the induction rule repeatedly, starting from the independently proved base case, proves many, often infinitely many, other cases. Since the base case is true, the infinity of other cases must also be true, even if all of them cannot be proved directly because of their infinite number.

Proof by contradiction

In proof by contradiction (also known as *reductio ad absurdum*, Latin for “by reduction to the absurd”), it is shown that if some statement were true, a logical contradiction occurs, hence the statement must be false.

Proof by construction

Proof by construction, or proof by example, is the construction of a concrete example with a property to show that something having that property exists. Joseph Liouville, for instance, proved the existence of transcendental numbers by constructing an explicit example. It can also be used to construct a counterexample to disprove a proposition that all elements have a certain property.

Proof by exhaustion

In proof by exhaustion, the conclusion is established by dividing it into a finite number of cases and proving each one separately. The number of cases sometimes can become very large. For example, the first proof of the four colour theorem was a proof by exhaustion with 1,936 cases. This proof was controversial because the majority of the cases were checked by a computer program, not by hand. The shortest known proof of the four colour theorem as of 2011 still has over 600 cases.

(The text is borrowed and modified from http://en.wikipedia.org/wiki/Mathematical_proof as of 8th January 2014)

Part 1. Decide whether the following statements are true (T) or false (F). Justify your answer.

1. Proof is an inductive argument for a mathematical statement.
2. Proof shall not enumerate many confirmatory cases.
3. Direct proof uses logical combinations to establish a conclusion.
4. In proof by mathematical induction only the base case is proved.
5. In proof by contradiction, the statement is proved by showing that opposite statement is false.
6. Proof by example is another name for proof by exhaustion.
7. In proof by exhaustion the statement is divided into cases.

Part 2. On the basis of the text, give definitions to the following terms:

Proof

Conjecture.....

Direct proof.....

Proof by induction.....

Proof by contradiction.....

Proof by construction.....

Proof by exhaustion.....

Part 3. Complete the following table. Use additional sources of information, if necessary:

Title	Methodology	Example of application
Direct proof	<i>The conclusion is established by logically combining the axioms, definitions, and earlier theorems</i>	<i>Proof that the sum of two even integers is always even</i>
Proof by induction		
Proof by contradiction		
Proof by construction		
Proof by exhaustion		

Task 3. Internet Search

Using sites recommended by your teacher and sites that you can find yourself, try to find information about famous mathematicians. The search should be done in pairs. Be ready to report your findings to the class.

Task 4. Writing

Having revised the material which you have learned during the lesson, complete one of the following parts of the task. In your solutions, use the linking words and words of logical sequence.

Part 1. Write a solution to the following linear equation:

$$2x - 4 = 10$$

Part 2. Write a solution to the following linear equation:

$$\frac{3}{4}x + \frac{5}{6} = 5x - \frac{125}{3}$$

Part 3. Write a solution to the following linear equation:

$$2(3x - 7) + 4(3x + 2) = 6(5x + 9) + 3$$

Unit 10. Discrete Mathematics

Lesson 19

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about Discrete Mathematics. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. What topics of Discrete Math do you believe to be most useful?
2. What do you think is the hardest topic of Discrete Math?
3. How can knowledge of Discrete Math be applied in everyday life?

Practical Concern

1. What practical application does Discrete Math have?
2. What tasks does Discrete Math solve?
3. What spheres of activity need Discrete Math most?

Analytical Concern

1. What is Discrete Mathematics?
2. What is the difference between Discrete Math and Algebra?
3. How can Discrete Mathematics help in business?

Creative Concern

1. What is the most interesting topic of Discrete Math?
2. What associations do you have with Discrete Mathematics?
3. How can Discrete Mathematics help to create art objects?

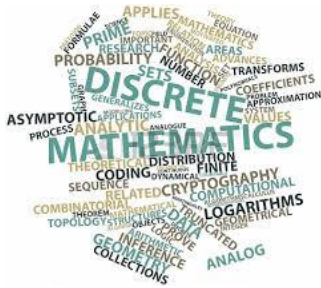
Task 2. Reading

Now, read the text about Discrete Mathematics and answer the quiz questions. You have 20 minutes for this activity.

Discrete Mathematics

Discrete mathematics is the study of mathematical structures that are fundamentally discrete rather than continuous. In contrast to real numbers that have the property of varying “smoothly”, the objects studied in discrete mathematics – such as integers, graphs, and statements in logic – do not vary smoothly in this way, but have distinct, separated values. Discrete mathematics therefore excludes topics in “continuous mathematics” such as calculus and analysis. Discrete objects can often be enumerated by integers. More formally, discrete mathematics has been characterized as the

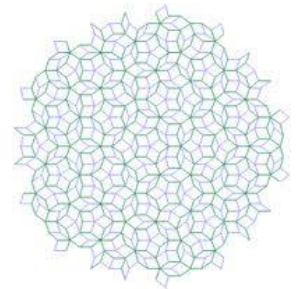
branch of mathematics dealing with countable sets (sets that have the same cardinality as subsets of the natural numbers, including rational numbers but not real numbers). However, there is no exact, universally agreed, definition of the term “discrete mathematics.” Indeed, discrete mathematics is described less by what is included than by what is excluded: continuously varying quantities and related notions.



The set of objects studied in discrete mathematics can be finite or infinite. The term finite mathematics is sometimes applied to parts of the field of discrete mathematics that deals with finite sets, particularly those areas relevant to business.

The study of how discrete objects combine with one another and the probabilities of various outcomes is known as combinatorics. Other fields of mathematics that are considered to be part of discrete mathematics include graph theory and the theory of computation. Topics in number theory such as congruencies and recurrence relations are also considered part of discrete mathematics.

The study of topics in discrete mathematics usually includes the study of algorithms, their implementations, and efficiencies. Discrete mathematics is the mathematical language of computer science, and as such, its importance has increased dramatically in recent decades.



Research in discrete mathematics increased in the latter half of the twentieth century partly due to the development of digital computers which operate in discrete steps and store data in discrete bits. Concepts and notations from discrete mathematics are useful in studying and describing objects and problems in branches of computer science, such as computer algorithms, programming languages, cryptography, automated theorem proving, and software development. Conversely, computer implementations are significant in applying ideas from discrete mathematics to real-world problems, such as in operations research.

Although the main objects of study in discrete mathematics are discrete objects, analytic methods from continuous mathematics are often employed as well.

(The text is borrowed and modified from <http://mathworld.wolfram.com/DiscreteMathematics.html> and http://en.wikipedia.org/wiki/Discrete_mathematics as of 9th January, 2014)

1. What does Discrete Mathematics study?

- | | |
|---------------------------------|------------------------------|
| A. Any mathematical structures. | C. Integers, graphs etc. |
| B. Continuous structures. | D. Astrological predictions. |

2. What topics are excluded from Discrete Mathematics` study?
 - A. Calculus and analysis.
 - B. Logic.
 - C. Combinatorics.
 - D. Probability.
3. Combinatorics studies...
 - A. words and sentences.
 - B. computations.
 - C. any numbers.
 - D. how discrete objects combine.
4. What was the reason of discrete mathematics research increase?
 - A. Economical value.
 - B. Development of digital computers.
 - C. Social changes.
 - D. Development of space exploration.
5. Where can concepts of discrete mathematics be useful?
 - A. Geography.
 - B. Linguistics.
 - C. Computer Science.
 - D. Physical Education.

Task 3. Vocabulary Practice

Match the spheres of Discrete Mathematics` (1-8) study with their descriptions (a-h). You have 5 minutes for this task.

1. Coding theory	a. is concerned with identifying the values, uncertainties and other issues relevant in a given decision, its rationality, and the resulting optimal decision
2. Logic	b. deals with situations where success depends on the choices of others, which makes choosing the best course of action more complex
3. Decision theory	c. is the branch of mathematical logic that studies sets, which are collections of objects
4. Combinatorics	d. the study of the properties of codes and their fitness for a specific application
5. Game theory	e. is concerned with the properties of numbers in general, particularly integers
6. Probability theory	f. the study of the principles of valid reasoning and inference
7. Number theory	g. studies the way in which discrete structures can be combined or arranged
8. Set theory	h. deals with events that occur in countable sample spaces

Task 4. Vocabulary Practice

Read the following extract about social choice theory, which lies in the scope of study of Discrete Mathematics. Suggest your antonyms to the adjectives in bold. Underline suffixes and prefixes which are used in adjectives. You have 3 minutes for this task.

Social choice theory or social choice is a (1) **practical** framework for analysis of combining individual opinions to reach a (2) **individual** decision or social welfare. Individual preferences are collected to produce a social welfare function – essentially a preference ranking of the scenarios that are (3) **impossible** to society. Social choice theory is the philosophical and mathematical study of the type of conclusions that can be determined through (4) **same** aggregation methods.



Using (5) **similar** factors such as interests, values and welfare, social choice theory aims to determine the (6) **worst** rules of structuring a (7) **unfair** voting framework. Social choice theory is a (8) **failing** discipline started by Kenth Arrow who originated the study following his introduction of the impossibility theorem in 1951. This theory is (9) **inapplicable** to group decision making, negotiations and (10) **same** economic processes.

(The text is borrowed and modified from http://en.wikipedia.org/wiki/Social_choice_theory as of 9th January, 2014)

Task 5. Language in Use

Conditionals are often used in mathematical discourse with the aim of explaining hypothesis-conclusion relations. They are often used in proofs, equations solving, explanations etc. Study the table in which the use and functions of conditionals are explained. After doing so, match the parts of the table to create conditionals. You have 10 minutes for this task.

Conditionals

Conditionals consist of two parts: if-clause (hypothesis) and main clause (result). There are four main types of conditional sentences:

Type 0 – expresses something which is always true.

If+present simple, main clause – present simple

e.g. If we add two positive numbers, it makes positive number.

Type 1 – expresses real or very probable actions in the present/future.

If+present simple, main clause – future/imperative/modal verb

e.g. If you solve this equation, the next one will be easy to understand.

Type 2 – expresses imaginary situations which are unlikely to happen in the present of future.

If+ past simple/past continuous, main clause- would/could +pres. Infinitive

e.g. *If I were you, I would use another method.*

If the numbers were even, it would be easier to solve equation.

Type 3 – expresses imaginary situations that are contrary to facts in the past.

If+past perf./past perf. continuous, main clause -would/could+perf.infinitive

e.g. *If we had used another method, the proof would have been shorter.*

If the population of men is 45%,	we could solve the equation.
If $x=2$,	we receive even number.
If you score 95% at the lesson,	the conclusion would be true.
If the total number was given,	the population of women is 55%.
If he had known all the variants,	you will find y and z.
If you find x,	then $3-x=1$.
If we add two odd numbers,	he would have chosen the other one.
If the hypothesis was true,	you will receive A.

Differentiated Activity

Task 6. Group activity

Work out the topical content of the extracts and report your findings to the class. You have 10 minutes for this task.

Group 1. Read the following extract and get ready to explain the algorithm by drawing an example.

The nearest neighbour algorithm was one of the first algorithms used to determine a solution to the travelling salesman problem. In it, the salesman starts at a random city and repeatedly visits the nearest city until all have been visited. It quickly yields a short tour, but usually not the optimal one.

These are the steps of the algorithm:

1. stand on an arbitrary vertex as current vertex.
2. find out the shortest edge connecting current vertex and an unvisited vertex V .
3. set current vertex to V .
4. mark V as visited.
5. if all the vertices in domain are visited, then terminate.
6. Go to step 2.

Group 2. Read the following extract and get ready to explain the strengths and drawbacks of the algorithm.

The nearest neighbour algorithm is easy to implement and executes quickly, but it can sometimes miss shorter routes which are easily noticed with human insight, due to its "greedy" nature. As a general guide, if the last few stages of the tour are comparable in length to the first stages, then the tour is reasonable; if they are much greater, then it is likely that there are much better tours. Another check is to use an algorithm such as the lower bound algorithm to estimate if this tour is good enough.

In the worst case, the algorithm results in a tour that is much longer than the optimal tour. To be precise, for every constant r there is an instance of the travelling salesman problem such that the length of the tour computed by the nearest neighbour algorithm is greater than r times the length of the optimal tour. Moreover, for each number of cities there is an assignment of distances between the cities for which the nearest neighbour heuristic produces the unique worst possible tour. The nearest neighbour algorithm may not find a feasible tour at all, even when one exists.

(The text is borrowed and modified from http://en.wikipedia.org/wiki/Nearest_neighbour_algorithm as of 10th January, 2014)

Group 3. Read the extracts from the tasks of Group 1 and 2. Inside your group, discuss what practical applications the algorithm may have and where the "travelling salesman problem" may appear.

Task 7. Tiered Task

You are going to watch a video with Robert Sedgewick talking about the course in Analytic Combinatorics. Choose whatever part of the task you feel confident to complete or do them all. You have 10 minutes for the task. Use the following link to watch the video: <http://www.youtube.com/watch?v=Zrq-8qZks3U>

Part 1. Decide whether the following statements are true (T) or false (F). Justify your answer.

1. According to D. Knuth, people who analyse algorithms can appreciate either elegant mathematical patterns or elegant computational procedures.
2. The theoretical payoff of algorithm study is getting the job done more quickly and more economically.
3. The study of algorithms on a scientific basis started over 50 years ago.
4. Donald Knuth put the study of algorithms on a scientific basis.
5. The course begins with the introduction to the Symbolic Method.
6. The Symbolic Method for defining Generating Functions is described in the context of applications and the analysis of algorithms.
7. Permutations, Trees, Streams, Words and Mappings belong to Basic Structures.

Part 2. Fill in the gaps:

“People who analyse (1) have double happiness. First of all, they (2) the sheer beauty of elegant mathematical (3) that surround elegant (4) procedures. Then they receive a practical (5) when their theories make it (6) to get other jobs done more quickly and more (7)” – that’s how Donald Knuth, who put the study of algorithms on a scientific (8) over 50 years ago, described the (9) behind the analysis of algorithms. This course begins with the introduction to (10) Functions and Real Asymptotics and then introduces the (11) Method for defining Generating Functions in the context of applications and the (12) of algorithms, as well as basic structures, such as (13) , Trees, Streams, Words and (14) As such, it is an introduction to Analytic (15) in a context of the analysis of algorithms.

Part 3. Answer the following questions:

1. What does D. Knuth mean by saying that “People who analyse algorithms have double happiness”?
2. What practical effect may be achieved through the study of algorithms?

3. What topics are included in the Basic Structures?
4. What other topics are introduced in the course of Analytic Combinatorics?

Task 8. Pair work

Work in pairs. Using the help box from Task 5, ask each other questions about what would happen:

- ...if you were given the Nobel Prize?
- ...if there were no calculating machines?
- ...if you had to choose only one science to study?
- ...if every person was a mathematical prodigy?
- ...if you could analyse all the probabilities of any event?

You have 5 minutes to complete this task.

Task 9. Team Work: Brain Ring: Revanche

You are going to be divided into three teams. Choose your team name and the captain. The Brain Ring competition consists of two parts:

1. You have to solve and explain the solution of one of the suggested puzzles.
 2. You have to prepare the puzzle to the rival team and solve theirs.
- The team which does both parts of the Brain Ring correctly, wins.

Puzzle 1.

How many words of length 8 can you form, where the first letter is the same as the last letter (there are 26 letters in English alphabet)?

Puzzle 2.

How many ways can 5 people sit in a row if 2 of them insist on not sitting together?

Puzzle 3.

The code to open a combination lock is an ordered sequence of four digits chosen from the set $\{1, 2, 3, 4, 5, 6\}$. How many codes are possible if repetition

- (1) is allowed
- (2) is not allowed?

Home Assignment

Do Tasks 1-3 from Workbook section.

Optional Activity

Task 10. Facilitated Task

Read the extract from the text about Discrete Mathematics. Put the words in brackets into the correct form.

Discrete mathematics (**be**) the study of mathematical structures that (**be**) discrete rather than continuous. In contrast to real numbers, discrete mathematics (**study**) objects such as integers, graphs, and statements in logic. These objects do not vary smoothly, but have distinct, separated values. Discrete mathematics therefore (**exclude**) topics such as calculus and analysis. Discrete objects can often (**count**) using integers.

Mathematicians say that this is the branch of mathematics (**deal**) with countable sets (sets that have the same cardinality as subsets of the natural numbers, including rational numbers but not real numbers). The set of objects (**study**) in discrete mathematics can be finite or infinite. The term finite mathematics is sometimes (**apply**) to parts of the field of discrete mathematics that deals with finite sets, particularly those areas relevant to business.

Research in discrete mathematics (**increase**) in the latter half of the twentieth century partly due to the development of digital computers which (**operate**) in discrete steps and store data in discrete bits. Concepts discrete mathematics (**be**) useful in studying and describing objects and problems in branches of computer science, such as computer algorithms, programming languages, cryptography and software development. In turn, computer implementations (**be**) significant in applying ideas from discrete mathematics to real-world problems, such as in operations research.

(The text is borrowed and modified from http://simple.wikipedia.org/wiki/Discrete_mathematics as of 10th January, 2014)

Task 11. Complex Task

Read the article about one of the trends of future programming. Answer the following questions:

1. What does the "Platonish position on Math" mean?
2. What are the earliest known Mathematics applications?
3. What definition of Math does the author give?
4. What do the words "construct useful fictions" mean in the context of the text?
5. What may happen if we encounter other systems of intelligence, according to the author?

Does Math Really Exist?

By Alex Knapp

In the midst of a rather interesting discussion of the notion of Aristotle's Unmoved Mover, Leah Libresco went on a mild digression about the philosophy of mathematics that I couldn't let go of, and feel compelled to respond to. She says:

"I take what is apparently a very Platonist position on math. I don't treat it as the relationships that humans make between concepts we abstract from day to day life. I don't think I get the concept of 'two-ness' from seeing two apples, and then two people, and then two houses and abstracting away from the objects to see what they have in common.

I think of mathematical truths existing prior to human cognition and abstraction. The relationship goes the other way. The apples and the people and the houses are all similar insofar as they share in the form of two-ness, which exists independently of material things to exist in pairs or human minds to think about them."

The notion that there's something special about math – that it has some sort of metaphysical significance – only makes sense if you ignore the history of how we uncovered math to begin with. It was, despite Leah's protestations, *exactly* just the abstraction of pairs and triplets and quartets, etc. The earliest known mathematics appear to be attempts to quantify time and make calendars, with other early efforts directed towards accounting, astronomy, and engineering.

Mathematics is nothing more and nothing less a tool that's useful for humans in solving particular problems. Math can be used to describe reality or **construct useful fictions**. For example, we know now that the space time we live in is non-Euclidian. But that doesn't make Euclidian geometry useless for everyday life. Quite the contrary – it's used every day. You can use mathematics to build models of reality that may not actually have any bearing on what's real. For example, the complicated math used to describe how the planets moved in the Ptolemaic model of the solar system – where everything orbited in circles around the Earth – actually produced very accurate predictions. But it was also wrong. There aren't actually trillions of physical dollars circulating in the economy – there are just symbols for them floating around.

The bottom line is that human beings have brains capable of counting to high numbers and manipulating them, so we use mathematics as a useful tool to describe the world around us. But numbers and math themselves are no more real than the colour blue – 'blue' is just what we tag a certain wavelength of light because of the way we perceive that wavelength. An alien intelligence that is blind has no use for the colour blue. It might learn about light and the wavelengths of light and translate those concepts completely differently than we do.

In the same way, since the only truly good mathematicians among the animals are ourselves, we assume that if we encounter other systems of intelligence that they'll have the same concepts of math that we do. But there's no evidence to base that assumption on. For all we know, there are much *easier* ways to describe physics than through complicated systems of equations, but our minds may not be capable of symbolically interpreting the world in a way that allows us to use those tools, any more than we're capable of a tool that requires the use of a prehensile tail.

Math is a useful descriptor of both real and fictional concepts. It's very fun to play around with and its essential for understanding a lot of subjects. But it's just a tool. Not a set of mystical entities.

(The text is borrowed and modified from <http://www.forbes.com/sites/alexknapp/2012/01/21/does-math-really-exist/> as of 10th January, 2014)

Lesson 20

Whole-Class Activity

Task 12. Check the results of Tasks 1-2 from your home assignment (10 minutes).

Task 13. Be ready to report the results of your Internet search (Task 3). Ask each other questions about Discrete Mathematics topics (10 minutes).

Task 14. In groups, discuss the following questions. Consult the information box if necessary (5 minutes):

1. What is an abstract?
2. What is the aim of an abstract?
3. In what spheres can abstracts be used?
4. In what part of a manuscript can an abstract appear?
5. What elements does an abstract consist of?
6. What elements of a an abstract are the most important?
7. What is the required length of an abstract?

Task 15. Read the following style guide on writing an abstract. Match the paragraphs with the headings (15 minutes).

- A. Explain your methods.
- B. Identify your purpose.
- C. Write your paper first.
- D. Describe your results.

- E. Explain the problem at hand.
- F. Give your conclusion.
- G. Determine the type of abstract you must write.



An abstract is a brief summary of a research article, thesis, review, conference proceeding or any in-depth analysis of a particular subject or discipline, and is often used to help the reader quickly ascertain the paper's purpose. When used, an abstract always appears at the beginning of a manuscript or typescript, acting as the point-of-entry for any given academic paper or patent application.

An academic abstract typically outlines four elements relevant to the completed work:

- The research focus (i.e. statement of the problem(s)/research issue(s) addressed);
- The research methods used (experimental research, case studies, questionnaires, etc.);
- The results/findings of the research; and
- The main conclusions and recommendations.

Writing an Abstract

If you need to write an abstract for an academic or scientific paper, don't panic; your abstract is simply a summary of the work or paper that others can use as an overview.

It helps your reader to understand the paper and helps people search for a particular work to find and decide whether it suits their purposes. An abstract is only a summary of the work you've already done, it's easy to accomplish!

1. _____ Even though an abstract goes at the beginning of the work, it acts as a summary of your entire paper. Rather than introducing your topic, it will be an overview of everything you write about in your paper.
2. _____ There are two primary styles of abstract: descriptive and informative. Typically, informative abstracts are used for much longer and technical research while descriptive abstracts are best for shorter papers.
3. _____ The reader wants to know why your research is important, and what the purpose of it is. Start your abstract by answering one or all of the following:
 - Why did you decide to do this study?
 - Why is this research important?
 - Why should someone read your entire essay?
4. _____ Readers need to know about the primary issue your paper deals with. You can sometimes combine the problem with your motivation, but it is best to be clear and separate the two.
 - What problem is your research trying to better understand or solve?
 - What is the scope of your study – a general problem or something specific?
 - What is your main claim or argument?
5. _____ Give an overview of how you accomplished your study. If you did your own work, include a description of it here. If you reviewed the work of others, it can be briefly explained.
 - Discuss your own research including the variables and your approach.
 - Describe the evidence you have to support your claim
 - Give an overview of your most important sources.
6. _____ In an informative abstract, you will be asked to provide the results of your study.
 - What is it that you found?
 - What answer did you reach from your research or study?
 - What are the general findings?
7. _____ This should finish up your summary and give closure to your abstract. In it, address the meaning of your findings as well as the importance of your overall paper. You may address the following questions in an informative abstract:
 - What are the implications of your work?
 - Are your results general or very specific?

(The text is borrowed and modified from <http://www.wikihow.com/Write-an-Abstract> as of 13th January 2014)

Task 16. Analyse the following abstract and answer the questions:

- What is the topic of the abstract?
- Why is the research important?
- What is the main claim of the article?
- What methods are used in the research?
- What are the results of the research?
- What are the implications of the research?

Binary cyclic codes from explicit polynomials over $GF(2^m)$

By Cunsheng Ding, Zhengchun Zhou

Abstract

Cyclic codes are a subclass of linear codes and have applications in consumer electronics, data storage systems, and communication systems as they have very efficient encoding and decoding algorithms. In this paper, monomials and trinomials over finite fields with even characteristic are employed to construct a number of families of binary cyclic codes. Lower bounds on the minimum weight of some families of the cyclic codes are developed. The minimum weights of other families of the codes constructed in this paper are determined. The dimensions of the codes are flexible. Some of the codes presented in this paper are optimal or almost optimal in the sense that they meet some bounds on linear codes. Open problems regarding binary cyclic codes from monomials and trinomials are also presented.

(The text is borrowed and modified from <http://www.sciencedirect.com/science/article/pii/S0012365X13005311> as of 13th January 2014)

Task 17. Restore the original form of the following abstract and put its parts into a logical order.

- | | |
|-----------|---|
| a. | At each time step the second player guesses a vertex, winning if it is the current location of the first player; if not the first player must move along an edge. |
| b. | It is shown that the graphs on which the second player can guarantee to win are precisely the trees that do not contain a particular forbidden subgraph, and best possible capture times on such graphs are obtained. |
| c. | One player moves invisibly around the graph, and the other player must guess his position. |
| d. | This paper introduces a pursuit and evasion game to be played on a connected graph. |

(The text is borrowed and modified from http://ac.els-cdn.com/S0012365X13003920/1-s2.0-S0012365X13003920-main.pdf?_tid=5ed52558-7c97-11e3-8956-0000aabb0f01&acdnat=1389647712_444fda17c0265edd5bf036f9fac43d3d as of 13th January 2014)

Differentiated Activity

Task 18. Tiered Task

Part 1. Analyse the following abstracts A and B. Answer the questions:

- What style is used in these abstracts?
- How do they differ?
- What do they have in common?

A.

Abstract. In 1959, Klee proved that a convex body K is a polyhedron if and only if all of its projections are polygons. In this paper, a new proof of this theorem is given for convex bodies in R^3 .

(The text is borrowed from <http://www.sciencedirect.com/science/article/pii/S0012365X13004056> as of 15th January 2014)

B.

Abstract. This is a brief survey on Euclidean embeddings of finite metric spaces, focusing on the power transform metric with many examples. Some old results are presented in slightly improved forms, and the last section contains a few new results. Proofs are given if they are elementary and not too long. Several problems and conjectures are also given.

(The text is borrowed from <http://www.sciencedirect.com/science/article/pii/S0012365X13003841> as of 15th January 2014)

Part 2. Compare abstracts C and D and answer the following questions:

- What do they have in common and what is different?
- What grammatical constructions are often used in abstracts? Give examples.
- What personal pronoun is used to define the author in the abstracts? Why?

C.

Abstract. Boolean expressions of Boolean algebras are logically equivalent to conditional logic expressions; we define and give theorems about equivalences of general conditional expressions; moreover, conditional expressions are properly contained in n -valued Post algebras. Theorems are given regarding equivalences of conditional logic in Post logic.

(The text is borrowed from <http://www.sciencedirect.com/science/article/pii/0012365X74901253> as of 15th January 2014)

D.

Abstract. An easy implementable polynomial algorithm to test for isomorphism of graphs embedded in arbitrary compact surfaces (maps) is given. The maps are

defined algebraically by Tutte's axtom system. We produce a canonical codification of them as a sequence of $4e$ integers ($2e$ if the map is orientable) where e is the number of edges. To test for isomorphism between two maps we just have to compare their codes. Some applications relying on the implementation are given.

(The text is borrowed from <http://www.sciencedirect.com/science/article/pii/0012365X80902320> as of 15th January 2014)

Part 3. Compare abstracts E and F and answer the following questions:

- What do these abstracts have in common and what is different?
- What structure elements do they have?
- Which abstract has more explicit structure? What expressions are used to introduce the structure elements?

E.

Abstract. Let $S = x_1, x_2, \dots, x_n$ be a sequence of n distinct elements from a linearly ordered set. We consider the problem of determining the length of the longest increasing subsequences of S . An algorithm which performs this task is described and is shown to perform $n \log n - n \log \log n + O(n)$ comparisons in its worst case. This worst case behavior is shown to be best possible.

(The text is borrowed from <http://www.sciencedirect.com/science/article/pii/0012365X7590103X> as of 15th January 2014)

F.

Abstract. The paper deals with tournaments (i.e., with trichotomic relations) and their homomorphisms. The study of tournaments by means of their homomorphisms is natural as tournaments are algebras of a special kind. We prove (1) theorems which relate combinatorial and algebraic notions (e.g., the score of a tournament and the monoid of its endomorphisms); (2) theorems concerned with strictly algebraic aspects of tournaments (e.g., characterizing the lattice of congruences of a tournament). Our main result is that the group of automorphisms and the lattice of congruences of a tournament are in general independent. In the last part of the paper we give some examples and applications to other fields.

(The text is borrowed from <http://www.sciencedirect.com/science/article/pii/0012365X75901041> as of 15th January 2014)

Task 19. Look at the following list of qualities of an abstract. Decide which of them belong to good and bad qualities. In pairs, justify your opinion and propose other characteristics of a good abstract (5 minutes).

1. Uses one or more well-developed paragraphs, which are unified, coherent, concise, and able to stand alone;
2. Uses slang, common words and expressions;
3. Uses graphics, charts, pictures;

4. Uses an introduction-body-conclusion structure in which the parts of the report are discussed in order: purpose, findings, conclusions, recommendations;
5. Uses five or more paragraphs with plenty of information about the research;
6. Follows strictly the chronology of the report/paper/article;
7. Provides logical connections between material included;
8. Does not use introductory and linking words;
9. Adds no new information but simply summarizes the report;
10. Contains a lot of information about the research with detailed descriptions and explanations;
11. Uses terminology, which is understood only by specialists in the sphere;
12. Provides new information, which was not mentioned in the report/paper/article;
13. Is intelligible to a wide audience;
14. Uses first person pronouns and expresses the author's opinion on the problem.



(The text is borrowed and modified from <https://owl.english.purdue.edu/owl/resource/656/1/> as of 17th January, 2014)

Task 20. Pair work

Choose any task from the following:

Part 1. Prepare an abstract of the text from Task 6 (Unit 8) about the nearest neighbour algorithm.

Part 2. Prepare an abstract of the text from Task 2 (Unit 8) about Discrete Mathematics.

Part 3. Prepare an abstract of the article from Task 11 (Unit 7) entitled "Math Myopia".

Ensure that your abstract contains the following parts:

- *Statement of the problem*
- *Findings / results*
- *Conclusions*

You have 20 minutes to perform and check the task.

Home Assignment

Do Task 4 from Workbook section.

Optional Activity

Task 21. Facilitated Task

Look at the following abstract. Some parts have been taken out of it. Insert linking words and expressions A-F into the gaps 1-6 to make a proper abstract.

<p>Abstract</p> <p>(1) a new method to solve functional equations of multivariate generating functions, (2) $F(r, s) = e(r, s) + x f(r, s) F(1, 1) + x g(r, s) F(qr, 1) + x h(r, s) F(qr, qs)$, giving a formula for $F(r, s)$ (3) a sum over finite sequences. (4) to show how one would calculate the coefficients of the generating function for parallelogram polyominoes, (5) impractical using other methods. (6) this method to answer a question from fully commutative affine permutations.</p> <p style="text-align: center;"><small>(The text is borrowed and modified from http://www.sciencedirect.com/science/article/pii/S0012365X13004901 as of 17th January, 2014)</small></p>	<p><i>A. We use this method</i></p> <p><i>B. such as</i></p> <p><i>C. which is</i></p> <p><i>D. in terms of</i></p> <p><i>E. This paper presents</i></p> <p><i>F. We also apply</i></p>
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Task 21. Complex Task

Analyse the following abstract and fill the information into the table:

<i>Problem</i>	
<i>Aim</i>	
<i>Methodology</i>	
<i>Results</i>	

Three types of randomness are integral to the strength of public-key cryptography. With the techniques of Allender et al., we present an analysis of how the ability to quickly distinguish Kolmogorov randomness allows for a probabilistic attack on two of the conjectured hard problems underlying public-key cryptography: the discrete logarithm and factoring. Specifically, Kolmogorov random strings are pertinent to inverting one-way functions and distinguishing pseudorandomness from true uniform randomness. This method provides a lens that more sharply categorizes the hardness of the discrete logarithm and factoring in the hierarchy of well-known complexity classes. Using this approach, we establish relationships between provably secure public-key cryptography, Kolmogorov complexity, and the essential cryptographic primitives.

(The text is borrowed and modified from <http://uss.tufts.edu/arc/HOW%20TO%20WRITE%20AN%20ABSTRACT%20for%20Tufts%20Symp.pdf> as of 17th January, 2014)

WORKBOOK

Task 1. Tiered Task

Part 1. Replace the words in bold with their synonyms.

1. Game theory is the study of mathematical **models** of conflict and cooperation between intelligent rational decision-makers.
2. An **alternative** term suggested “as a more descriptive name for the discipline” is interactive decision theory.
3. Game theory is **mainly** used in economics, political science, and psychology, as well as logic and biology.
4. Today, however, game theory applies to a wide **range** of behavioural relations.
5. Modern game theory began with the idea **regarding** the existence of mixed-strategy equilibria in two-person zero-sum games and its proof by John von Neumann.
6. His paper was followed by his 1944 book which **considered** cooperative games of several players.
7. The second edition of this book **provided** an axiomatic theory of expected utility.
8. This theory was developed **extensively** in the 1950s by many scholars.

(The text is borrowed and modified from http://en.wikipedia.org/wiki/Game_theory as of 13th January, 2014)

Part 2. Complete the collocations with the words in italics. Make up sentences using these collocations.

<i>sets</i>	<i>science</i>	<i>values</i>	<i>integers</i>	<i>numbers</i>
<i>field</i>	<i>structures</i>	<i>mathematics</i>	<i>notions</i>	<i>theory</i>
mathematical			graph.....	
distinct			computer.....	
countable.....			discrete.....	
rational.....			be enumerated by.....	
related.....			be applied to the	

Part 3. Fill in the gaps with the derivatives from the words in capitals.

The term “discrete mathematics” is used in contrast with “(1) mathematics,” which is the branch of mathematics (2) with objects that can vary smoothly (and which includes, for example, (3)). Whereas discrete objects can often be (4) by integers, continuous

CONTINUE
DEAL
CALCULATE
CHARACTER

<p>objects require real numbers.</p> <p>The study of how discrete objects combine with one another and the (5) of various outcomes is known as (6) Other fields of mathematics that are considered to be part of discrete mathematics include graph theory and the theory of (7) Topics in number theory such as congruencies and recurrence (8) are also considered part of discrete mathematics.</p> <p>The study of topics in discrete mathematics usually includes such topics as the study of algorithms, their (9) , and (10) Discrete mathematics is the mathematical language of computer science, and as such, its (11) has increased dramatically in recent decades.</p>	<p>PROBABLY COMBINE</p> <p>COMPUTE RELATE</p> <p>IMPLEMENT EFFICIENT IMPORTANT</p>
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(The text is borrowed and modified from <http://mathworld.wolfram.com/DiscreteMathematics.html> as of 13th January, 2014)

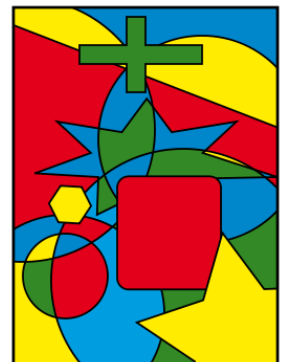
Task 2. Tiered Task

Read the text and do at least one part of the task after reading.

Grand challenges, past and present

The history of discrete mathematics has involved a number of challenging problems which have focused attention within areas of the field. In graph theory, much research was motivated by attempts to prove the four colour theorem, first stated in 1852, but not proved until 1976 (by Kenneth Appel and Wolfgang Haken, using substantial computer assistance).

In logic, the second problem on David Hilbert's list of open problems presented in 1900 was to prove that the axioms of arithmetic are consistent. Gödel's second incompleteness theorem, proved in 1931, showed that this was not possible – at least not within arithmetic itself. Hilbert's tenth problem was to determine whether a given polynomial Diophantine equation with integer coefficients has an integer solution. In 1970, Yuri Matiyasevich proved that this could not be done.



The need to break German codes in World War II led to advances in cryptography and theoretical computer science, with the first programmable digital electronic computer being developed at England's Bletchley Park. At the same time, military requirements motivated advances in operations research. The Cold War meant that cryptography remained important, with fundamental advances such as public-key cryptography being developed in the following decades. Operations research remained important as a tool in business and project management, with the critical path method being developed in the 1950s. The telecommunication industry has also motivated advances in discrete mathematics, particularly in graph theory and

information theory. Formal verification of statements in logic has been necessary for software development of safety-critical systems, and advances in automated theorem proving have been driven by this need.

Computational geometry has been an important part of the computer graphics incorporated into modern video games and computer-aided design tools. Several fields of discrete mathematics, particularly theoretical computer science, graph theory, and combinatorics, are important in addressing the challenging bioinformatics problems associated with understanding the tree of life.

Currently, one of the most famous open problems in theoretical computer science is the $P = NP$ problem, which involves the relationship between the complexity classes P and NP . The Clay Mathematics Institute has offered a \$1 million USD prize for the first correct proof, along with prizes for six other mathematical problems.

(The text is borrowed and modified from http://en.wikipedia.org/wiki/Discrete_mathematics as of 12th January, 2014)

Part 1. Which spheres the following problems belong to?

1. Four colour theorem.
2. Hypothesis that the axioms of arithmetic are consistent.
3. Hypothesis that a given polynomial Diophantine equation with integer coefficients has an integer solution.
4. Public-key cryptography.
5. Critical path method.
6. $P = NP$ problem.

Part 2. Match the concepts related to Discrete Mathematics history with their descriptions.

1.	Four colour theorem	a.	is not possible within arithmetic.
2.	Proof that the axioms of arithmetic are consistent	b.	is important as a tool in business and project management.
3.	Advances in cryptography and theoretical computer science	c.	was proved by Kenneth Appel and Wolfgang Haken, using substantial computer assistance.
4.	Operations research	d.	were stimulated by the need to break German codes.
5.	Critical path method	e.	is used in modern video games design.
6.	Advances in automated theorem proving	f.	is one of the most famous open problems in theoretical computer science.
7.	Computational geometry	g.	was developed in the 1950s.
8.	$P = NP$ problem	h.	have been driven by the need to develop safety-critical systems.

Part 3. Fill in the table with the information from the text.

#	Problem	Sphere	Description	Date of proof /development
1	Four colour theorem	<i>graph theory</i>	<i>proved by Kenneth Appel and Wolfgang Haken, using substantial computer assistance</i>	<i>stated 1852, proved 1976</i>
2	Hypothesis that the axioms of arithmetic are consistent			
3	Hypothesis that a given polynomial Diophantine equation with integer coefficients has an integer solution			
4	Public-key cryptography			
5	Critical path method			
6.	$P = NP$ problem			

Task 3. Internet Search.

Use the Internet to prepare a report on the new or developing topics of Discrete Mathematics. Mention scientists who worked with this topic, stages of its development, results and proofs.

Task 4. Writing.

Write an abstract to the report you have made in Task 3.

Remember that your abstract should contain the following parts:

- *Statement of the problem*
- *Findings / results*
- *Conclusions*

TEACHER'S BOOK

The present book is a basic learning resource designed for mixed-ability groups of future system analysts. It applies the principles of **professional-oriented** and **individualized learning** and is developed to help students study according to their individual needs, interests and styles of learning. Thus, the book is special in two respects: its content and procedure of learning.

The content of the book is designed to suit the needs of professional development and covers topics related to the sphere of system analysis. The book consists of 4 Modules:

Module 1 “Computer Systems” deals with the basics of computer hardware and software, programming and expert systems.

Module 2 “Networking Systems” introduces the issues of computer networks, the Internet and World Wide Web.

Module 3 “Economical System” covers such topics as Business and Enterprise, Banking, Market and Competition.

Module 4 “Mathematical Systems” contains information on Arithmetic and Number Theory as well as Discrete Mathematics.

The book applies a non-traditional procedure of learning, where there is a place for whole-class, differentiated and optional activity during the lesson (Unit). The workbook section also contains tasks developed as home assignment for individual learning.

➤ **Whole-Class Activities**

This section opens the Unit and contains the core material which builds up the basis for all other tasks. This section usually consists of a pre-assessment quiz with range of interests included, a core text, vocabulary tasks and language function tasks. It is recommended that students discuss the topic using pre-assessment questions (Think-Pair-Share mode) before reading and then proceed to read the text. After doing so, several vocabulary and language function exercises should be done.

➤ **Differentiated Activities**

This section of the book strives to make benefit of individual differences of students by proposing them variety of tasks designed to suit individual needs. This section is challenging for teacher because it needs a lot of effort and management skills to give

assistance and control the activity of every student. The section usually consists of several multi-level tasks, group and pair activities.

Multi-level tasks are divided into three parts which appear in order of increasing difficulty. The teacher may assign students to do one part, let them choose which part they want to accomplish or give task to do all the parts. It will be most effective if a student completes the task which slightly increases his or her level of competence. It is also advisable that students proceed to do tasks of higher level of difficulty in the course of learning.

Pair activities and *group activities* can also be organized in different ways so that students cooperate with each other and achieve mutual benefit.

Homogeneous grouping is the one where students are set together on the basis of approximately similar level of communicative competence. In this case teacher has the advantage of focusing instruction at the level of all students in the group and adjusting the pace and the amount of exercises done by every group.

Heterogeneous grouping, that is gathering students of varying levels of communicative competence, is an effective strategy to promote learning development of students. Low-level students benefit from being at positive learning environment, where they strive to reach higher level and also from the assistance of more able peers. High-level students are provided with opportunities to give explanations to others revising the material they learned before.

➤ **Optional Activity**

This part is designed to meet the needs of students striving to reach higher competency in English and for those who need additional assistance. The tasks from this part may be used as extra exercises or as a replacement of some activities from the previous sections. Optional Activity contains two tasks: first one represents the simplified version of the basic text with practical exercises which can be used as individual tasks for low-level students. The second task includes original text borrowed from different resources and questions to the text designed for high-level students.

➤ **Workbook Activity**

Workbook Activity is developed as home assignments for students to prepare at home. Workbook section also has multilevel structure so that students can choose whatever level of difficulty they prefer. The section also contains Project work and Internet search tasks which should be carefully prepared at home.

English-Ukrainian –Russian Glossary that include all the words introduced to the book as active vocabulary is given at the end of each Unit. The book is also accompanied by audio and video exercises available on the CD.

We hope that the following strategies (developed and described by C. A. Tomlinson [17, 18]) will help to use the book:

Flexible grouping – purposeful reordering of students into working groups to ensure that all students work with a wide variety of group mates and in a wide range of contexts during a relatively short span of classroom time. Flexible grouping enables students to work with peers of both similar and dissimilar readiness levels, interests, and learning preferences.

Jigsaw – is a cooperative strategy aimed at involving large number of students into work on a topic. Students first meet in small groups, called *home-base groups*. Here, they review the task they must complete and clarify goals for individuals and the group. They then divide into specialty groups, or *work groups*. Each specialty group is responsible for one facet of the overall task. Every member of the specialty group works to develop a full understanding of the assigned subtopic or subtask. After an appropriate time, students reassemble in their home-base groups. Each member of the group shares the information about his or her specialty. All group members are responsible for asking questions and learning about all facets of the topic.

Peer critiques – is a means of helping students provide useful feedback on peer work in progress. Typically, partners read one another's work and then provide both positive and constructive feedback by following a critique guide developed by the teacher (often with student input). Goals of peer critiques include helping students succeed with work, helping students work at increasingly high levels of quality, developing collegial relationships among peers, and helping students develop their ability to evaluate the quality of work.

Scaffolding – refers to any support system that enables students to succeed with tasks they find genuinely challenging. Goals of scaffolding include helping students be clear about the task's purpose and directions and helping students stay focused, meet the expectations for quality of work, find and use appropriate sources of information, and work effectively and efficiently. The many types of scaffolding include study guides, step-by-step directions, and comprehension strategies.

Think-Pair-Share (T-P-S) – instructional strategy, used to engage all learners in thinking and talking about a question or issue important to a current area of study. Typically the teacher begins a T-P-S by posing an important thought question. Students are asked to write their ideas or think about the question, working silently

until the teacher calls time (usually two to three minutes). This is the thinking phase of the process. In the second phase, pairing, students turn to a peer and exchange their thoughts about the question. In the final phase, sharing, the teacher states the question for the class as a whole and leads the class in a discussion of the question. The Think-Pair-Share strategy increases the likelihood that all students will engage with the question, will have something to contribute to the final discussion, and will be more invested in the outcome of the discussion than they would have been if the question had simply been posed once to the entire class and answered by the first student to raise a hand.

Tiering – a process of adjusting the degree of difficulty of a question, task, or product to match a student's current readiness level. To tier an assignment, a teacher 1) determines what students should know, understand, and be able to do as a result of the task; 2) considers the readiness range of students relative to these goals; 3) develops or selects an activity that is interesting, requires high-level thought, and causes students to work with the specified knowledge, undemanding, and skill; 4) determines the complexity level of the starting-point task compared with the range of student readiness; 5) assigns students to the various versions of the task at levels likely to provide attainable challenge.

We hope that this book will help facilitate and improve the efficacy of instruction to the multi-level group and wish you success and enthusiasm in the work.

The authors

UNIT 1. Computer Hardware and Software

Task 3.

1 – d, 2 – a, 3 – f, 4 – g, 5 – b, 6 – c, 7 – e.

Task 4.

1 – operating system, 2 – output, 3 – processing, 4 – programs, 5 – BIOS, 6 – hardware, 7 – computer, 8 – manufacturer, 9 – chips.

Task 5.

1 – a, 2 – g, 3 – e, 4 – h, 5 – b, 6 – d, 7 – f, 8 – c.

Task 7.

Part 1. 1 – software, 2 – controls, 3 – text-based, 4 – commands, 5 – user-friendly, 6 – install, 7 – menus, 8 – applications.

Part 2. 1 – T, 2 – F, 3 – T, 4 – T, 5 – T.

Part 3. See tapescript.

Task 8.

1. To start your computer, push the Power button.
2. To turn off your computer, click the Power button on the Start menu.
3. To drag a file, point to the file on the screen, press and hold the primary button, move the file to the new location.
4. In order to copy a file, right-click the file and select Copy option from the pop-up menu.
5. To delete a folder, right click the folder and select Delete from the menu.
6. To uninstall the program, click the Start button, then click Control Panel, select Programs and Components and then select the program that you want to uninstall.
7. To view a complete list of your programs, click the Start button, and then click All Programs.
8. To find a file use the Search box at the top of every folder.
9. To create a System Image, open Backup and Restore by clicking the Start button, clicking Control Panel, clicking System and Maintenance, and then clicking Backup and Restore. In the left pane, click Create a system image, and then follow the steps in the wizard.
10. To restore files, open Backup and Restore by clicking the Start button, clicking Control Panel, clicking System and Maintenance, and then clicking Backup and Restore and then click Restore my files.

Task 15.

A – Contents page, B – Title page, C – Warnings, D – Contact details, E – Troubleshooting, F – Functions, G – Index, H – Preface, I – FAQ.

Task 17.

1 – d, 2 – a, 3 – c, 4 – b.

Task 18.

Part 1. 1 – create, 2 – ‘Table’, 3 – columns, 4 – ‘ok’, 5 – document, 6 – spreadsheet, 7 workbook, 8 – cells, 9 – ‘copy’, 10 – ‘paste’.

Part 2. 1 – c, g, a, i, b; 2 – e, h, d, j, f.

Part 3. In the first case, a table is created in a document. On the other hand, a spreadsheet is inserted in a document in the second case. A table is a list of items, organized in several columns and rows. A spreadsheet is a tool, where the cells can interact and which can contain formulae causing the displayed value to change because of a change in some other cell.

Task 19.

Part 1. See Parts 2-3.

Part 2. 1 – Includes unnecessary information; 2 – Use of Passive Voice is not appropriate; 3 – Informal style; 4 – The order of actions is not obvious.

Part 3.

5 – Incorrect order of actions; 6 – Inappropriate use of Passive Voice; 7 – Paragraph is too long; 8 – Use of professionalisms.

Correct variant:

1. Load the appropriate paper
2. Open the file that you want to print.
3. Click File, and then click Print.
4. Click Properties, then click Setup to get into Feature tab.
5. Select the Feature tab, then click Select the media size from Size drop-down list.
6. Select Borderless check box.
7. If you are printing photos, select Best from the Print Quality list. Alternatively, select Maximum dpi, which provides up to 4800 x 1200 optimized dpi for optimum print quality.
Note: This setting might temporarily use a large amount of hard disc space (400 MB or more) and will print more slowly. To avoid this, you may change other print settings (for more information, see Settings).
8. Start printing.

Task 21.

- A. 1 – Click, 2 – Select, 3 – Click.
- B. 1 – Shut, 2 – Unplug, 3 – Open.

Task 22.

The manual explains how to clean Java cash and is developed for Java software. The Java Control Panel can be accessed from Windows Control Panel.

WORKBOOK**Task 1.**

Part 1. 1 – stored, 2 – flash memory, 3 – upload, 4 – word-processing program, 5 – photo-editing program, 6 – unit, 7 – LCD screens, 8 – pixels.

Part 2. 1 – runs, 2 – perform, 3 – input, 4 – output, 5 – files, 6 – peripheral, 7 – interact, 8 – commands, 9 – graphical user interfaces, 10 – screen.

Part 3. Open task.

Task 2.

Part 1. 1 – T, 2 – T, 3 – F, 4 – F, 5 – T, 6 – T.

Part 2.*Linux OS*

Advantages: one of the most secure systems, free of charge, provides exceptional performance even on a small hard disk.

Disadvantages: complex OS, lack of multimedia support, small amount of users.

Mac OS

Advantages: requires low level of maintenance, fewer occurrences of computer viruses.

Disadvantages: low compatibility with hardware and software

Windows

Advantages: highly compatible, feature-rich, wide selection of software, widespread usage

Disadvantages: expensive, vulnerable, most targeted system.

Part 3. Open task.

UNIT 2. Programming

Task 2.

1 – D, 2 – B, 3 – B, 4 – C, 5 – A, 5 – B.

Task 3.

1 – b, 2 – e, 3 – a, 4 – g, 5 – c, 6 – f, 7 – d.

Task 4.

Programming – coding (syn.), step– stage (syn.), turn on – turn off (ant.), perform – execute (syn.), language – code (syn.), add – subtract (ant.), part – whole (ant.), primitive – complicated (ant.), high-level – low-level (ant.), general – specific (ant.), convert – change (syn.), break down – divide (syn.), instruction – command (syn.)

Task 5.

1 – c, 2 – f, 3 – a, 4 – h, 5 – g, 6 – d, 7 – b, 8 – e.

Task 7.

Part 1. 1 – code, 2 – hardware, 3 – specialized, 4 – scientists, 5 – businessmen, 6 – algebra, 7 – class, 8 – concept, 9 – relationship, 10 – object-oriented programming.

Part 2. 1 – F, 2 – T, 3 – F, 4 – T, 5 – T, 6 – F, 7 – F, 8 – T.

Part 3. Open task.

Task 18.

Part 1. 1 – executing, 2 – 3-8, 3 – expected, 4 – defects, 5 – failed, 6 – troubleshooting, 7 – steps, 8 – bug, 9 – repeat, 10 – system.

Part 2.

1. Whoever is executing test case.
2. 3-8 steps.
3. Specifying the expected result
4. Indicating the failed step.
5. Breaking it up into smaller sets.
6. Only when they are needed.

Part 3. Open task.

Task 19.

Part 1. 1 – Test case ID, 2 – Author, 3 – Windows Vista, 4 – file, 5 – Type, 6 – Bold, 7 – Expected, 8 – Actual.

Part 2. 1 – Change PIN, 2 – any number except '5555', 3 – Main menu, 4 – Click the 'Change PIN' button, 5 – Re-enter '5555', 6 – The system displays a message of successful operation.

Part 3. Suggested answer:

Case 1111: Ensure that application behaves correctly if printer is not available.
Steps: 1. Verify that no printer is connected with machine. 2. Open the application and click on Print. 3. Verify that proper message appears for printer unavailability.

WORKBOOK**Task 1.**

Part 1. 1 – machine language, 2 – develop, 3 – subtract, 4 – perform, 5 – high-level language, 6 – interact, 7 – convert, 8 – compare.

Part 2. Suggested answers:

1 – steps, 2 – large, enormous, 3 – first, 4 – operates, 5 – executes, 6 – commands, 7 – errors, 8 – dividing.

Part 3. 1 – applications, 2 – understandable, 3 – compiler, 4 – instructions, 5 – operations, 6 – programming, 7 – popularity, 8 – complexity.

Task 2.

Part 1. 1 – C, 2 – C, 3 – C++, 4 – Pascal, 5 – C++, 6 – C++, 7 – C++, 8 – Java.

Part 2.

#	Programming language	Sphere of Use	Advantages	Disadvantages
1	C ++	Large projects	Reusability Object-oriented structure	Less efficient than C
2	C	Game programming	Makes programs faster and smaller	Cannot be reused
3	Pascal	Teaching language	Easy to understand	Is mostly used only for teaching
4	Fortran	Science	Computes values of any size to high precision	Not flexible Hard to read and write
5	Java	Networking	Quite easy Reusability	Lower efficacy Slow interface

Part 3. Suggested answers:

PHP is a common language for webpage design that is sometimes used as a scripting language. PHP is designed for rapid website development, and as a result contains features that make it easy to link to databases, generate HTTP headers, and so forth. As a scripting language, it contains a relatively simple set of basic components that allow the programmer to quickly get up to speed, though it does have more sophisticated object-oriented features.

LISP is functional language used mostly in computer science research. LISP is unusual in that it stores (nearly) all data in lists, which are like arrays, but without index numbers. The syntax for lists is very simple, making it easy for programmers to implement complex structures.

Task 21.

a – 3, b – 6, c – 8, d – 2, e – 5, f – 4, g – 1, h – 7.

UNIT 3. EXPERT SYSTEM

Task 3. 1 – c, 2 – a, 3 – b, 4 – g, 5 – d, 6 – e, 7 – f.

Task 4. 1 – applications, 2 – equipment, 3 – information, 4 – reasoning, 5 – maintenance, 6 – explanation, 7 – users, 8 – thought, 9 – settings, 10 – manufacturing.

Task 5.

1. The first electro-mechanical computer was developed in 1939 by Konrad Zuse.
2. Over 6, 000 new computer viruses are released every month.
3. The first computer mouse was constructed in 1964 by Dough Engelbart.
4. Over 1 million domain names are registered every month.
5. The first hard drive which could hold 5 MB of data was created in 1979.
6. 200 million transistors are used in an average video card.
7. Music in the style of the composers of the past can be composed by artificial intelligence system.
8. First web browser Mosaic was released in 1993.
9. Alan Turing is considered to be the father of AI.
10. More than 2 billion computers will be used in 2015.

Task 7.

Part 1. 1 – expert system, 2 – input, 3 – performs, 4 – analysis, 5 – context, 6 – conceptual map, 7 – applications, 8 – platforms, 9 – effective, 10 – unstructured.

Part 2. 1. COGITO is expert system semantic intelligence platform.

2. Semantic analysis enables system to understand the meaning of words based on their context.
3. Conceptual map is, basically, a structured representation of the content.
4. The first feature of COGITO semantic technology is the understanding of the relationships between the different concepts within a sentence.
5. The second important feature of COGITO is its capability to perform full disambiguation.

Part 3. See transcripts.

Task 15. a – 7, b – 5, c – 1, d – 11, e – 2, f – 10, g – 4, h – 6, i – 12, j – 9, k – 13, l – 4, m – 8.

Task 17.

Responsible for	working with clients, analysis, testing, quality assurance, networking, data analysis, testing, debugging, audits, disaster recovery, problem resolution, design analysis, updating technical documentation
Assist	disaster recovery, problem resolution, design analysis
Create and	data warehouse, user account profiles and passwords

maintain	
Conduct	cost analysis, data analysis, design analysis
Test	data verification methods
Resolve	complex problems
Play key role in	working with clients, cost analysis, testing, quality assurance, networking, problem resolution
Participate in	cost analysis problem resolution design analysis, updating technical documentation
Perform	design analysis data analysis, debugging, audits, cost analysis, testing,
Prepare	detailed program specifications

Task 18.

Part 1. 1 – profile, 2 – descriptive, 3 – attention, 4 – providing, 5 – employment, 6 – job titles, 7 – detail, 8 – responsibilities, 9 – stage, 10 – education, 11 – experience, 12 – qualifications, 13 – objective, 14 – contact details, 15 – interview.

Part 2.

1. Profile statement should be brief and interesting.
2. Going into detail with full job description
3. Most of their experience comes from time in education
4. Show how you have used any training you received in a real working environment
5. Less than three.

Part 3. Open task.**Task 21.**

1 – Personal information, 2 – Name, 3 – Date of birth, 4 – Nationality, 5 – Address, 6 – Education, 7 – Establishment, 8 – Degree, 9 – Working Experience, 10 – Other skills, 11 – Interests.

WORKBOOK**Task 1.**

Part 1. 1 – simulate, 2 – reasons, 3 – expressed, 4 – adapted, 5 – based, 6 – translate, 7 – provides.

Part 2.

1 – intelligence, 2 – developed, 3 – analyse, 4 – applications, 5 – components, 6 – engine, 7 – facts, 8 – interprets, 9 – classification.

Task 3.

Part 1. 1 – B, 2 – A, 3 – C, 4 – A, 5 – B.

Part 2.

Name	ELIZA	Cleverbot
Date of creation	1966	1997
Developer	Joseph Weizenbaum	Rollo Carpenter
Turing test performance	Seemed to be able to fool users into believing that they were conversing with a real human	Out of the 334 votes cast, Cleverbot was judged to be 59.3% human
Key method of operation	recognition of cue words or phrases in the input, and giving the output of corresponding pre-programmed responses that can move the conversation forward in a meaningful way	After searching through its saved conversations, it responds to the input by finding how a human responded to that input when it was asked

Part 3. Open task.

UNIT 4. COMPUTER NETWORKS

Task 2. 1 – F, 2 – T, 3 – F, 4 – F, 5 – T, 6 – F, 7 – T.

Task 3. 1 – c, 2 – e, 3 – a, 4 – g, 5 – d, 6 – b, 7 – f.

Task 4. 1 – b, 2 – d, 3 – a, 4 – c, 5 – a, 6 – d, 7 – b, 8 – c, 9 – c, 10 – d.

Task 5.

1. Pablo Picasso said that computers were useless. They could only give us answers.
2. Bill Gates said that it was fair to say that personal computers had become most empowering tool we had ever created. They were (are) tools of communication, they were (are) tools of creativity, and they could (can) be shaped by their user.
3. Isaac Asimov said that he did not fear computers. He feared the lack of them.
4. Richard Dawkins said that he rather looked forward to a computer program winning the world chess championship. He thought that humanity needed a lesson in humility.
5. Sydney J. Harris said that the real danger was not that computers would begin to think like men, but that men would begin to think like computers.
6. Tim O'Reilly said that we were (are) entering a new world in which data may be more important than software.
7. Kent Conrad said that access to computers and the Internet had become a basic need for education in our society.
8. Ray Kurzweil said that supercomputers would achieve one human brain capacity by 2010, and personal computers would do so by about 2020.
9. W. Daniel Hillis said that people were mostly focused on defending the computers on the Internet, and there had been surprisingly little attention to defending the Internet itself as a communications medium.
10. Hod Lipson said that we had seen computers play chess and beat grand masters. We had seen computers drive a car across a desert. But interestingly, playing chess was easy, but having a conversation about nothing was really difficult for a computer.

Task 7.

Part 1. 1 – T, 2 – T, 3 – F, 4 – F, 5 – T, 6 – T.

Part 2. 1 – router, 2 – network, 3 – number, 4 – applications, 5 – transmitted, 6 – scheme, 7 – addressing, 8 – TCP/IP protocol, 9 – various, 10 – wireless, 11 – Ethernet, 12 – use, 13 – radio waves, 14 – provided, 15 – cable.

Part 3.

1. Router – a device that you must have in order to establish a network.
2. Network – a number of computers that are connected together to share information or work on common applications or projects.
3. Addressing – a scheme used to transmit and address data between the computers.
4. Wired router – a router that transmits data using an Ethernet cable.

5. Wireless router – a router that transmits data using either a cable or radio waves.

Task 8. Suggested answers:

The customer explained that he was trying to set up a home network and asked if there was a way to do it without stinging Ethernet cable. The consultant assured him that it was possible and suggested to consider setting up wireless network.

The customer asked what hardware was required to build a wireless network. The consultant explained that no hardware other than wireless adapters was required to build a small wireless LAN.

The customer inquired how many computers could share one Wi-Fi network. The consultant said that the exact number of devices varied but was probably larger than customer thought.

The customer asked if two routers could be used on the same home network. The consultant answered that installing two routers on the same home network could be useful when building a hybrid wired and wireless network.

The customer inquired how Wi-Fi use affected computer battery life. The consultant explained that using Wi-Fi on a computer or handheld device could significantly increase its power consumption.

Task 10.

a) group, connected, network, speed, include, distance, several, access, web.

b) A computer network is a group of computers connected to each other electronically.

A local area network (often called a LAN) connects two or more computers, and may be called a corporate network in an office or business setting.

An "internetwork", sometimes called a Wide Area Network (because of the wide distance/range between networks) connects two or more smaller networks together. The largest internetwork is called the Internet.

Task 17. 1 – b, 2 – e, 3 – a, 4 – c, 5 – f, 6 – d.

Task 18.

Part 1. Apply for the position, gain experience in, enclose a copy of a CV, look forward to meeting, be available for the interview, have the opportunity, study full time, work for three years.

Part 2.

1 – post of, 2 – I am eager, 3 – specialise in, 4 – experience in, 5 – I currently work, 6 – I have been responsible, 7 – be contacted, 8 – to hearing.

Part 3. Suggested answer:

Dear Hiring Manager,

I am interested in the advertisement for the position of website designer which I read on Craigslist.com. Although I don't have experience related to the work with companies specializing in T-shirt production, I am eager to try myself in web design.

I am interested in site development and design and I already have some ideas about your site.

I am looking forward to hearing from you.

Yours faithfully,

Lillian Black.

Task 19.

Paragraph 1 – 1, 4, 8

Paragraph 2 – 2, 5, 7, 10, 12, 14, 16, 18

Paragraph 3 – 13, 17, 19, 21, 23

Paragraph 4 – 3, 6, 9, 11, 15, 20, 22, 24

Task 14.

1 – interest, 2 – opportunity, 3 – experience, 4 – candidate, 5 – include, 6 – applications, 7 – things, 8 – service, 9 – understanding, 10 – development, 11 – analysis, 12 – testing, 13 – documentation, 14 – reached, 15 – speaking.

WORKBOOK

Task 1.

Part 1. 1 – c, 2 – b, 3 – b, 4 – a, 5 – c, 6 – a, 7 – b, 8 – c.

Part 2.

1. Computer networks allow computers to exchange data.
2. Nodes can include hosts and networking hardware.
3. Computer networks facilitate interpersonal communication.
4. Authorized users may access information stored on other computers.
5. Computer network may be used by hackers to deploy computer viruses
6. Complex computer network may be difficult to set up.

Part 3. 1 – collections, 2 – users, 3 – connects, 4 – cabling, 5 – manage, 6 – share, 7 – send, 8 – fall into, 9 – server, 10 – applications, 11 – allows, 12 – require, 13 – Local, 14 – Wide, 15 – phone lines.

Task 2.

Part 1. 1 – F, 2 – T, 3 – F, 4 – F, 5 – T, 6 – T, 7 – F, 8 – T.

Part 2. Open task.

Part 3. Open task.

UNIT 5. THE INTERNET

Task 3.

1 – c, 2 – f, 3 – g, 4 – b, 5 – a, 6 – d, 7 – e.

Task 4. 1 – revolutionized, 2 – networks, 3 – interconnect, 4 – emerged, 5 – public, 6 – capability, 7 – purpose, 8 – accessible, 9 – connects, 10 – chat, 11 – transmission, 12 – digital, 13 – applications, 14 – sales, 15 – transform.

Task 5. Suggested answers:

What is the Internet? How many countries are linked into data exchanges? How many Internet users were estimated to be in 2011? What part of world`s population does it represent? Is there only one way to access the Internet? Most online services offer access to the Internet, don`t they? How else is it possible to access the Internet?

Task 6.

Part 1. 1 – in my humble opinion, 2 – by the way, 3 – laugh out loud, 4 – you got to be kidding.

Part 2. 1 - e-mail, 2- arrived, 3 – share, 4 – changed, 5 – typing, 6 – fashion, 7 – download, 8 – toolbar, 9 – firewall, 10 – wallpaper, 11- shorter, 12 – writing, 13 – abbreviation, 14 – spoken.

Part 3. Open task.

Task 16.

1 – D, 2 – A, 3 – F, 4 – B, 5 – G, 6 – C, 7 – E.

Task 17.

1 – To, 2- From, 3 – Date, 4 – Subject, 5 – clients, 6 – I think, 7 – employees, 8 – I would like, 9 – please.

Task 18.

Part 1. 1 - company or institution, 2 - partner or employee, 3 - intended purpose, 4 - intended audience, 5 - business letter, 6 – short, 7 - quickly and clearly.

Part 2. Memo is not a business letter, nor does it follow the format of a letter. Rather, it needs to be written in short, succinct sentences so that the points you need to make are made quickly and clearly. As a memo is not a letter, salutary remarks are not needed.

Part 3. Open task.

Task 19.

Part 1. 1 – Date, 2 – Subject, 3 – stored, 4 – server, 5 – Since, 6 – use, 7 – easier, 8 – reference, 9 – note, 10 – home, 11 – accessed, 12 – contact.

Part 2. 1 – To, 2 – From, 3 – Date, 4 – Subject, 5 – information, 6 – essential, 7 – recommending, 8 – take, 9 – departments, 10 – measures, 11 – ensure, 12 – within.

Part 3. 1 – provides, 2 – be programmed, 3 – V, 4 – where, 5 – was, 6 – send, 7 – on the part, 8 – who, 9- V, 10 - company`s, 11 – V, 12 – let`s.

Task 21.

1 – C, 2 – A, 3 – E, 4 – B, 5 – D.

WORKBOOK**Task 1.**

Part 1. 1 – system, 2 – protocol, 3 – resources, 4 – blogging, 5 – hyperlinks, 6 – engines, 7 – browser, 8 – services.

Part 2. 1- information, 2 – model, 3 – protocol, 4 – communicate, 5 – communicate, 6 - browsers, 7 - hyperlinks, 8 – ways, 9 – messaging, 10 – synonymous.

Part 3. 1 – development, 2 – organization, 3 – standardized, 4 – browser, 5 – creation, 6 – graphical, 7 – manipulations, 8 – dominant, 9 – users.

Task 2.

Part 1. 1 – google.com, 2 – youtube.com, 3 – facebook.com, 4 – yahoo.com, 5 – amazon.com, 6 – wikipedia.org, 7 – ebay.com, 8 – twitter.com, 9 – bing.com, 10 – msn.com.

Part 2. Search: google.com, yahoo.com, bing.com

Social Networking: facebook.com

Video-Sharing: youtube.com

Reference: wikipedia.org

Commerce: amazon.com, ebay.com, msn.com

Part 3. Open task.

UNIT 6. BUSINESS AND ENTERPRISE

Task 2.

1 – T, 2 – F, 3 – F, 4 – T, 5 – F

Task 3.

1 – d, 2 – g, 3 – a, 4 – f, 5 – c, 6 – e, 7 – b, 8 – i, 9 – h.

Task 4.

1 – c, 2 – b, 3 – d, 4 – a, 5 – b, 6 – d, 7 – a, 8 – c, 9 – b, 10 – c.

Task 5.

A. 1 – putting, 2 – to make, 3 – building, 4 – transforming, 5 – setting up, 6 – to bring.

B. 1 – to reflect, 2 – creating, 3 – deciding, 4 – to appear.

C. 1 – launching, 2 – to change, 3 – returning, 4 – drinking, 5 – to expand.

Task 7.

Part 1. 1 – T, 2 – T, 3 – F, 4 – F, 5 – T.

Part 2.

1 – Reorganization, 2 – software, 3 – designed, 4 – Chief Executive, 5 – services, 6 – providing, 7 – consumers, 8 – devices, 9 – tablets, 10 – management, 11 – compete, 12 – responsibilities, 13 – executives, 14 – employee.

Task 15.

1 – Writer`s address, 2 – Date, 3 – Reader`s address, 4 – Salutation, 5 – Text, 6 – Complimentary close, 7 – Signature, 8 – Typed name.

Task 16.

1 – F, 2 – A, 3 – E, 4 – D, 5 – B, 6 – C.

Task 17.

Informational letter: 7, 1, 12

Letter of request: 3, 6, 11

Letter of complaint: 4, 10, 2

Letter of apology: 8, 5, 9

Task 19.

Introduction: I am writing to request..., I received your June 16th letter requesting...,

The purpose of this letter is to ..., This is in response to your request...

Body: Moreover, ..., First, ..., Additionally, ..., Consequently, As you may know.

Conclusion: Looking forward to hearing from you, If you have any questions, feel free to contact me at ..., We appreciate your cooperation in this matter, Let me know if you have any further questions..., In closing, I believe that..., Thank you for your prompt attention on this matter.

Task 20.

Part 1.

1 – e, 2 – c, 3 – d, 4 – f, 5 – b, 6 – a.

Part 2. Suggested answers:

1. Dear Mr. Kent
2. As stated, the logo should be reproduced in colour
3. The logos on the t-shirts you sent are in black, which is unacceptable.
4. Please make the necessary corrections and
5. Thank you for your prompt attention on this matter.
6. Bye,

Part 3. Suggested answer

Dear Mr. Moriarity,

The purpose of this letter is to formally invite you, on behalf of the Board of Directors, to be the Closing Keynote Speaker at the upcoming 2015 IDCRI Conference.

The theme of this conference is "Latest Breakthrough in IT". It will be held at the Mountainview Conference Facility, in Montpelier, Vermont from December 3 to 5, 2006.

For you information, Susan Crutchlow from Business & IT will be the opening Keynote Speaker. The provisional title of her presentation is "The Perspective of IT in Business Sphere". We will forward a complete draft speaker program to you in a couple of weeks to give you an idea of the specific subjects that will be covered by the other speakers.

We expect attendance this year to be the highest ever; in the area of 2,000 delegates and 150 speakers. This includes a large contingent from our new European Chapter that is based in Geneva.

In closing, we would be pleased and honoured if you would consent to be our closing speaker at the 2006 ICDRI Conference. I will call you in a week or so to follow up on this.

Yours sincerely,

Richard Bagnall

Executive Director

International Disabled Children Research Institute

Task 22.

1. I am writing this letter to convey my apologies for the inconvenience.
2. I was not in the office and have just returned from a week long holiday.
3. I have reviewed your request and will be sending the person to fix your air conditioner by today evening.
4. You need not pay any charges for the service that we provide today.
5. You have been a valuable customer for us.
6. Once again, I am sorry for the trouble.
7. I am always there to serve you.

8. Yours sincerely

WORKBOOK

Task 1.

Part 1. 1 – f, 2 – d, 3 – a, 4 – c, 5 – f, 6 – b.

Part 2.

1 – company, 2 – ownership, 3 – corporation, 4 – supplier, 5 – profit, 6 – business, 7 – shareholder, 8 – retailer, 9 – goods, 10 – director, 11 – proprietor.

Part 3.

1 – multinational, 2 – company, 3 – subsidiary, 4 – networks, 5 – employs, 6 – CEO, 7 – manufacturer, 8 – consumer, 9 – line, 10 – vendor.

Task 2.

Part 1. Suggested answer:

1. Advances in IT have changed business.
2. Analysing startup costs.
3. Maintenance expenses.
4. Business automation helps to save time.
5. Automation leads to job losses.
6. Facilities of electronic databases.
7. Security vulnerability.

Part 2. Suggested answers:

Advantages: quick correspondence, minimizing business travel through telecommunication, immediate process of paperwork, automated calculation of transactions, convenient storage means.

Disadvantages: high startup costs, need to purchase user licenses, costs for training employees to use technology, expensive maintenance, elimination of jobs, alienation of clients, vulnerability to security breaches.

Part 3. Open task.

UNIT 7. BANKING

Task 3.

1 – c, 2 – e, 3 – b, 4 – h, 5 – a, 6 – g, 7 – d, 8 – f.

Task 4.

1 – account, 2 – deposit, 3 – cash, 4 – cheque, 5 – debit, 6 – payment, 7 – debit card, 8 – credit, 9 – transactions, 10 – balance, 11 – account statement.

Task 5.

1. Meeting was cancelled due to poor weather conditions.
2. Banks were closed on Monday because of public holiday.
3. Access was denied since the password was wrong.
4. Bank changed interest rate in order to raise money from deposits.
5. As the company had low profit, its share price fell.
6. Banks lend money in order to earn profit.
7. Bank account was closed due to continually going in overdraft.
8. The reason to withdraw money is the end of deposit period.

Task 6.

Part 1. Mentioned ideas: 1, 3, 6, 8, 9, 13.

Part 2. 1 – convenient, 2 – balance, 3 – funds, 4 – stocks, 5 – risk, 6 – financial institution, 7 – manually, 8 – secure, 9 – site, 10 – https, 11 – passwords, 12 – accounts, 13 – public, 14 – transactions, 15 – log out.

Part 3. Open task.

Task 15.

1 – G, 2 – F, 3 – A, 4 – D, 5 – B, 6 – E, 7 – C.

Task 17.

1 – b, 2 – b, 3 – a.

Task 19.

Good writing: Electronic thank-you notes;

Clear and appropriate content of e-mail;

Clear and meaningful subject line like “Application for system analyst position”;

Writing “Dear Sir or Madam” if the name isn’t supplied;

Writing “Ms” if the marital status is unknown;

Starting by saying why you’re writing;

Including your job title in signature block;

Giving full name and full contact information, including mailing address and phone number in signature block.

Bad writing: Sending e-mail randomly to someone in the company saying “I’m not sure if you are the right person, but I figured you could forward this...”;

Using alias and extension like “gamenerd777@whatever.net”;

Blank subject line;

Writing first and last names in greeting line (“Dear Mr. Jack Tomphson”);

Starting by introducing yourself and small talk questions;

Using stylized fonts;

Using all capitals;

Sending a content-empty e-mail with attachment;

Naming attachments by numbers (l1tr2343).

Task 22.

1 – To, 2 – Thank you for buying Agel, 3 – Dear Mr. Clement, 4 – We value your business and will do our best to respond fast to your business needs, 5 – Sincerely, 6 – Client Services Manager.

WORKBOOK

Task 1.

Part 1.

O	V	E	R	D	R	A	F	T				
			E	E				U				
			V	P			T	R	A	D	E	U
			E	O		B	A	N	K			N
T	R	A	N	S	A	C	T	I	O	N		D
			U	I		U		N	M			E
		F	E	T		R	E	T	A	I	L	R
	L	I	M	I	T	R		E	R		E	W
B	O	N	D			E		R	G		N	R
		A	E			N		E	I		D	I
		N	B			C		S	N			T
		C	I			Y		T				E
F	E	E	T				C	R	E	D	I	T

Part 2.

1 – borrow, 2 – account, 3 – credit, 4 – interest, 5 – mortgage, 6 – underwriting, 7 – fell, 8 – currencies, 9 – loans, 10 – transactions.

Part 3.

1 – banking, 2 – media, 3 – access, 4 – allowed, 5 – statements, 6 – transfer, 7 – bill, 8 – grow, 9 – connections, 10 – offer, 11 – browser, 12 – customers, 13 – interest, 14 – advantage.

Task 2.

Part 1. 1 – d, 2 – f, 3 – a, 4 – b, 5 – c, 6 – e.

Task 3.

Chequing account

Advantages: offers you comfortable and secure access to your account, lacks monthly service fees.

Saving account

Advantages: allows the account holder to amass interest on the funds deposited for future use;

Disadvantages: holders of savings account are limited to the amount of deposits and withdrawals they can make on monthly basis; holders are not allowed to access their funds with cheques.

Certificates of Deposit Account

Advantages: have relatively higher interest rates compared to the traditional savings account.

Disadvantages: holders are not able to access their money any time.

Money Market Bank Account

Advantages: interest is normally higher than that imposed on checking and savings accounts.

Disadvantages: you have to hold a certain minimum amount of money, otherwise you will be charged a monthly fee.

Individual Retirement Account

Advantages: lets you to save on your own for retirement.

Disadvantages: no tax-free cash withdrawals.

Part 3. Open task.

UNIT 8. MARKET AND COMPETITION

Task 3.

1 – g, 2 – c, 3 – a, 4 – h, 5 – b, 6 – e, 7 – d, 8 – f.

Task 4.

1 – structure, 2 – industry, 3 – monopoly, 4 – supplies, 5 – price, 6 – consumers, 7 – marketplace, 8 – demand, 9 – substitute, 10 – quality, 11 – competition, 12 – profit.

Task 5.

1. The prices may change in the nearest month.
2. The CEO must have gone on business trip.
3. Employees must follow safety rules at the workplace.
4. The company should develop another competitive product line.
5. The bank can raise interest rate without customer notification.
6. The guests should arrive at the conference at 9:00 AM.
7. He cannot make it at the opening time.
8. Companies should / have to meet the customers` expectations.
9. We may enter the foreign market the next year.

Task 6.

Part 1. 1 – F, 2 – T, 3 – T, 4 – T, 5 – F, 6 – T, 7 – F, 8 – F.

Part 2.

1 – demand, 2 – market, 3 –business, 4 – competition, 5 – producers, 6 –affect, 7 – decisions, 8 – react, 9 – amount, 10 – product, 11 –entry, 12 – price.

Part 3.

1. Price, revenue, demand.
2. A large number of producers means there is so many competitors that each one is too small to affect the market.
3. A market power is defined as the ability to control the price.
4. A large number of producers, homogeneous product, free entry and exit.
5. The demand for a highly priced product will fall.

Task 7.

Part 1. Open task.

Part 2. Suggested answers:

Make your own unique product and follow your strategy.

Analyse competitor`s weaknesses and strengths.

Respond to customers` needs.

Keep focus on how to serve the customers more efficiently

Emphasize on innovations into business.

Try to find a niche market and serve that niche to the best of your effort

Part 3. Suggested answers:

Several things are evident from this chart:

- Each curve – supply and demand – indicates the quantity supplied or demanded at the prices offered. At a price of \$4.00, for example, buyers would be willing buy about 85 units. However, at that price, only about 10 would be supplied.
- Where the two curves intersect, the equilibrium, or market, price is found. The quantity supplied at that price is the same as the quantity demanded at that price – about \$7.50 in this chart.
- When the market price changes – because of a change in supply – the demand curve is not directly affected. If the price decreases, there will be an increase in quantity demanded but not a change in overall demand.
- Supply and demand curves often have a curved – as opposed to straight line – shape since there is no reason why the same change in price – say, \$1.00 – will have the same impact at high or low prices. For example, if the price of heavy cream were reduced from \$3.00 to \$2.00 a pint, quantity demanded would increase. However, if heavy cream sells for an already low price of \$1.00 per pint, reducing the price even further would have little effect. This product simply contains too many calories for consumers to consume more even if it were free.

Task 15.

1 – D, 2 – A, 3 – F, 4 – B, 5 – E, 6 – C.

Task 16.

1 – E, 2 – A, 3 – C, 4 – B, 5 – D.

Task 17.

Aim of investigation: the aim of ... is to ..., will outline, was to determine ..., the purpose of ... is to ..., to investigate.

Who requested the report: was requested by, as requested by, was instructed, was asked, make appropriate recommendations, ...was asked to submit ...

When the report was requested: by (date), on (date), before (date).

Methodology used: was collected, with discussions, was used, obtain, carry out (a research, a task etc.), was undertaken, were surveyed, responses were identified, questionnaires.

Recommendations: should be done, should be undertaken, it is recommended that..., make the following recommendations...

Task 18.

Part 1. Suggested answer:

1. Introduction
 - 1.1. Background
 - 1.2. Aim
 - 1.3. Scope
2. Historical Background
 - 2.1 History of Internet Use in School

- 2.2. Current State of Internet Implementation
3. Methodology
4. Content
 - 4.1. Learning Objectives
 - 4.2. Learning Activities
 - 4.2.1. Listening
 - 4.2.2. Speaking
5. Pedagogical Approach
6. Conclusions
7. Recommendations

Part 2.

1 – moreover, 2 – however, 3 – therefore, 4 – namely, 5 – although, 6 – as the result, 7 – although, 8 – as, 9 – due to, 10 – however.

Part 3.

1. What is the title of a report? Who is the author of a report?
2. What is the context and scope of the report? What are the objectives of a report?
3. What form did your enquiry take ? Did you carry out interviews or questionnaires, how did you collect your data ? What measurements did you make ?
4. What is the result of the research? What are the advantages and disadvantages of an issue in questions?
5. What have you concluded as a result of the research?
6. What recommendations may be made to improve the issue?

Task 19.

Good writing: separation of parts of the report so that they stand out clearly; use of subheadings; use of dot points/ numbers/ letters to articulate these elements; use of tables and figures (graphs, illustrations, maps etc) for clarification; a neat header and/or footer; use of consistent and appropriate formatting; use of clear and correct information; formal language.

Bad writing: the inclusion of careless, inaccurate, or conflicting information; the inclusion of outdated or irrelevant data; facts and opinions that are not separated; use of informal style of writing; use of stylized fonts; unsupported conclusions and recommendations; careless presentation and proof-reading; too much emphasis on appearance and not enough attention to solid content.

Task 21.

1 – F, 2 – D, 3 – E, 4 – B, 5 – H, 6 – A, 7 – G, 8 – C.

WORKBOOK**Task 1.****Part 1.**

1 – b, 2 – a, 3 – c, 4 – b, 5 – c, 6 – a, 7 – b, 8 – c.

Part 2.

1. In perfect competition each firm produces homogeneous product.
2. There are no barriers to entry into the market.
3. No single firm can influence the market price.
4. There are a very large numbers of firms in the market.
5. There is no need for government regulation.
6. Firms can only make normal profits in the long run.

Part 3. Suggested answers:

1 – occurs, 2 – firm, company, 3 – producer, 4 – good, 5 – is made up, 6 – business, 7 – make, provide. Deliver, 8 – firm, 9 – eliminate, 10 – merchant, trader, 11 – large, 12 – set, 13 – industries, 14 – influence.

Task 2.**Part 1.**

1 – T, 2 – F, 3 – F, 4 – T, 5 – F, 6 – T, 7 – T, 8 – T.

Part 2. Suggested answers:

1. Develop a competitive marketing strategy.
2. Size up the competition.
3. Organize strengths and weaknesses in a chart.
4. Teaming up the competition.

Part 3.

1. A competitive marketing strategy is one which objectively assesses the strengths and weaknesses of a product or service and compares them to that of its direct competitors.
2. A company can gather information about competitors either in-house through pre-existing staff, or can outsource to a research firm along with other components of the competitive marketing strategy.
3. Strengths and weaknesses should be organized into a chart alongside the company's strengths and weaknesses for easy comparison.
4. In the event that research on the competition indicates that the company is weaker in most areas and possess no competitive edge, its competitive marketing strategy might entail teaming up with the competition.
5. Teaming up with competition could mean buying out the competition or vice versa, or it could also mean turning the competition into a client.

UNIT 9. ARITHMETIC AND NUMBER THEORY

Task 2.

1 – B, 2 – E, 3 – C, 4 – D, 5 – A.

Task 3.

1 – c, 2 – a, 3 – g, 4 – b, 5 – d, 6 – f, 7 – e.

Task 4.

1 – order, 2 – precedence, 3 – expression, 4 – multiplication, 5 – exponents, 6 – right, 7 – change, 8 – brackets, 9 – parts, 10 – addition.

Task 5. Suggested answers:

Two times four is eight. Thirty divided by six is five. Four plus seven equals eleven. Fifty five minus one is fifty four. Six by two is twelve. Sixty three divided by three is twenty one. Nine plus five is 14.

Task 7.

Part 1.

1. Linear equations with variables on both sides.
2. Getting rid of variable on one side.
3. $3x$ minus 7 is equal to $5x$ plus 4.
4. $x = 5, 5$.

Part 2.

1. ... get rid of variable on one side.
2. ... get rid of the smaller coefficient.
3. ... bring down the sign that comes before the number.
4. ... solve any equation, which is use of inverse operations.
5. ... get rid of addition and subtraction first

Part 3. See the Tapescript.

Task 9.

Puzzle 1.

The smallest amount of one-dollar and two-dollar bills the cashier may give to the old man is $1 \times 1 + 10 \times 2 = 21$.

He must give the old man a multiple of 21 i.e. 21 or 42 or 63 or 84 or 105 or 126 or 147 or 168 or 187; without exceeding 200. Out of all these numbers only 105 can be added to a multiple of 5 to sum up to make 200 altogether.

So he must give the balance of 95 in five-dollar bills.

Therefore, the cashier must give 5 one-dollar bills, 50 two-dollar bills and 19 five-dollar bills.

Puzzle 2.

The scales show their combined weight to be 170 pounds, and as the lady weighs 100 pounds more than the combined weight of the dog and baby, she must have weighed

exactly 135 pounds. As the dog weighed 60 percent less than the baby, we can readily see that the baby weighs 25 pounds and the dog but 10 pounds.

Puzzle 3.

Let $e > d > c > b > a$ be the girls weights.

NB no two girls have the same weights, otherwise there would have been duplicate weighings.

$e+d$ must be the heaviest and $e+c$ the second heaviest weighing.

$a+b$ must be the lightest and $a+c$ the second lightest weighing.

It might be the $a+d$ or $b+c$ could be next, fortunately we don't need to know.

The sum of the weighings is 1212 and each girl is weighed four times

$$\Rightarrow a+b+c+d+e = 1212/4 = 303$$

$$c = (a+b+c+d+e) - (a+b) - (d+e) = 303 - 114 - 129 = 60$$

$$a+c = 116 \Rightarrow a = 116 - 60 = 56$$

$$a+b = 114 \Rightarrow b = 114 - 56 = 58$$

$$c+e = 125 \Rightarrow e = 125 - 60 = 65$$

$$e+d = 129 \Rightarrow d = 129 - 65 = 64$$

So the girls weights are: 56, 58, 60, 64 and 65.

Task 17.

1 – assume, 2 – hence, 3 – implies, 4 – gives, 5 – since, 6 – then, 7 – since, 8 – so, 9 – yields, 10 – conclude, 11 – however, 12 – therefore, 13 – hence.

Task 18.

Part 1. 1 – equals, 2 – stated, 3 – numbers, 4 – prove, 5 – definition, 6 – power, 7 – equations, 8 – times, 9 – exponentials, 10 – which, 11 – logarithm, 12 – relationship, 13 – because, 14 – so, 15 – proved.

Part 2.

$$\log_a (M \cdot N) = \log_a M + \log_a N$$

$$\text{Let } \log_a M = x \text{ and } \log_a N = y$$

Writing it as an exponential,

$$a^x = M \text{ and } a^y = N$$

Then, lets multiply x and y :

$$a^x \cdot a^y = M \cdot N, \text{ or}$$

$$a^{x+y} = M \cdot N$$

Written as a logarithm,

$$\log_a (M \cdot N) = x + y. \text{ So,}$$

$$\log_a (M \cdot N) = \log_a M + \log_a N$$

Part 3. See tapescripts.

Task 19.

Part 1.

Assume that $n = 6d$.

Therefore, $n = 2(3d)$.

So, if we let $r = 3d$, we see **that** $n = 2r$ for some integer r , **which** means that n is even.

Part 2. 1 – b, 2 – c, 3 – a, 4 – d, 5 – d, 6 – a, 7 – c, 8 – b, 9 – c, 10 – b.

Part 3. 1 – suppose, 2 – thus, 3 – yields, 4 – so, 5 – can, 6 – the, 7 – both, 8 – if, 9 – contradicts, 10 – forced.

Task 20. Suggested answer:

They lost 7 pence altogether

Suppose each lady has x apples

$$x/2 + x/3 - 2(2x/5) = 7$$

$$15x + 10x - 24x = 210$$

$$x = 210$$

Note: Mrs. Johns lost 21 pence.

Task 21.

1 – c, 2 – a, 3 – b.

Task 22.

Suggested answer:

Let the first girl be x , the first boy is $2x$, the second girl is $3x$ (since x plus $3x = 4x$ twice the first boys age) boy three is $6x$ ($6x + 2x = 8x$ twice girl 1 and 2 ages) and the third girl is $12x$ (twice boy one and two). Therefore $21 = 12x$, $21/12$ is 1.75 making the first boys age 3.5 years.

WORKBOOK

Task 1.

Part 1. 1 – counting, 2 – division, 3 – logarithmic, 4 – operations, 5 – properties, 6 – relation, 7 – discrete, 8 – applied.

Part 2. 1 – concerned, 2 – numbers, 3 – counting, 4 – foundation, 5 – distinction, 6 – use, 7 – operations, 8 – solving, 9 – Number, 10 – rest.

Part 3. Suggested answers: 1 – actions, 2 – ideas, 3 – elementary, 4 – daily, 5 – underline, 6 – stage, 7 – expressing, 8 – proclaim, 9 – title, 10 – widely.

Task 2.

Part 1. 1 – F, 2 – T, 3 – T, 4 – F, 5 – T, 6 – F, 7 – T.

Part 2.

A proof is a deductive argument for a mathematical statement.

A conjecture is an unproven statement that is believed true.

Direct proof is a proof, where the conclusion is established by logically combining the axioms, definitions, and earlier theorems.

Proof by mathematical induction is a proof, which applies the induction rule repeatedly, starting from the independently proved base case.

Proof by contradiction is a proof which shows that if some statement were true, a logical contradiction occurs.

Proof by construction is the construction of a concrete example with a property to show that something having that property exists.

Proof by exhaustion is a proof, where the conclusion is established by dividing it into a finite number of cases and proving each one separately

Part 3.

Title	Methodology	Example of application
Direct proof	The conclusion is established by logically combining the axioms, definitions, and earlier theorems	Proves that the sum of two even integers is always even
Proof by induction	applies the induction rule repeatedly, starting from the independently proved base case	proves that a property known to hold for one number holds for all natural numbers
Proof by contradiction	shows that if some statement were true, a logical contradiction occurs	shows that $\sqrt{2}$ is an irrational number
Proof by construction	constructs a concrete example with a property to show that something having that property exists	proves the existence of transcendental numbers by constructing an explicit example
Proof by exhaustion	the conclusion is established by dividing it into a finite number of cases and proving each one separately	proof of the four colour theorem was a proof by exhaustion with 1,936 cases.

Task 4. Suggested answers:

Part 1.

Equation: $2x - 4 = 10$

1. Add 4 to both sides of the equation:

$$2x = 14$$

2. Divide both sides by 2:

$$x = 7$$

The answer is $x = 7$.

Part 2.

$$\text{Equation: } \frac{3}{4}x + \frac{5}{6} = 5x - \frac{125}{3}$$

1. Multiply both sides by the lowest common multiple of 4, 6, and 3, or 12.

$$12\left(\frac{3}{4}x + \frac{5}{6}\right) = 12\left(5x - \frac{125}{3}\right)$$

3. Simplify:

$$12\left(\frac{3}{4}x\right) + 12\left(\frac{5}{6}\right) = 12(5x) - 12\left(\frac{125}{3}\right)$$

$$3(3x) + 2(5) = 60x - 500$$

$$9x + 10 = 60x - 500$$

4. Subtract $9x$ from both sides of the equation:

$$10 = 51x - 500$$

5. Subtract $9x$ from both sides of the equation:

$$510 = 51x$$

6. Divide both sides by 51:

$$x = \frac{510}{51} = 10$$

The answer is $x = 10$.

Part 3.

$$\text{Equation: } 2(3x - 7) + 4(3x + 2) = 6(5x + 9) + 3$$

1. Complete multiplication.

$$6x - 14 + 12x + 8 = 30x + 54 + 3$$

7. Group like terms on each side of the equal sign.

$$18x - 6 = 30x + 57$$

8. Subtract $18x$ from both sides of the equation.

$$-6 = 12x + 57$$

9. Subtract 57 from both sides of the equation.

$$-63 = 12x$$

10. Divide both sides of the equation by 12 and simplify.

$$x = -\frac{63}{12} = -\frac{21}{4}$$

The answer is $x = -\frac{21}{4}$

UNIT 10. DISCRETE MATHEMATICS

Task 2.

1 – C, 2 – A, 3 – D, 4 – B, 5 – C.

Task 3.

1 – d, 2 – f, 3 – a, 4 – g, 5 – b, 6 – h, 7 – e, 8 – c.

Task 4. Suggested answers:

1 – theoretical, 2 – collective, 3 – possible, 4 – various, 5- different, 6 – optimal, 7 – fair, 8 – growing, 9 – applicable, 10 – other.

Task 5.

If the population of men is 45%, the population of women is 55%.

If $x=2$, then $3-x=1$.

If you score 95% at the lesson, you will receive A.

If the total number was given, we could solve the equation.

If he had known all the variants, he would have chosen the other one.

If you find x , you will find y and z .

If we add two odd numbers, we receive even number.

If the hypothesis was true, the conclusion would be true.

Task 7.

Part 1. 1 – F, 2 – F, 3 – T, 4 – T, 5 – F, 6 – T, 7 – T.

Part 2. 1 – algorithms, 2 – experience, 3 – patterns, 4 – computational, 5 – payoff, 6 – possible, 7 – economically, 8 – basis, 9 – mathematics, 10 – generating, 11 – symbolic, 12 – analysis, 13 – permutations, 14 – mappings, 15 – combinatorics.

Part 3.

1. First of all, they experience the beauty of elegant mathematical patterns and elegant computational procedures. Then, they receive a practical payoff when their theories make it possible to get other jobs done more quickly and more economically.

2. The theories can make it possible to get other jobs done more quickly and more economically.

3. Permutations, Trees, Streams, Words and Mappings

4. Generating Functions and Real Ssymptotics, Symbolic Method for defining Generating Functions .

Task 8. Suggested answers:

If I were given Nobel Price, I would spend money on further investigations.

If there were no calculating machines, people would have to do mental calculations.

If I had to choose only one science to study, I would choose Mathematics.

If every person was a mathematical prodigy, there would be more discoveries in the world.

If I could analyze all the probabilities of any events, I would be able to predict disasters and prevent them.

Task 9.

Puzzle 1. You have 26 different choices for the first letter, 26 choices for the second, and so on. From the Product Rule, it follows that there are 26^8 different words, if no letter is similar. Provided that the 8th letter must be equal to the first, the answer is 26^7 .

Puzzle 2. Firstly, let's work out how many ways there are without the condition of two people not sitting together. There are 5 possibilities for the first place, 4 for second and so on, so the number of ways is $5 \times 4 \times 3 \times 2 \times 1 = 120$.

The next step is to work out how many of these possibilities have the two people sitting next to each other. There are 4 ways in which two people can sit next to each other. For each of these ways there are two possibilities, one with one person on the right, and the other with them on the left. For each of these 8 ways, there are $3 \times 2 \times 1 = 6$ ways the other people could have sat. So, there are $8 \times 6 = 48$ ways in total. $120 - 48 = 72$. So, the answer is 72.

Puzzle 3. If repetition is allowed, the total number of combinations is $6^4 = 1296$.

If repetition is not allowed, for the first digit we have 6 options, for the second digit (provided that the one used option cannot be used again) – 5 options, for the third digit – 4 options, and for the fourth digit – three options. So, the total amount of combinations would be $6 \times 5 \times 4 \times 3 = 360$.

Task 10.

1 – is, 2 – are, 3 – studies, 4 – excludes, 5 – be counted, 6 – dealing, 7 – studied, 8 – applied, 9 – increased, 10 – operate, 11 – are, 12 – are.

Task 11.

1. Not to treat Mathematics as the relationships that humans make between concepts we abstract from day to day life.
2. The earliest known mathematics appear to be attempts to quantify time and make calendars, with other early efforts directed towards accounting, astronomy, and engineering.
3. Mathematics is nothing more and nothing less a tool that's useful for humans in solving particular problems.
4. Use of Mathematics to build models of reality that may not actually have any bearing on what's real
5. if we encounter other systems of intelligence that they'll have the same concepts of math that we do

Task 15.

1 – C, 2 – G, 3 – B, 4 – E, 5 – A, 6 – D, 7 – F.

Task 17.

1 – d, 2 – c, 3 – a, 4 – b.

Task 19.

Good qualities: 1, 4, 6, 7, 9, 13.

Bad qualities: 2, 3, 5, 8, 10, 11, 12, 14.

Task 21.

1 – E, 2 – B, 3 – D, 4 – A, 5 – C, 6 – F.

WORKBOOK

Task 1.

Part 1. 1 – patterns, 2 – other, 3 – mostly, 4 – variety, 5 – concerning, 6 – dealt with, 7 – gave, 8 – widely.

Part 2.

mathematical structures, distinct values, countable sets, rational numbers, related notions, graph theory, computer science, discrete mathematics, be enumerated by integers, be applied to the field.

Part 3.

1 – continuous, 2 – dealing, 3 – calculus, 4 – characterized, 5 – probabilities, 6 – combinatorics, 7 – computation, 8 – relations, 9 – implementations, 10 – efficiencies, 11 – importance.

Task 2.

Part 1.

1 – graph theory, 2 – logic, 3 – logic, 4 – cryptography, 5 – operations research, 6 – theoretical computer science.

Part 2.

1 – c, 2 – a, 3 – d, 4 – b, 5 – g, 6 – h, 7 – e, 8 – f.

Part 3.

#	Problem	Sphere	Description	Date of development/proof
1	Four colour theorem	graph theory	proved by Kenneth Appel and Wolfgang Haken, using substantial computer assistance	Stated 1852, proved 1976
2	Hypothesis that the axioms of arithmetic are consistent	logic	Gödel's second incompleteness theorem, proved in 1931, showed that this was not possible	1931
3	Hypothesis that	logic	In 1970, Yuri	1970

	a given polynomial Diophantine equation with integer coefficients has an integer solution		Matiyasevich proved that this could not be done.	
4	Public-key cryptography	cryptography	Was stimulated by the Cold War	Decades after the Cold War
5	Critical path method	operations research	Is used as a tool in business and project management	1950
6.	$P = NP$ problem	theoretical computer science	one of the most famous open problems in theoretical computer science	Current time

TRANSCRIPTS

UNIT 1. COMPUTER HARDWARE AND SOFTWARE

Task 6.

Source: <http://www.youtube.com/watch?v=76J0dNZ0MZc>

An operating system is composed of software that is necessary to run your computer. Operating system software controls your computer's hardware components, including peripheral hardware attached to your computer, and all other software being used on your computer.

Traditional operating systems, such as disk operating system, or DOS, were text-based, and usually consisted of commands you had to remember, and computer responses that were very brief. Most modern operating systems, such as Windows Vista and Windows XP, have a user-friendly graphical user interface, or GUI.

When you install a piece of application software on your computer, it usually uses the element of the GUI that come with the operating system, and adds its own graphical user interface elements. A GUI sometimes uses metaphors for objects familiar in real life, such as the desktop, or the view through a window. Elements of a GUI include such things as: windows, menus, buttons, scroll bars, icons, and wizards. With the increasing use of multimedia as part of the GUI, sound, voice, motion video, and virtual reality interfaces seem likely to become part of the GUI for many applications. GUIs are easier to use, faster, and accommodate better organization of your applications and files than traditional operating systems.

Task 18.

Source: <http://www.youtube.com/watch?v=JwbI4Zzd4r8>

My name is Stephaney and I work with CMAT solutions. Today I am going to show you how to create a spreadsheet in Microsoft Word. In order to create a spreadsheet in Word, simply open up Word, go to 'File', 'New blank document'. You can create a spreadsheet in a couple of different ways. You can go to 'Table', 'Insert Table', select the number of columns and select the number of rows you wish. In this case we are going to have 5 columns with 2 rows in our spreadsheet. Click 'Ok' and it will automatically create a table or a spreadsheet inside the Word document for you.

The other way to create an Excel spreadsheet in a Word document is by opening up Excel, starting a new Workbook, typing your data; you can select the cells of your spreadsheet, right-click, select 'Copy', open up Word, create a new blank document and then right-click and paste. And your spreadsheet will paste in your Word document.

And it's as easy as that. In order to create a spreadsheet in Word, you can simply do an 'Insert table' and select the number of columns and rows you wish or you can create a spreadsheet in Excel and copy and paste.

UNIT 2. PROGRAMMING

Task 7.

Source: <http://bigthink.com/videos/why-i-created-c>

In the really old days, people had to write their code directly to work on the hardware. They wrote load and store instructions to get stuff in and out of memory and they played about with bits and bytes and stuff. You could do pretty good work with that, but it was very specialized. Then they figured out that you could build languages fit for humans for specific areas. Like they built FORTRAN for engineers and scientists and they built COBALT for businessmen. And then in the mid-'60s, a bunch of Norwegians, mostly Ole-Johan Dahl and Kristen Nygaard thought why can't you get a language that sort of is fit for humans for all domains, not just linear algebra and business. And they built something called SIMULA. And that's where they introduced the class as the thing you have in the program to represent a concept in your application world. So if you are a mathematician, a matrix will become a class, if you are a businessman, a personnel record might become a class, in telecommunications a dial buffer might become a class—you can represent just about anything as a class. And they went a little bit further and represented relationships between classes; any hierarchical relationship could be done as a bunch of classes. So you could say that a fire engine is a kind of a truck which is a kind of a car which is a kind of a vehicle and organize things like that. This became known as object-oriented programming or also in some variance of it as data abstraction.

Task 18.

Source: <http://www.youtube.com/watch?v=7BKUn5TzAIE>

Hi, I'm Carla from ReQtest, today we are going to discuss how to write effective test cases. Writing effective test cases will help whoever is executing the test case. Here are a few tips to help you write better and more effective test cases.

To start off, you should have 3-8 steps in a test case. If you only have a couple of test steps, use a checklist instead. It will work just as well.

When you write a test case, you don't need to specify the expected result for each test step, if the result is obvious. However, when testers report defects based on the test case, they should indicate which test step failed. This will make troubleshooting easier.

If your test case has too many steps you should break it up into smaller sets. Why? Well, if there are a whole bunch of steps and an error occurs somewhere, it

gets confusing for the developer who has to fix the bug as well as future testers who would have to repeat all the steps to test it. Lastly, only use pre-conditions if you need them. For example, if you have to load a set of customers into the system before testing begins then you need pre-condition. If not, leave the field it blank.

So that's it. Follow these tips and I'm sure you will be writing effective test cases in no time.

UNIT 3. EXPERT SYSTEM

Task 7.

Source: <http://vimeo.com/43587551>.

Part 1.

The objective of this video is to introduce COGITO. COGITO is expert system semantic intelligence platform. It is a technology that takes any kind of text input in any kind of format and performs a deep linguistic analysis by going through all the different steps which lead up to the semantic analysis what is then able to understand the meaning of words based on their context. The outcome of the analysis is the conceptual map, basically, a structured representation of the content, which is then used to run different kinds of applications from semantic searchers, to automatic categorization, to competitive intelligence platforms, to natural language interfaces – all which enable a very effective, fast and precise automatic management of unstructured information.

Part 2-3.

In order to understand the unique features of COGITO, let's analyse sample sentences using the interface on the actual engine. If I write the following sentence: 'The seats of my lousy Chevy are actually great', the system, because it has a deep understanding of language, is able to understand that in this sentence there is a direct relationship that links 'the seats' with 'great'. So from the analysis of this sentence the system understands that what is 'actually great' are 'the seats', and what is 'lousy' is 'my Chevy'. So the first feature of COGITO semantic technology is the understanding of the relationships between the different concepts within a sentence.

The second important feature of COGITO is its capability to perform full disambiguation. For example, if I write the sentence: 'The jaguar eats meat', based on the context it is able to understand from the text that a jaguar is a panther, which is an animal, and that when it 'eats', it eats with a mouth, and that the 'meat' is flesh of an animal. So, based on the context, the system is able to understand that jaguar is an animal and then go on to perform full disambiguation on the rest of the content.

No, if I make a change, and write something like ‘The jaguar eats gas’, the system is able to understand that in this case ‘Jaguar’ is a luxury car, ‘eat’ means ‘to consume’, and ‘gas’ is ‘gasoline’. So, the second important aspect of COGITO is its capability to perform full disambiguation.

Task 18.

Source: <http://www.youtube.com/watch?v=D2RHfzBLRzg>

The best way to start your CV is with a profile statement. Use a short descriptive statement that grabs attention and really sells you to the recruiter. This gets them interested and wanting to read more about you. A profile statement is a great way to encourage your prospective employer to keep on reading. Keep it brief and interesting – but remember you need to be able to expand on your profile statement points at the interview.

When providing an overview of your employment history, all you need to give are employers’ names, dates and job titles. Don’t waste valuable time going into detail with full job descriptions or specific responsibilities; you can do this at the interview stage. Highlight your previous responsibilities concentrating on the skills and strengths you acquired throughout your employment history.

A brief summary of your education is important too especially for younger people as most of your experience comes from your time in education. Make a big deal of your achievements; remember this CV needs to sell you to the recruiter. What is so good about you that they should invite you in to see them? What exactly have you done that is worth telling people about?

Including your qualifications. This is very important as they demonstrate a commitment to delivering an objective, as well as an ability to work hard in pursuit of a goal. These qualities are of great interest to any employer recruiting for any type of job. Show how you have used any training you received in a real working environment, but don’t simply write a list of courses you have been on. Anyone can write a list, and anyone can attend a course, only people who really understood the training can demonstrate putting it into practice for real. Feel free to provide a brief insight into no more than three of your interests, but don’t go overboard. Remember you’re applying for a job not membership of the local sports team!

Finally, and probably most importantly, your contact details. How else are they going to get in touch to offer you the interview?

UNIT 4. COMPUTER NETWORKS

Task 7.

Source: http://www.youtube.com/watch?v=9LhkW_dkZvU

Today we are going to talk about what is a computer router. Computer router is a device that you have to have in order to have a network. What is a network? A network consists of a number of computers that are connected together to share information or work on common applications or projects. You could also have printers on your network and other devices. What a computer router is used for, is to take the data that is being transmitted between the computers and make sure that it gets routed to the right computers. This is done by a scheme called addressing and it uses a certain type of a protocol. These days we use TCP/IP protocol, which allows the data to flow over a cable and go between computers. When computer is connected to a router, all the computers that it wants to talk to will also be connected to that router.

There are various types of routers. We have, what is called, wired routers and wireless routers. Wired router will only transmit data if you have a cable - (I have a cable right here in front of me) – an Ethernet cable. So, you have to have an Ethernet cable in order for a wired router to work. On a wireless router you could use either a cable or just use radio waves that come out of a wireless router. However, what you have to remember with a wireless router that you have to bring the signal in first – and that is going to come in through a cable. Wireless routers have to be provided with the information through a cable and then they transmit it out by radio waves. So, there are two different types of routers. We most commonly know wireless routers at homes.

UNIT 5. THE INTERNET

Task 6.

Source: <http://www.youtube.com/watch?v=OPltpdu9KGM>

In 1972, the first *e-mail* was sent. Soon, the Internet arrived, a free global space to share information, ideas and amusing pictures of cats. Before the Internet, English changed through people speaking it, but the *Net* brought typing back into fashion and hundreds of cases of repetitive strain injury. Nobody had ever had to *download* anything before, let alone use a *toolbar*, and the only time someone set up a *firewall*, it ended with a massive insurance claim and a huge pile of charred *wallpaper*.

Conversations were getting shorter than the average attention span. Why bother writing a sentence when an abbreviation would do and leave you more time to *blog*, *poke*, and *reboot* when your *hard drive* crashed? In my humble opinion became *IMHO*, by the way became *BTW*, and if we're honest that life-threatening accident was pretty hilarious, simply became *FAIL*.

Some changes even passed into spoken English. For your information, people frequently ask questions like, “How can *LOL* mean laugh out loud and lots of love?” If you’re gonna complain about that, then *UG2BK* (You got to be kidding).

Task 18.

Source: <http://video.about.com/esl/Learn-ESL--Tips-for-Writing-a-Business-Memo.htm>

"Memo" is a short form of the word "memorandum." Generally speaking, a memo is an inter-office or internal written communication for a company or institution. It is prepared by a partner or employee.

Questions Before Writing a Memo

Before sitting down to write a business memo you need to ask yourself two questions:

1. *What* is the intended purpose of the business memo that I plan to write?
2. *Who* is the intended audience? In some cases, not everyone in the company will be a recipient of the memo.

Once you have gathered the necessary facts and thought about and answered the above two preliminary questions, you can begin composing your memo. Keep in mind that a memo is not a business letter nor does it follow the format of a letter. Rather, it needs to be written in short, succinct sentences so that the points you need to make are made quickly and clearly. Keep in mind at all times, the K.I.S.S. principle, which stands for keep it short and simple.

You will likely prepare several drafts of your memo. It is a good idea to have someone else in your office proofread your memo for punctuation, flow, grammar and general overall appearance before you present the final memo.

Generally, there are 3 basic components to memos:

1. The Heading - the top of the page should have the word "Memo" written on it. Under the word "Memo" will be four separate lines. The first is the "To" line. Here you list all of the recipients within your office who will be receiving a copy of the memo. Next is the "From" line. Here you list your name or initials. The third line is the "Date" line. Put in the date you complete the memo. The fourth line is the "Re" or "Subject" line. Here you list what your memo is about. Be specific as to what topic or issue you are writing about. The more specific you are, the quicker a recipient will be to grasp the issue you are trying to communicate.

2. The Main Body - This is the core section. List your key concerns first. Put in some details as to what is in issue, but keep the KISS principle in mind. Business writing is about communication, so make sure that every sentence is concise.

3. The Closing - List your recommendations for how to address the core issues or problems. List the steps that need to be taken, by when and by whom.

You may choose to put back-up information such as a chart or statistics in another document that can be attached to your memo, but if you do so, be sure to make reference to this fact in the closing. Once you have completed writing the business memo, ask yourself if you have fully answered the preliminary questions clearly. Who was the memo intended for and was the purpose fully met.

As a memo is not a letter, salutary remarks are not needed. Make good use of formatting by underlining sections and key points. Spell check and thoroughly proofread the document before it leaves your desk. You may want to include your email address and phone number in the closing for the convenience of your colleagues.

UNIT 6. BUSINESS AND ENTERPRISE

Task 7.

Source: <http://www.youtube.com/watch?v=MXQheBSTGt0>

The faces behind Microsoft's re-organization

The reorganization Microsoft Corp has announced represents the most sweeping re-structuring of the world's largest software company since 2008. The move is designed to better align Microsoft's operations, with Chief Executive Steve Ballmer's stated goal of becoming a "devices and services" company. Microsoft's stronghold of providing software for PCs is under threat as consumers and corporations increasingly turn to mobile devices, such as smart phones and tablets, and to Web-based software.

Gamers Can't Handle the New Female Head at Xbox

Microsoft's new company reorganization promotes Julie Larson-Green, a 19-year company veteran, to head up Xbox—a position recently left vacant by Don Mattrick in a move that has a lot of gamers very, very upset because she's a woman, who supposedly has no gaming experience. When the news hit the social gaming news site N4G, commenters were quick to point out her shortcomings.

Microsoft to unveil big management reorganization

Microsoft will unveil its biggest management reorganization in at least five years, to better compete in a world of mobile devices and Web-based services. The changes will shift the duties and responsibilities of many top Microsoft executives and are intended to eliminate overlap within the 98,000-employee company.

UNIT 7. BANKING

Task 6.

Source: <http://www.youtube.com/watch?v=ddqh7D4EGdQ>

Banking used to be a tremendous hassle. Just a few years ago, you'd have to rush to your bank, hoping to make it before closing time. The Internet has made banking extremely convenient. You can check your balance, transfer funds, and even monitor your stocks and investments in real-time.

But with that convenience comes risk. After all, what would a criminal want more than easy access to your money? You probably already have online banking set up. Here are some simple tips to remember to help keep you—and your money—safe.

Always type in the URL of your financial institution. Phishing attacks often contain deceiving links that send you to fraudulent websites that look and function exactly like the real ones. Typing in your bank's URL manually ensures you are visiting the true site.

Use the secure connection to your financial institution. Most banks automatically take you to their secured site. If not, try using "https" when typing in the URL. Your web browser may even display a lock icon that tells you your connection is secure.

Create strong, unique passwords for each of your online accounts. We've created a video on how to do that at the Security Matters website.

Don't conduct online banking at a public computer. Use your home desktop or laptop to make your transactions or check balances.

And finally, and perhaps the simplest tip of all, remember to log out when you're finished. Always find the "Log out" option on your bank's website and click it when exiting.

Online banking is convenient and efficient. With these simple tips, you can make it a safe experience as well.

UNIT 8. MARKET AND COMPETITION

Task 6.

Source: <http://www.youtube.com/watch?v=9Hxy-TuX9fs>

Cost curves are always going to look the same, but other elements, like price, revenue and demand, will differ depending on the market structure that the business operates in. Are there lots of producers or only a few? Is my product just like everyone else's or is it unique? The characteristics of a market will clue you in as to the type of market structure you're dealing with. Really, there's a continuum of market structures. Let's take a look.

At one extreme, we have perfect competition. Well, if it is competitive, how many producers are we talking about? – A lot. How many is 'a lot' or 'large number'? Economists aren't really specific about it, but a large number of producers means there is so many competitors that each one is too small to affect the market. In

my mind, I tend to think of maybe a hundred and more so that each competitor has one percent or less of a market. Since nothing you do affects the market, no one really cares what you do and you are free to make decisions without worrying about how the competition will react.

How else can I recognize a perfectly competitive market? Besides having a large amount of sellers, each of those sellers will be producing exactly the same thing. In perfect competition, the product is identical, or homogeneous, or non-differentiated, no matter who produces it.

One more characteristic – it's easy for firms to come and go from the industry, that is, there's free entry and exit. Think about it. This industry has lots of producers. Why? Because it's easy to get in and set up shop. In an industry like this, lots of producers, all producing exactly the same thing, how much market power, where market power is defined as the ability to control the price, does an individual firm have? – None. You have no ability to drive the price, because one – you're so small, and two – everyone else produce exactly the same thing that you do. Time to think – what will happen if you try to raise the price?

UNIT 9. ARITHMETIC OPERATIONS AND NUMBER THEORY

Task 7.

Source: <http://www.youtube.com/watch?v=wShnYemIr28>

Hi! My name is Maria, I'm a mathematician and today I'm going to explain how to solve linear equations with variables on both sides. So, if I have an equation like $3x$ minus 7 is equal to $5x$ plus 4 .

The first thing you want to do is to get rid of variable on one side. So, I have a $3x$ and I have a $5x$, and easiest thing to do to avoid negatives when possible is to get rid of the smaller coefficient. So, if I have 3 and 5 , I'll get rid of 3 . So because of the $3x$ is positive, the way that I would get rid of it according to inverse operations is by subtracting it. So, I'd subtract $3x$, because when I do it $3x$ minus $3x$ will cancel itself out. So, if I subtract $3x$ from one side of the equation, I have to subtract $3x$ from another side of the equation. I know that I can only subtract like terms, so I'm going to subtract it from $5x$. So when I do that, $3x$ minus $3x$ cancels out, and I'm left with negative seven. It's really important to always remember to bring down the sign that comes before the number. Bring down the equal sign. $5x$ minus $3x$ is equal to $2x$ and I bring down $+4$. Now when the variables are on one side, I just follow the same steps that I follow to solve any equation, which is use of inverse operations. And always remember to get rid of addition and subtraction first. So, I'm going to do minus 4 on both sides, and when I do that, I have a negative 7 minus 4 is negative 11 equals $2x$. Four and minus four cancels itself out. Last step – I'm going to divide by two on both

sides, and I'm going to get x equals negative eleven halves, or if I go ahead I change it into x number being negative five and a half.

Task 18.

Source: <http://www.youtube.com/watch?v=vi7tnxKU4SI>

We would like to prove the theorem in logarithm.

Let's say that log to the base a of M times N equals the log to the base a of M plus log to the base a of N . Stated differently, the logarithm of the product of two numbers is equal to the sum of the logarithms of the numbers.

To prove this, let's say that log to the base a of M is x , and let log to the base a of N is y . Then, by definition if the log to the base a of M is x , then a to the power of x is M . Writing it as an exponential, a to the power of y is N . Then, let's multiply these two equations. So, we get a to the power of x times a to the power of y is M times N . And multiplying the exponentials a to the power of x times a to the power of y is a to the power of x plus y equals M times N . Now, we have an exponential, which can be written as a logarithm. So, log to the base a of M times N equals x plus y . And once we have this relationship we put x and y back into it, because x is log to the base a of M , and y is log to the base a of N .

So, log to the base a of M times N is log to the base a of M plus log to the base a of N , and we have proved the theorem.

UNIT 10. DISCRETE MATHEMATICS

Task 7.

Source: <http://www.youtube.com/watch?v=Zrq-8qZks3U>

I'm Bob Sedgewick, professor of Computer Science in Princeton.

"People who analyse algorithms have double happiness. First of all, they experience the sheer beauty of elegant mathematical patterns that surround elegant computational procedures. Then they receive a practical payoff when their theories make it possible to get other jobs done more quickly and more economically." - That's how Donald Knuth, who put the study of algorithms on a scientific basis over 50 years ago, described the Mathematics behind the analysis of algorithms. This course begins with the introduction to Generating Functions and Real Symptotics and then introduces the Symbolic Method for defining Generating Functions in the context of applications and the analysis of algorithms, as well as basic structures, such as Permutations, Trees, Streams, words and Mappings. As such, it is an introduction to Analytic Combinatorics in a context of the analysis of algorithms.

GLOSSARY

UNIT 1. Computer Hardware and Software

<i>№</i>	<i>English</i>	<i>Ukrainian</i>	<i>Russian</i>
1.	add	додавати	прибавлять
2.	adjust	налаштовувати	настраивать
3.	application	додаток	приложение
4.	approach	підхід	подход
5.	arrange	впорядковувати	организовывать
6.	assistance	допомога, підтримка	помощь, поддержка
7.	attach	додавати	прикреплять
8.	avoid	уникати	избегать
9.	brightness	яскравість	яркость
10.	button	кнопка	кнопка
11.	calculations	обчислення	исчисления
12.	cellphone	мобільний телефон	мобильный телефон
13.	comprehensive	зрозумілий	понятный
14.	condition	умови, стан	состояние, условие
15.	consist of	складатися з	состоят из
16.	contents	зміст	содержание
17.	Control Panel	панель управління	панель управления
18.	copy	копіювати	копировать
19.	CPU (central processing unit)	ЦП (центральний процесор)	ЦП (центральный процессор)
20.	damaged	пошкоджений	поврежденный
21.	decade	десятиліття	десятилетие
22.	delete	видаляти	удалить
23.	desktop	робочий стіл	рабочий стол
24.	device	пристрій	устройство
25.	digital camera	цифрова камера	цифровая камера
26.	disable	відключати	отключать
27.	display	відображати, дисплей	отображать, дисплей
28.	download	завантажувати	загружать
29.	drag	перетягувати	перетягивать
30.	drop-down	той, що випадає	выпадающий
31.	edit	редагувати	редактировать
32.	enormously	надзвичайно	чрезвычайно

33.	ensure	переконатися	убедиться
34.	error	помилка	ошибка
35.	flash memory card	флеш-пам'ять	флэш-память
36.	flexible	гнучкий	гибкий
37.	flip	перевертати	переворачивать
38.	forecast	передбачати	предсказывать
39.	foundation	основа	основа
40.	government	уряд	правительство
41.	GUI (graphical user interface)	графічний інтерфейс користувача	графический интерфейс пользователя
42.	guide	керувати	направлять
43.	hard-drive	жорсткий диск	жесткий диск
44.	hardware	апаратні засоби	аппаратное обеспечение
45.	hardware configuration	конфігурація апаратних засобів	конфигурация аппаратного обеспечения
46.	headphone	наушник	наушник
47.	image	образ	образ
48.	increase	збільшувати	увеличивать
49.	inkjet printer	чорнильно-струменевий принтер	чернильно-струйный принтер
50.	input device	пристрій вводу	устройство ввода
51.	insert	вставляти	вставляют
52.	install	встановлювати	устанавливать
53.	instruction	вказівки	указания
54.	involve	включати	включать
55.	item	одиниця, предмет	единица, предмет
56.	keyboard	клавіатура	клавиатура
57.	LCD screen	рідкокристалічний екран	жидкокристаллический экран
58.	link	зв'язок, посилання	связь, ссылка
59.	lock	блокувати	блокировать
60.	loudspeakers	гучномовці	колонки
61.	manipulate	поводитися	обращаться
62.	manual	керівництво	руководство
63.	manually	вручну	вручную
64.	manufacturer	виробник	производитель

65.	memory	пам'ять	память
66.	mouse	миша	мышь
67.	move	пересувати	перемещать
68.	occur	відбуватися	происходит
69.	operating system	операційна система	операционная система
70.	output device	пристрій виводу	устройство вывода
71.	package	пакування	упаковка
72.	pattern	модель	модель
73.	peripherals	периферійні пристрої	периферийные устройства
74.	photo-editing program	програма редагування фотографій	программа редактирования фотографий
75.	pinch	щипати, розтягувати	щипать, растягивать
76.	pixel	піксель	пиксель
77.	plug in	включати в мережу	включать в сеть
78.	pop-up	той, що впливає	выскакивающий
79.	power cord	шнур живлення	шнур питания
80.	power outlet	розетка	розетка
81.	prediction	передбачення	предсказание
82.	preface	вступ	вступление
83.	probably	вірогідно	возможно
84.	process	процес, обробляти	процесс, обрабатывать
85.	processing	обробка	обработка
86.	raw	сирий	сырой
87.	remove	видалити	удалить
88.	reset	скидати	сбрасывать
89.	resolution	роздільна здатність	разрешение
90.	response	відповідь	ответ
91.	restore	відновлювати	восстанавливать
92.	reverse	перевертати	переворачивать
93.	rise	підніматися	повышаться
94.	rotation	обертання	вращение
95.	run	виконувати (про програму)	выполняют (о программе)
96.	scroll bar	панель прокрутки	панель прокрутки
97.	sequence	послідовність	последовательность
98.	settings	налаштування	настройки
99.	software	програме	программное

100.	Start Button	забезпечення	обеспечение
101.	store	меню «Пуск»	меню «Пуск»
102.	suppose	зберігати	хранить
103.	Task Manager	припускати	предполагать
104.	troubleshooting	диспетчер завдань	диспетчер задач
		пошук та виправлення	поиск и исправление
		несправностей	несправностей
105.	turn off	вимикати	выключать
106.	turn on	вмикати	включать
107.	type	друкувати (на	печатать (на
		клавіатурі)	клавиатуре)
108.	uninstall	видаляти	деинсталлировать
109.	unit	одиниця, елемент	единица, элемент
110.	unplug	відключати	отключить
111.	unstable	нестабільний	нестабильный
112.	user guide	керівництво	руководство
		користувача	пользователя
113.	view	переглядати	просматривать
114.	virtual reality	віртуальна реальність	виртуальная
			реальность
115.	voice recognition	система розпізнавання	система распознавания
		голосу	голоса
116.	warning	попередження	предупреждение
117.	wireless	бездротовий	беспроводной
118.	word-processing	програма обробки	программа обработки
	program	тексту, текстовий	текста, текстовый
		редактор	редактор

UNIT 2. Programming

<i>№</i>	<i>English</i>	<i>Ukrainian</i>	<i>Russian</i>
1.	achieve	досягати	достигать
2.	add	додавати	прибавлять
3.	ambiguous	двозначний	двузначный
4.	argue	сперечатися	спорить
5.	art	мистецтво	искусство
6.	assembler language	мова асемблера	язык ассемблера
7.	behaviour	поведінка	поведение
8.	binary	бінарний	бинарный

9.	brace	дужка	скобка
10.	break down	розділяти, ламати	разделять, ломать
11.	button	кнопка	кнопка
12.	column	колонка	колонка
13.	commonly	зазвичай	обычно
14.	compare	порівнювати	сравнивать
15.	comparison	порівняння	сравнение
16.	compiler	компілятор	компилятор
17.	compiling	компіляція	компиляция
18.	complement	доповнювати	дополнять
19.	compose	складати	составлять
20.	consequence	наслідок	последствие
21.	consist	складатися	состоять
22.	convert	перетворювати	превращать
23.	CPU	центральний процесор	центральный процессор
24.	create	створювати	создавать
25.	current	поточний	текущий, данный
26.	customer	клієнт	клиент
27.	debugging	усунення помилок	исправление ошибок, отладка
28.	defect	дефект	дефект
29.	demand	вимога	требование
30.	demanding	вимогливий	требовательный
31.	describe	описувати	описывать
32.	description	опис	описание
33.	detailed	детальний	детальный
34.	develop	розробляти	разрабатывать
35.	discover	знаходити	находить
36.	display	відображати, екран	отображать; экран
37.	engineering	інженерна майстерність	инженерное мастерство
38.	error	помилка	ошибка
39.	execute	виконувати	исполнять
40.	expected	очікуваний	ожидаемый
41.	explain	пояснювати	объяснять
42.	fix	виправляти	исправлять
43.	flexible	гнучкий	гибкий
44.	functionality	функціональність	функциональность

45.	hard drive	жорсткий диск	жесткий диск
46.	high-level language	мова високого рівня	язык высокого уровня
47.	housing	корпус	корпус
48.	identify	визначати	определять
49.	improve	вдосконалювати	усовершенствовать
50.	include	включати	включать
51.	instructions	команди	команды
52.	intended	призначений	предназначенный
53.	interact	взаємодіяти	взаимодействовать
54.	keywords	ключові слова	ключевые слова
55.	machine code	машинний код	машинный код
56.	manipulate	обробляти	обрабатывать
57.	meaningful	значущий	значимый
58.	motherboard	материнська плата	материнская плата
59.	object-oriented	об'єктно-орієнтований	объектно-ориентированный
60.	observe	спостерігати	наблюдать
61.	outcome	результат	результат
62.	perform	виконувати	исполнять
63.	performance	виконання	исполнение
64.	pixel	піксель	пиксель
65.	platform	платформа	платформа
66.	point	вказувати	указывать
67.	precise	точний	точный
68.	probability	вірогідність	вероятность
69.	processor	процесор	процессор
70.	purely	виключно	исключительно
71.	refer to	відноситися до	относиться к
72.	release	випуск	выпуск
73.	remark	примітка	пометка
74.	represent	представляти	представлять
75.	requirements	вимоги	требования
76.	resemble	бути схожим	напомять
77.	reusability	можливість повторного використання	возможность повторного использования
78.	review	переглядати	пересматривать
79.	rigid	жорсткий	жесткий
80.	row	ряд	ряд

81.	run the program	запустити програму	запускать программу
82.	satisfy	задовольняти	удовлетворять
83.	sentence	речення	предложение
84.	sequence	послідовність	последовательность
85.	software	програмне забезпечення	программное обеспечение
86.	source code	первинний код	исходный код
87.	speaker	динамик	динамик
88.	specify	уточнювати	уточнять
89.	step	крок	шаг
90.	strict	жорсткий	жесткий
91.	subtract	віднімати	вычитать
92.	successful	успішний	успешный
93.	tedious	стомливий	утомительный
94.	test case	тестовий випадок	тестовый случай
95.	turn on	вмикати	включать
96.	value	значення	значение

UNIT 3. Expert Systems

<i>№</i>	<i>English</i>	<i>Ukrainian</i>	<i>Russian</i>
1.	achievement	досягнення	достижение
2.	adapt	приспосовувати	приспосабливать
3.	advertisement	оголошення	объявление
4.	aim to	мати намір	иметь намерение
5.	appear	з'являтися	появляться
6.	application	заява	заявление
7.	approach	підхід	подход
8.	arise	виникати	возникать
9.	artificial intelligence	штучний інтелект	искусственный интеллект
10.	assist	допомагати	помогать
11.	batch method	метод групової обробки	метод групповой обработки
12.	be able	бути здатним	быть способным
13.	be based on	засновуватися на	основываться на
14.	carrier history	історія працевлаштування	история трудоустройства
15.	clear	чіткий	четкий

16.	competitive	конкурентний	конкурентный
17.	complex	складний	сложный
18.	complex systems	складні системи	комплексные системы
19.	computer science	комп'ютерна наука	компьютерная наука
20.	computer-generated	створений комп'ютером	созданный компьютером
21.	conduct	проводити	проводить
22.	conversation	розмова	разговор
23.	conversational	розмовний; діалоговий	разговорный; диалоговый
24.	criterion	критерій	критерий
25.	cue word	слова-репліки	слова-реплики
26.	CV	резюме	резюме
27.	database	база даних	база данных
28.	decision support	підтримка рішень	поддержка решений
29.	deduce	робити висновки	делать выводы
30.	diagnose	діагностувати	диагностировать
31.	dialog interface	діалоговий інтерфейс	диалоговый интерфейс
32.	digitized	цифровий	цифровой
33.	disease	хвороба	болезнь
34.	distinguish	розрізняти	различать
35.	diverse	різноманітний	разнообразный
36.	divide	розділяти	разделять
37.	education	освіта	образование
38.	employer	роботодавець	работодатель
39.	exist	існувати	существовать
40.	experience	досвід	опыт
41.	expert system	експертна система	экспертная система
42.	explanation	пояснення	объяснение
43.	fault diagnosis	діагностика помилок	диагностика ошибок
44.	fixed	фіксований	фиксированный
45.	formulation	формулювання	формулировка
46.	generate	створювати	создавать
47.	goal	мета	цель
48.	gradually	поступово	постепенно
49.	human intelligence	людський інтелект	человеческий интеллект
50.	imitate	імітувати	имитировать
51.	immediately	негайно	немедленно

52.	include	включати	включать
53.	inference engine	механізм логічного виводу	механизм логического вывода
54.	intelligence	інтелект	интеллект
55.	interactive	інтерактивний	интерактивный
56.	invent	винаходити	изобретать
57.	investing	інвестування	инвестирование
58.	invisible	невидимий, непомітний	невидимый; незаметный
59.	knowledge base	база знань	база знаний
60.	logic simulation	симуляція логіки	симуляция логики
61.	maintain	підтримувати	поддерживать
62.	mineral deposits	родовища мінералів	месторождение минералов
63.	missing	відсутній	отсутствующий
64.	narrow	вузький	узкий
65.	natural language	природна мова	естественный язык
66.	necessary	необхідний	необходимый
67.	online assistant	оперативний асистент	оперативный ассистент
68.	overview	огляд	обзор
69.	participate	брати участь	принимать участие
70.	perform	виконувати	исполнять
71.	personal details	особисті дані	личные данные
72.	petroleum	нафта	нефть
73.	prepare	готуватися	готовиться
74.	process	обробляти	обрабатывать
75.	process control	контроль процесу	контроль процесса
76.	provide	забезпечувати	обеспечивать
77.	qualifications	кваліфікації	квалификации
78.	reasoning	міркування	умозаключение
79.	references	рекомедації	рекомендации
80.	replacement	заміна	замена
81.	request	запит	запрос
82.	require	вимагати	требовать
83.	resolve	вирішувати	решать
84.	response	відповідь	ответ
85.	rule	правило	правило
86.	sales	продаж; торгівля	продажа; торговля
87.	semantic	семантичний	семантический

88.	simulate	симулювати	симулировать
89.	solve	вирішувати	решать
90.	spelling	правопис	правописание
91.	sufficiently	достатньо	достаточно
92.	supplement	доповнення	дополнение
93.	targeted	націлений	нацеленный
94.	template	шаблон	шаблон
95.	Turing test	тест Тюрінга	тест Тьюринга
96.	tutorial	навчальний	обучающий
97.	understandable	зрозумілий	понятный
98.	user guide	керівництво користувача	руководство пользователя
99.	variable	змінна	переменная
100.	work experience	досвід роботи	опыт работы

UNIT 4. Computer Networks

<i>№</i>	<i>English</i>	<i>Ukrainian</i>	<i>Russian</i>
1.	acknowledgment	визнання	признание
2.	advanced	вдосконалений	усовершенствованный
3.	advert	оголошення	объявление
4.	allow	дозволяти	позволять
5.	apply	подавати заяву	подавать заявление
6.	assume	припускати	допускать
7.	authorized	авторизований	авторизированный
8.	avoid	уникати	избегать
9.	barrier	бар'єр	барьер
10.	branch	гілка	ветвь
11.	brief	короткий	краткий
12.	cable	кабель, дрiт	кабель
13.	Campus Area Network	кампусна мережа	кампусная сеть
14.	chat room	чат	чат
15.	computer network	комп'ютерна мережа	компьютерная сеть
16.	computer virus	комп'ютерний вірус	компьютерный вирус
17.	concise	стислий	краткий
18.	connection	з'єднання	соединение
19.	consider	розглядати, обдумувати	рассматривать
20.	core	ядро; ключовий	ядро; ключевой
21.	correspond	відповідати	соответствовать

22.	costly	дорогий	дорогой
23.	cover letter	супровідний лист	сопроводительное письмо
24.	data	дані	данные
25.	data network	мережа даних	сеть данных
26.	data packets	пакети даних	пакеты данных
27.	decade	десятиліття	десятилетие
28.	deploy	приводити в дію; використовувати	приводить в действие; использовать
29.	discard	відкидати	отбрасывать
30.	disturb	турбувати	беспокоить
31.	enclosed	прикладати, додавати	прикладывать
32.	entity	установа	учреждение
33.	establish	встановлювати	устанавливать
34.	exchange	обмінювати	обменивать
35.	expansion	розширення	расширение
36.	extranet	екстранет	экстрасеть
37.	facilitate	полегшувати, допомагати	облегчать, помогать
38.	feature	риси, якість	свойство, качество
39.	firewall	брандмауер	брандмауэр
40.	gateway	шлюз	шлюз
41.	growth	зростання	рост
42.	hacker	хакер	хакер
43.	home user	домашній користувач	домашний пользователь
44.	host	хост	хост
45.	hub	концентратор	концентратор
46.	impression	враження	впечатление
47.	inappropriate	невідповідний	несоответствующий
48.	increase	зростання	рост
49.	insecure	ненадійний	ненадежный
50.	instant messaging	миттєві повідомлення	мгновенные сообщения
51.	interfere	втручатися; перешкоджати	вмешиваться, быть помехой
52.	interpersonal	міжособистісний	межличностной
53.	intranet	інтранет	интранет
54.	invaluable	безцінний	бесценный

55.	latency	латентність	латентность
56.	letter of application	супровідний лист	сопроводительное письмо
57.	Local Area Network	локальна комп'ютерна мережа	локальная компьютерная сеть
58.	look forward	чекати	ожидать
59.	Metropolitan Area Network	міська мережа	городская сеть
60.	mirror	відображати	отображать
61.	mode	метод, спосіб	метод, способ
62.	modem	модем	модем
63.	network bridge	мережевий міст	сетевой мост
64.	network switch	мережевий комутатор	сетевой коммутатор
65.	opportunity	можливість	возможность
66.	outline	окреслювати	обрисовать
67.	pass	проходити	проходить
68.	post	позиція	позиция
69.	power line communication	зв'язок по лінії електропередач	связь по линии электропередач
70.	practical application	практичне застосування	практическое применение
71.	prevent	попереджати; запобігати	предупреждать
72.	properties	властивості	свойства
73.	prospective	ймовірний; майбутній	вероятный
74.	provide	забезпечувати	обеспечивать
75.	proxy server	проксі-сервер	прокси-сервер
76.	radio communication	радіозв'язок	радиосвязь
77.	rely on	покладатися на; спиратися на	полагаться на
78.	repeater	ретранслятор	ретранслятор
79.	requirements	вимоги	требования
80.	responsibility	відповідальність	ответственность
81.	route	маршрут	маршрут
82.	rule set	набір правил	набор правил
83.	scope	межі, рамки	границы, рамки
84.	security system	система безпеки	система безопасности
85.	server	сервер	сервер
86.	set	набір	набор

87.	set up	встановлювати	устанавливать
88.	share	розподіляти	распределять, делиться
89.	signature	підпис	подпись
90.	skills	навички	навыки
91.	store	зберігати	хранить
92.	suitability	відповідність	соответствие
93.	tailor	приспосовувати	приспосабливать
94.	telecommunication	телекомунікація	телекоммуникация
95.	terminate	обмежувати	ограничивать
96.	traffic	трафік	трафик
97.	trojan	троян	троян
98.	trusted	надійний, довірений	надежный, доверенный
99.	video conferencing	відеоконференція	видеоконференция
100.	Wide Area Network	глобальна мережа	глобальная сеть
101.	wired router	дротовий маршрутизатор	проводной маршрутизатор
102.	wireless	бездротовий	беспроводной
103.	wireless router	бездротовий маршрутизатор	беспроводной маршрутизатор

UNIT 5. The Internet

<i>№</i>	<i>English</i>	<i>Ukrainian</i>	<i>Russian</i>
1.	academic	академічний	академический
2.	accelerate	прискорювати	ускорять
3.	acceptance	прийняття	принятие
4.	access	доступ	доступ
5.	accessible	доступний	доступный
6.	adapt	адаптувати, приспосовувати	адаптировать, приспосабливать
7.	approximately	приблизно	приблизительно
8.	array	сукупність	масса, совокупность
9.	auction	аукціон	аукцион
10.	blogging	ведення блогу	ведение блога
11.	browser	браузер	браузер
12.	capability	можливість	возможность
13.	confuse	плутати	путать, смешивать
14.	contain	містити	содержать
15.	decentralization	децентралізація	децентрализация

16.	disseminate	розповсюджувати, поширювати	распространять
17.	diverse	різноманітний	разнообразный
18.	dominate	переважати	доминировать
19.	e-business	інтернет-бізнес	интернет-бизнес
20.	edit	редагувати	редактировать
21.	email	електронна пошта	электронная почта
22.	embedded	вбудований	встроенный
23.	emerge	з'являтися	возникать
24.	enable	давати змогу, уможлилювати	давать возможность
25.	extensive	широкий	широкий
26.	global	глобальний	глобальный
27.	government	уряд	правительство
28.	graphics	графіка	графика
29.	hyperlink	гіперпосилання	гиперссылка
30.	hypertext document	гіпертекстовий документ	гипертекстовый документ
31.	Hypertext Transfer Protocol	протокол передачі даних	протокол передачи данных
32.	incorporation	об'єднання	объединение
33.	information-sharing	обмін інформацією	обмен информацией
34.	infrastructure	інфраструктура	инфраструктура
35.	interchangeable	взаємозамінний	взаимозаменяемый
36.	interconnected	взаємопов'язаний	взаимосвязанный
37.	interlinked	взаємопов'язані	взаимосвязанный
38.	Internet Protocol television	Інтернет-телебачення	Интернет -телевидение
39.	interrelated	взаємопов'язаний	взаимосвязанный
40.	keyword	ключове слово	ключевое слово
41.	library	бібліотека	библиотека
42.	linked	з'єднаний	связанный
43.	listing	перелік	перечень
44.	medium	засіб	средство
45.	memorandum	меморандум	меморандум
46.	multimedia	мультимедіа	мультимедиа
47.	navigate	здійснювати пошук	совершать поиск
48.	offer	пропонувати	предлагать
49.	optical	оптичний	оптический

50.	page	сторінка	страница
51.	peer-to-peer network	пірингова мережа, децентралізована мережа	піринговая, децентрализованная сеть
52.	population	населення	население
53.	print publishing	друковане видавництво	печатное издательство
54.	protocol suite	набір протоколів	набор протоколов
55.	public	громадський	общественный
56.	rapid	швидкий	быстрый
57.	redefine	переглянути, змінити	пересмотреть, изменить
58.	reference	посилання	ссылка
59.	release	випуск	выпуск
60.	repetitive strain injury	травми від постійних навантажень	травма от повторяющихся нагрузок
61.	reshape	змінювати, перетворювати	изменять, превращать
62.	respond	відповідати	отвечать
63.	retail outlet	роздрібна точка продажу	точка розничной продажи
64.	search engine	пошукова система	поисковая система
65.	serve	обслуговувати	обслуживать
66.	several	кілька	несколько
67.	social network	соціальна мережа	социальная сеть
68.	The Internet	Інтернет	Интернет
69.	transmission	передача	передача
70.	utilize	використовувати	использовать
71.	vast	широкий	широкий
72.	voice over Internet Protocol	система телефонії через інтернет-протокол	система телефонии через интернет- протокол
73.	web feed	стрічка новин	лента новостей
74.	web page	веб-сторінка	веб-страница
75.	World Wide Web	всесвітня мережа	всемирная паутина
76.	worldwide	всесвітній	всемирный

UNIT 6. Business and Enterprise

<i>№</i>	<i>English</i>	<i>Ukrainian</i>	<i>Russian</i>
1.	accountability	звітність	отчетность
2.	advances	досягнення	достижения
3.	advertising	реклама	реклама
4.	agribusiness	сільськогосподарське виробництво	сельскохозяйственное производство
5.	amount	кількість	количество
6.	announce	оголошувати	объявлять
7.	apologize	вибачатися	извиняться
8.	appreciate	цінувати	ценить
9.	attention	увага	внимание
10.	attract	привертати	привлекать
11.	bankruptcy	банкрутство	банкротство
12.	board of directors	рада директорів	совет директоров
13.	business letter	діловий лист	деловое письмо
14.	busy	зайнятий	занятой
15.	campaign	кампанія	кампания
16.	celebrity	знаменитість	знаменитость
17.	chief executive officer	виконавчий директор	исполнительный директор
18.	commit	чинити	совершать
19.	company	компанія	компания
20.	complaint	скарга	жалоба
21.	comply	погоджуватися, виконувати	исполнять, соглашаться
22.	condition	умова	условие
23.	constitute	складати	составлять
24.	consumer	споживач	потребитель
25.	contemporary	сучасний	современный
26.	corporation	корпорація	корпорация
27.	correspondence	листування	корреспонденция
28.	debt	борг	долг
29.	duty	мито	пошлина
30.	economy	економіка	экономика
31.	elimination	ліквідація	ликвидация
32.	employee	службовець, працівник	служащий, работник
33.	employer	роботодавець	работодатель

34.	enterprise	підприємство	предприятие
35.	etymology	етимологія	этимология
36.	export	експорт	экспорт
37.	financial business	фінансова діяльність	финансовая деятельность
38.	firm	фірма	фирма
39.	general partnership	повне товариство	полное товарищество
40.	good	товар	товар
41.	governance	управління	управление
42.	headquarters	орган управління	орган управления
43.	implement	виконувати	исполнять
44.	income	прибуток	доход
45.	income tax	податок на прибуток	подоходный налог
46.	influence	вплив	влияние
47.	intend	мати намір	иметь намерение
48.	investigation	дослідження	исследование
49.	investment	інвестування	инвестирование
50.	invitation	запрошення	приглашение
51.	involve	включати	включать
52.	job	робота	работа
53.	legal	юридичний	юридический
54.	legal claim	юридичний позов	юридический иск
55.	legal entity	юридична особа	юридическое лицо
56.	liability	відповідальність	ответственность
57.	limited liability company	компанія з обмеженою відповідальністю	компания с ограниченной ответственностью
58.	losses	збитки	убытки, потери
59.	manufacturer	виробник	производитель
60.	market sector	сектор ринку	сектор рынка
61.	member	член	член, участник
62.	mining	гірничя промисловість	горная промышленность
63.	mistake	помилка	ошибка
64.	monitor	відстежувати	отслеживать
65.	multiple	численний	многочисленный
66.	order	замовлення	заказ
67.	owner	власник	владелец
68.	ownership	власність	собственность

69.	parties	сторони	стороны
70.	performance	виконання	исполнение
71.	persuade	переконувати	убеждать
72.	policy	політика	политика
73.	prevalent	поширений	распространенный
74.	privately owned	той, що знаходиться у приватній власності	находящийся в частной собственности
75.	profit	прибуток	прибыль
76.	profitable	прибутковий	прибыльный
77.	property	власність	собственность
78.	protection	захист	защита
79.	provide	надавати	обеспечивать
80.	real estate	нерухомість	недвижимость
81.	receive	отримувати	получать
82.	reorganization	реорганізація	реорганизация
83.	repeat customer	постійний клієнт	постоянный клиент
84.	replacement	заміна	замена
85.	request	запит	запрос
86.	retailer	роздрібний торговець	розничный торговец
87.	sales	продаж	продажа
88.	separate	окремий	отдельный
89.	service	послуги	услуги
90.	share	акція	акция
91.	shareholder	акціонер	акционер
92.	shipping	транспортування	транспортировка
93.	sole proprietor	одноосібний власник, приватний підприємець	единоличный собственник, частный предприниматель
94.	stem from	походити від	происходит от
95.	sue	подавати позов	подавать иск
96.	suggest	пропонувати	предлагать
97.	supplier	постачальник	поставщик
98.	trade	торгівля	торговля
99.	trade name	торгова марка	торговая марка
100.	transaction	ділова операція	деловая операция
101.	transportation	транспортування	транспортировка
102.	unemployed	незайнятий, безробітний	незанятый, безработный
103.	utilities	комунальні послуги	коммунальные услуги

UNIT 7. Banking

<i>№</i>	<i>English</i>	<i>Ukrainian</i>	<i>Russian</i>
1.	account	рахунок	счет
2.	account statement	виписка з рахунка	выписка со счета
3.	annual	річний	годовой
4.	assets	активи	активы
5.	ATM	банкомат	банкомат
6.	available	наявний, доступний	доступный
7.	balance	баланс	баланс
8.	bank account	банківський рахунок	банковский счет
9.	bank	банк	банк
10.	bank loan	банківський кредит	банковский кредит
11.	banker	банкiр	банкир
12.	bond	облігація	облигация
13.	borrow	позичати	занимать
14.	cash	готівка	наличные деньги
15.	charge	призначати, вимагати (ціну)	назначать, требовать (плату)
16.	cheque	чек	чек
17.	commercial bank	комерційний банк	коммерческий банк
18.	compatible	сумісний	совместимый
19.	connection	з'єднання	соединение
20.	convenience	зручність	удобство
21.	credit	кредит	кредит
22.	credit card	кредитна карта	кредитная карта
23.	currency	валюта	валюта
24.	customer	клієнт	клиент
25.	debit	дебет	дебет
26.	demand	вимагати	требовать
27.	deposit	вклад, депозит	вклад, депозит
28.	earn	заробляти	зарабатывать
29.	e-mail	електронний лист	электронное письмо
30.	encourage	надихати	вдохновлять
31.	endanger	ставити під загрозу	ставит под угрозу
32.	ensure	гарантувати, переконувати	гарантировать, убеждать
33.	entrust	довіряти	доверять

34.	evolve	розвиватися	развиваться
35.	exceed	перевищувати	превышать
36.	fee	плата, збір	плата, сбор
37.	financial instruments	фінансові інструменти	финансовые инструменты
38.	financial market	фінансовий ринок	финансовый рынок
39.	fishing	фішинг (викрадення цінної інформації)	фишинг (выуживание ценной информации)
40.	header	верхній колонтитул	верхний колонтитул
41.	individual retirement account	особистий пенсійний рахунок	личный пенсионный счет
42.	institution	установа	учреждение
43.	interest	відсоток	процент
44.	interest rate	процентна ставка	процентная ставка
45.	investment bank	інвестиційний банк	инвестиционный банк
46.	issue	випускати	выпускать
47.	lend	позичати	занимать
48.	liability	відповідальність	ответственность
49.	loan	позика, кредит	кредит, ссуда
50.	log out	виходити (з системи)	выходить (из системы)
51.	maintain	підтримувати	поддерживать
52.	manually	вручну	вручную
53.	margin	маржа	маржа
54.	mortgage	застава, іпотека	залог, ипотека
55.	mortgage bank	іпотечний банк	ипотечный банк
56.	national bank	національний банк	национальный банк
57.	offer	пропонувати	предлагать
58.	online banking	дистанційне здійснення банківських операцій, інтернет-банкінг	банковское обслуживание через интернет
59.	overdraft	овердрафт, перевищення кредиту	овердрафт, превышение кредита
60.	overdraft limit	ліміт овердрафту	лимит овердрафта
61.	owned	у власності	принадлежащий
62.	pay	платити	платить
63.	payment	оплата	оплата
64.	private bank	приватний банк	частный банк
65.	purchase	купувати	покупать
66.	rate	рівень, тариф, ставка	тариф, ставка

67.	recipient	одержувач	получатель
68.	reflect	відображати	отображать
69.	relatively	відносно	относительно
70.	replace	замінювати	заменять
71.	restrict	обмежувати	ограничивать
72.	retail bank	банк для фізичних осіб	банк для физических лиц
73.	retirement	вихід на пенсію	выход на пенсию
74.	revenue	річний дохід	годовой доход
75.	robbery	пограбування	ограбление
76.	run the business	вести бізнес	вести дело, бизнес
77.	save	зберігати	сохранять
78.	saving account	ощадний рахунок	сберегательный счет
79.	savings bank	ощадний банк	сберегательный банк
80.	secondary market	вторинний ринок	вторичный рынок
81.	securities	цінні папери	ценные бумаги
82.	share	акція	акция
83.	shareholder	акціонер	акционер
84.	similarity	подібність	сходство
85.	stock market	фондовий ринок	фондовый рынок
86.	subsidiary	дочірня компанія	дочерняя компания
87.	sufficient	достатній	достаточный
88.	terminal	термінал	терминал
89.	thieve	красти	красть
90.	trade	торгівля	торговля
91.	transaction	банківська операція	банковская операция
92.	turn	оборот	оборот
93.	unauthorized	неавторизований	неавторизированный
94.	underwriting	гарантована купівля і розміщення цінних паперів	гарантирование размещения и покупки ценных бумаг
95.	universal bank	універсальний банк	универсальный банк
96.	withdraw	відкликати, виводити (про активи, гроші)	отзывать, снимать (деньги)

UNIT 8. Market and Competition

<i>№</i>	<i>English</i>	<i>Ukrainian</i>	<i>Russian</i>
1.	abundant	поширений	распространенный

2.	additional	додатковий	дополнительный
3.	agriculture	сільське господарство	сельское хозяйство
4.	appropriate	відповідний	соответствующий
5.	assume	припускати	предполагать
6.	barrier	перешкода	препятствие
7.	benchmark	стандарт, еталон	стандарт, эталон
8.	buyer	покупець	покупатель
9.	carry out	виконувати	исполнять, проводить
10.	change	змінювати	изменять
11.	collect	збирати	собирать
12.	committee	комітет	комитет
13.	competition	конкуренція	конкуренция
14.	competitive	конкурентоспроможний	конкурентоспособный
15.	confident	впевнений	уверенный
16.	consider	обмірковувати	обдумывать
17.	copyright	авторське право	авторское право
18.	cost	коштувати	стоять
19.	curve	крива	кривая
20.	demand	попит	спрос
21.	department	відділення	отделение
22.	determine	визначати	определять
23.	economist	економіст	экономист
24.	efficacy	ефективність	эффективность
25.	entry	вхід, вступ	вход, вступление
26.	erroneous	помилковий	ошибочный
27.	exclude	виключати	исключать
28.	exclusive	виключний	исключительный
29.	expansion	розширення	расширение
30.	expensive	дорогий	дорогой
31.	facility	можливість	возможность
32.	free	безкоштовний	бесплатный
33.	good	товар	товар
34.	government	уряд	правительство
35.	hurdle	перешкода	препятствие
36.	identical	однаковий, тотожний	идентичный
37.	improvement	вдосконалення	усовершенствование
38.	in response	у відповідь	в ответ
39.	indicate	визначати	определять
40.	influence	впливати	влиять

41.	in-house	внутрішній	внутренний
42.	insufficient	недостатній	недостаточный
43.	interdependent	взаємозалежний	взаимозависимый
44.	issue	проблема	проблема
45.	leverage	важіль	рычаг
46.	market force	ринкова сила	рыночная сила
47.	market power	ринкова влада	рыночная власть
48.	marketing strategy	стратегія маркетингу	стратегия маркетинга
49.	marketplace	ринок	рынок
50.	monopoly	монополія	монополия
51.	natural resource	природний ресурс	природный ресурс
52.	oil industry	нафтова промисловість	нефтяная промышленность
53.	oligopoly	олігополія	олигополия
54.	opposite	протилежний	противоположный
55.	outline	окреслити	очертить
56.	perfect competition	ідеальна конкуренція	идеальная конкуренция
57.	prevent	попереджати	предупреждать
58.	price	ціна	цена
59.	producer	виробник	производитель
60.	questionnaire	анкета	анкета, опросник
61.	recommendations	рекомендації	рекомендации
62.	report	звіт	отчет
63.	require	вимагати	требовать
64.	restricted	обмежений	ограниченный
65.	right	право, порядок	право, порядок
66.	seller	продавець	продавец
67.	service	послуга	услуга
68.	significant	значний	значительный
69.	strength	сила	сила
70.	submit	подавати на розгляд	подавать на рассмотрение
71.	substitute	замінник	заменитель
72.	supply	пропозиція	предложение
73.	survey	дослідження	исследование
74.	team up	об'єднуватись	объединяться
75.	total utility	сукупна корисність	совокупная полезность
76.	undertake	починати, проводити	начинать, проводить

77.	update	оновлювати	обновлять
78.	weakness	недолік	недостаток
79.	worry	турбуватися, хвилюватися	волноваться

UNIT 9. Arithmetic and Number Theory

<i>№</i>	<i>English</i>	<i>Ukrainian</i>	<i>Russian</i>
1.	addition	додавання	сложение
2.	advanced	досконалий, підвищеного типу	усовершенствованный
3.	algebraic integer	ціле алгебраїчне число	целое алгебраическое число
4.	applicable	придатний	применимый
5.	approximate	приблизний	приблизительный
6.	argument	аргумент	аргумент
7.	arise	виникати	возникать
8.	arithmetic	арифметика	арифметика
9.	assume	припускати	предполагать
10.	axiom	аксіома	аксиома
11.	barcode	штрихкод	штрихкод
12.	base case	основний випадок	основной случай
13.	brackets	дужки	скобки
14.	calculations	обчислення	вычисление
15.	calculus	числення	исчисление
16.	case	випадок	случай
17.	coding theory	теорія кодування	теория кодирования
18.	combine	поєднувати	объединять
19.	common	спільний, загальний	общий
20.	conclude	робити висновок	делать вывод
21.	confirmatory	підтверджувальний	утвердительный
22.	conjecture	припущення	предположение
23.	construction	конструкція	конструкция
24.	contradiction	протиріччя	противоречие
25.	controversial	дискусійний	дискуссионный
26.	convince	переконувати	убеждать
27.	counting	рахунок	счет
28.	cryptography	криптографія	криптография
29.	daily life	повсякдення	будни

30.	decrease	зменшувати	уменьшать
31.	deductive	дедуктивний	дедуктивный
32.	definition	визначення	определение
33.	demonstrate	демонструвати	демонстрировать
34.	difference	різниця	разница
35.	digit	цифра	цифра
36.	directly	безпосередньо	непосредственно
37.	discrete mathematics	дискретна математика	дискретная математика
38.	distinguish	розрізняти	различать
39.	division	ділення	деление
40.	elementary	елементарний, первинний	элементарный, первичный
41.	encode	кодувати	кодировать
42.	enumerate	перелічувати	перечислять
43.	equation	рівняння	уравнение
44.	error detection	виявлення помилки	определение ошибки
45.	evaluate	оцінювати	оценивать
46.	exhaustion	вичерпання	перебор
47.	explicit	чітко виражений	четко выраженный
48.	exponential	показниковий	показательный
49.	exponentiation	зведення у степінь	сведение в степень
50.	expression	вираз	выражение
51.	field	поле, величина	поле, величина
52.	imply	мати на увазі	подразумевать
53.	increase	збільшувати	увеличивать
54.	instance	випадок	случай
55.	integer	ціле число	целое число
56.	involve	включати	включать
57.	justification	доведення	доказательство
58.	linear equation	лінійне рівняння	линейное уравнение
59.	logarithm	логарифм	логарифм
60.	logarithmic function	логарифмічна функція	логарифмическая функция
61.	logical	логічний	логичный
62.	manipulation	операція	операция
63.	multiplication	множення	умножение
64.	number	кількість, число	количество, число
65.	number theory	теорія чисел	теория чисел
66.	obey	підпорядковуватися	подчиняться

67.	occur	траплятися	происходит
68.	operations	дія, операція	действие, операция
69.	operator precedence	першочерговість дій	первоочередность действий
70.	order of operations	порядок дій	порядок действий
71.	parentheses	круглі дужки	круглые скобки
72.	percentage	відсоток, процентне відношення	процент, процентное соотношение
73.	perform	виконувати	исполнять
74.	precedence	першочерговість	первоочередность
75.	prime number	просте число	простое число
76.	proof	доказ	доказательство
77.	property	властивість	свойство
78.	quantity	кількість	количество
79.	quotient	частка	частное, показатель
80.	range	межі, діапазон	границы, диапазон
81.	rational number	раціональне число	рациональное число
82.	reasoning	міркування	рассуждение
83.	repeatedly	повторно	повторно
84.	solution	рішення	решение
85.	square root	квадратний корінь	квадратный корень
86.	statement	твердження	утверждение
87.	subtraction	віднімання	вычитание
88.	sum	додавати	прибавлять
89.	take away	віднімати	вычитать
90.	take power	зводити у степінь	сводит в степень
91.	theorem	теорема	теорема
92.	times	помножити	умножать
93.	total	сума	сумма
94.	unsullied	незаплямований	незапятнанный
95.	validity	дійсність	истинность
96.	value	цінність, значення	значение
97.	vinculum	горизонтальна риса	горизонтальная черта
98.	wireless communication	бездротовий зв'язок	беспроводная связь
99.	yield	приводити до чогось	приводит к чему-либо

UNIT 10. Discrete Mathematics

<i>№</i>	<i>English</i>	<i>Ukrainian</i>	<i>Russian</i>
1.	abstract	анотація	аннотация
2.	aggregation	об'єднання, агрегація	объединение, агрегация
3.	algorithm	алгоритм	алгоритм
4.	appear	з'являтися	появляются
5.	arbitrary	вільний, випадковий	случайный
6.	ascertain	встановлювати, виявляти	выяснять, устанавливать
7.	brief	короткий	краткий
8.	calculus	числення	исчисление
9.	cardinality	потужність множини	мощность множества
10.	challenge	виклик	вызов
11.	challenging	той, що стимулює	стимулирующий
12.	coding theory	теорія кодування	теория кодирования
13.	coefficient	коефіцієнт	коэффициент
14.	combinatorics	комбінаторика	комбинаторика
15.	combine	поєднувати	объединять
16.	computation	розрахунок	расчет
17.	computer aided design	система автоматизованого проектування	система авторизованного проектирования
18.	congruence	відповідність, конгруентність	соответствие, конгруэнтность
19.	conjecture	припущення	предположение
20.	continuous	безперервний, тривалий	непрерывный, континуальный
21.	conversely	навпаки	наоборот
22.	countable	злічуваний	исчисляемый
23.	decision theory	теорія рішень	теория решений
24.	decoding	розшифровка	расшифровка
25.	dimensions	розміри, виміри	размеры, измерения
26.	discrete	окремий, дискретний	дискретный, отдельный
27.	discrete mathematics	дискретна математика	дискретная математика
28.	discrete steps	окремі кроки	отдельные шаги
29.	distinct	особливий, окремий	отдельный

30.	efficiency	корисність, дієвість	полезность
31.	efficient	корисний	полезный
32.	encoding	шифрування	шифрование
33.	enumerated	перелічений	перечисленный
34.	evasion	ухилення	уклонение
35.	exclude	виключати	исключать
36.	execute	виконувати	исполнять
37.	finite	скінченний	конечный
38.	framework	структура, рамки	структура, рамки
39.	game theory	теорія ігор	теория игор
40.	graph	графік	график
41.	graph theory	теорія графів	теория графов
42.	implementation	виконання, реалізація	исполнение, реализация
43.	implication	висновок	вывод
44.	importance	важливість	важность
45.	in contrast	у протилежність	в противоположность
46.	inapplicable	незастосовний	неприменимый
47.	incompleteness	незакінченість	неполнота
48.	indeed	дійсно	действительно
49.	integer	ціле число	целое число
50.	involve	включати	включать
51.	mathematical structures	математичні структури	математические структуры
52.	natural number	натуральне число	натуральное число
53.	nearest neighbour algorithm	метод найближчого сусіда	алгоритм ближайшего соседа
54.	notion	поняття	понятие
55.	number theory	теорія чисел	теория чисел
56.	outcome	результат	результат
57.	preferences	переваги	преимущества
58.	probability	вірогідність	вероятность
59.	probability theory	теорія ймовірності	теория вероятности
60.	property	властивість	свойство
61.	public-key cryptography	криптографія з відкритим ключем	криптография с открытым ключем
62.	quantity	кількість	количество
63.	random	випадковий	случайный
64.	real number	дійсне число	действительное число

65.	recurrence	повторення	повтор
66.	requirements	вимоги	требования
67.	separated	окремий	отдельный
68.	set	множина	множество
69.	set theory	теорія множин	теория множеств
70.	social choice theory	теорія суспільного вибору	теория социального выбора
71.	social welfare	соціальний добробут	социальное благополучие
72.	statement	твердження	утверждение
73.	subset	підмножина	подмножество
74.	substantial	значний	значительный
75.	summary	короткий виклад	краткое изложение
76.	travelling salesman problem	задача комівояжера	задача коммивояжера
77.	value	значення	значение
78.	vary	змінюватися	изменяться
79.	vertex	вершина	вершина

ACTIVITY PACK

UNIT 1. COMPUTER HARDWARE AND SOFTWARE

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

The first computer was invented by.... (Babbage/ Zuse / Sheutz / Pascal...).

In course of time, computers have become ... (cheaper / more expensive / smarter / more complicated / smaller / more popular / simpler ...).

I think that the most important breakthrough in computer development is the invention of ... (punch card data storage / first calculator / relay / transistors ...).

Analytical Concern

The first computer was invented because ... (people needed to count more quickly / people wanted to create music / there was a need to develop technology ...).

If computer wasn't invented, people would have ... (invented some other kind of calculating machine / stayed at the same level of development / created more harmonious society ...).

I think that (users / manufacturers / politics / merchandisers ...) benefit most from the existence of computers.

Practical Concern

We can use computer for ... (calculating / drawing / writing / playing games / developing a project / communication ...).

The main parts of a computer are ...(hard drive/ keyboard / motherboard...).

I think that the most useful software is ... (Microsoft Office / Windows / Skype / Corel Draw / Photoshop ...).

Creative Concern

The computer mouse is called that way because ... (it resembles mouse / it is small / it moves quickly / it is just a funny word ...).

We can use computer programs to ... (create cards / write books / edit photos / compose videos ...).

Broken keyboard may be used to ... (create magnets from keys / create necklace from keys /sprout seeds ...).

UNIT 2. PROGRAMMING

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

I suppose that programming was To my mind, the main breakthrough was the introduction of... Nowadays programming is ...

Practical Concern

I know such languages as ... I have an experience using ... Nowadays people use programming in various fields, such as ...

Analytical Concern

There are three main classes (generations) of programming languages ... The criteria of such classification is the degree of ... I suppose, that technology would have been absolutely different ...

Creative Concern

Programming can be used in various creative ways ... Programming can be used to compose music ... With the help of programming software engineers create computer games...

UNIT 3. EXPERT SYSTEMS

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

Computer can perform a lot of complicated tasks, such as calculation, design.... To my mind, it is (not) rational to trust a computer in the sphere of health care, because ... I think that computer analysis is better than human expertise when ...

Practical Concern

The term “expert system” means any system that can... Expert systems are a branch of AI which... AI devices are widely used in ...

Analytical Concern

The advantages of computer analysis are that... The disadvantage is that computer analysis... I suppose, that computer analysis without human interference can be used in the spheres of...

Creative Concern

Sci-fi writers often mention AI technologies... It would be beneficial if AI was used in kitchen devices/ hair dryer because in this way... In 20 years AI technologies will develop/be used in every sphere...

UNIT 4. COMPUTER NETWORKS

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

Computer networks have huge/great/no impact on...The benefits of computer networks include.....I suppose that the drawbacks of computer networks are

Analytical Concern

I think that in future computer networks will...When establishing home network, we must take into account the following The risks of having your own computer network include.....

Practical Concern

I use such computer networks as...I think that characteristics of computer networks are ... To use computer networking technology, we need to...

Creative Concern

I associate with computer networks such concepts as... The work of computer networks may be illustrated in the following way..... I suppose that computer networks are called that way because

UNIT 5. THE INTERNET

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

The Internet is a global network... the Internet was created in... The Internet proved to be beneficial in ...

Analytical Concern

The Internet has changed dramatically... The Internet has reshaped such activities as ... I suppose in future the Internet will ...

Practical Concern

I usually use the Internet for... My favourite site is... Many professions are closely connected with the Internet, such as...

Creative Concern

The Internet may be used in entertainment to ... Artists may use the Internet to ... I suppose, the Internet has influenced modern art in ...

UNIT 6. BUSINESS AND ENTERPRISE**Task 1. Pre-Assessment**

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

I would prefer to work for a large corporation/ in a family business because... The benefits of running your own business include..... I would like to work as a freelancer/employer because.....

Analytical Concern

The good points of being a freelancer are... On the other hand, ... Before you set up your business, you should analyze.... The risks of running a business are

Practical Concern

I suppose that the most important industry of our country is... There are good and bad points of being a sole proprietor, like... To become a businessman, one should have...

Creative Concern

If I had a business, it would.... Creative industries include design The good advertisement was made to promote....

UNIT 7. BANKING

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

I suppose that a bank is a financial institution that ...Banks can make money in different ways, for example The risks of online banking include

Analytical Concern

The advantages of having a saving account are... On the other hand, ... Before you choose a bank to work with, you should analyze... The pros of online banking include... Nevertheless...

Practical Concern

There are many banks in our country, for example...I suppose, the most popular banks are ...Banks usually offer such types of accounts as...

Creative Concern

In my opinion, a perfect bank should ... Friendly atmosphere in a bank can ... Advertising campaign is very important in banking. Banks can outline their...

UNIT 8. MARKET AND COMPETITION

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

I suppose that competition is a market structure in which there is ... I suppose that competition positively influences the market, as If there is no competition, the market structure will become

Analytical Concern

The winner in competition is determined by... In a perfectly competitive market, there is ... An example of a perfectly competitive market is ...

Practical Concern

Before buying a product I usually take into account such criteria as... When choosing between two similar products, I analyze ... A monopolistic market is a kind of market where ...

Creative Concern

In my opinion, advertizing plays important role in... Nowadays effective advertizing should have such features as ... If I had business, I would...

UNIT 9. ARITHMETIC AND NUMBER THEORY

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

Arithmetic is a branch of science which... Arithmetic first emerged in... Common arithmetic operations include ...

Analytical Concern

Arithmetic is widely used in analysis of ... Doing business often includes dealing with Arithmetic, for example ... Number theory can be used in ...

Practical Concern

Arithmetic is used in many spheres, such as... I suppose, the first purpose of calculation was ... Arithmetic is often used by people who work as ...

Creative Concern

Arithmetic may be used in ...Arithmetic was mentioned in such books as ... I think that the phrase 'Arithmetic of Art' means ...

UNIT 10. DISCRETE MATHEMATICS

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

I suppose that most useful topics of Discrete Math are.... To my mind, the hardest topic is, probably, ... Discrete Mathematics can be applied in such spheres of everyday life as ...

Practical Concern

Discrete Mathematics can have many practical applications, like... Discrete Math can help to solve many tasks, such as ... I suppose, Discrete Mathematics is most needed in the spheres of ...

Analytical Concern

Discrete Mathematics is ... The difference between Discrete Mathematics and Algebra lies in ... I suppose, Discrete Mathematics has many applications in business, such as ...

Creative Concern

In my opinion, the most interesting topic of Discrete Math is... I associate Discrete Mathematics with ... Discrete Mathematics may be used to...

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