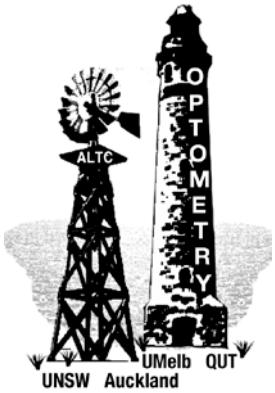

A COMPENDIUM OF LOW VISION LEARNING ACTIVITIES FROM AROUND THE WORLD

Edited by Barbara Junghans and Helen Dalton

An outcome of the Australian Learning and Teaching Council project

Delivering optometric graduates ready for practice beyond the cities and ready to service an ageing population

conducted by Associate Professor Barbara Junghans (The University of New South Wales), Ms Anthea Cochrane (The University of Melbourne), Associate Professor Peter Hendicott (Queensland University of Technology) and Associate Professor Rob Jacobs (The University of Auckland).

funded by

AUSTRALIAN LEARNING & TEACHING COUNCIL
Promoting excellence in higher education

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A note from the Editors

This *Compendium of Low Vision Learning Activities from Around the World* is the culmination of a low vision course benchmarking process that involved 19 colleges or schools of optometry across Australasia, North America and the United Kingdom. As a thank you for taking the time to help with the benchmarking process, participating educators were asked to contribute one favourite or popular learning activity for inclusion in the *Compendium* and thus provide a useful resource for each other. Fourteen educators submitted activities that they knew from experience would have significant impact on the student. These activities have been arranged in a continuum, from those requiring no previous knowledge to those demanding full understanding of many aspects of caring for the low vision patient.

We sincerely hope you enjoy seeing the activities other educators have created and that you can glean new ideas. In particular, we hope you are able to see how reflecting on and referring to the *Guidelines on Learning that Inform Teaching* (see Reference 1 below) can help you tweak your designed activities so that they become powerful learning experiences that will have a lasting impact on the student.

We have attempted to preserve 'the voice' of each contributor. However, it is obvious that by selecting only one activity from a series of many embedded within a course, some of the context and the sense of place in the assessment scheme may have been lost. This has made it difficult, if not impossible, to do justice to some submissions when it has come to evaluating the impact of the activity with regards to specific *Guidelines on Learning that Inform Teaching*. For example, for all of the labs it is assumed that a facilitator is nearby to offer support and feedback. However, Guideline #16 was ticked against an activity only if there was specific mention of feedback in the construction and conduct of the activity. The evaluations we have made are merely starting points.

A template is provided (see Appendix 1) to assist teaching staff when constructing learning activities. The completed template can be used to guide tutors and sessional staff towards assuring that the learning objectives of activities are understood and facilitated, and by students to guide their learning.

If you have found the *Compendium* useful for your courses in any way, we would love to hear from you (b.junghans@unsw.edu.au).

Barbara Junghans and Helen Dalton
The University of New South Wales
January 2011

References used to interpret the attributes of each activity

1. *Guidelines on Learning that Inform Teaching.* For an overview see Appendix 2.
   http://www.guidelinesonlearning.com/about-the-guidelines

   The *Guidelines on Learning that Inform Teaching* were developed by Emeritus Professor Adrian Lee (former PVC (Education & Quality Improvement), UNSW; Associate Professor Michele Scoufis (former Director, Learning and Teaching Unit, UNSW); and the Academic Board of UNSW in 2003. These Guidelines align with key concepts that commonly underpin principles of learning. It is not expected that every guideline will be relevant to and applicable in all learning and teaching practices.

2. *Optometrists Association Australia Universal (entry-level) and Therapeutic Competency Standards for Optometry 2008.* Kiely, P.M. Clin Exp Optom. 2009; 92(4): 362-386. (see Appendix 3 for excerpts, available in full at the Optometry Council of Australia and New Zealand web site www.ocanz.org/component/docman/doc_download/12-candidate-guide-appendix-a)

Acknowledgements

Helen Dalton, Learning & Teaching, University of New South Wales, Sydney, Australia
The usefulness and layout of the *Compendium* is ultimately due to Helen's input. Helen reviewed the activities and helped shape the appearance of the *Compendium*, classified the activities pedagogically, added further annotation to the various educators' personal comments on the value of the activities in order to make the entire package appear more cohesive, and importantly, aligned with the *Guidelines on Learning that Inform Teaching* where relevant.

The contributors

Many thanks to those who contributed to this *Compendium*. Several email reminders were sent out early in the piece, and again after further requests for additional information. The low vision educators below came through with exemplars to make this *Compendium* an educationally worthwhile and interesting tool.

Australasia	Mei Boon, The University of New South Wales
	Andrew Carkeet, Queensland University of Technology
	Anthea Cochrane, The University of Melbourne
	Robert Jacobs, The University of Auckland
	Jan Lovie-Kitchin, LV Consultant, Brisbane
UK	Hannah Bartlett, Aston University
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	Elli Kohllbaum, Indiana School of Optometry
	Tracy Matchinski, Illinois College of Optometry

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Contents

Low Vision educators participating in a world-wide curriculum benchmarking process for use by Australasian schools of optometry have each contributed one activity they know has an impact on student learning. Their activities have been collated as a Compendium *as follows, for use by all low vision educators.*

Appendices

Low Vision Learning Activities

Learning activity	Low Vision Posters
Why chosen	Provides an opportunity for Year 3 students to produce a piece of work that is assessed at the individual and team performance level on topics that have not been extensively previously covered (e.g. 'phones for the visually impaired'). By this time students have seen several patients in the clinic and completed all their lectures. Students are expected to work with people they have not worked with before. Students are given the opportunity to carry out a literature search in the area of visual impairment and summarise the outcomes. Students present their work to their peers in the form of a poster.
Learning objectives	To extend knowledge gained from lectures through further independent learning. To be able to present knowledge to others in the field using an interesting visual format. To be able to work as part of a team.
Prior knowledge	All knowledge gained about caring for the visually impaired learnt throughout all learning activities thus far.
Principles addressed	The value of independent learning. Information literacy regarding accessing information relevant to the visually impaired.
Graduate attributes and capabilities developed	Ability to access information independently. Ability to work in a team. Ability to present written information in a visually appealing format. Addresses Optometrists Association Australia Universal (entry Level) Competency Standards for Optometry 2008: 1.1.1; 1.5.2.
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. 2. Effective learning is supported by a climate of inquiry where students feel appropriately challenged and activities are linked to research and scholarship. 3. Activities that are interesting and challenging, but which also create opportunities for students to have fun, can enhance the learning experience. 4. Structured occasions for reflection allow students to explore their experiences, challenge current beliefs, and develop new practices and understandings. *Contextualising students' learning experiences* 5. Learning is more effective when students' prior experience and knowledge are recognised and built on. 6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to

	the workplace or wider community. 7. If dialogue is encouraged between students and teachers and among students (in and out of class), thus creating a community of learners, student motivation and engagement can be increased. *Creating an inclusive learning and teaching experience* 9. Students learn in different ways and their learning can be better supported by the use of multiple teaching methods and modes of instruction (visual, auditory, kinaesthetic, and read/write). *Designing an engaging, contextualised and inclusive curriculum* 11. When students are encouraged to take responsibility for their own learning, they are more likely to develop higher-order thinking skills such as analysis, synthesis and evaluation and be better prepared for life long learning. 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context. *Teaching and engaging, contextualised and inclusive curriculum* 13. Learning can be enhanced and independent learning skills developed through appropriate use of information and communication technologies. 14. Learning cooperatively with peers – rather than in an individualistic or competitive way – may help students develop interpersonal, professional and cognitive skills to a higher level. 15. Effective learning is facilitated by assessment practices and other student learning activities that are designed to support the achievement of desired learning outcomes.

Posters

Working in groups of 6-7, students conduct a literature review of one aspect of low vision that has not been covered in lectures and create a poster to share with the whole class, e.g. 'phones for the visually impaired'.

Assessment is undertaken at both the individual and group level.

Submitted by	Ahalya Subramanian, City University London, UK Ahalya.Subramanian.1@city.ac.uk

Learning activity	Enlargement and Low Vision Aids
Why chosen	This is an experiential learning activity designed to get students feeling comfortable handling low vision instruments despite not yet knowing any theory. I find the students really exercise their creativity trying to work out how each of the instruments works. This activity is an exemplar of how a patient with low vision would experience being introduced to a low vision aid.
Learning objectives	To become familiar with optical low vision aids. To become familiar with CCTV, electronic aids, computer enhancements. To practice calculating enlargement requirements. To adopt a reflective practice during practical classes.
Prior knowledge	This practical assumes no previous formal lectures or instruction on the different kinds of low vision aids or how they are used.
Principles that are addressed	Appreciating the relationship between calculated and visualised enlargement, learning the types of low vision optical and electronic aids. That there is capacity for valuable independent learning to support didactic instruction.
Graduate attributes and capabilities developed	Ability to think critically and analytically to creatively solve problems. Ability to reflect on learning. Appreciation and respect of diversity in our community. Ability to work collaboratively and in a multidisciplinary environment. Addresses Optometrists Association Australia Universal (entry Level) Competency Standards for Optometry 2008: 1.1.1; 1.3.3; 5.4.1.
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. 2. Effective learning is supported by a climate of inquiry where students feel appropriately challenged and activities are linked to research and scholarship. *Contextualising students' learning experiences* 6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to the workplace or wider community. 7. If dialogue is encouraged between students and teachers and among students (in and out of class), thus creating a community of learners, student motivation and engagement can be increased. *Creating an inclusive learning and teaching experience* 9. Students learn in different ways and their learning can be

	better supported by the use of multiple teaching methods and modes of instruction (visual, auditory, kinaesthetic, and read/write). *Designing an engaging, contextualised and inclusive curriculum* 10. Clearly articulated expectations, goals, learning outcomes and course requirements increase student motivation and improve learning. 11. When students are encouraged to take responsibility for their own learning, they are more likely to develop higher-order thinking skills such as analysis, synthesis and evaluation and be better prepared for life long learning. 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context.
Enlargement and Low Vision Aids	
Submitted by	Mei Boon, The University of New South Wales, Australia m.boon@unsw.edu.au

Student Name:_____

Student id:_____

Low Vision Practical 2

This practical has **3** aims.

1. To practice calculating enlargement requirements.
2. To become familiar with optical low vision aids (high add lenses, monocular and binocular telescopes, stand magnifiers, hand-held magnifiers, prisms)
3. To become familiar with CCTV, electronic aids, computer enhancements

This practical assumes that you have not had any formal lectures or instruction on the different kinds of low vision aids or how they are used. In this practical, you are encouraged to pick up each optical aid and familiarise yourself with the aid in terms of weight, how it feels in your hand, what you can see through the eye pieces. If you are not sure how to use any instrument, ask one of your instructors. This is an interactive practical. You should link what you have seen, felt and heard today with what you will later learn in your lectures and readings.

To get the most out of the practical, you should try each of the optical aids and for each aid,

(a) Identify and record its type and markings

(b) Give examples of its potential uses

(c) Note whether it can be used for more than one working distance

(d) Describe how to use it in language you remember.

Sometimes, you will be asked to do an additional task to highlight a particular feature of how to use the aid. Do these additional tasks as well.

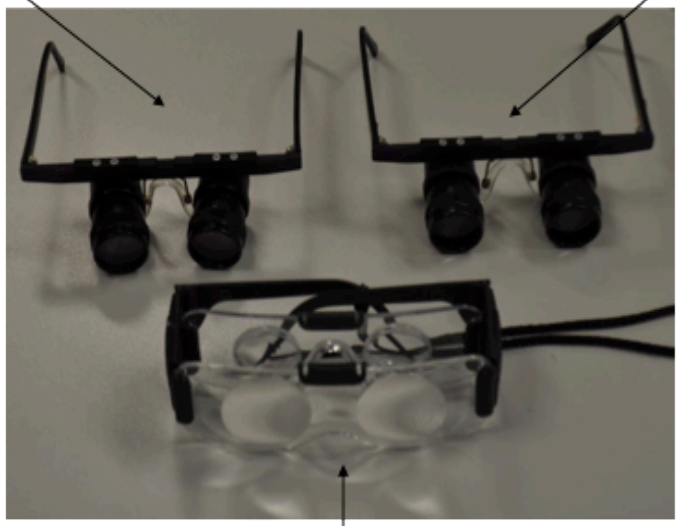
1. Here are 3 **binocular spectacle-mounted telescopes**. How do they differ?

[A]

View N10 print with and without the telescope. How much larger does the print appear through the telescope? What is the enlargement ratio?

[B].

View 6/9 print with and without the telescope. How much larger does the print appear through the telescope? What is the enlargement ratio?

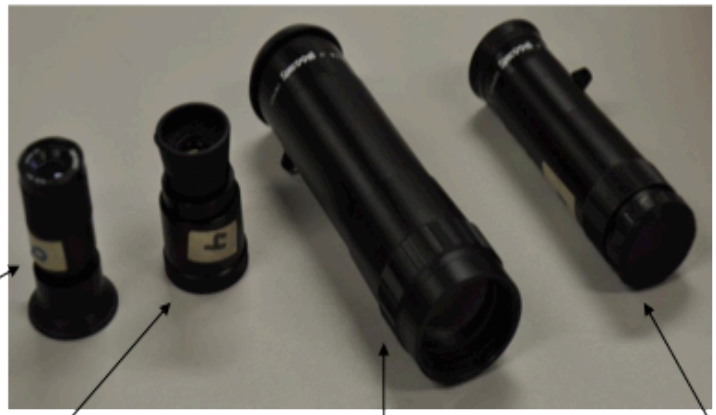


[C]

2

2. These are **hand-held telescopes**.

Focus at intermediate and far distances? How easy is it to switch between the distances?



[A] [B] [C] [D]

View 6/9 print with one short and one long telescope.

What are their enlargement ratios? _____
How do they differ?

_____

What generalisation can you make about telescope length and enlargement ratio?_____

_____

3

Try spotting (localisation and focussing), tracing around an object, tracking a moving object, scanning.

2. How do you use this telescope?

3. This is a _____

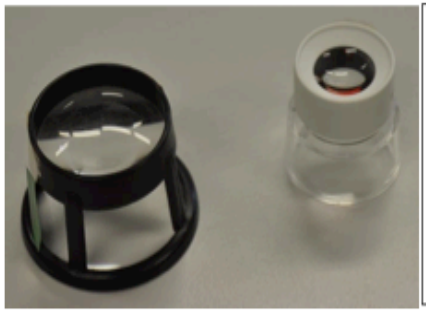
-design telescope. Why is it shaped this way?

What is the enlargement ratio?
How does the view differ from a Galilean telescope design?

4. I don't think this is a telescope. What is it?
How do you use it?

4

5.



Measure emerging vergence from the stand magnifier. Image a fluorescent tube on paper. Add plus lenses until clear. This is equivalent magnitude but opposite power to emergent vergence.

[A] Left optical aid

Can you see the print clearly? If not, does lifting the stand magnifier result in clear vision? Then you need to increase the reading addition. If vision is worse, then the reading addition is already too strong.

[B] Right optical aid

6

Compare enlargement if you hold the hand magnifier from your eye at a distance equivalent, > & < the focal power of the lens. What should you tell your patient about how to use this?

[A] Left optical aid

[B] Right optical aid

7.

[A] Top optical aid

[B] Lower optical aid

8.

[A] Top optical aid

[B] Lower optical aid

Why is one of the spectacles prescribed monocularly and the other binocularly?

9. Electronic Vision Enhancement Systems

Speak with the representatives from HumanWare called_____ and _____ . Try out each of the systems.

Time how long it takes you to read the same paragraph personally using the autoreader, the CCTV and the handheld spot reader. Which do you find easiest to use and why?

10. LV aids for peripheral vision loss

[A] Using Prisms

Use the hemianopia simulator. Shift information from the non-seeing area towards the primary visual direction using the prism. How far out can you see now?

[B] Using telescopes.

Use the reverse end together with the RP simulator. How far out can you see now?

11. Magnification Calculation

Log Scale

M/cm/D	Snellen	logMAR
50	20/2500	2.1
40	20/2000	2.0
32	20/1600	1.9
25	20/1250	1.8
20	20/1000	1.7
16	20/800	1.6
13	20/630	1.5
10	20/500	1.4
8	20/400	1.3
6	20/320	1.2
5	20/250	1.1
4	20/200	1.0
3.2	20/160	0.9
2.5	20/125	0.8
2	20/100	0.7
1.6	20/80	0.6
1.3	20/63	0.5
1.0	20/50	0.4
0.8	20/40	0.3
0.6	20/32	0.2
0.5	20/25	0.1
0.4	20/20	0.0

Problems: A person can read 2M print from 25 cm with a +4.00 DS addition lens. He has a goal size of 1.0M print.

What enlargement ratio is required?

_____

Can you calculate the reading distance that would allow this magnification? _____

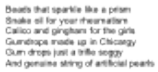
Can you calculate the dioptric power of the lens which would allow clear viewing at that distance?

The concept of reading reserve:

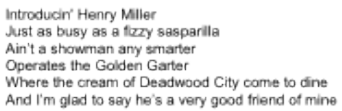
Time yourself reading the following passage from a distance of 40 cm. _____

0.4M

0.6M



1.0M



Learning activity	Simulations, patient panels and a video story
Why chosen	These various activities have been found to successfully engage students in experiencing visual impairment through: using refraction software, an essay about experiences whilst wearing simulator goggles, meeting a panel of patients always proves pivotal, and the power of viewing a video on albinism.
Learning objectives	To gain practice using a bracketing technique to refract the visually impaired patient. To experience what it is like to be visually impaired and come to personally understand the functional limitations and adaptations required. To learn directly from those who are vision impaired how their lives have been altered (or not).
Prior knowledge	How to refract, how to measure visual acuity and visual fields.
Principles that are addressed	Refracting a visually impaired patient requires interpolation. Being visually impaired can have fewer restrictions than most people might imagine.
Graduate attributes and capabilities developed	An ability to adapt the fundamental eye examination techniques to suit the more challenging and difficult cases. Empathy for those with visual impairment. Addresses Optometrists Association Australia Universal (entry Level) Competency Standards for Optometry 2008: 1.3.3; 3.5.1; 5.1.2.
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. 3. Activities that are interesting and challenging, but which also create opportunities for students to have fun, can enhance the learning experience. 4. Structured occasions for reflection allow students to explore their experiences, challenge current beliefs, and develop new practices and understandings. *Contextualising students' learning experiences* 5. Learning is more effective when students' prior experience and knowledge are recognised and built on. 6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to the workplace or wider community. *Creating an inclusive learning and teaching experience* 9. Students learn in different ways and their learning can be better supported by the use of multiple teaching methods and modes of instruction (visual, auditory, kinaesthetic, and read/write). *Designing an engaging, contextualised and inclusive curriculum* 11. When students are encouraged to take responsibility for their own learning, they are more likely to develop higher-order thinking skills

	such as analysis, synthesis and evaluation and be better prepared for life long learning. 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context. *Teaching and engaging, contextualised and inclusive curriculum* 13. Learning can be enhanced and independent learning skills developed through appropriate use of information and communication technologies.

Favourite Low Vision Activities

Computer-based refraction:

Students in 4th year do a low vision patient simulation refraction software exercise in one of the early laboratories in the low vision course. It is an Excel-based refractive program, focuses on bracketing techniques, near point bracketing.

Simulator goggles

First week of class students are given a pair of simulator goggles that they keep for a week or two. They have to write a paper responding to certain questions and write about their visual experiences through experiencing a range of activities in the home and community: what was surprising; what was easier than they expected; what was harder; what were their adaptations. Then, they have to go online and investigate a particular problem that they weren't able to resolve on their own. They also wear those goggles when they learn acuity, contrast acuity and visual fields. They measure themselves so that when they're having the experience they know what the visual data is that correlates with it.

Panel of patients

For example, introduce the visually impaired kid who blows them away with what he can do on his computer.

Blindfolded experiences

Blindfold students and introduce them to the long cane travel technique.

Videos

Show a video about albinism.

Submitted by	Roanne Flom, Ohio State University, USA RFlom@optometry.osu.edu

Learning activity	Functional Consequences Of Low Vision
Why chosen	Students learn best by doing, rather than just hearing or reading about a topic. This activity is an exemplar of experiencing how a patient's low vision impacts daily living activities.
Learning objectives	To gain insight into the functional consequences of low vision. To be able to measure visual function for the visually impaired.
Prior knowledge	How to measure high and low contrast visual acuity, threshold print size and print size giving fluency, contrast sensitivity, central visual fields.
Principles that are addressed	Measurement of important visual functions for persons with vision impairment: high and low contrast acuity, readable print, contrast sensitivity, central fields.
Graduate attributes and capabilities developed	An understanding of the lack of concordance between clinical measures of vision and patient's reported level of difficulty with everyday tasks. Empathy for and an understanding of the impact of visual impairment on daily living. Ability to work in a team. Addresses Optometrists Association Australia Universal (entry Level) Competency Standards for Optometry 2008: 1.1.1; 1.3.3; 3.1.1; 3.2.1.
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. 3. Activities that are interesting and challenging, but which also create opportunities for students to have fun, can enhance the learning experience. 4. Structured occasions for reflection allow students to explore their experiences, challenge current beliefs, and develop new practices and understandings. *Contextualising students' learning experiences* 5. Learning is more effective when students' prior experience and knowledge are recognised and built on. 6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to the workplace or wider community. 7. If dialogue is encouraged between students and teachers and among students (in and out of class), thus creating a community of learners, student motivation and engagement can be increased. *Creating an inclusive learning and teaching experience* 8. The educational experiences of all students are enhanced when the diversity of their experiences are acknowledged, valued, and drawn on in learning and teaching approaches and activities. 9. Students learn in different ways and their learning can be better supported by the use of multiple teaching methods and modes of instruction (visual, auditory, kinaesthetic, and read/write).

	Designing an engaging, contextualised and inclusive curriculum 10. Clearly articulated expectations, goals, learning outcomes and course requirements increase student motivation and improve learning 11. When students are encouraged to take responsibility for their own learning, they are more likely to develop higher-order thinking skills such as analysis, synthesis and evaluation and be better prepared for life long learning. 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context. *Teaching and engaging, contextualised and inclusive curriculum* 14. Learning cooperatively with peers – rather than in an individualistic or competitive way – may help students develop interpersonal, professional and cognitive skills to a higher level. 15. Effective learning is facilitated by assessment practices and other student learning activities that are designed to support the achievement of desired learning outcomes.

Functional Consequences of Low Vision

Aim

To gain some insight into the functional consequences of low vision (Practical report is due in next week).

Methods

Work in your groups and perform the following exercises on each other; each student is to take a turn at being 'visually impaired'.

A. Impairment

Using the three (3) spectacles/goggles supplied to your group to simulate different forms of low vision (one simulator per pair), assess the following visual functions:

A1. High contrast distance VA

A2. Low contrast distance VA

A3. Threshold print size

A4 Print size giving fluency

A5. Pelli-Robson letter contrast sensitivity
Use the methods described on pages 3-7 & 3-8 of this manual. *NOTE: PLEASE DO NOT HANDLE THE CHART EXCEPT BY THE RING AT THE TOP.*

A6. Central visual fields
Assess monocularly (better eye only) and binocularly with the Tangent screen, using the methods described on page 3-10 of this manual.

B. Activity Limitations

You will undertake a number of 'real world' tasks with your partner as follows:

B1. Walk with your sighted guide from a consulting room, outside to the second level of B block opposite and back again.

B2. Plug an instrument into a wall plug; make a drink of cordial; find the packet of biscuits, take one - Yes, you may eat and drink in the Clinic just this once, but with only your first simulation!!

B3. Put on the supplied T-shirt correctly and use a mirror to comb your hair.

B4. Select a can of tomato soup from the goods arranged on the bench and find the correct money to pay for it.

B5. Select a low vision device which would enable the 'visually impaired' person to read the Electricity Bill.

B6. Write a short thank you letter.

Procedures

The above activities will be run as multiple stations, as follows: A1 – A4 in Room 9, A5 in Room 11, A6 in Rooms 7 & 8 and Clinical research room (B517), B1 outside, B2 in Room 13, B3 in Room 12, B4 in Room 10, B5 & B6 in VRC rooms

Please rotate through the stations in an orderly manner; up to three pairs can be conducting each of these activities at any one time.

Report

1. Tabulate the vision assessments of all group members against each LV simulation.
2. Provide a group discussion on the impairments and activity limitations you all experienced and the likely handicaps these would cause. Compare and contrast the different types of vision loss – no more than 2 A4 pages.
3. Provide one brief group discussion (less than 1 page) on the relationships between the clinical measures of the visual impairments and the activity limitations experienced.
4. Each group member is to write a brief reflection on your own experiences of simulated low vision and what it would mean to you.

Submitted by	Jan Lovie-Kitchin, LV Consultant, Brisbane, Australia j.lovie-kitchin@qut.edu.au

Learning activity	Sighted Guide/Visual Acuity Distance and Near
Why chosen	The sighted guide technique for the student doctor to use with a person with visual impairment sets the stage for future interactions with low vision patients at the eye exam or elsewhere at social gatherings. The lab covers such things as the etiquette around supporting the visually impaired person. For example, knowing not to pet the guide dog or to offer your arm rather than take the arm of the person with visual impairment. This activity is an exemplar of how to interact with people with visual impairment at various locations and how to assist them.
Learning objectives	To know when and how to use sighted guide technique. How to build trust with a patient who is visually impaired and gain an awareness of the functional limitations to be addressed during the low vision evaluation.
Prior knowledge	Able to recognise the need to offer human guide help and have the empathy to offer it.
Principles that are addressed	How to approach the person with visual impairment and negotiate the interaction of offering assistance. How to take and record distance and near visual acuities for a visually impaired person.
Graduate attributes and capabilities developed	Communication skills and empathy for the visually impaired person. Ability to negotiate the optimum means of assisting the partially sighted person in achieving mobility in a range of physical environments, and to actually carry out the desired assistance. Ability to adapt clinical skills in evaluating vision for a person who is visually impaired. Addresses Optometrists Association Australia Universal (entry Level) Competency Standards for Optometry 2008: 1.1.1; 1.3.3; 3.1.2; 3.2.1; 5.1.3.
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. 3. Activities that are interesting and challenging, but which also create opportunities for students to have fun, can enhance the learning experience. 4. Structured occasions for reflection allow students to explore their experiences, challenge current beliefs, and develop new practices and understandings. *Contextualising students' learning experiences* 6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to the workplace or wider community. *Designing an engaging, contextualised and inclusive curriculum* 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context. *Teaching and engaging, contextualised and inclusive curriculum* 14. Learning cooperatively with peers – rather than in an individualistic or competitive way – may help students develop interpersonal, professional and cognitive skills to a higher level.

Lab 1 - Sighted Guide/Visual Acuity Distance and Near

Objectives Lab 1 At the completion of this Laboratory Exercise, the student will be able to determine:

a) When and how to use the Sighted Guide technique for a person with visual impairment.

b) How to measure acuity with low vision charts for a person with decreased vision distance and near and convert metric to Snellen fractions.

First Hour

***What is Orientation & Mobility and Sighted Guide?**

The goal of O&M and Sighted Guide is to enable the client or patient to enter any environment whether it is familiar or unfamiliar, and to function safely, efficiently, gracefully, and independently.

Orientation:
Orientation is the process of using the senses to establish and maintain one's position in space in relation to other objects.

Human Guide:
The human guide uses their body movements and verbal information provided to the client who is holding onto the guide's arm just above the elbow. This type of Sighted Guide is:

- Safe, efficient;
- Gives control; and
- Socially acceptable.

Making Contact

When approaching a person who is blind, introduce yourself and ask them whether they would like your help. Do not grab or pull at them. If they indicate they would like assistance, verbally offer your arm and then brush your arm against theirs.

Grasp


GRASP

The person who is blind should grasp your arm just above your elbow with their fingers on the inside of your arm near your waist and their thumb will be on the outside. The grasp must be firm to be maintained while walking, yet not so tight as to cause discomfort. If the grip is too tight, say so. This technique allows you flexibility and freedom of motion with both of your hands, and gives the person who is blind a sense of your body motion.

Support Grasp

Some blind people are frail. Others have balance problems that make use of the standard grasp inadequate. Rather than holding your arm above the elbow, a blind person may prefer to link their arm with yours. This will decrease the space between the two of you and provide added support. To accommodate a person who is blind and their unsteadiness you likely will need to slow your walking pace.

Stance

Hold your arm relaxed and steady at your side. The person who is blind's arm is at a 90-degree angle and held close to their side. They should proceed by being one half-step behind you. The person who is blind will follow your movements. Do not steer them. If you meet a person who is blind who seems to be going "off course" while crossing a street or perhaps is out of the crosswalk you could give the a verbal instruction such as "go left" or "go right," and use *their* left or right, not yours if you are facing them.


STANCE

Taking a Seat

When guiding a person who is blind to a chair you should try to approach a chair from the front or side. Tell the person who is blind they are at the front or side of the chair and slowly bring them up to it until their knees or shins touch the seat. Say to them whether the chair has arms. Place your guiding arm's hand on the chair back and let them follow your arm down to locate it with the hand they have been

grasping your arm with. Allow people who are blind to seat themselves. Do not help them physically or move the chair or other furniture unless asked to. Say if there is a table. Unless they are frail or otherwise disabled, people who are blind are capable of getting up from a chair without help. Once they are standing, then the correct stance and grasp techniques can be used.

Narrow-Area Stance

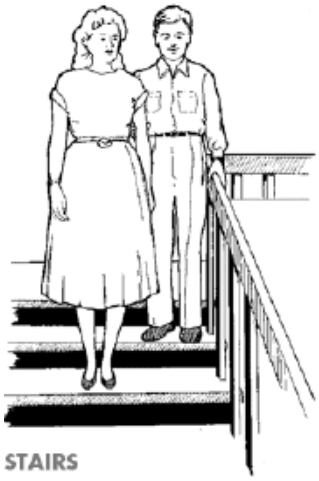
When you are approaching areas that are crowded or narrow, such as a doorway, move your forearm and hand so that they rest against the lower portion of your back, with your elbow at a 90-degree angle and your palm facing outward. The person who is blind will take this cue, slide their hand down to your wrist and move directly behind you at an arm's length, while still maintaining a firm grip. Take smaller steps and walk slower as you move through the narrow area. After walking through the narrow area, return your arm to the guide position and walk normally.

Doors

When approaching a door, assume the narrow-area stance and tell the person who is blind in which direction the door opens. This allows them to help you by holding the door with their free hand while passing through it. Do not try to turn around to hold the door open. This is awkward and diverts your attention.

Stairs

Six feet before reaching the first step, tell the person who is blind that you are approaching stairs. Approach them directly and in such a way that the person who is blind's free hand is closest to the rail. Mention whether the stairs go up or down and how many there are. Pause to allow them to locate the first step and the railing. Always remain a step ahead and proceed as you normally would. Remain to the right-hand side of stairs to avoid a collision with others. Pause at each landing to allow the blind person to stand beside you and to cue them that there are no more steps until you begin to move again. Tell the person who is blind when you have reached the top or bottom of the stairs.



Do's for the Sighted Guide

- Do ask the person who is blind: "Do you want some help?" or "Would you like to take my arm?"
- Initiate the contact.
- Touch the back of your hand to the back of their hand.
- The person who is blind holds your arm just above the elbow.
- Walk at a comfortable pace.
- Pause at stairs, curbs, or if there are changes in surface texture. Provide information.
- The person who is blind should be closest to handrail.
- In a narrow space, verbally prompt the person who is blind to get directly behind you.
- Walk very slowly, monitor position.
- As the Guide you are responsible for safety.

Don'ts for the Sighted Guide

- Don't grab the patient's arm
- Always ask "Would you like to travel with a sighted guide?" or, "Would you like to take my arm?"
- Don't wait to be asked when greeting someone with blindness, let him/her know where you are by initiating contact.

A**s the guide, remember:**

- You are 2 people wide
- Make the necessary accommodations when negotiating objects
- As you are walking, help the person anticipate what will happen next by: Slowing down or

stopping before reaching steps, curb, elevator, doorway, etc.
- Verbalizing what is happening (or about to happen)
- When showing the person who is blind to a chair, guide their hand on to the chair and verbally orient them to the chair's position
- Once you have reached the destination, make sure that the individual is orientated to their surroundings
- Leave the person next to a wall or other sturdy object for a reference point.

First Activity *Sighted Guide:*

Now it is your turn to try it. Partner with someone and complete the obstacle course.

1. Place a visual impairment simulator on your lab partner in the exam chair.
2. Leave the room guiding the partner.
3. Walk to the stairway and go to the fourth floor.
4. Walk to the elevator and return to the second floor.
5. Walk to the stairway and go to the snack room.
6. Guide your partner to the snack table.
7. Orient your partner to the food.
8. Choose a snack.
9. Have your partner pour him or herself a drink.
10. Walk to the elevator and return to the second floor.
11. Reseat your partner in the exam chair.

Swap places and repeat.

**Information for the lab was adapted from the Power Point presentation: What is Orientation & Mobility?*
Darick Wright, CLVT/COMS, Adjunct Faculty, NECO & UMass-Boston, NEEI/Perkins Vision Clinic

Second Hour

Visual Acuity

Distance Visual Acuity Assessment
1. Feinbloom Distance Acuity Flip Chart
2. ETDRS Distance Chart.

Procedures for Testing Distance Visual Acuity:
- Distance visual acuities in low vision practice are usually initiated at a 10-ft test distance with Feinbloom Chart and 4M, 2M or 1M distances with ETDRS
- You should instruct the patient to look in the direction of the distance acuity chart, encourage head and eye movements which might facilitate eccentric viewing
- When you use the Feinbloom Chart, if the patient hesitates on the last symbol available on a line, skip it and move on using positive reinforcement. It is not necessary to dwell too long on each acuity line trying to get each and every symbol identified
- Initially there should be some kind of illumination source on the charts either through back illumination or by using an adjacent stand goose neck lamp. A standard 75-watt incandescent bulb is fine for this purpose. When the last acuity symbol is identified, you should then move the illumination away from the chart and ask the patient whether the chart is more easily seen with increased or decreased light. You do not have to quantify the light in candles/m^2, just note on the record whether increased, average, or decreased illumination was preferred for the test.

Recording the distance visual acuities:

1. Identify your test distance and acuity size in fraction form as you do your Snellen notation (i.e. 10/200)
2. Identify the name of the chart used and the type of symbol identified (i.e. Feinbloom distance chart number)
3. Note if there appears to be eccentric viewing and the direction of the eccentric viewing if possible
4. Note the quality of the illumination (i.e. average, reduced, or bright illumination).

1. What distances in feet is recommended to measure low vision distance visual acuities using the Feinbloom chart? _____
What distance in meters is recommended to measure low vision distance visual acuities using the ETDRS Chart? _____

2. When testing distance visual acuities, you should instruct the patient to look in the direction of the

distance acuity chart and encourage what type of viewing?_____

3. Using a low vision simulator, measure distance visual acuity with the following distance test charts. Convert this to Snellen notation (Feinbloom e.g. 10/700 → 20/1400) (ETDRS e.g. 4M/20M → 20/100) Does the Snellen fraction match up with for your Feinbloom and ETDRS measurements?

ETDRS Distance Acuity Chart Actual Recording	Feinbloom Distance Acuity Flip Chart Actual Recording
OD	OD
OS	OS
OU	OU
ETDRS Distance Acuity Chart Snellen Equivalent	Feinbloom Distance Acuity Flip Chart Snellen Equivalent
OD	OD
OS	OS
OU	OU

Near Visual Acuity Assessment
Lighthouse Near Chart

The near acuity chart selected consists of isolated high contrast numbers, letters or symbols. Hand the chart to the patient and ask the patient to hold the card where he or she usually reads. Ask the patient to look at the symbols on the chart and if they can read any of the lines. Ask them to start at the top of the chart and read as many lines as possible. Once again, encourage head and eye movements that might facilitate eccentric viewing. When the smallest lines are identified, record the letter, number or symbol size in metric notation in fraction form using the numerator as the test distance in meters and the denominator of the fraction as symbol size in meters (i.e. .4/5M).

Once again identify:
1. Symbol size and type (i.e. 2M isolated high contrast letters).
2. Test distance.
3. Preferred illumination.
4. Type of chart.

Note: Newspaper print is approximately: 1M or 20/50 Reduced Snellen

Using low vision simulators, measure the near visual acuity with the following near visual acuity charts. Convert to Snellen: Example 0.4M/ 3.2M→20/160

Lighthouse Near Visual Acuity Test (Modified ETDRS)	Lighthouse Near Visual Acuity Test Snellen Equivalent
OD	OD
OS	OS
OU	OU

Submitted by	Richard Jamara, New England College of Optometry, USA JamaraR@neco.edu

Learning activity	Using Telescopes for Near Vision: What does it feel like?
Why chosen	Students are given an opportunity to handle and view through the devices. This assignment is one of a series that explores different characteristics of telescopic and plus lens systems. This activity is an exemplar of applying fundamental optical principles in a practical context.
Learning objectives	To be able to apply fundamental optical principles in a practical context and use the devices as may be prescribed to patients.
Prior knowledge	The phenomenon of vergence amplification in telescopic systems.
Principles that are addressed	Optical principles of telescopes translated into the 3-D environment.
Graduate attributes and capabilities developed	Takes care and is accurate with measurements in measuring and recording. Addresses Optometrists Association Australia Universal (entry Level) Competency Standards for Optometry 2008: 1.1.1; 3.1.2; 3.2.1; 5.4.1; 5.4.2.
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. *Contextualising students' learning experiences* 5. Learning is more effective when students' prior experience and knowledge are recognised and built on. *Designing an engaging, contextualised and inclusive curriculum* 10. Clearly articulated expectations, goals, learning outcomes and course requirements increase student motivation and improve learning. 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context.

LOW VISION ASSIGNMENT 5

THE PROBLEMS OF USING TELESCOPES FOR NEAR VISION

Equipment required
Select some typical telescopes. **Ask the demonstrator to help you select:**

2x Galilean telescope (Coil Spectacle Binocular)
2.75x Astronomical telescope (Marcus)
3x Galilean telescope (Eschenbach spectacle-mounted)
4x, 6x and 8x Astronomical monocular telescopes (Marcus)
8x Astronomical binoculars

WHEN CARRYING OUT THE FOCUSSING EXERCISES DESCRIBED BELOW, BE SURE TO ADJUST THESE FOR YOUR PD SO THAT THE TWO MONOCULAR FIELDS OVERLAP

Hand-held Snellen chart
Bailey-Lovie Near Word Reading Chart
Tape measure
Rule

Time required 45 minutes

Even though the telescopes you have selected are those you used as 'distance' telescopes in the previous session, because they are focussing telescopes, they also have the versatility to be used at other distances. This means, for example, that the patient using the telescope to see the TV display screens in the railway station could also see the timetable posters; the person wanting to see the bus numbers when going

shopping may also see the display in the shop window.

Experiment with the range of viewing distances that the telescopes can allow by carrying out the following procedure. The vertex distance that you use will not affect your measurements in this experiment, so if you normally wear spectacles, KEEP THEM ON.

From the furthest possible viewing distance, view a critical visual target with plenty of small detail. One suggestion is to view from the door of the Low Vision Clinic through the glass panel of the door to Reception, and up the street. Focus the telescope as accurately as possible. DO NOT ADJUST THE FOCUS OF THE TELESCOPE AGAIN. Now position yourself so you can look at a target on the other side of the room, through the telescope. (The letters you use should be as small as possible – remember you are using high magnification – so you may need to use a reading chart for this distance task). Now walk towards the chart until the view starts to become blurred - DON'T MAKE ANY EFFORT TO ACCOMMODATE, TRY TO RELAX YOUR EYES - you are trying to measure the TELESCOPE'S performance! Record your distance from the chart in the left-hand column below.

TELESCOPE TYPE	CLOSEST FOCUSSING DISTANCE WITH FIXED-FOCUS FOR INFINITY	CLOSEST FOCUSSING DISTANCE WITH FOCUS ADJUSTED FOR NEAR	FIELD OF VIEW (IN MM) AT CLOSEST VIEWING DISTANCE	
2x Galilean				
3x/4x Galilean				
			Telescope	Plus Lens
2.75x Astronomical				
4x Astronomical				
6x Astronomical				
8x Astronomical monocular				
8x Astronomical binocular				

The distance you have recorded is the closest possible viewing distance you could use if the telescope was fixed-focus for distance and you could not alter its length. Why is this closest focussing distance not the same as it would be if you were to view unaided? (i.e. Why is your accommodation not working?)

What is the relationship between the closest focussing distance and the magnification?

Do astronomical or Galilean telescopes (of comparable magnification) have the closest focussing distance?

Now consider the telescopes when focussed specifically for the near distance.

Now repeat your measurement of the closest viewing distance, but this time adjust the focus of each of the telescopes in turn so that it is focussed for the closest possible distance (this will be when it is at its maximum length; that is, it has the largest separation between the eyepiece and objective lenses). ONCE AGAIN, DON'T MAKE ANY EFFORT TO ACCOMMODATE, TRY TO RELAX YOUR EYES. For some telescopes, expect this distance to be very close. Measure from the front surface of the telescope in each case. Record these values in the table above.

What is the relationship between the closest focussing distance and the magnification?

Do astronomical or Galilean telescopes (of comparable magnification) have the closest focussing distance?

What is the difference between the astronomical BINOCULAR and MONOCULAR telescopes? Why do you

think this is?

Now measure the field of view at near with the astronomical monoculars

Place a mm rule across a Bailey-Lovie reading chart, and support both on a clipboard. View the chart through the telescope, focussed for the closest viewing distance. Position the chart so that the small print can be seen as clearly as possible. Viewing the rule simultaneously, record the field-of-view in mm in the table above.

For comparison, measure the field of view of a plus lens magnifier of equivalent power. Use a full-aperture trial lens in a trial frame, and find the appropriate powers by using M=F/4.

What do you notice about the working distances you are using?

For equivalent magnification, is the field of view bigger with a telescope or a plus-lens magnifier?

Which type of magnifying device is "best" for near vision?

Submitted by	Christine Dickinson, The University of Manchester, UK chris.dickinson@manchester.ac.uk

Learning activity	Device Magnification, Device Verification, M notation
Why chosen	This activity comes after the relevant lectures. It introduces students to a range of devices and has them demonstrate the optical principles incorporated into the device designs. Through this students gain hands-on experience with handling, focusing, and understanding the working distances appropriate for these devices. This activity is an exemplar of having to verify the attributes of a particular visual aid
Learning objectives	To understand the optics of low vision devices such as telescopes, stand magnifiers, hand-held magnifiers and spectacle-mounted microscopes. To understand the principles relating to magnification for low vision devices. To be able to verify the specifications of low vision devices. To be able to explain the aspects of a low vision device that have importance for comfortable use. To be able to apply M notation to lettering used in a patients own reading materials.
Prior knowledge	Basic and advanced geometric optics (vergence concepts and telescope optics), formulas applicable to the optics of devices used in low vision rehabilitation. Verification strategies for devices. Letter charts and application of M-unit notation.
Principles that are addressed	The optics of low vision devices.
Graduate attributes and capabilities developed	Has working knowledge of low vision device optics Addresses Optometrists Association Australia Universal (entry Level) Competency Standards for Optometry 2008: 1.1.1; 3.1.2; 3.2.1; 5.4.1; 5.4.2.
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. *Contextualising students' learning experiences* 6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to the workplace or wider community. *Creating an inclusive learning and teaching experience* 9. Students learn in different ways and their learning can be better supported by the use of multiple teaching methods and modes of instruction (visual, auditory, kinaesthetic, and read/write). *Designing an engaging, contextualised and inclusive curriculum* 10. Clearly articulated expectations, goals, learning outcomes

	and course requirements increase student motivation and improve learning. 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context.

NAME:_____
Partners: _____

V631 LAB
LOW VISION OPTICS LAB
Device Magnification, Device Verification & M notation

Purpose: To gain familiarity with devices by hands-on involvement, demonstrate device verification, and illustrate factors important in device use such as field of view, working distance, device modification (telescopes).
Equipment to bring: PD Stick, Class Notes from Lectures

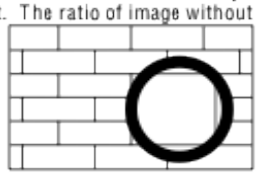
Procedures:

Section A: Telescope Verification

1. Use the formula given in class, M_{TS} = Objective Lens Diameter(mm)/ Exit Pupil Diameter(mm) and measurements of the telescope provided to determine the magnification of the telescope. Round your measurements to the nearest estimated tenth of a millimeter and show work.

   M_{TS} = _____

   Does the exit pupil move with or against in respect to the eyepiece?_____
   Is this a Galilean or Keplerian system?_____

2. Use the *direct comparision method* to verify the magnification of the telescope. Compare the number of markings on the board that are stacked vertically to the number seen through the telescope covering the same height. The ratio of image without magnification/magnified images of bricks is equal to the M_{TS}.  (In this example, the magnification is 3x)

   What is your estimated M_{TS}?_____

3. What would the label specifications be for the telescope that you have been using based on your measurements? (e.g. 8 x 20 or Mag x Objective Diameter in mm)_____
4. **What are the measurements on the telescope's label?** _____
5. How do your results compare? If off, why?_____

6. Look at the telescopes with the special marking and compare the movement of the exit pupil to that used in the exercises above. (Circle the correct answer)

   a. In a Keplerian TS, the exit pupil will move (with or against) the movement of the telescope.
   b. In a Galilean TS, the exit pupil moves (with or against) the movement of the telescope.

NAME:_____
Partners: _____

Section B: Uncorrected ametropia with telescope

1. Focus telescope for distant object at 10 ft. (with your best distance correction). Measure tubelength and record below. Make one lab partner an uncorrected 10 D hyperope by placing a trial lens at the eyepiece and record the power used below. Refocus the telescope for the distant object and remeasure the length of the telescope.
    a. Original Tubelength:_____
    b. New tubelength: _____

2. Refocus telescope for distant object at 10 ft. (with your best distance correction). Measure tubelength and record below. Make one lab partner an uncorrected 10 D myope by placing trial lenses in a trial frame or Janelli clips and record the power used below. Refocus the telescope for the distant object and remeasure the length of the telescope.
    a. Original Tubelength:_____
    b. New tubelength: _____

Finish these statements with shortened or lengthened:

To adjust a telescope for uncorrected hyperopia, tubelength must be _____.

To adjust a telescope for uncorrected myopia, tubelength must be _____.

Section C: Vergence Amplification

Using the monocular telescope at a distance less than optical infinity results in divergence emerging from the telescopic eyepiece. This divergence is greater than that present with the same object distance and no telescope in the system.

1. Focus the telescope for infinity; then, view an object located 1 meter away through the telescope without refocusing it. Use trial lenses at the eyepiece to neutralize the emerging divergence and focus the object at near. Since most of those participating can accommodate for this distance, the subject may need to view an object across the room with the telescope, then quickly view the near target while a lab partner interposes a plus lens, decreasing the plus with each trial until the target is just clear.
    L'(measured)= _____
2. Using the equation for calculating the accommodative demand at the eyepiece (the emerging divergence) of $L' = \mathbf{M}^2 L$, compare your measured result to the calculated value (Use M from telescope label.)
    L'(calculated)=_____

NAME:_____

Partners: _____

Section D: Verification of a Stand Magnifier

1. Use a focusable telescope to focus on a grid's **image** through the non-illuminated stand magnifier provided. **Measure distance from stand magnifier lens to telescope's objective lens (d_1).** Measure the distance from the bottom of the stand magnifier lens to the object (l). Remove the stand magnifier and move the grid back until it is in focus through the telescope only. (Do not change the focus of the telescope.) Again measure the distance from the telescope to the object (d_2). **Solve for l'. (l') = (d_2-d_1).** Remember L+F_m=**L'**. Now solve for F_m. ***Remember signs with your measurements.***

   d_1 = _____ d_2 = _____

   l' = _____

   F_m = _____

2. What is the Multacc Factor for the stand magnifier? M_t = _____

3. Some patients lift a stand magnifier off the page to see most clearly. From an optical standpoint, why is this helpful?

   What could be done optically to allow them to rest the stand on the page?

Section E: Field of View and Mag with Pocket Magnifier (2 POINTS)

View newsprint with an illuminated pocket magnifier.

1. What is the effect of changing eye-to-lens distance on FOV with the illuminated pocket magnifier (Keeping the magnifier-eye distance constant)?

2. What is the effect on magnification of altering only the magnifier to object distance and not eye-to-lens distance?

3. How would you know if you are holding the object at the focal point of the lens without measuring?

4. What is the dioptric power of the pocket magnifier?_____

   What is the labeled magnification?_____

   What formula was used to calculate the magnification listed on the label based on the relationship to the dioptric power listed? Write out formula.

NAME:_____
Partners: _____

Section F: Spectacle-Mounted Microscope

Compare the image quality (distortion, chromatic aberration, curvature of field) of a high power aspheric lenticular microscopic lens to the equally high power microscopic doublet looking from edge to edge.

What are the differences in the view thru the lenses for the same power? (Opinion. No correct answer.)

Describe the differences in the lens appearances.
Microscopic Doublet:

Aspheric Lenticular:

Section G: Measure the materials listed and then list the lettersize in M notation. USE LOWER CASE

Headlines in newspaper:	_____mm	_____M
Lower case text in newspaper:	_____mm	_____M
Magazine:	_____mm	_____M
Children's book:	_____mm	_____M
Paperback:	_____mm	_____M

Submitted by	Elli Kohllbaum, Indiana University ekollbau@indiana.edu

Learning activity	Reading Rates with Different Magnification Systems
Why chosen	This activity is one in a series. In particular, this activity allows the student to work with a partner to experience near devices through the use of vision impairment simulators and think about what it is like to have to live using low vision aids. This activity is an exemplar of using devices that limit the ability to efficiently read typical printed material books, magazines, etc.
Learning objectives	Apply knowledge about the optics, including equivalent power and field of view of different types of near devices to the needs of the low vision patient. Identify the importance of training the low vision patient in the proper use of low vision devices. Acknowledge the physical and psychosocial problems patients experience when learning to use low vision devices. Recognise and ameliorate common problems encountered by patients in using each category of low vision device.
Prior knowledge	Taking acuity, making magnification predictions, proper selection of near devices, timing reading rates, and proper training with devices.
Principles that are addressed	Proper device selection and instruction regarding use of device. Understanding why under-magnification and over-magnification do not work.
Graduate attributes and capabilities developed	Empathy to instruct patients with disabilities in an appropriate manner. Ability to prescribe with fundamental optical and lighting theory in mind but appropriate to a patient's unique needs and physical capabilities. Addresses Optometrists Association Australia Universal (entry Level) Competency Standards for Optometry 2008: 1.1.1; 3.1.2; 3.2.1; 5.4.1; 5.4.2.
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. 4. Structured occasions for reflection allow students to explore their experiences, challenge current beliefs, and develop new practices and understandings. *Contextualising students' learning experiences* 5. Learning is more effective when students' prior experience and knowledge are recognised and built on. 6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to the workplace or wider community. 7. If dialogue is encouraged between students and teachers and among students (in and out of class), thus creating a community of learners, student motivation and engagement can be increased. *Creating an inclusive learning and teaching experience* 9. Students learn in different ways and their learning can be better supported by the use of multiple teaching methods and modes of instruction (visual, auditory, kinaesthetic, and read/write). *Designing an engaging, contextualised and inclusive curriculum* 10. Clearly articulated expectations, goals, learning outcomes and course

	requirements increase student motivation and improve learning. 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context. *Teaching and engaging, contextualised and inclusive curriculum* 14. Learning cooperatively with peers – rather than in an individualistic or competitive way – may help students develop interpersonal, professional and cognitive skills to a higher level.

LABORATORY 7B - READING RATES WITH DIFFERENT MAGNIFICATION SYSTEMS

This lab is built on Labs 2-5 and many of the instructions in those previous labs apply here. Knowledge gained in these previous labs will be built-upon in Lab 7B.

REQUIRED READING
Brilliant, R,W. Essentials of low vision practice. Boston: Butterworth-Heinemann, 1999, pp.213-218, 224-226, 232-233.

REQUIRED EQUIPEMENT
Calculator, tape measure, watch with second hand

OBJECTIVES
Upon completion of this laboratory session, the student should be able to:

1) recognise the importance of training the low vision patient in the proper use of low vision devices
2) recognise physical and psychosocial problems patients experience when learning to use low vision devices
3) recognise common problems encountered by patients in using each category of low vision device
4) understand field of view of different type of near device.

EXERCISES
Students will work with a partner and complete the worksheet in this lab. The worksheet (see overleaf) needs to be turned into your lab instructor by the end of the lab session. Each student should take a turn being the patient and the doctor. While being doctor, the student will take a near and distance acuity and make a calculation of equivalent power. The students then work together to pick one appropriate near device in each of the 4 optical categories listed on the worksheet. The 5th category is the electronic magnifier. The patient then uses the device, acuity is taken and a reading test of two minutes is performed. The words per minute reading rate is calculated by counting the total words read and divide by 2. The patient tells the doctors their comments on each device as it is used and the doctor records these comments. The partners should then switch roles.

TOPICS FOR CLOSING DISCUSSION

1) What was your favourite device? Why?

2) What was your least favourite device? Why?

3) What device gave the best reading rates? The worst? What is a good reading rate to achieve with a low vision device?

4) What can be done to help maximise patients reading speed with low vision devices?

5) What physical problems did you encounter while using near low vision devices?

6) What psychosocial problems might patients experience while learning to use a near device?

7) Does it appear to be more helpful to the patient if, as they read, they move their head while keeping the reading material still, or move the reading material while keeping their head still? Why?

Name ____________________ Box No. ____________________

Distance VA ____________________ ROV ____________________

Near VA ____________________ Predicted Feq. to achieve .6m ____________________

Device	Equivalent Power/ Device Used	Near Acuity	Reading Speed Words per Minute	Comments
Microscope				
Hand Held Magnifier				
Stand Magnifier				
Telemicroscope				
Electronic Magnifier				

Submitted by	Tracy Matchinski , Illinois College of Optometry, USA TMatchin@ico.edu

Learning activity	**The use of hand and stand magnifiers and electronic aids: potential problems**
Why chosen	Students work in small groups as they rotate around a range of optical and electronic aid stations to calculate and measure field of view, working distance, reading speed and fluency. Individual group responses are reported out to the whole class in an open forum so students can learn from their peers. Clinical implications of the results of each station are related back to real life scenarios by a facilitator. Links are made in the use of these clinical assessments as outcome measures in a low vision clinical or research setting. This activity is an exemplar of understanding the effects of the various forms of magnification upon reading for low vision patients when using particular low vision aids. For example: The field of view with a high powered (x6) optical aid, measured at 3 eye-to lens distances (25cm, 10cm, and 0cm), is compared to that of a low powered optical aid (x2). Evidently the largest field of view is when both optical aids are used in the spectacle plane but the difference is more marked with the high-powered device.
Learning objectives	Be able to understand the optical principles of optical low vision aids, in particular the relationship with eye to lens distance. Be able to determine magnification. Be able to clinically evaluate reading fluency and determine magnification of an optical device. Be able to advise and instruct Low Vision patients in use of high powered optical aids in the spectacle plane. Be able to work in a team, have good communication skills (particularly the skill of listening).
Prior knowledge	The optical principles of angular magnification and transverse magnification.
Principles that are addressed	The association between field of view, depth of focus and magnification. Provision of appropriate hand magnifiers to the patient through use of calculations and recognition of the relevant parameters.
Graduate attributes and capabilities developed	Good communications skills. Ability to work in a team. Appreciation of the impact of disability on normal functioning in everyday tasks. Addresses Optometrists Association Australia Universal (entry Level) Competency Standards for Optometry 2008: 1.1.1; 1.3.3; 3.1.2; 3.2.1; 5.4.1; 5.4.2.
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. *Contextualising students' learning experiences* 6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to the workplace or wider community. 7. If dialogue is encouraged between students and teachers and

	among students (in and out of class), thus creating a community of learners, student motivation and engagement can be increased. *Designing an engaging, contextualised and inclusive curriculum* 10. Clearly articulated expectations, goals, learning outcomes and course requirements increase student motivation and improve learning. 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context. *Teaching and engaging, contextualised and inclusive curriculum* 14. Learning cooperatively with peers – rather than in an individualistic or competitive way – may help students develop interpersonal, professional and cognitive skills to a higher level. 16. Meaningful and timely feedback to students improves learning.

Lab 2: The problems of using hand and stand magnifiers and electronic aids

Aim: To introduce you to some of the problems of magnification

1. Hand and Stand Magnifiers: Field of View

Materials
Range of hand and stand magnifiers, ranging in power from low to high, some with illumination.

Use of magnifiers
A stand magnifier is designed to be used resting on the page. A hand magnifier should be held as far away from the page as possible without blurring

Procedure
The effects of altering the working distance will be investigated by altering the eye-to-lens distance and measuring the field of view for each of the magnifiers in mms. Complete the table below

Type of magnifier	Eye to lens distance	Field of view (mms)
	25 cm 10 cm 0 cm	
	25 cm 10 cm 0 cm	

2. Hand and Stand Magnifiers: Reading Speed

Reading Speed = $\frac{\text{Words correctly read}}{\text{Time taken (seconds)}}$

Convert Reading Speed to words per minute
For Information: Reading speed is dependent on print size; for all practicals, print size is the same (1.0M, N8) and therefore values are comparable.

Reading Index = $\frac{\text{Reading Speed (words per minute)}}{\text{Print Size (M)}}$

For the purposes of this practical, reading speed will only be measured for the first 60 seconds, then the patient will be stopped.

Read the enclosed reading speed chart without magnification at 25cm. Record time taken (up to 60

seconds), number of words correctly read and print size (1.0M). Convert to reading speed in words per minute for the table below.

Read the same chart with each type of magnifier. Record your answer in words correctly read, time taken in seconds (up to 60 seconds) and print size. (1.0M) and convert to reading speed in words per minute.

Magnifier type, Print size	Reading Speed
None	

3. Hand and Stand Magnifiers: Verification

Procedure: Focimeter the lens in the LVA and calculate the magnification:

Magnification = rF

Where r = the distance from the eye in metres - you may assume 0.25m.

Type	Dioptric power	Magnification

4. EVES Closed Circuit Television: Desktop

You are encouraged to investigate the controls on the EVES for colour, magnification and focus. Calculate maximum magnification and reading speed for this passage of text

Measure the size of a letter in the text and note. Set the magnification to its maximum. Measure the same letter on the screen.

Magnification = Letter size on screen/ original

Original Size	Screen size	Magnification
Reading speed: words in seconds = wpm. Reading Index =		

5. EVES Videolupe

Calculate magnification and reading speed for this passage of text

Measure the size of a letter in the text and note. Set the videolupe on the text. Measure the same letter on the screen.

Magnification = Letter size on screen/ original

Original Size	Screen size	Magnification
Reading speed: words in seconds = wpm. Reading Index =		

6. EVES Portable Closed Circuit Television

Calculate maximum magnification and reading speed for this passage of text

Measure the size of a letter in the text and note. Set the magnification to its maximum. Measure the same letter on the screen.

Magnification = Letter size on screen/ original

Original Size	Screen size	Magnification
Reading speed: words in seconds = wpm. Reading Index =		

Submitted by	Moyra McClure, University of Ulster, UK me.mcclure@ulster.ac.uk

Learning activity	Management of a Hypothetical Patient
Why chosen	This exercise challenges students to use a broad range of skills as required for low vision management. This activity is an exemplar of handling a typical patient who would initially present at a Vision Rehabilitation Centre and then be seen subsequently in private practice
Learning objectives	To be able to recognise suitable means of transport for any low vision patient, patient entitlement to transport services support and the method for achieving such support. To be able to select appropriate optical and non-optical devises suited to the patient with macular disease. To be able to calculate the equivalent viewing distance for low vision devices. To be able to write a letter to a corporate Disability Adviser describing the patient's peculiar requirements and requesting assistance for the patient.
Prior knowledge	Optical theory, care of the Low Vision patient including social aspects of patient management.
Principles addressed	The ability to interpret and integrate the history and clinical examination findings in order to arrive at an appropriate diagnosis and management plan.
Graduate attributes and capabilities developed	Ability to identify issues relevant to the visually impaired patient, including lifestyle issues. Ability to gather all information and data relevant to the patient with macular disease. Ability to make decisions critical to prescribing appropriate aids for the patient with macular disease. Understands the support agencies available to the visually impaired and how to support the patient to ensure eligibility is processed. Ability to recognise the social impact of visual disability. Addresses Optometrists Association Australia Universal (entry Level) Competency Standards for Optometry 2008: 1.1.1; 1.3.3; 1.4.2; 1.5.2; 3.8.1; 4.1.1; 4.1.2; 5.1.1; 5.1.3; 5.4.1; 5.4.2.
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. 2. Effective learning is supported by a climate of inquiry where students feel appropriately challenged and activities are linked to research and scholarship. *Contextualising students' learning experiences* 5. Learning is more effective when students' prior experience and knowledge are recognised and built on. 6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to the workplace or wider community. 7. If dialogue is encouraged between students and teachers and among students (in and out of class), thus creating a community of

	learners, student motivation and engagement can be increased. *Creating an inclusive learning and teaching experience* 9. Students learn in different ways and their learning can be better supported by the use of multiple teaching methods and modes of instruction (visual, auditory, kinaesthetic, and read/write). *Designing an engaging, contextualised and inclusive curriculum* 10. Clearly articulated expectations, goals, learning outcomes and course requirements increase student motivation and improve learning. 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context. *Teaching and engaging, contextualised and inclusive curriculum* 13. Learning can be enhanced and independent learning skills developed through appropriate use of information and communication technologies. 14. Learning cooperatively with peers – rather than in an individualistic or competitive way – may help students develop interpersonal, professional and cognitive skills to a higher level.

Final Problem in Low Vision

Mr JJ who is 19 years of age presents to you in your private optometry practice. He was diagnosed as having Stargardt's disease approximately 5 years earlier. He is under regular review from his ophthalmologist, who reviewed him 2 weeks ago.

Mr JJ has recently commenced tertiary studies, doing a Bachelor of Applied Science (Human Movement Studies) at the Technical University of South East Queensland, TUSEQ, which has courses, structure, administration and rules identical to your university. Mr JJ is concerned that he will have difficulty reading course materials, performing some of the practical laboratories, reading notes projected in lectures.

He is reasonably self-sufficient in terms of transport. He can catch buses, but has difficulty reading bus numbers. Mr JJ says he likes to ride his bicycle, but has a gravel-rash on his left fore-arm, the consequence of an encounter with a pot-hole. He asks you if you think it is "OK" for him to ride a bicycle.

The results of your assessment today are:

Vision	R – 6/95^{+2}	L – 6/95
Ret	R -2.00DS	L -1.75
Subj	R -1.25/-0.25 X 180	L -1.25 /-0.25 X 180
VA	R – 6/75^{+2}	L – 6/60^{-2}
Near	R N10, and L N8, OU N8	@ 9 cms without any Rx

Ocular health
Ophthalmoscopy shows macular scarring and pigment clumping with an area of approximately 1.5 DD in both retinas.

Amsler fields
A central distortion of about 5 cm diameter with some small missing patches for each eye, with the Amsler grid held at 40 cm.

QUESTIONS

You may research and discuss the following questions in your groups, but must submit your answers as an individual report. Please limit your answer to each of the questions to less than 2 pages per question.

1. Is Mr JJ eligible for the Disability Support Pension and transport concessions, due to blindness? How should he obtain such support if he were eligible?

2. What optical and/or non-optical devices would you recommend for Mr JJ to trial to assist him with his visual tasks? (limit of 4 devices on this) Give reasons for, and calculations used in selecting the

devices. 3. What advice should you offer Mr JJ about whether or not it is OK for him to ride his bicycle? 4. Write a **succinct** report to Mr JJ's disability advisor at TUSEQ, describing the nature of Mr JJ's eye condition, difficulties he may experience pursuing his studies, and suggesting possible assistance that the university and its teaching staff can offer Mr JJ.	
Submitted by	Andrew Carkeet, Queensland University of Technology, Australia a.carkeet@qut.edu.au

Learning activity	Mock Low Vision Patients
Why chosen	These mock patients tie in prior learning representative of that required to manage a type of patient that will be seen commonly in low vision practice.
Learning objectives	To challenge the student to reflect on previous learning and knowledge on low vision. To integrate this prior knowledge by demonstrating an ability to manage the patient.
Prior knowledge	This activity requires students to synthesise all previous learning in the area of low vision as a final year review activity.
Principles that are addressed	The ability to interpret and integrate the history and clinical examination findings in order to arrive at an appropriate diagnosis and management plan.
Graduate attributes and capabilities developed	Able to identify issues relevant to the visually impaired patient. Able to gather all information and data relevant to the patient with macular degeneration. Able to make decisions critical to prescribing appropriate aids for the patient with macular degeneration. Addresses Optometrists Association Australia Universal (entry Level) Competency Standards for Optometry 2008: 1.1.1; 1.4.2; 1.8.1; 2.4.1; 4.1.2; 3.1.2; 3.2.1; 3.8.1; 4.1.1; 4.2.1; 5.4.1; 5.4.2; 5.4.5.
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. 2. Effective learning is supported by a climate of inquiry where students feel appropriately challenged and activities are linked to research and scholarship. *Contextualising students' learning experiences* 5. Learning is more effective when students' prior experience and knowledge are recognised and built on. 6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to the workplace or wider community. *Designing an engaging, contextualised and inclusive curriculum* 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context. *Teaching and engaging, contextualised and inclusive curriculum* 13. Learning can be enhanced and independent learning skills developed through appropriate use of information and communication technologies.

"Mock" Low Vision Patients

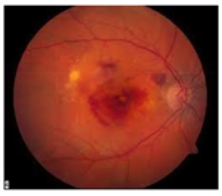
Year 5

Anthea Cochrane
Dept of Optometry & Vision Sciences
University of Melbourne

AMD patient

– A patient aged 75 years presents to you with a diagnosis of exudative age-related macular degeneration.

Right eye



Left eye

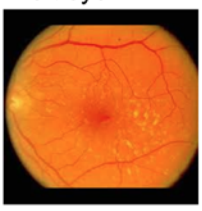


Photo courtesy of National Eye Institute, National Institutes of Health.
Accessed 10.01.2011

1

AMD patient

– Distance visual acuities are R 6/30 and L 2.4/60. With a +4.00 D addition she is able to read N20 size print. Contrast sensitivity is 9 dB on the Melbourne Edge Test.

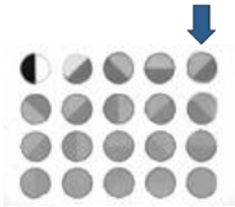


Photo courtesy of Pacific University , Oregon, USA. Accessed 10.01.2010

AMD patient

1. Describe the patient symptoms and clinical signs in a patient with exudative age-related macular degeneration

Hint: Include Charles Bonnet

Photo courtesy of National Eye Institute, National Institutes of Health. Accessed 10.01.11

2

AMD patient

2. A) Based on the right eye distance visual acuity, what would you predict near visual acuity to be using a +4.00 D addition at 25 cm?
   (In your answer write down the rule you used to allow you to predict the near acuity)
   B) Suggest reasons why this result was not obtained.
   C) Convert the left eye distance visual acuity to standard 6 m Snellen notation.

AMD patient

3. Predict the magnification required to read N5 print.

3

AMD patient

4. Construct a table that that covers all possible near magnification types for this patient as shown:

Type of magnifier	Advantages/ Disadvantages
Hand Magnifier	Portable,familiar, inexpensive etc

AMD patient

5. What optical devices and non-optical strategies would you suggest for writing

Photo courtesy of American Printing House for the Blind. Accessed 10.01.11

4

AMD patient

6. The patient asks about her treatment options. Briefly summarise the main treatment options available for wet macular degeneration

Photo: http://www.smh.com.au/news/diet/low-gi-not-a-diet/2008/04/21/1208742833971.html. Accessed 10.01.2011

AMD patient

7. What additional multidisciplinary services might be of benefit to this patient?

5

Submitted by	Anthea Cochrane, The University of Melbourne, Australia antheac@unimelb.edu.au

Learning activity	Low Vision Learning: Case Studies
Why chosen	Encourages discussion within student groups and brings together concepts from across the course.
Learning objectives	To be able to take a full history relating to low vision and its impact on visual function relating to both vocational and avocational demands. To be able to describe in detail the selection of appropriate optical and non-optical aids suited to specific cases of low vision, plus options for rehabilitation. To address patient welfare and recognise suitability for registration as blind or partially-sighted and the entitlements that accrue there from.
Prior knowledge	Range of optical and non optical aids, rehabilitation options and processes, the impact of visual function with low vision, the existence of counseling support for blind/low vision patients, welfare rights for those who are blind or have low vision.
Principles addressed	Patient interaction and communication. The gamut of the low vision consultation: initiating factors to be considered, provision of aids, socio-legal aspects of the visually impaired.
Graduate attributes and capabilities developed	Ability to use clinical interpretive skills with low vision patients. Ability to assimilate and integrate information. Addresses Optometrists Association Australia Universal (entry Level) Competency Standards for Optometry 2008: 1.1.1; 1.4.2; 1.5.2; 3.8.1; 4.1.1; 4.1.2; 5.1.3; 5.4.1; 5.4.2.
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. *Contextualising students' learning experiences* 5. Learning is more effective when students' prior experience and knowledge are recognised and built on. 6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to the workplace or wider community. *Designing an engaging, contextualised and inclusive curriculum* 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context.

Case Studies

Case Record 1

A diabetic retinopathy patient attends your clinic for the first time. He has visual acuities of 6/30 for distance, N12 for near, and full visual fields in both eyes. He works as a teacher and needs some help with small print. He suffers with glare and likes to use public transport. Describe your consultation with him, including:

- any extra information that you would ask him for
- provision of optical and non-optical aids

- whether he is suitable for blind or partial sight registration
- If so, what would the benefits be?

Case Record 2

An age-related macular disease patient attends your clinic for the first time. She has visual acuities of 3/60 for distance, N24 for near, and full visual fields in both eyes. She lived alone and needs some help with small print for reading bills and food packets. She enjoys watching television, and needs some help with this. She suffers with disability glare. Describe your consultation with her, including:

- any extra information that you would ask her for
- provision of optical and non-optical aids
- whether she is suitable for blind or partial sight registration
- If so, what would the benefits be?

Submitted by	Hannah Bartlett, Aston University, UK H.E.Bartlett@aston.ac.uk

Learning activity	CCTV Assessment of Patient
Why chosen	This activity takes the material taught the previous year in low vision lectures and laboratory classes to a personal and practical level. The students find that they have to apply the earlier material in an immediate clinical situation. This provides motivation for students to revise the earlier material so that they can appear knowledgeable and professional to the low vision patients seeking their advice. This activity is an exemplar of communication with the low vision patient and coming to understand their needs and capabilities.
Learning objectives	To become proficient in effective communication with the patient with visual impairment during the examination. To become proficient in the clinical techniques and decision making required as applied to determining the suitability of a CCTV magnifier for a vision impaired patient. To be able to develop an effective management plan for the patient prescribed a CCTV magnifier.
Prior knowledge	Completion of Part IV of the 5-year BOptom program including the didactic and practical components that cover the topic "Low vision".
Principles that are addressed	Communication skills and their importance in management of people with low vision. The need for a secure understanding of the basic principles of optics when working with the low vision patient.
Graduate attributes and capabilities developed	Clinical competence in assessing the vocational and avocational need for sophisticated solutions regarding magnification for the visually impaired. Empathy for the patient with visual impairment. Addresses Optometrists Association Australia Universal (entry Level) Competency Standards for Optometry 2008: 1.1.1; 1.3.3; 1.4.2; 1.5.2; 3.1.2; 3.2.1; 4.1.1; 5.1.1; 5.1.3; 5.4.1; 5.4.2; 5.4.3; 5.4.4.
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. *Contextualising students' learning experiences* 5. Learning is more effective when students' prior experience and knowledge are recognised and built on. 6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to the workplace or wider community. *Creating an inclusive learning and teaching experience* 9. Students learn in different ways and their learning can be better supported by the use of multiple teaching methods and modes of instruction (visual, auditory, kinaesthetic, and read/write). *Designing an engaging, contextualised and inclusive curriculum* 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are

	most effectively acquired in a disciplinary context. *Teaching and engaging, contextualised and inclusive curriculum* 14. Learning cooperatively with peers – rather than in an individualistic or competitive way – may help students develop interpersonal, professional and cognitive skills to a higher level.

CCTV Assessment

Students undertake a CCTV assessment session at the Royal New Zealand Foundation of the Blind (url: http://www.rnzfb.org.nz/). In these sessions student optometrists work in pairs under the guidance of a clinical instructor to assess the magnification and other requirements of a person with low vision who wishes to use a CCTV magnifier.

There is no structured handout for this practical class apart from the checklist guide and the record form. Students may have access to their lecture and laboratory notes from the previous year's classes in Low Vision.

Checklist of information needed for CCTV Evaluations

The accompanying record form may be used as an addition to the normal patient record

1. Is patient a full member of the RNZFB?

2. To what uses will the patient put a CCTV? List all uses.
   Is writing (e.g. filling in forms) one of the tasks the CCTV might need to be used for? Will colours need to be seen?

3. What is the Enlargement required for N5 print to be (i) just readable?
   and (ii) readable with fluency?

4. What Enlargement is required for the patient to perform each of the actual tasks they wish to do with the CCTV?

   e.g. (i) if newspaper reading is the goal: then what enlargement is needed for this task?

   (ii) if reading bank-statements is the goal, then what enlargement is necessary for this task?

5. What Viewing Distance (spectacle plane to screen) is used for the measurements in (4) above.

6. Does the patient need to wear glasses for this viewing distance?

7. Does the patient prefer black print on white (normal contrast) of white print on black (reverse contrast)?

8. What room lighting conditions does the patient prefer for CCTV use (e.g. normal or dim room illumination)?

9. Does the patient prefer the fixed camera type CCTV or the moving (hand-scanning) camera CCTV type?

10. What is the patient's reading speed (fluency) with the preferred CCTV type and with optimum settings?
    Get an estimate in words per minute, or grade speed using adjectives (e.g. very slow, slow, … fast, etc).

Consultation Date ……..

Client LAST-NAME First-name Initial Title RNZFB membership type	…… …… Associate ☐ Full ☐
Tasks that the CCTV is likely to be used for? List all uses.	…… …… …… ……
Will the CCTV be used for writing?	
Will colours need to be seen?	
What is the Enlargement required for N5 print to be readable?	(i) *Just readable* (ii) *Readable with fluency*
What Enlargement is required for each of the actual tasks to be done with the CCTV?	Task Enlargement …… …… …… ……
Viewing Distance used (face to screen)?	
Are spectacles needed for this viewing distance? Details	…… ……
Normal (B on W) or reverse contrast (White print on Black) preferred?	
Room lighting preferred for CCTV use	
CCTV type preferred	
Reading speed (fluency) with the preferred CCTV type and best settings?	

Notes

Consultants Names ….

Record Form – CCTV Assessment for Low Vision 2

Submitted by	Robert Jacobs, The University of Auckland, New Zealand r.jacobs@auckland.ac.nz

Learning activity	Low Vision Grand Rounds
Why chosen	This activity is for 3rd Year students who have not yet had a 'real' clinical experience with a visually impaired patient and yet are expected to be knowledgeable about performing a low vision evaluation the next term. The Grand Rounds provides a minimum of two full patient encounters, allows hands-on clinical learning and application of concepts from the lectures and gives the student greater confidence with this patient population. This activity is an exemplar of what students will be doing upon graduation in practice as a low vision optometrist. The activity simulates a real world clinical situation within the comfort of an experienced faculty mentor and small group environment. It also helps to break down typical stereotypes concerning visually impaired patients.
Learning objectives	Be able to accurately take a full case history including medical and ocular history. Be able to measure visual acuity, visual fields, contrast sensitivity, and undertake a trial frame refraction and ocular health evaluation (if indicated) on a visually impaired patient. Be able to apply optical principles to appropriate device selection and use appropriate techniques for optical and non-optical device instruction as necessary. Be able to develop a treatment and management plan including appropriate follow-up appointments and referrals for other services. To reflect on the emotional aspects of working with the visually impaired. To appreciate the functional visual deficits related to ocular disease experienced by these patients with special visual needs.
Prior knowledge	Appropriate case history, examination techniques, trial frame refraction skills, device selection strategies, and clinical problem solving strategies tailored to meet the needs of visually impaired patients. Ocular diseases.
Principles that are addressed	Clinical application of low vision rehabilitation principles and techniques.
Graduate attributes and capabilities developed	Communication skills suited to patients with a disability that can elicit the unique needs of the visually impaired patient. Ability to strategically and appropriately adapt clinical eye examination skills to suit the visually impaired patient. Ability to develop a long-term management plan for the complicated visually impaired patient. Addresses Optometrists Association Australia Universal (entry Level) Competency Standards for Optometry 2008: 1.1.1; 1.3.3; 3.1.1; 3.8.1; 4.1.1; 4.2.1; 5.1.1; 5.1.2; 5.1.3; 5.1.4; 5.4.1; 5.4.2.

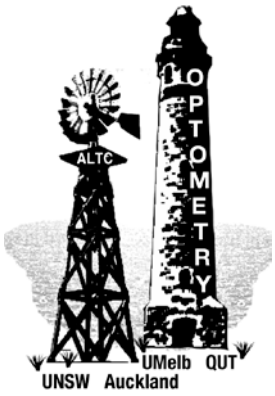
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. 4. Structured occasions for reflection allow students to explore their experiences, challenge current beliefs, and develop new practices and understandings. *Contextualising students' learning experiences* 5. Learning is more effective when students' prior experience and knowledge are recognised and built on. 6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to the workplace or wider community. *Designing an engaging, contextualised and inclusive curriculum* 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context. *Teaching and engaging, contextualised and inclusive curriculum* 15. Effective learning is facilitated by assessment practices and other student learning activities that are designed to support the achievement of desired learning outcomes. 16. Meaningful and timely feedback to students improves learning.

Low Vision Grand Rounds Paper

Format:	Type your answers to the following questions in sentence form using 12 point font. Include the question and then your answer. Put your name at the top of each page as a header and make sure the pages are numbered starting with page 2. Total paper should be 2-3 pages single spaced with double spacing between questions. I reserve the right to take away points for spelling and grammar mistakes. 5 points possible if proper format is followed.
Question 1:	What was your biggest challenge of the evening in working with the low vision patients? Describe your difficulties and why you feel they arose. How were they ultimately resolved? 10 points
Question 2:	What did you enjoy most about working with the low vision patients? Were there any pleasant surprises? What surprised you most about the personalities of the patients? 10 points
Question 3:	Which diseases robbed the patients of their sight? Discuss each disease and an overview of its pathology. How does each disease impact the daily functioning of the patient? Discuss impact of each disease on visual acuity and visual field. I prefer a general disease overview in your own words. If you utilise reference material be sure to cite as appropriate. 10 points
Question 4:	Do the magnification, field of vision and illumination capabilities of the devices make sense based on the case data and your clinical power formulas? If not, is there a possible explanation as to why? Describe the patients' favourite devices in terms of magnification, field of view, illumination and mobility characteristics. 10 points
Question 5:	What is your follow up plan? Describe where you would go from here and any other referrals you would make if applicable. 5 points

Total possible points: 50

Submitted by	Sarah Hinkley, Michigan College of Optometry, USA sarahhinkley@ferris.edu



APPENDICES

Appendix 1

Learning Activity Template

Learning activity	
Why chosen	
Learning objectives	
Prior knowledge	
Principles addressed	
Graduate attributes and capabilities developed	
Guidelines on Learning that Inform Teaching demonstrated in this activity	See http://www.guidelinesonlearning.com/ and Appendix 2. Delete Guidelines not demonstrated. *Engaging students in learning* 1. Effective learning is supported when students are actively engaged in the learning process at every stage. 2. Effective learning is supported by a climate of inquiry where students feel appropriately challenged and activities are linked to research and scholarship. 3. Activities that are interesting and challenging, but which also create opportunities for students to have fun, can enhance the learning experience. 4. Structured occasions for reflection allow students to explore their experiences, challenge current beliefs, and develop new practices and understandings. *Contextualising students' learning experiences* 5. Learning is more effective when students' prior experience and knowledge are recognised and built on. 6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to the workplace or wider community. 7. If dialogue is encouraged between students and teachers and among students (in and out of class), thus creating a community of learners, student motivation and engagement can be increased. *Creating an inclusive learning and teaching experience* 8. The educational experiences of all students are enhanced when the diversity of their experiences are acknowledged, valued, and drawn on in learning and teaching approaches and activities. 9. Students learn in different ways and their learning can be better supported by the use of multiple teaching methods and modes of instruction (visual, auditory, kinaesthetic, and read/write). *Designing an engaging, contextualised and inclusive curriculum* 10. Clearly articulated expectations, goals, learning outcomes and course requirements increase student motivation and improve learning. 11. When students are encouraged to take responsibility for their own

	learning, they are more likely to develop higher-order thinking skills such as analysis, synthesis and evaluation and be better prepared for life long learning. 12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context. *Teaching and engaging, contextualised and inclusive curriculum* 13. Learning can be enhanced and independent learning skills developed through appropriate use of information and communication technologies. 14. Learning cooperatively with peers – rather than in an individualistic or competitive way – may help students develop interpersonal, professional and cognitive skills to a higher level. 15. Effective learning is facilitated by assessment practices and other student learning activities that are designed to support the achievement of desired learning outcomes. 16. Meaningful and timely feedback to students improves learning.

Learning Activity Process

How students will work and what they will need to do to achieve the learning objectives.

How students and teaching staff will know if the learning objectives have been achieved.

What resources will be required to achieve the desired outcomes?

Appendix 2

See http://www.guidelinesonlearning.com/

Guidelines on Learning that Inform Teaching

The GUIDELINES | Overview

1. Effective learning is supported when students are actively engaged in the learning process at every stage.
2. Effective learning is supported by a climate of inquiry where students feel appropriately challenged and activities are linked to research and scholarship.
3. Activities that are interesting and challenging, but which also create opportunities for students to have fun, can enhance the learning experience.
4. Structured occasions for reflection allow students to explore their experiences, challenge current beliefs, and develop new practices and understandings.
5. Learning is more effective when students' prior experience and knowledge are recognised and built on.
6. Students become more engaged in the learning process if they can see the relevance of their studies to professional, disciplinary and/or personal contexts, for example through linking learning experiences to the workplace or wider community.
7. If dialogue is encouraged between students and teachers and among students (in and out of class), thus creating a community of learners, student motivation and engagement can be increased.
8. The educational experiences of all students are enhanced when the diversity of their experiences are acknowledged, valued, and drawn on in learning and teaching approaches and activities.
9. Students learn in different ways and their learning can be better supported by the use of multiple teaching methods and modes of instruction (visual, auditory, kinaesthetic, and read/write).
10. Clearly articulated expectations, goals, learning outcomes and course requirements increase student motivation and improve learning.
11. When students are encouraged to take responsibility for their own learning, they are more likely to develop higher order thinking skills such as analysis, synthesis and evaluation and be better prepared for life long learning.
12. Graduate attributes – the qualities and skills the university hopes its students will develop as a result of their university studies – are most effectively acquired in a disciplinary context.
13. Learning can be enhanced and independent learning skills developed through appropriate use of information and communication technologies.
14. Learning cooperatively with peers – rather than in an individualistic or competitive way – may help students develop interpersonal, professional and cognitive skills to a higher level.
15. Effective learning is facilitated by assessment practices and other student learning activities that are designed to support the achievement of desired learning outcomes.
16. Meaningful and timely feedback to students improves learning.

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Appendix 3

Australian Entry Level Professional Competencies Generally Required for Low Vision Assessments and in which Low Vision is specifically mentioned.

Extracts are from the *Optometrists Association Australia Universal (entry-level) and Therapeutic Competency Standards for Optometry 2008.* =Kiely, P.M. Clin Exp Optom. 2009; 92(4): 362-386.

Available in full at the Optometry Council of Australia and New Zealand web site
www.ocanz.org/component/docman/doc_download/12-candidate-guide-appendix-a

Note: the suggestions of actions under each subheading are not an exhaustive list.

1.1 Maintains and develops optometric knowledge, clinical expertise and skills

1.1.1 Optometric knowledge, equipment and clinical skills are maintained and developed

Ability to continue to develop skills and knowledge

Ability to access material such as recent publications, journal articles, library materials (including books, electronic media, seminar and conference proceedings, online databases)

1.3 Acts in accordance with the standards of ethical behaviour of the profession

1.3.3 Advantage (in a physical, emotional or other way) is not taken of the relationship with the patient.

Recognition of the obligation of optometrists to respect the dignity and rights of the patient

1.4 Communicates appropriate advice and information to patients and others

1.4.2. Liaison with other professionals is maintained

Ability to access details of suitable health professionals, eye care professionals or teachers for referral and reporting

1.5 Uses resources from optometric and other organisations to enhance patient care

1.5.2 Community and other resources are recommended to patients.

Ability to identify patients who could benefit from services from societies and support agencies. Understanding of the optometrist's role in advising patients of the services that different organisations provide and how these organisations can be contacted. An example is referral to specialist low vision support organizations.

1.8 Provides for the care of patients with special needs

1.8.1 Subsidised eye care schemes are understood and explained, recommended or made available to patients who are entitled to them

3.1 Formulates an examination plan

3.1.1 An examination plan based on the patient history is designed to obtain information necessary for diagnosis and management

Tests and procedures appropriate to the patient's condition and abilities are selected.

3.2 Implements examination plan

3.2.1 Tests and procedures which efficiently provide the information require for the diagnosis are performed.

Ability to be proficient, safe and accurate with equipment and in the performance of the techniques

Ability to recognise what tests should included or excluded for different patient presentations and the order in which tests should be performed.

3.5 Assesses refractive status

3.5.1 The spherical, astigmatic and presbyopic components of the correction are measured.

Ability to select and apply appropriate tests to determine the spherical, astigmatic and presbyopic components of the correction for a range of presentations.

3.8 Assess the significance of signs and symptoms found during the ocular examination in relation to the patient's eye and/or general health

3.8.1 Pertinent ocular signs and/or visual symptoms found during the ocular examination are identified and their relevance determined

Ability to identify ocular signs and /or visual symptoms and recognise their significance in terms of: general welfare of the patient the medical condition of the patient, the management of the patient

4.1 Establishes a diagnosis

4.1.1 Accuracy and validity of test results and information from the case history and other sources are critically appraised

4.2 Evaluates the expected prognosis of the condition or disease

4.2.1 Information from a number of sources is integrated to determine the expected prognosis of the disease or condition

5.1 Designs a management plan for each patient and implements the plan agreed to with the patient/carer.

5.1.1 The diagnosis and prognosis are presented and explained in a clear manner that the patient can understand

Ability to provide written information about the patient's condition/disease

5.1.2 The relative importance or urgency of the presenting problems and examination findings is determined and addressed in the management plan

5.1.3 Management options to address the patient's needs are discussed

Ability to discuss the aims and objectives of management and the patient's expectations of the different management plans

5.1.4 A course of management is agreed to with the patient, following counselling and explanation of the likely course of the condition, case management and prognosis.

Ability to consider and select from a range of management options such as optical correction (spectacles, contact lenses, low vision aids), vision therapy, pharmacological therapy, task modification, environmental adaptations, referral etc. Understanding of the need to make clear recommendations to the patient about management options, to discuss the likely prognosis of the disease with and without treatment/management, and the consequences of non-adherence

Ability to provide advice about ongoing care, review, referral, discharge.

Understanding of the need to discuss repercussions of management options (e.g. the patient's ability to drive or to operate machinery).

5.4 Prescribes low vision devices.

5.4.1 A range of low vision devices suitable to the patient's needs is selected and demonstrated, where indicated.

Consideration of factors such as working distances, magnification requirements, physical ability of the patient to manage different devices, pathology associated with low vision, incidental optical effects, low vision aid design, special materials, tints, lighting requirements when determining what types of low vision devices may be suitable for the patient.

Ability to assess the suitability of aids such as closed circuit television, computer software for low vision, mobility aids, independent living aids, telescopes.

Ability to demonstrate and explain the use of low vision devices to the patient.

5.4.2 Low vision devices suited to the patient's visual requirements and functional needs are prescribed.

Ability to prescribe a low vision device to meet the needs of the patient. Understanding of the benefit of providing low vision devices for a trial period.

5.4.3 The patient is instructed in the use of prescribed low vision devices.

Ability to instruct the patient in the use of prescribed low vision devices in terms of working distance, lighting requirements, whether the device is to be used in conjunction with spectacles etc.

5.4.4 The success of the low vision device is evaluated and monitored and additional or alternative devices or management strategies are prescribed or recommended.

Understanding of the need for review visits for reassessment of visual performance.
Understanding of the need to recommend ongoing primary eye care.

5.4.5 The patient is informed of and, if necessary, referred to other rehabilitative services.
Knowledge of organisations offering rehabilitative and other services to patients with low vision.
Recognition of the need to inform the patient of rehabilitative services from which they might benefit, e.g. low vision clinics, other health-care practitioners, comanagement and support organisations.