



**OFFICE FOR STANDARDS
IN EDUCATION**

INSPECTING SUBJECTS AND ASPECTS 11-18

INFORMATION TECHNOLOGY

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INSPECTING INFORMATION TECHNOLOGY

INTRODUCTION

When inspecting information technology, you need to find out how good the pupils are at the subject, to what extent they have the knowledge, skills and understanding that lie at its heart, whether they can use it effectively and whether it captures their interest. Your findings need to be explained with reference to contributory factors, including the quality of teaching, access to information technology outside the school as well as in it, and curricular opportunities which stimulate interesting applications.

WHAT YOU NEED TO DO

These are the main questions which your inspection should answer.

- How high are the attainments in information technology, and are they high enough?
- How well are pupils progressing?
- How well is information technology taught?
- What other factors affect pupils' standards in information technology?

Before you begin your inspection in the school

- Revise your knowledge of the *Handbook* and associated guidance.
- Where necessary, make sure you are familiar with the particular course objectives and examination syllabuses used in the school.

You should already have a good knowledge of the National Curriculum Programmes of Study for information technology and the level descriptions.

- Analyse performance data, to form a view of the standards achieved in recent years and any trends, and to establish hypotheses about strengths and weaknesses in information technology.
- Study any documentation which has been made available, and evaluate its potential contribution to the quality of teaching and its coverage of curricular requirements.

When you are in the school

- Use the first-hand evidence from observation of lessons, looking at pupils' work and talking with them to assess pupils' level of capability, what they do well and where they could do better. Focus on the current pupils in the year groups in which they become 14, 16 and 18 or when they are scheduled to complete a major module of work - for example, a short GCSE course. Refer to the records of teachers' assessments of pupils' work. Assess what progress pupils are making through the school - how fast it is, on how wide a front and in what depth.

See the later section on attainment and progress.

- Observe teaching, talk to teachers about their work, look at their plans and records, and judge how effective the teaching is - how it contributes to pupils' attitudes to learning, progress and standards. See which approaches work well and which are unsuccessful.

See the later section on teaching.

- Take stock of the way any other factors affect how well information technology is taught and the standards achieved. Assess, in particular, how effectively the subject is led, managed and resourced, and note the contribution which ancillary support, if any, makes to the quality of teaching and pupils' achievements.

See the later section on other aspects of provision and management.

- Make sure that your observation forms contain enough evidence to support your judgements; telling examples are needed for your subject report.

Literacy, numeracy and information technology

- Expect to take responsibility for co-ordinating the evidence and judgements about pupils' capability in information technology, drawing evidence from across other subjects in the curriculum.
- Evaluate any contribution information technology teaching makes to developing pupils' skills in numeracy and literacy.
- Be alert to situations where weaknesses in numeracy and literacy impede progress in information technology or render the object of applying information technology nugatory - for example, in retrieving information which is ill understood.
- Record your evidence and evaluations on numeracy and literacy in the 'Other significant evidence' section of the observation form.

Feeding back your inspection findings

- Feed back your findings clearly and helpfully to the member of the senior management team responsible for the school's strategy for information technology, to the head of information technology and to the individual teachers by:
 - identifying the most important strengths and weaknesses in the teaching and, if appropriate, the application of information and communications technology in subjects, and by supporting your assessments with illustrations from the lessons and other work you have seen;
 - giving convincing reasons for what you judge to be successful or otherwise, making clear how the total provision, including teaching, affects what is achieved;
 - showing the senior management team and the head of department how other factors, particularly leadership and management, affect the quality of provision and the standards achieved;

- ensuring that there is opportunity to discuss the findings and that points for satisfaction and for development are identified.

Writing the subject section

- Make sure that the information technology section of the report tells a coherent and convincing story. It should explain why the standards achieved are as they are. In particular, report on the effectiveness of the teaching and the management of information and communications technology in the curriculum. The following questions will help you to check the quality of your reporting.
 - Are examination results interpreted so as to give a clear view of the standards attained, to show how they compare with other subjects in the school, and to identify any trends over time?
 - Are there clear judgements of what is currently achieved by the pupils in the year groups in which they become 14, 16 and 18 or when they near completion of courses in information technology - for example, half a GCSE or a vocational certificate? Are there strong and weak features identified in the different aspects of the subject?
 - Is evidence drawn from other subjects to present the picture of what pupils achieve in information technology and how they use their skills?
 - Is there a convincing explanation of any significant differences in standards between what is seen and what the results indicate?
 - Are variations in the progress of different groups of pupils or in different years evaluated and explained?
 - Does the evaluation of teaching spell out how it affects pupils' response and what they achieve? Is it clear whether teachers' expectations are appropriate, and which teaching methods are successful and which are not? Is there an explanation of any other factors - such as the curriculum offered for information technology, the resources available, or the leadership and management - which are significant in affecting standards?
 - Is it clear how far standards and teaching have improved since the last inspection and are reasons given?
 - Are the main judgements supported by the most telling examples?
 - Is it clear what needs to be done to raise standards in information technology?

ATTAINMENT AND PROGRESS

Your judgements on attainment will be based on **performance data** and direct **observations** in the school. Any differences between these judgements **must be explained convincingly**.

Interpreting data

- For pupils aged 16, compare the school's GCSE results with:
 - the results achieved in all schools nationally;
 - the results for schools of 'similar type' (comprehensive, selective or modern);
 - the results achieved in other subjects in the school.

All pupils are required to study information technology to age 16. This might be through:

- *a full GCSE course in information technology or information systems;*
- *a combined GCSE course which pairs information technology with another subject, as a 'half subject';*
- *a vocational course in information technology leading to a qualification - for example, GNVQ;*
- *an information technology component within another vocational course.*

Some pupils may not take a course leading to a qualification in information technology.

- Take account of the entry policy for the year groups for which data are available and establish its likely impact on the pupils taking the subject and their results.

Be alert to the proportion of the year group which is not entered for GCSE in information technology or fails to achieve a grade in it.

- For students post-16, analyse the results in A-level and AS examinations, particularly by comparing results in information technology with those in other subjects in the school.

Some students will follow a programme of work as part of GNVQ courses at Foundation and Intermediate levels.

Using evidence from observations

- Ensure that evidence about capability in information technology is drawn from subjects across the curriculum and from extra-curricular activities - for example, a computer club.

*Sometimes subjects - for example, mathematics - may contribute new knowledge, skills and understanding in information technology. More often, pupils will use information technology as a resource to enhance their learning in other subjects. In these cases, it may be entirely appropriate for pupils to be working below their level of competence in information technology. Whatever the level of the work, such observations from other subjects and extra-curricular activities provide evidence of **capability in information technology**.*

- Judge the attainment of pupils by 14 and 16 years **in relation to all aspects of the National Curriculum Programme of Study and level descriptions**, even if pupils study courses which are focused on wider, or more limited, objectives in information technology - for example, key skills in GNVQ.

The main aspects of information technology are: communicating and handling information, controlling, measuring and modelling, understanding the impact of information technology on methods of working and on social economic, ethical and moral issues.

Significant weakness in any aspect of information technology compared with others means that standards overall are not high enough.

- For pupils aged 14, use teacher assessments alongside your observations as an indicator of attainment and a means of comparing, for example, the achievements of boys and girls.
- For pupils following GCSE, A-level, AS and GNVQ courses to 16 and 18, judge their attainment in relation to the syllabuses and course objectives.
- **Observe pupils using information technology, and listen** to their discussions.

This will provide insights into how well pupils have acquired operational competencies:

- *fluency in basic operations, such as using a keyboard and mouse and printing;*
- *correct use of information technology features and techniques, such as formatting and editing text, backing-up material, entering spreadsheet formulae, and setting up data loggers;*
- *ability and confidence to explore unfamiliar software or databases;*

and whether they are discerning in the use of information technology, interpret output sensibly, and recognise whether outcomes are reasonable or call for further refinement or investigation.

- **Look at samples of pupils' earlier work.**

This will indicate the range of applications used by pupils, the quality of work and the way it developed. Samples of work may, though, give an unduly positive view of pupils' attainment because they are likely to be 'polished', and may reflect the contributions of peers, parents and teachers, with little significant modification by pupils.

- **Talk with individuals or small groups of pupils** about their current and past work or about the displayed materials, and establish who the information technology 'experts' are in any group, to whom other pupils may turn for support.

It is helpful to do this with information technology resources to hand, because pupils can then refer to specific pieces of work or demonstrate the points they want to make. Ask pupils to show you some of their work to explain how tasks were carried out, how they evaluated successive versions of the work, and the results they obtained.

Some useful prompt questions as pupils are working with information technology might be: "How do you use this ...?" "If you don't know how to use this, can you teach yourself to with the HELP facilities?" "Could you use any other facility to help this task?" "What difference would it make?" "Who decided to use information technology for this ... , and why?" "How would a commercial firm use this application?" "Is this work all your own effort?" "Was it done in school or at home?" The responses will also help you to assess the balance between pupils' and teachers' input, as well as the pupils' skill and understanding. Some tasks which 'expert' pupils may undertake in support of their peers - for example, in the library - can yield evidence of higher level attainments.

- As you **watch pupils** using information technology, **look at their work** and **talk with them**, draw out evidence of the extent to which pupils:
 - communicate, retrieve and analyse information efficiently and reliably;

- investigate patterns and relationships;
- create, explore and develop attractive and effective designs using various forms of information technology and other media;
- solve problems by building models, constructing procedures and appropriate measurement and control;
- know about, and discuss, real-world applications of information technology and understand the implications for working life and society;
- have the necessary literacy and numeracy skills to make sense of information displayed or produced in the course of their application of information technology.

These attributes will help you to shape your analysis of strengths and weaknesses in the subject as well as the overall judgement about attainment. Remember that in your reporting you need to go further than just citing the attributes; you should spell out the most telling evidence which exemplifies them.

PUPILS' ATTITUDES TO LEARNING

- Look out for characteristics that pupils might show such as the following:
 - interest, enthusiasm and curiosity which drives pupils to explore the potential of information technology both in and out of school;
 - willingness to investigate the features and capabilities of systems or software, to solve problems and learn from their mistakes;
 - effective collaboration with others in using equipment and software and solving problems;
 - readiness and confidence to use information technology, such as plotting a graph or analysing questionnaire responses - for example, in other subjects;
 - care, concentration and attention to detail - for example, when manipulating text and graphics in a desktop publishing project;
 - responsibility in the safe handling of equipment, software and information.

TEACHING

- Judge the quality of teaching by weighing its strengths and weaknesses according to the criteria in the *Framework*, and assess its **impact on educational standards**, but be open to other features which make lessons particularly effective or ineffective.

Teaching cannot be satisfactory where pupils, or a significant minority of them, learn less than you would expect considering what they already knew. The same is true where they do not firmly consolidate their learning.

- Inform your views by reference to the characteristics of effective teaching in information technology, in which teachers:
 - demonstrate confident knowledge and practical competence in information technology and provide a good model of practice, whilst giving pupils sufficient opportunity to demonstrate their competence (*subject knowledge, methodology, planning*);
 - explain concepts clearly and provide straightforward, effective demonstrations of applications, to enable pupils to understand and apply them confidently and correct mistakes (*subject knowledge, methodology, planning*);
 - provide challenging tasks and problems which build and draw on pupils' knowledge and conceptual understanding of information technology (*subject knowledge, planning expectations*);
 - build on the attainment in information technology which pupils have developed inside and outside school (*assessment, planning*);
 - carefully judge when to intervene to help pupils solve problems, to avoid frustration and to advance their learning, but giving pupils sufficient opportunity to find their own solutions and approaches to problems (*methodology, assessment, expectations*);
 - expect pupils to work to high standards in an information technology task - for example, in communicating through text, graphics or sound, or in handling information, modelling or controlling (*subject knowledge, expectations, homework*);
 - expect pupils to use terminology correctly and fluently, and to give reasoned explanations for choosing particular applications or approaches in specific circumstances (*subject knowledge, expectations, match, homework*);
 - encourage pupils to be aware of information technology in everyday life and to ensure that their views are well informed, reasoned and expressed (*subject knowledge, expectations, homework*);
 - give careful, informed and judicious attention to issues of health and safety when using information technology, to data accuracy, security and privacy, and to ethical issues involved in handling electronic information (*subject knowledge, methodology, organisation, expectations*).

- Take care when evaluating teaching which has only superficially positive features; for example, teaching which:
 - includes practical activity but does not significantly advance pupils' skills, knowledge or understanding; an example might be retrieval of raw facts from a CD-ROM or Internet source, without clarity about the purpose of the work and how to select appropriately;
 - pitches work or explanations at the wrong level - for example, by dealing with computerised systems in commerce when pupils have no experience and little understanding how stock control or invoicing operates in a large organisation;
 - records assessments of pupils' work but as tick lists of activities undertaken rather than evaluations of quality;
 - sets pupils work in groups on worthwhile practical activities, but the teacher does not adequately monitor individual progress, with the result that pupils can become reliant on their peer with control of the keyboard or equipment;
 - offers pupils (mainly from 14 to 16 and in the sixth form) coursework tasks which appear to be challenging, but it turns out that the majority of the pupils are following the same routines with similar topics and data or working with very similar templates.

OTHER ASPECTS OF PROVISION OR MANAGEMENT

Curriculum and assessment

The development of capability in information technology depends on contributions from subjects across the curriculum. Schools adopt different models for teaching information technology and developing capability in its use.

- Evaluate whether there is a clear and effective strategy for developing the full range of capability in information technology.

Matters which have a bearing on this include the extent to which: subject schemes of work go beyond just mentioning information technology as a resource for learning and spell out firm intentions for teaching capability in information technology; provision matches intentions; information technology contributions across the curriculum are 'audited' and co-ordinated, so that there is a coherent programme of information technology work; timetable arrangements facilitate the use of information technology.

Many pupils will develop an expertise in the use of computers at home.

- Evaluate how the school tracks pupils' experience of information technology outside school and seeks to build on this, but at the same time ensures equality of access and opportunity for all pupils.

Be alert to situations where pupils with the expertise from home dominate group or other activities in class. You should ensure that the school is giving all pupils the support they need and that none is 'left out'.

Partnership with parents and the community

- Evaluate contributions to the standards achieved - for example, through:
 - opportunities for pupils to observe the use of information technology in contexts external to the school;
 - links with business and commerce allowing in-depth study of the application of information technology to enhance individual project work for pupils following information technology courses to 16 and 18 years;
 - harnessing outside expertise in the school's information technology provision.

Staffing, accommodation and resources

Provision of facilities for information technology is a major investment for a school.

- Within the 'evaluate and report' requirements in the *Framework*, pay attention to the impact of matters such as:
 - the accessibility of computers, peripherals and items of licensed software;
 - technical support, maintenance and updating;
 - the compatibility and coherence of computer systems, and the quality of any internal and external networking.

OBSERVATION FORMS

There follow two sample observation forms for information technology. These are intended to show how evidence and judgements contribute to a coherent picture of attainment in these lessons. In one lesson, the teaching is judged to be 'very good' (grade 2) and in the other it is considered 'satisfactory' (grade 4).

INFORMATION TECHNOLOGY YEAR 8 MIXED ABILITY - Very good teaching**CONTEXT:**

Previous lessons have introduced ps to Smartbox and Smart software to build simple procedures. Lesson focuses on building further, more complex procedures to simulate set of traffic lights. PoS 1a, 1b, 1d, 1e, 2b and 3a. Control strand.

TEACHING:

A difficult group very well managed by the CT eg some unruly behaviour at start of lesson handled extremely well to allow lesson to proceed. Good planning ensures clear objectives which are shared fully with ps resulting in increased motivation. Effective methodology evident in good support for paired work: CT ensures timely intervention with each group to maintain interest and momentum. High expectations with level of challenge well adapted to all pairs through v good use of qs - eg to make higher attainers think about modularity and lower attainers to predict outcomes. Good knowledge of software and the foibles of these old machines. Good use of time - eg groups set deadlines which are met. Effective use of dated computers. Grade 2

RESPONSE:

Ps v keen on using the computer and well motivated by the work. They concentrate well when doing the task. Behaviour is generally good after initial disturbance and is fully maintained by the CT. Two ps show initiative when building procedures - eg in allowing one to call another. Grade 3

ATTAINMENT:

All ps able to give sequence of direct instructions through Smart software to control the lights (L3). About two-thirds develop a set of commands which perform a specified traffic light sequence and can modify these to change timing (L4). Two pairs are beginning to appreciate the need to form procedures (L5), and one pair can call one procedure from another (L6). Grade 5

PROGRESS:

Prior attainment for most ps in the control strand was below expectations, so all make good gains. Lowest attainers developed the ability to make all the necessary electrical connections, to load software and to give single instructions leading to specified outcomes. Others were developing the sophistication of their sequences well. Grade 3

INFORMATION TECHNOLOGY YEAR 10 MIXED ABILITY - Satisfactory teaching**CONTEXT:**

Ps' first use of Access database following use of simpler database in KS3. Following initial recap and intro to new application, ps worked in pairs to design a record for addresses of friends and a form for data input.

TEACHING:

- + T built on pupils' knowledge of a simpler database which they had used in year 9 and began appropriately with a recap of associated terminology.
 - + Task well matched for the middle attainers - about two thirds of the group.
 - + Pairing of pupils ensured good peer support for the lower attainers.
 - + T showed good knowledge of database structure and of the Access software in her clear explanations.
 - + Time for pupils to use computers was maximised.
 - Little differentiation. The tightly structured task did not allow the higher attainers any scope in determining their own fields and field lengths, although the form design allowed more scope for all pupils.
 - Lesson left hanging somewhat - no attempt to summarise at the end.
- Grade 4

RESPONSE:

All worked conscientiously throughout. Showed real enthusiasm and collaborated well in pairs. Grade 3

ATTAINMENT:

All understood need for consistent structure and most were aware of different uses to which database could be put. Familiar with Windows interface and most could sort out problems as they occurred. All knew terms such as field, table, form. All could set up a form without using Wizard, but three pairs needed help with this. Most at L5 with potential to reach L6; a few still at L4. Grade 5

PROGRESS:

Ps had not used a database for about six months and so made rapid initial progress. They quickly grasped the idea of a form. Although much time spent setting up the database to pre-determined parameters, all made adequate progress in designing a form and understanding its value. A few experimented confidently with aspects of the design. Grade 4

ABOUT THIS BOOKLET

This is one of a set of booklets which make up *Inspecting subjects and aspects 11-18*. The set consists of:

- an introductory booklet, *General guidance*, which is for all inspectors who evaluate the work of secondary age pupils - it is mainly about inspecting subjects;
- separate booklets on inspecting specific subjects and aspects; the contents page of *General guidance* shows the subjects and aspects which have booklets.

The main points in the *General guidance* are summarised in each subject, but if you are inspecting the work of secondary age pupils you should read the introductory booklet so that you are fully in the picture of what you have to do.

The contents of all the booklets are on the Internet and can be accessed from OFSTED's website [<http://www.ofsted.gov.uk>]. This will allow you to obtain guidance for individual subjects or aspects.

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