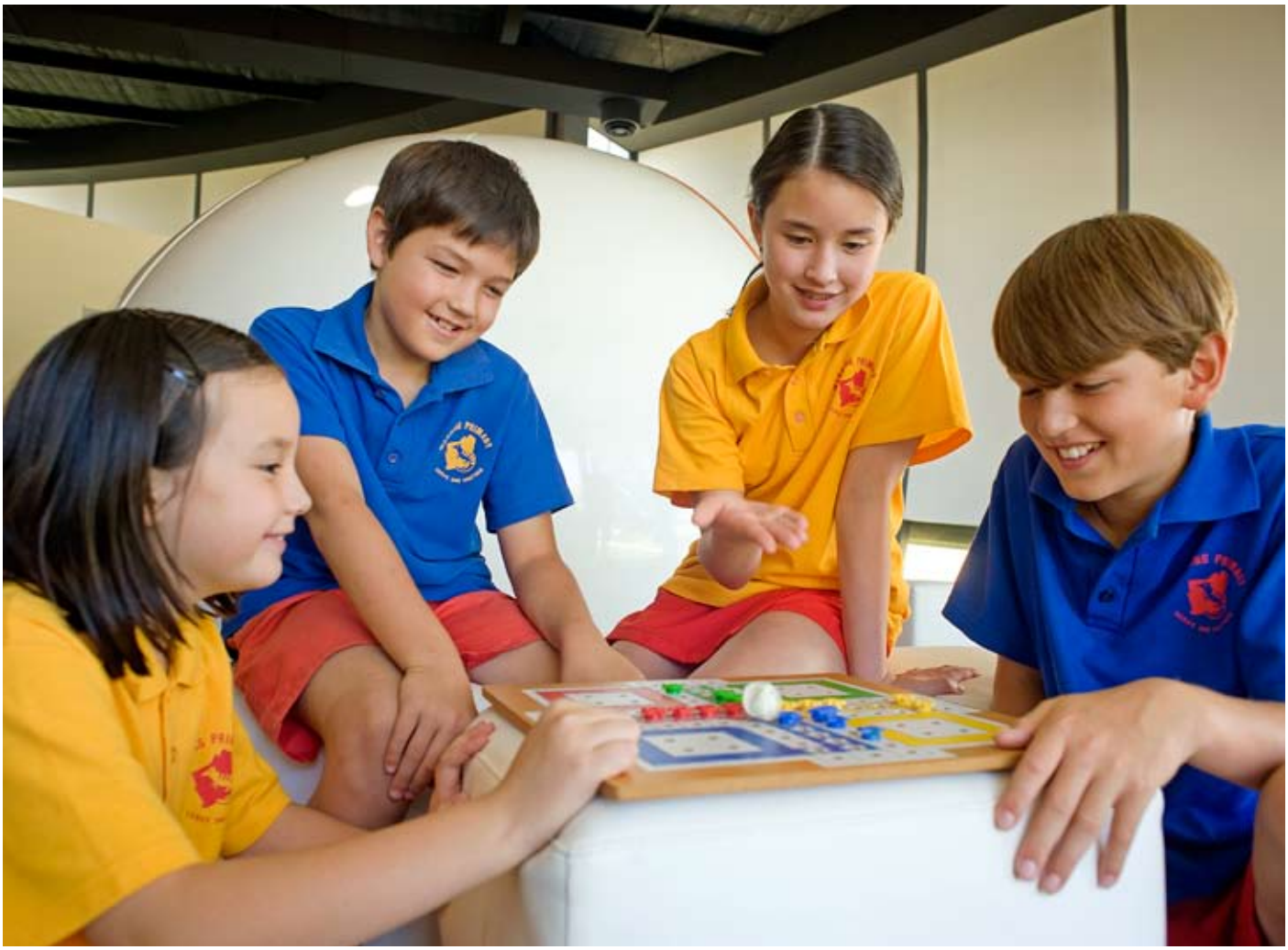
Kit 6:

Technology Help

Guide Dog Discovery Centre

Curriculum Worksheets

Association for the Blind of WA
Guide Dogs WA



Teachers Guide to Kit 6: Technology and Other Good Ideas

This kit focuses on Assistive Technology for people who are living with a disability, especially a vision disability.

It offers direct relevance for the English, Technology and Enterprise and Society and Enterprise Learning Areas as well as indirect relevance to Science, LOTE and Mathematics.

In this guide:

Key Messages & Learnings in this module:

1. When we design and use any technology we think about how people will use it, and in doing so, we make assumptions about people's abilities. But there are not many abilities that are common to all humans. If we design and create something that assumes an ability that not everyone has, we create a barrier to those people's participation. In a very real sense, we often make a disability much more of a problem than it needs to be.

2. For most people, vision is the dominant source of information. This has had a huge influence on the way humans have always designed and used technology. But technology designed to use vision can pose problems for people living with some degree of vision impairment.

3. Computers, the internet, movies and television are examples of very popular and important technologies of modern life but they can be challenging for anyone living with vision or hearing impairment.

4. Rethinking the way we design, create and use technology can make a big difference to people's lives.

Food for Thought: Technology Proves a Point

Education, training and employment have long been among the most difficult challenges facing people with a disability. Access to education and training has improved dramatically in recent decades but this has not yet translated to significant improvements in employment outcomes.

Disability is strongly linked to poverty and ill-health, not only for the person who has a disability but also their families. This impacts on the prosperity and wellbeing of their entire communities.

But recent progresses in technology show how the right tools can help rather than hinder people with disabilities - unlocking what they can do. When we get technology right, it can open up possibilities that benefit everyone.

Quick Overview of the Provided Activities

6.1 New & Improved

This exercise engages students in an innovation-based process of reconsidering a common invention in the context of vision impairment. A worksheet, which focuses on vision impairment, is provided but you can adapt the concept to any other form of disability or indeed allow students to choose which disability they will refer to.

6.2 Double Bonus Ideas

This is a straightforward worksheet-based activity designed to reinforce the philosophy behind the concept of Universal Design; not only that buildings, products and services should be designed to maximise the number of people who can access them, but also to maximise the ways in which these people can access them and the benefits they can derive. It is based on the belief that accessible design helps everyone, not just those who have a disability.

6.3 Simulated Surfing

This hands-on activity reinforces understandings and knowledge about the variety of eye conditions and vision impairments (refer to Kit 2) but does so with specific reference to assistive technology. The core components are construction (by either the teacher or the students) of a set of 'spectacles' which simulate different kinds of vision impairment and then browsing the internet with these 'spectacles', including exploration of the accessibility features of various websites.

Easily found materials which may be useful include flyscreen mesh off-cuts, fabric netting, bubble wrap, tissue paper, cellophane, plastic food wrap and paper with holes cut in to simulate tunnel or patchy vision. Although it is important to remember that these materials will not accurately simulate specific eye conditions, they can still be useful reminders of how much vision impairment, like other disabilities, varies not only in symptoms but in severity and significance.

There are number of ways you can choose to use this activity in the classroom such as:

- Setting up an interactive display which students can use in their spare time (or set it up with a number of other interactive displays based on other activities and conduct a lesson in which groups of students rotate through different activities)
- Providing students with light card, scissors, glue, sticky tape and various translucent or opaque materials with which to construct their own simulation spectacles for use on various websites.
- Offer a modified activity in which the screens of several computer monitors are covered in various materials. Engage students in browsing the internet, trying both sites they know well and sites they don't.

Good websites to include in your test list include:
Disability Services Commission of Western Australia
www.disability.wa.gov.au
Association for the Blind of WA – including the Accessibility page
www.guidedogswa.com.au

6.4 Online and Alright

This activity can be completed during class time but it also makes an ideal and self-contained homework task (although it does assume that students have internet access). It is also ideal as an extension activity for students who may have finished other work.

It involves a worksheet which asks students to explore and reflect on the visual aspects of websites. It is designed to both raise awareness of such features and to reinforce the concept that universal design features such as these offer benefits (economic and otherwise) across many parts of human society, sighted or not. For example, people who have literacy problems such as dyslexia can benefit from audio features. People who care for people with a vision impairment can benefit, as can businesses from higher customer numbers.

6.5 Audio Alive

This activity introduces the concept of “Audio Description” as an example of how accessibility can be improved for people who are blind or vision impaired, or who find it difficult to enjoy movies and television for other reasons. In an “Audio Described” movie, a narrator provides a commentary which is designed to describe and explain the visual content of the movie, such as scenery and setting as well as facial expressions and body language. The trick, of course, is to manage this without interfering with the soundtrack of the movie itself.

In this activity, students prepare their own audio described script (either in written, audio or oral format).

As above, this activity can be completed during class time (with an extract from a pre-recorded TV program) but it also makes an ideal and self-contained homework task. By varying the length and level of detail expected, it can easily be adapted to suit the level at which your students are working.

Other Suggested Learning Activities

Discussions & Projects

- Hold a discussion around things we don't think of as 'disabilities' but which nonetheless create challenges and to which we have technological responses. For example, small children cannot do some things safely so we have invented all sorts of devices to help. Discuss left-handedness – what things are more difficult for left-handed people to use. Explore with your students the concept that this difficulty is created because the devices were designed for right-handed people, not because being left-handed is a disability in any sense.
- Ask your students to spend a week observing devices and technologies used by the people they know – and to think of ways these can be made better.
- With older students you might like to hold a debate (or a series of small debates) about the pros and cons of designing prosthetics and bionic devices. For example, you could debate whether government money should be invested in helping develop a bionic eye ensuring that the students consider the question of whether disabilities are things we should try to 'fix' at all or whether they are part of the natural diversity of humans. Should we try to give everyone the same abilities? An interesting discussion question here is "Who decides this?"
- Engage pairs or small groups of students in role-playing a job interview in which the candidate has a vision impairment.
- Set a 'speculative fiction' creative writing task to explore what futuristic technology could mean for people who have a disability.

Useful Websites

www.disability.wa.gov.au
www.assistiveware.com/podcasts.php
ww.edutopia.org (including www.edutopia.org/technology-visually-impaired-video)
www.ithaca.edu/wise/topics/educ_students.htm
www.yourlocalcinema.com.au/about-accessible-cinema
www.mediaaccess.org.au

iTunes & You Tube

Both of these sites have some freely available resources related to the enabling role that technology can play for people living with a disability. We recommend that you explore these resources before deciding which to use with your students.

On iTunes you may like to start by exploring the following free podcast series:

- The Assistive Technology Show
- Closing the Gap
- Exploring the frontiers of Assistive Technology

On www.youtube.com you may like to search under the keywords "assistive technology" or "adaptive technology" and explore the various video clips available at that time.

Background Reference Material

Nobody is sure exactly how many people have a disability but the World Bank estimates between 10 and 12% of all people on Earth live with a disability of some kind which interferes with the normal tasks of daily living. That's more than 600 million people. Many (perhaps a third) of these are considered to have a severe disability.

Terminology

Language is powerful; the words we choose and how we use them really matters. But there isn't unanimous agreement on the correct language to use when talking about disability. Some people, for example, feel that saying 'people with disabilities' is better than 'disabled people' because the person comes first and the disability is not used a label. Others may (and do) disagree but in Western Australia, the decision has been made that "people with a disability' is the appropriate phrase or to adapt this to context such as 'people who are blind or vision impaired'.

Similarly, some people prefer the term 'visually impaired' and others 'vision impaired' to avoid any suggestion that the impairment relates to how someone appears to others but only to their own vision capacity. 'Visually impaired' is not generally considered acceptable in Western Australia. The phrase 'the blind' is considered outdated and unacceptable.

Prosthetics refers to the production and application of artificial body parts. These may or may not replicate body functions.

Bionics refers to using electronics and/or mechanical parts to help people do difficult or dangerous things by supplementing or duplicating parts of the body:

Universal Design is the simple idea that we should design and create all buildings, products and services so that we maximise the number of potential users and the extent of their use. Universal Design should cover a range of abilities, sizes and ages.

Examples - Assistive Technology for People who are Blind or Vision Impaired

Device or System	What it does
Accessible Mobile Phones	Some phones have various features which can be useful including a tactile dot on the number 5, large text, colour contrast options, large buttons, sound effects, talking menus.
Braille Translation Software	Software programs which translate regular text into Braille coding.
Computer Magnification	Software which allows for text and images to be magnified much more than regular software.
Video Magnifiers (CCTV)	Video devices of various sizes which magnify images – these can be useful in different ways than computer magnification.
Electronic/Refreshable Braille Displays	Electronic devices which display Braille code using tiny metal or plastic pins. Used with Braille translation software.
Electronic Identification Devices	Devices which create and then 'read' labels. A popular example uses barcode technology to enable people to label large numbers of items with barcodes which can then be read with a hand-held device.
Embossing Machines	Machines which function much like printers except that instead of putting ink on paper, they put impressions on paper. These include Braille embossers but also devices which create tactile images such as maps and diagrams.
Portable Computers/ Electronic Notetakers	Various devices can be used for people who are blind or vision impaired to take notes by typing into a Braille or regular keyboard. Especially useful for students and people attending meetings or lectures.
Portable Reading or Playback Devices	These devices read information from various sources out loud. Some need to be used with a computer, others can be used independently.
Print Scanners	These are machines which work a little like photocopiers but use Optical Character Recognition software to enable the information to be turned into a synthesized voice. These are especially useful for reading simply designed document such as reports, bills, or novels.
Screen Readers	A screen reader works with a voice synthesizer to turn the information on a computer screen to audio.
Talking GPS	The satellite-driven Global Positioning System or GPS allows people to have real-time access to information about where they are and what is nearby. Talking GPS systems use portable notetakers and specialized software to give this information in audio format.

Relevant Extracts from the Western Australian Curriculum Framework
Learning Areas and Outcomes information for this kit

Technology & Enterprise	TECHNOLOGY IN SOCIETY	• Students understand how cultural beliefs, values, abilities and ethical positions are interconnected in the development and use of Technology and Enterprise. • Students evaluate the appropriateness of technologies on ethical and moral grounds, as well as considering economic advantage and the suitability of products, processes, systems, services and environments for individuals and groups at local, national and international levels.
	SYSTEMS	• Students design, adapt and use systems that are appropriate to achieving solutions to technology challenges.
	PROCESSES	• Students apply a technology process to create or modify products, processes, systems, services or environments to meet human needs and realise opportunities.
Society & Environment	TIME, CONTINUITY & CHANGE	• Students understand that people's actions and values are shaped by their understanding and interpretation of the past. • Students recognise that by studying people and events of the past, they can better understand the present and make informed judgments about the future. They realize that people's ideas and values are influenced by the actions and values of those who have come before. • Students can, for example, explore the impact of technological and economic developments.
English	WRITING	• Students write for a range of purposes and in a range of forms using conventions appropriate to audience, purpose and context.

New & Improved

Imagine you are in charge of a company that helps other people to make their inventions and products better.

1. What to do first: *Understand the problem*

Choose and draw an invention that you know well.

Label your diagram to show how you think this invention is (or could be) difficult or dangerous for someone who is blind or vision impaired to use.

2. What to do next: *Come up with new ideas*

Think of ways to make it easier or safer for someone who is blind or vision impaired to use.

How could you change the things that are a problem now?

Are there other new features that could make it even easier and safer to use?

List or draw your ideas.

3. What to do last: *Make a decision*

Which of your ideas would be most helpful to people who are blind or vision impaired?	*Which of your ideas could also be useful for people who aren't blind or vision impaired?*
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Which ideas do you think are best for your company to develop? Why?

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Double Bonus Ideas

Some ideas and inventions can be useful in more ways than their inventor first thought.

For example, some things invented for sighted people can be useful for people living with blindness, too, and many things invented for people who are vision impaired can also be useful for people who are fully sighted.

For each one of these inventions, write at least one task for which it could be useful to someone who is blind or vision impaired and one for someone who is fully sighted.

Sticker Dots	Colour-Detector	Textured Clothes Labels	Magnifying Glass	Audio Software
Satellite Navigation	Bar Codes & Scanners	Bumpy Paving Stones	Voice Synthesizer	Puff Paint

Simulated Surfing

Imagine what it's like to surf the internet if you are blind or vision impaired. It probably seems difficult or impossible but it's not at all!

You might be surprised at how many clever ideas are helping make the internet friendlier and more useful for people living with vision impairment.

1. Browsing with a difference

Using sets of spectacles made of various materials, explore several websites.

Site URL	What is it like to visit without your normal vision?

2. Try Again with Tricks Up Your Sleeve

Read the Common Accessibility Features *information.*
Now explore the sites above again - as well as some new ones.

Site URL	What accessibility features do you find most useful and why?

Common Website Accessibility Features

Recent versions of Microsoft Windows, Apple operating system (Mac OS) and Linux contain many accessibility features that can assist people who are blind or vision impaired.

Adjusting the text size:

Internet Explorer – Windows 98/ME/2000/XP
Go to the 'View' pull-down menu and go to 'Text Size'

A pop-up menu should appear showing you five different text sizes. Select 'Larger' or 'Largest' to make the text larger. This will also increase the size on many other sites.

Internet Explorer - Windows Vista/7
Hold down the CTRL key on your keyboard. Press the '+' key to make the text bigger or the '-' key to make the text smaller. Keep repeating step 2 until the text is at a suitable size.

Safari – Mac OS
Hold down the 'Apple' key and press the '+' key. Repeat until the text is at a suitable large.

Firefox – Windows (all), Mac OS, Linux
Hold down the CTRL key on your keyboard. Press the '+' key to make the text bigger or the '-' key to make the text smaller. Keep repeating step 2 until the text is at a suitable size.

Adjusting the Colour Contrast:

Internet Explorer – Windows 98/ME/2000/XP/Vista/7
Go to the 'Tools' pull-down menu and select 'Internet Options'. In the bottom-left hand corner you will see a 'Colors' button. Select this button and choose the colours you want then click OK on the 'Colors' and 'Internet Options' screen.

Safari – Mac OS
The easiest way to change the colours is to use the built-in 'reverse' feature in Mac OS 10.4 Tiger or higher. This will reverse all colours on the screen. This option can be selected by holding down the 'CTRL', 'Option' and 'Apple' keys while pressing the number '8'. Repeat step 1 to change the colours back to normal.

Firefox – Windows (all), Mac OS, Linux
Go to Options > Content > Colour to change the colour settings.

Text-to-Speech Access:

Windows 98/2000/XP/Vista/7:
You can purchase an additional software program such as JAWS that will allow your computer to read web pages to you aloud.

Mac OS:
Mac OS 10.4 Tiger and higher have a built-in program called VoiceOver which can read aloud text on your computer screen, including web pages. To turn on VoiceOver, hold down the 'Apple' key and press the 'F5' key. Further information about VoiceOver can be obtained from Apple web site www.apple.com

Linux
Linux Operating Systems such as Ubuntu, Suse and Fedora have a built-in program called Orca which, like VoiceOver, can read aloud text on your computer screen including web pages. It also has a built in magnifier and the ability to change colour contrast. More information about Orca is at http://live.gnome.org/orca

Audio Alive

Lots of cool inventions have been created to make things better for people who are living with a disability (many of them have been created by people who have a disability themselves!).

One of these clever ideas is "Audio Described" movies and television. Try creating some for yourself.

What to do

Choose one section of a movie or television program. Prepare a description of what is happening for someone who is blind.

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Things to remember:

✓ Your audience will want to hear the soundtrack, the actors speaking and any sound effects.
✓ Your description should stick only to what you can see.
✓ Keep it short … and don't talk over the top of the good bits!

Online and Alright

More software packages and websites are now being designed with features for people who are blind or vision impaired.

Here are some examples:

- ✓ Text enlargement
- ✓ Audio (built-in sound recording that reads something out loud)
- ✓ Text-only options
- ✓ Options to change colour contrast

What to do

Visit a variety of websites until you have found at least five with features designed for people who are blind or vision impaired. Complete the table below.

Website Address	Whose website is it? What is it about?	What features does it have?

Blindness and vision loss are the most common type of disability in the world. Although nobody knows the exact numbers, many millions of people live with blindness and vision loss every day.

This means that any new ideas which can help people who are blind have plenty of potential customers! And many of these ideas can be useful for sighted people, too.

Make a list of groups of people who could benefit from these features, and why this matters (we have started you off).

Group of people who could benefit	**Types of benefits**
People who are blind or have a vision impairment	