Vision Health Module
Teaching Plan

❖ ***How do our eyes work – Part 1***

❖ ***How do our eyes work – Part 2***

❖ ***Looking after our eyes***

❖ ***We all see differently***

❖ ***Technology and Vision***

❖ ***Child-to-Child Vision Screening***

Contents

Overview

The Vision 20/20 Project

The Vision 20/20 Project began in 2019 to address the need to improve vision screening for children in schools; currently in New Zealand, vision screening is not mandatory. Children are screened only in Year 7 and there are issues with absences, results not reaching parents, and teachers are not informed of the results.

Eighty percent (80%) of learning requires vision, and over half of our brain is dedicated to vision and visual processing. Even small deficits in vision can seriously impact the academic, behavioural and sporting performance of children.

The Vision 20/20 Project is a multi-disciplinary research collaboration between occupational therapy and product design at Otago Polytechnic, the school of medicine (ophthalmology) at Otago University and staff and pupils at Tahuna Normal Intermediate School.

Our solution has been to develop a toolkit for child-to-child vision screening. This toolkit enables children to screen each other's vision in the classroom. We aim to raise awareness about the need for good vision in the classroom among children and teachers. Hopefully, children will take these messages home and encourage their parents to bring them to an optometrist if necessary. Children also learn about vision science and eye health. We hope in this way to raise awareness and results are both sent home to parents and recorded into the school database. Our project aims to ensure that 100% of Year 7 children have their vision tested and obtain glasses if necessary; removing any visual impairment barriers that are preventing them from participating fully in their school and home life.

We have integrated the vision screening toolkit into a teaching package; the "Vision Health Module". The provision of child-to-child vision screening in the context of teaching about vision and eye health ensures that the conversation about vision is one that is owned by the teacher and the pupil. This method of teaching empowers children by increasing the level of interest and relevance to the children.

The Vision Health Module

The Vision Health Module is a ready-made teaching package for Year 7 teachers to implement in their classrooms, over six separate sessions. It incorporates the New Zealand science and health curricula and necessitates minimal preparation from teachers.

Aims of the Vision Health Module

- To improve children's knowledge regarding the eye and vision, eye health, and available technology for the management of visual impairment, and to present this knowledge in a manner that conforms to the New Zealand Science and Health Curricula.
- To introduce children to fair testing concepts, and to empower them to take responsibility for their own eye health.
- To explore children's attitudes regarding visual impairment and wearing glasses, and to increase their confidence in their ability to seek help for visual problems.
- To utilise fun activities and hands-on learning to enable children to understand others' experiences of visual impairment and how vision impacts our health.

Each unit utilises a Google Slides PowerPoint presentation with full teaching notes, and includes a mixture of teacher-led learning, class discussions and practical activities.

Units have been designed to be used either individually or worked through as a complete package.

Summary of units

How do our eyes work – part 1: This unit introduces children to key parts of the eye and their function. There are various activities to be completed to consolidate learning.

How do our eyes work – part 2: This unit builds on the learning completed in "How do our eyes work – part 1". It investigates more advanced concepts such as blind spots, dominant eyes, and optical illusions. Each area has an associated practical activity.

Looking after our eyes: This unit introduces children to the importance of vision for learning, ways to look after their eyes, common symptoms of visual impairment, and what it is like to visit the optometrist.

We all see differently: This unit introduces children to relevant eye conditions and enables them to experience these through vision simulations.

Technology and vision: This unit investigates technology that can mitigate the effects of visual impairment. This lesson includes a lot of hands-on learning.

Child-to-child vision screening: This unit includes a short Google Slides presentation to introduce the child-to-child vision screening process. Children are then divided into groups of three. Three to four (3-4) groups complete the vision screening at once (9-12 children), under supervision from the teacher.

Student workbook

The student workbook has been designed to be completed in conjunction with the units.

Activity	Can be used with
Activity 1: Drawing partner's eye – labelling parts	How do our eyes work – part 1
Activity 2: Labelling parts of the eye – side view	How do our eyes work – part 1
Activity 3: Mix and match – draw line from part of eye to correct function	How do our eyes work – part 1
Activity 4: Optical illusions	How do our eyes work – part 2
Activity 5: Crossword – eye health	Looking after our eyes
Activity 6: Wordfind – eye conditions	We all see differently
Extension activities	All

Achievement Objectives

Students' prior knowledge

This module is taught assuming students have limited prior knowledge of vision, eye health, eye conditions, technology used to mitigate visual impairment, and vision screening. Even if children have visited the optometrist, they will likely not have used "tumbling E" charts.

However, the level of prior learning may differ between students in the class due to differences in their primary school curriculums. This is addressed by asking the children throughout the lesson what their prior knowledge is about each topic. The time spent on each part of the lesson can then be adapted as necessary.

Level 4 Science concepts

Investigating in science
- Build on prior experiences, working together to share and examine their own and others' knowledge.
- Ask questions, find evidence, explore simple models, and carry out appropriate investigations to develop simple explanations.

Participating and contributing
- Use their growing science knowledge when considering issues of concern to them.
- Explore various aspects of an issue and make decisions about possible actions.

Level 4 Health concepts

D1 Societal attitudes and values
- Investigate and describe lifestyle factors and media influences that contribute to the well-being of people in New Zealand.

D2 Community resources
- Investigate and/or access a range of community resources that support well-being and evaluate the contribution made by each to the well-being of community members.

Learning Intentions

By the end of this Vision Health Module students will be able to:

- Examine and build on their knowledge of how the eye and vision work.
- Carry out basic fair testing through the use of peer vision screening.
- Investigate technology for visual impairment.
- Make informed choices about eye care and eye health.
- Identify factors which contribute to children wearing glasses.
- Experience and reflect on the impact of visual impairment.
- Explore societal attitudes regarding wearing glasses.
- Describe and evaluate how the Vision Health Module supports the development of well-being for students.

Learning intentions have also been developed for each unit and are listed at the end of each unit. There are two different options for evaluating these.

Vision Health Module
How do our eyes work – Part 1

Brief Description

Students will learn about key parts of the eye and their function.

Duration: 45 minutes

Year Level: 7

Topics: Vision

Preparation: 15 minutes

Overview

| Whole class | PowerPoint slides and learning, including class discussions | 15 minutes |
| Small groups | Activities (individually or in small groups) | 30 minutes |

HOW DO OUR EYES WORK – PART 1		
Topic	**Info/learning**	**Related activity**
What is vision?		• Brainstorm what children already know about vision and eyes
Parts of the eye – front view	• Label parts, discuss function of each	• Brainstorm what parts children already know • Complete workbook activity – drawing partner's eye and labelling parts
Parts of the eye – side view	• Label parts, discuss function of each	• Brainstorm what parts children already know • Complete workbook activity - Labelling side-view diagram • Mix and match – functions of eye parts
Parts of the eye – interactive	• Review parts of the eye and functions	• Complete workbook activity - Mix and match – functions of eye parts
Iris colour survey	• Discuss most common iris colours around the world	• Survey class iris colours, compare to worldwide results
Pupil size	• Review the function of the pupil	• Work in pairs to complete pupil size activity

Equipment and Preparation

<u>Equipment</u>

- Google Slides PowerPoint link
- Computer and screen to display PowerPoint
- Whiteboard and pen (to survey class iris colours)
- Student workbook – activities 1, 2, 3

<u>Preparation</u>

- Become familiar with material and activities

Teacher Notes

A picture of each slide is included with teacher notes below. These teacher notes are included in the Google Slides presentation as well.

Title page

Slide 2: What is Vision?

What is vision?
- Brainstorm with the class what they already know about vision and the eye, to determine their prior level of learning.

Slide 3: Parts of the eye – front view
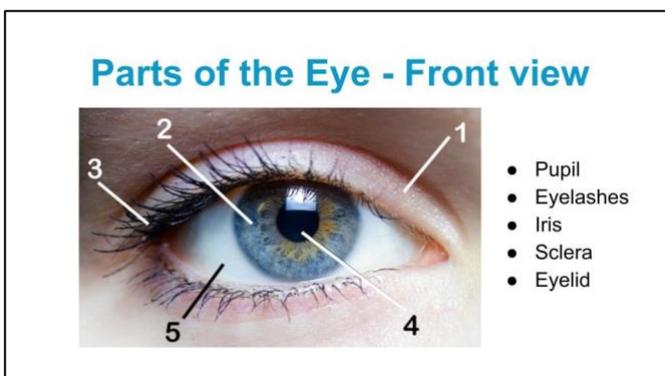
See which parts of the eye the children can already name (answers on next slide).

Slide 4: Parts of the eye – front view
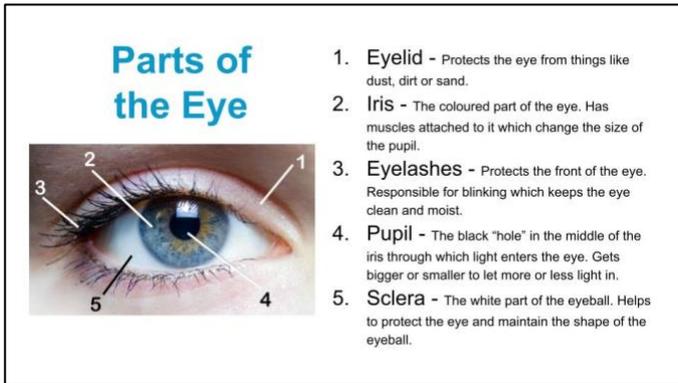
Discuss what each part does.

- Eyelid: protects the front of the eye. Responsible for blinking which keeps the eye clean and moist.

- Eyelashes: protect the eye from things like dust, dirt or sand.

- Sclera: the white part of the eyeball. Covers most of the eyeball, tough. Helps protect eye and maintain shape of eyeball

- Pupil: black circle in the middle of the iris through which light enters the eye. Like a hole, or an opening in the iris. Can get bigger or smaller to let more or less light in.

- Iris: the colourful part of the eye - determines what colour our eyes are. Has muscles attached to it which change the size of the pupil to let more or less light in.

Workbook activity: complete "Activity 1: Drawing and Labelling an Eye" in the student workbook.

## Slide 5: Parts of the eye – side view
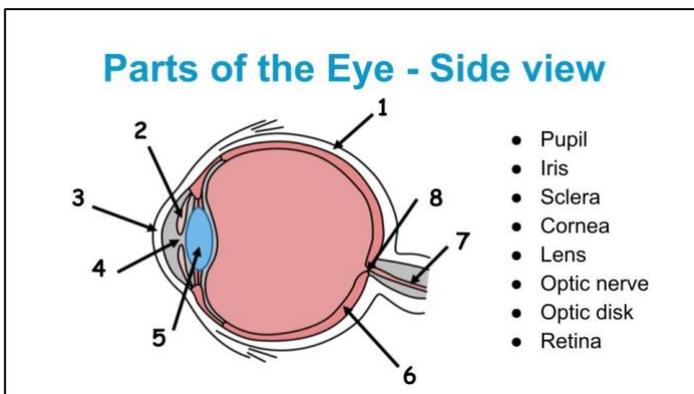
See which parts of the eye the children can already name (answers on next slide).

## Slide 6: Parts of the eye – side view
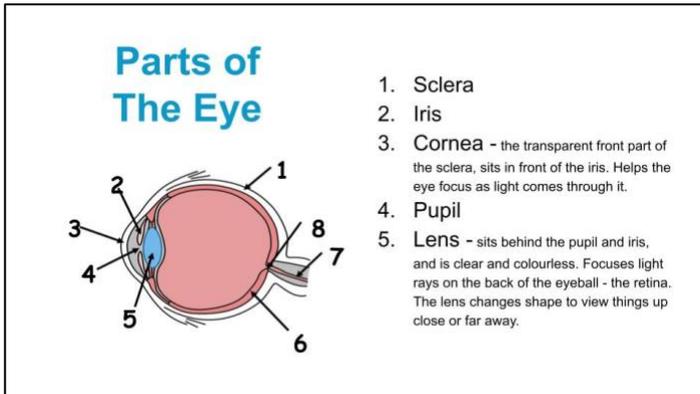
Discuss what each part does.

- Cornea: the transparent front part of the sclera, sits in front of the iris. Helps the eye focus as light comes through it.

- Lens: behind the pupil and iris, clear and colourless. Focuses light rays on the back of the eyeball - the retina. The lens changes shape to view things up close or far away.

Ask the kids - who remembers what the iris, pupil and sclera do? (Answers on slide 4).

Slide 7: Parts of the eye – side view
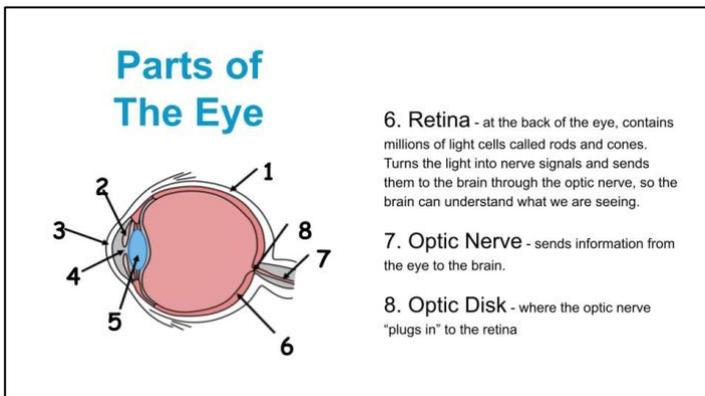
Discuss what each part does.

- Retina: at the back of the eye, contains millions of light cells called rods and cones. Turns the light into nerve signals and sends them to the brain through the optic nerve, so the brain can understand what we are seeing.

- Optic Nerve: sends information from the eye to the brain.

- Optic Disk: where the optic nerve "plugs in" to the retina (in other words, the optic disk is the front surface of the optic nerve).

Workbook activity: complete "Activity 2: Labelling the parts of the eye" in the student workbook.

Slide 8: Parts of the eye – recap
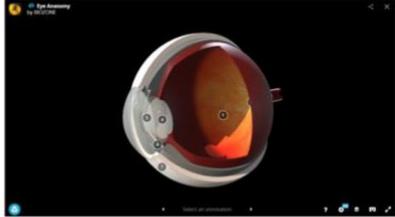
Use the interactive model to move the eye around and look at parts of the eye from different angles. Label each part of the eye, and review functions.

Workbook activity: complete "Activity 3: Mix and Match" in the student workbook.

Slide 9: Activity – Iris colour survey

The iris can be many different colours. Eye colours vary depending on what country you live in, but eye colour statistics from around the world are as follows:

Brown:
- 55-79% of the world's population.
- One of the reasons that brown is the most common eye colour is that eye colour is partially genetic, and the colour brown is dominant. This means that if one of your parents has brown eyes, you will likely also have brown eyes, even if your other parent has different coloured eyes.

Blue:
- 8-10% of the world's population.
- All people who have blue eyes have a very distant common ancestor!

Hazel:
- 5% of the world's population.
- Hazel eyes look like a mixture of brown, green, orange and gold.
- This eye colour is common in North Africa, the Middle East, Brazil and Spain.

Amber:
- 5% of the world's population.
- These eyes look like a very light brown or golden yellow.
- This colour is common in people who are Asian, Spanish, South American or South African.

Green:
- 2% of the world's population.
- This colour is very common in people who are Irish or Scottish, or who live in Northern Europe.

Grey:
- <1% of the world's population.

Red:
- <1% of the world's population.
- This is usually when someone is albino and they lack pigment (colour) in their skin. This means they also lack pigment in their eyes, so the light reflects off the blood vessels in their eyes and make them look red.

Heterochromia:
- <1% of the world's population.
- This is where each iris is a different colour. It is common dogs but very rare in people.

Iris colour survey
- This activity is best completed teacher-led, as a whole class.
- First ask students to discuss in pairs or small groups what their eye colours are.
- Call out each colour and ask children to put their hands up if their eyes are that colour.
- Have a child count the hands and tally the numbers on the board.
- Calculate the percentage of each eye colour in your classroom.
- Compare to the statistics of eye colour from around the world.

Discussion
Discuss what eye colours children have in their family – are they mostly similar or different? What colours are most common? Are their eyes the same colour as their parents and siblings?

Statistics from: https://www.worldatlas.com/articles/which-eye-color-is-the-most-common-in-the-world.html

Slide 10: Activity – Pupil size

Recap:
- The pupil is actually a "hole" in the middle of the iris, through which light enters the back of the eye. It can get bigger or smaller to let more or less light in.
- The pupil only takes in as much light as it needs to see things.
- When the environment is bright, the pupil becomes smaller to let less light into the eye.
- When the environment is dark, the pupil becomes larger to let as much light as possible into the eye.

Ask students to complete this activity in pairs or threes. Then come back together and discuss the results as a class.

Activity instructions:
In pairs or threes, you are going to observe how your pupil changes size in response to light.

1. Look towards the window or an area of bright light for 10 seconds. Observe the size of each other's pupils – are they large or small?

2. Now cup your fingers around your eyes and look somewhere dark for 10 seconds. Observe the size of each other's pupils again. Have they changed size?

Learning Intentions

There are two options for evaluating the learning intentions from this uniy: teacher or peer assessment.

1. Teacher assessment: the teacher can photocopy this page and evaluate these intentions with each child
2. Peer assessment: the children can evaluate their level of learning with a peer.

CHILD'S NAME:	CLASS:		
LEARNING INTENTIONS **How do our eyes work – Part 1**	**ACHIEVEMENT LEVEL**		
	YES	NO	PARTLY
Identify key parts of the eye and their function (pupil, iris, cornea, sclera, eyelash, eyelid, retina, optic nerve, optic disk)			
Compare class iris colours to worldwide statistics			
Experience how pupil size changes in response to light			

Vision Health Module
How do our eyes work – Part 2

Brief Description

Students will gain a deeper understanding of how their eyes work, including learning about blind spots, dominant eyes, and optical illusions.

Duration: 45 minutes

Year Level: 7

Topics: Vision

Preparation: 15 minutes

Overview

| Whole class | PowerPoint slides and learning, including class discussions | 15 minutes |
| Small groups | Activities (individually or in small groups) | 30 minutes |

HOW DO OUR EYES WORK – PART 2		
Topic	**Info/learning**	**Related activity**
Parts of the eye - recap	- What is the optic disc? - What is the retina? - How does light get to the brain?	Brainstorm what children have remembered from Unit 1
Blind spots	What is a blind spot?	- Finding your blind spot activity – part 1 - Finding your blind spot activity – part 2
Dominant eyes	What is a dominant eye?	Finding your dominant eye activity
Optical illusions	- What are optical illusions? - Watch video about making own optical illusions at home	Workbook activities – optical illusions - what do you see?

Equipment and Preparation

<u>Equipment</u>

- Google Slides PowerPoint link
- Computer and screen to display PowerPoint
- Blank white A4 paper (one each per student)
- Black pens
- Student workbook – activity 4

<u>Preparation</u>

- Become familiar with material and activities

Teacher Notes

A picture of each slide is included with teacher notes below. These teacher notes are included in the Google Slides presentation as well.

Title page

Slide 2: Parts of the eye - recap
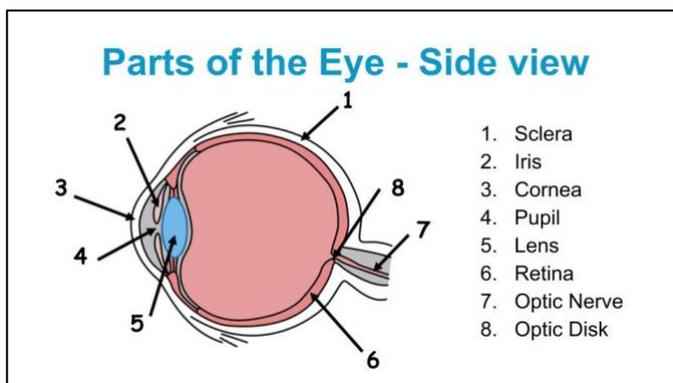
Review each part of the eye, including function. Focus discussing the function of the retina, optic nerve, and optic disk.

1. Sclera: the white part of the eyeball. Covers most of the eyeball, tough. Helps protect eye and maintain shape of eyeball

2. Iris: the colourful part of the eye - determines what colour our eyes are. Has muscles attached to it which change the size of the pupil to let more or less light in.

3. Cornea: the transparent front part of the sclera, sits in front of the iris. Helps the eye focus as light comes through it.

4. Pupil: black circle in the middle of the iris through which light enters the eye. Like a hole, or an opening in the iris. Can get bigger or smaller to let more or less light in.

5. Lens: behind the pupil and iris, clear and colourless. Focuses light rays on the back of the eyeball - the retina. The lens changes shape to view things up close or far away.

6. Retina: at the back of the eye, contains millions of light cells called rods and cones. Turns the light into nerve signals and sends them to the brain through the optic nerve, so the brain can understand what we are seeing.

7. Optic Nerve: sends information from the eye to the brain.

8. <u>Optic Disk</u>: where the optic nerve "plugs in" to the retina (in other words, the optic disk is the front surface of the optic nerve).

Slide 3: What is a blind spot?

Who remembers the optic disk?
Optic disk = where the optic nerve "plugs in" to the retina
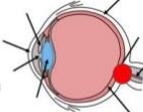
- The rod and cone cells in the retina convert the light to electrical signals to go to our brain. However, there are no rod and cone cells at the optic disk.

- What does this mean?
  - This means that the area of your optic disk doesn't give your brain any visual information, and that this part of our visual field is not perceived.
  - When you hold the paper so the light from the dot falls on your optic disk, you CAN'T see the dot!
  - When the light isn't falling on your optic disk, you CAN See the dot.

- How come you don't usually notice this!? Because our clever brain "fills in the gaps"! Let's see an example of this (next exercise).

This concept may be difficult to grasp for some children.

Slide 4: Finding your blind spot – Part 1

Explain to the children that they are going to do an activity to find their blind spot.

- Students can complete this activity individually or in pairs.
- It may be easier to complete steps 1-3 as a class.
- Once the activity is completed, discuss the results as a class.

Equipment needed per student
- 1 piece of A4 paper
- Black pen
- Ruler
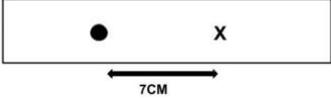
Instructions Part 1:
1. Fold the piece of A4 paper in half (so it's A5 size), then fold in half again the same way, so you have a long, narrow piece of paper, as in the picture above.

2. Draw a 1cm circle on the left side of the paper.

   a. Measure 7cm to the right, then draw a 1cm cross.

3. Hold the paper so the cross is on the **RIGHT** side, an arm's length away from your nose.

4. **Close your RIGHT eye** and **look at the cross with your LEFT eye.**

5. Move the paper **very slowly** towards your nose. Make sure you keep looking at the cross.

6. You will find that the dot disappears then reappears as you move the paper towards you!

7. Repeat for the other eye: turn the paper so the cross is on the left, and cover your left eye.

Explanation: the dot disappears for a brief moment - this is when the light is falling on their optic disk. No signals are going to their brain so the brain thinks there is nothing there. When the light stops falling on their optic disk, they can see the dot again.

Slide 5: Finding your blind spot – Part 2
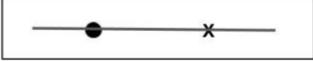
Instructions Part 2

1. Draw a line straight through the circle and cross as shown.

2. Repeat Part One. You will find that even when you can't see the circle, the line appears to have no gaps.

What's going on?
This is an example of your brain "filling in the gaps". When the light hits your blind spot and the dot disappears, your brain assumes that the line is unbroken and fills in the piece of the line where the dot would be, so even though you can't see the dot, the line seems to continue. The brain is very good at filling in gaps from your blind spot and usually this is helpful, as it would be very annoying to notice your blind spot all the time.

Discuss results as a class.

Slide 6: What is a dominant eye?

- Because our eyes are in slightly different positions, they actually see two slightly different images. Our brain is really good at combining these two images into one 3-D image.

- However, when looking at something with both eyes, most people see the image from one eye more than the other. This is your dominant eye; the eye that we prefer to use, and which sends slightly more information to the brain about what we are seeing.

- Having a dominant eye is like being left or right-handed. People can be right-eye dominant, left-eye dominant, or neither. 80% people are right-eye dominant, 10% left, 10% neither. Your dominant eye is not necessarily the same as your dominant hand.

Slide 7: Activity – Finding your dominant eye

Students can complete this activity individually or in pairs.

Demonstrate first.

Student instructions

1. Make a triangle with your index fingers and thumbs as in the photo - make sure the triangle is small.

2. Hold your arms out straight in front of you, as far away as possible

3. With both eyes open, look through the triangle at an object in the distance (at least 3m away). Make sure the object is in the centre of the triangle.

4. Keep your hands still but close your right eye. Does the object stay in the centre of the triangle or appear to move?

5. Still keeping your hands still, now open your right eye but close your left. Does the object stay in the centre of the triangle or appear to move?

6. The eye that was open when the object moved the least, is your dominant eye.

Discussion

- The eye that was open when the object moved the least, is your dominant eye. For example, you were looking through the triangle with your left eye (your right eye was closed), and the object hardly seemed to move. You then looked through the triangle with your right eye open (left eye closed), and the object was no longer in the centre of the triangle and appeared to move to one side. In this case, your left eye is your dominant eye, and the one you use the most.

- How many children have a right dominant eye? How many a left? How many neither?

Slide 8: What is an optical illusion?

- Recap: the eyes send signals to the brain about the colour, light and patterns of we are seeing. The brain then interprets these signals to work out what we are looking at.

- The problem is that these signals between our eyes and brain are very basic. Sometimes the brain must "fill in the blanks" from the signals it gets from the eyes, or it gets these signals mixed up.

- **Optical illusion = when the brain gets confused about what it is seeing.** For example, the brain might think things are moving when they're not or see colours that aren't really there.

Workbook activity: complete "Activity 4: Optical Illusions" in the student workbook.

Slide 9: Optical illusion video

Watch the video about creating your own optical illusions at home.

Learning Intentions

There are two options for evaluating the learning intentions from this unit: teacher or peer assessment.

1. Teacher assessment: the teacher can photocopy this page and evaluate these intentions with each child
2. Peer assessment: the children can evaluate their level of learning with a peer.

CHILD'S NAME:	CLASS:		
LEARNING INTENTIONS **How do our eyes work – Part 2**	**ACHIEVEMENT LEVEL**		
	YES	**NO**	**PARTLY**
Have a basic understanding of your blind spot			
Identify your dominant eye			
Have a basic understanding of what optical illusions are			

Vision Health Module
Looking after our eyes

Brief Description

Students will gain a deeper understanding of eye health and vision, including learning about digital eye strain, looing after their eyes, the importance of vision for learning, symptoms of eye problems, and what it's like to visit an optometrist.

Duration: 45 minutes

Year Level: 7

Topics: Eye health, vision

Preparation: 15 minutes

Overview

Whole class	PowerPoint slides and learning, including class discussions	25 minutes
Small groups	Activities (individually or in small groups)	20 minutes

LOOKING AFTER OUR EYES		
Topic	**Info/learning**	**Related activity**
Digital eye strain	• Overview of digital eye strain	• Brainstorm – what is this?
20-20-20 rule	• Overview of rule	• In groups make an eye-catching poster illustrating this concept
Looking after your eyes	• Wearing sunglasses • Spending time outside	• Workbook activity – crossword about eye health
Vision and learning	• Overview of why vision is important	• Brainstorm symptoms someone might have if they needed to get their eyes tested
Things to look out for	• List of possible symptoms of visual impairment	• How many did the children think of?
Eye testing – visiting an optometrist	• Brief overview of process • Watch video of process	• Who has been to an optometrist? What was it like? • Discuss children's thoughts on wearing glasses
True/False	• Discuss answers	• In groups, answer true/false questions related to vision and learning

Equipment and Preparation

Equipment

- Google Slides PowerPoint link
- Computer and screen to display PowerPoint
- Materials to make poster
- Student workbook – activity 5

Preparation

Become familiar with material and activities

Slide 1: Title page

Slide 2: Eye Health – Digital eye strain

What is digital eye strain?
- Also called computer vision syndrome.
- From spending too long looking at screens (computer, iPad/tablet, phone)
- Results in eye discomfort and vision problems, from prolonged computer, tablet or phone use.

Symptoms:
- Sore eyes
- Sensitivity to light
- Headaches
- Difficulty refocusing between distance and near

Treatment:
- Test your vision - use glasses if necessary
- Blink regularly
- Have screen tilted away from you not upright, have top of screen bit lower than eye level so looking down at it
- 20-20-20 rule - on next page.

Slide 3: Eye Health – The 20-20-20 rule

- 20-20-20 rule: every 20 minutes take a 20 second break and look at an object that's 20 feet away
- How far is 20 feet? About 6 metres.
- Why do you think this helps?
  - You are refocusing your eyes and looking at something in the distance.

Slide 4: Eye Health – How else can we look after our eyes?

Other ways to look after your eyes:
How can you look after your eyes when you're outside?

- Wearing sunglasses
  - UV light rays are not visible to our eyes. They cause our skin to darken (getting a suntan), but also cause wrinkles, skin discolouration, sunburn and skin cancer. If you don't protect your eyes UV light can cause eye disease.
  - Wearing UV blocking sunglasses is important to prevent this.
  - Increased likelihood of UV exposure:
    - Time of day - when sun highest in sky, usually 10am to 2pm.
    - Highly reflective surfaces like sand or snow.
    - Australia and New Zealand because of the thin ozone layer.
  - How many of you have sunglasses?

- Spending 2 hours outdoors every day can help to prevent myopia/short-sightedness.
  - Needs to be playing, with focus on distance/far-away.
  - Not reading books/near work.
  - Sunbathing ok.

Workbook activity: complete "Activity 5: Crossword: Eye Health" in the student workbook.

Slide 5: Vision and Learning

Vision is vital for learning.
To learn, the eyes must be able to:

- Focus on things far away e.g. the whiteboard
- Focus on things close up e.g. a book
- Change focus from things far away to close up
- Move focus quickly and accurately from line to line e.g. when reading
- Focus quickly on moving objects e.g. when playing sports

Ask children to brainstorm things someone might notice if they had problems with their vision (answers on next slide).

Slide 6: Things to look out for

Ask children to read through the list. Did they guess many symptoms?

- Complaining of not seeing clearly
- Headaches
- Rubbing eyes
- Burning or itchy eyes
- Shutting one eye when reading
- Tilting the head at an angle to the book
- Holding a book very close or sitting close to the TV
- Using finger to keep place when reading
- Poor concentration
- Copying incorrectly from the blackboard
- Losing place when copying or reading
- Blinking excessively when doing near vision work
- Reversing letters or numbers
- Writing up or down hill, with irregular letter or word spacing
- Feeling dizzy or sick when trying to focus
- Seeing double
- Squinting
- Difficulty with hand-eye coordination when playing sports

Slide 7: Eye Testing

Regular eye testing is important – if conditions are picked up early, they are easier to manage.
- Who has been to an optometrist? What was it like?

Optometrist visits:
- There is a machine called an automatic refractor that you will look at images through.
- You will read some letters on a chart.
- The optometrist may put some drops in your eye to make your pupils bigger. This enables them to test your eyes more accurately.
- If the optometrist thinks you need glasses, they will try different strength lenses in front of your eyes to make your vision better.
- You will then be able to choose some glasses frames that you like.

Wearing glasses
- If you need glasses but don't wear them, your vision can get worse. It's really important to bring your glasses to school and wear them when you need to.
- Ask children their thoughts about wearing glasses.
    - Do they like them? Why/why not? If why not, what would make them like wearing them more?
    - What do their friends think?
    - What do their parents think?
    - What can glasses help with?

Slide 8: True or False?

Discuss with the children whether they think each fact is true or false.

<u>True or false?</u>

1. **60-80% of all learning is through your eyes**

   a. **TRUE**, most of what we learn is through what we see in our environment.

2. **Your eyes can get sunburnt**

   a. **TRUE** - it is called photo-ophthalmia and means that UV rays from the sun have burnt and damaged your cornea. You can also get photoretinitis, which is when infrared light burns the retina. Symptoms of these can be feeling like you have shards of glass in your eye, redness, blurry vision and sensitivity to bright light.

3. **About ¼ of the human brain is dedicated to vision and seeing**

   a. **FALSE** - it's actually over half of our brain! This is why it is so important that we can see properly.

4. **Symptoms of vision problems can include headaches, blinking lots, seeing double or finding it difficult to concentrate when reading.**

   a. **TRUE**

5. **The eye is the most complex organ in the body**

6. **FALSE** - the brain is the most complex organ, the eye is the 2nd most complex.

Learning Intentions

There are two options for evaluating the learning intentions from this unit: teacher or peer assessment.

1. Teacher assessment: the teacher can photocopy this page and evaluate these intentions with each child
2. Peer assessment: the children can evaluate their level of learning with a peer.

CHILD'S NAME:	CLASS:		
LEARNING INTENTIONS **Looking after our eyes**	**ACHIEVEMENT LEVEL**		
	YES	NO	PARTLY
Understand the causes, symptoms and treatment for digital eye strain			
Explain the 20-20-20 rule			
List two ways to look after your eyes			
Understand why vision is important for learning			
List possible symptoms of visual impairment			
Know what to expect at an optometrist visit			
Explore attitudes towards wearing glasses			

Vision Health Module
We all see differently

Brief Description

Students will learn about key eye conditions that are relevant to them: myopia, hyperopia, astigmatism and colour blindness. They will experience myopia and colour blindness through vision simulations. Learning will predominantly include experimenting with vision simulations and completing activities to help children understand other's experience of visual impairment.

Duration: 45 minutes

Year Level: 7

Topics: Eye conditions (myopia, hyperopia, astigmatism, colour blindness)

Preparation: 25 minutes

Overview

Whole class   PowerPoint slides and learning, including class   20 minutes
                   discussions

Small groups   Activities x 6 (individually or in small groups)   25 minutes

WE ALL SEE DIFFERENTLY		
Topic	**Info/learning**	**Related activity**
Eye conditions	• What is an eye condition?	• Ask children to brainstorm what this means • Have they heard of any of the conditions on the list? • Do they know people with glasses? Why do they have them?
Myopia and hyperopia	• What is myopia? • Watch video of myopia • What is hyperopia? • Watch video of hyperopia	• Myopia simulation
Astigmatism	• What is astigmatism?	
Colour blindness	• What is colour blindness?	• Colour blindness simulation

Equipment and Preparation

Equipment

- Google Slides PowerPoint link
- Computer and screen to display PowerPoint
- Whiteboard and pen
- Coloured pencils or felt pens
- iPads (enough for children to work individually or in small groups)

Preparation

- Become familiar with material and activities
- Ensure children can access the simulations with school internet restricted settings

Teacher Notes

A picture of each slide is included with teacher notes below. These teacher notes are included in the Google Slides presentation as well.

Title page

Slide 2: Eye Conditions
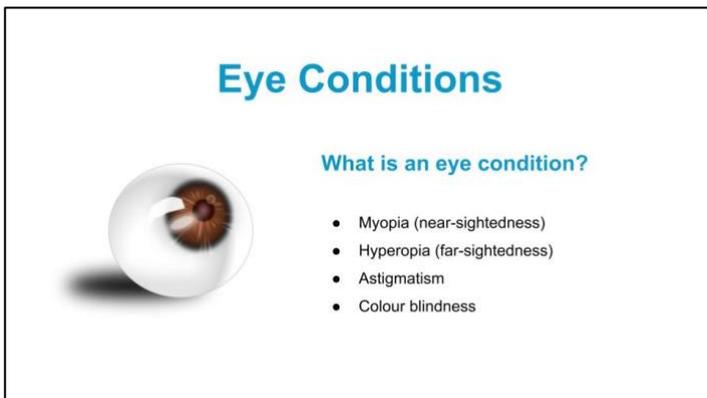
Eye conditions – also called visual impairment.

What is an eye condition?
- A problem that occurs in the eye that affects someone's vision and changes the way they see the world. Some eye conditions are able to be fixed and others aren't.

- Who has heard of any of the things on this list? Do you know what they are?

- We are going to talk about the conditions in red today.

Do you know anyone with an eye condition?
- Do you know people with glasses?
- Do you know why they have them?

Slide 3: Myopia and Hyperopia
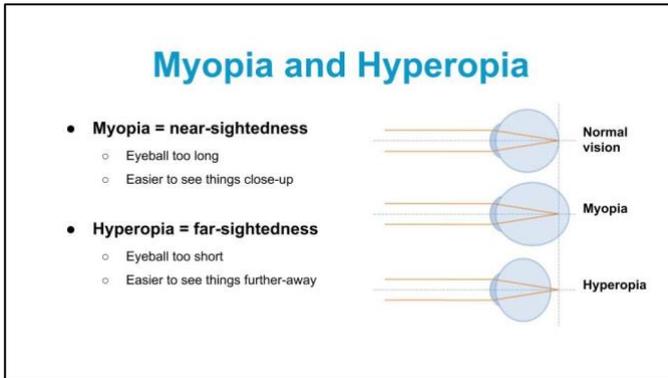
Discuss with the class what myopia and hyperopia are.

Myopia:
- Near-sightedness or short-sightedness
- Eyeball too long, so light gets focused in front of the retina
- This means that objects that are far-away look blurry, and objects that are close look clear.
- Most common.

Hyperopia:
- Far-sightedness or long-sightedness
- Eyeball too short, so light gets focused behind the retina
- This means that objects that are far-away look clear, but objects that are close look blurry.

Tip to remember: "Hyperopia" = longer word = long-sightedness. Easier to see objects a LONG way away.

Slide 4: Myopia and Hyperopia Videos
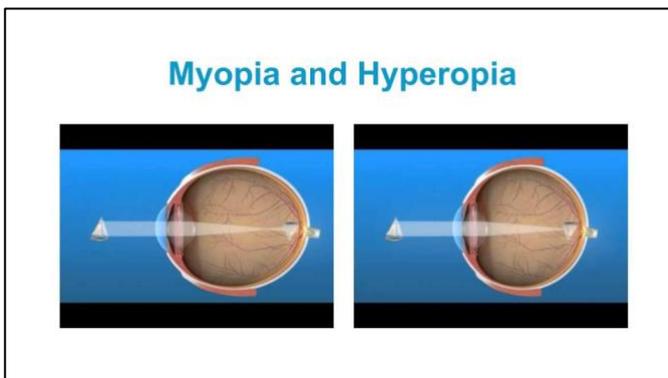
Watch these two short videos explaining myopia (15 seconds) and hyperopia (17 seconds).

Slide 5: Activity - Myopia Simulation

Myopia can make it difficult to see things that are far away. In school, this may mean it is hard to see the whiteboard or things on the wall, and that is also hard to see the ball when playing sports. Some people may have mild myopia, whereas others may have severe myopia.

Teacher instructions
- First discuss background information on what myopia is.
- Emphasize that the simulator simulates what it is like to have untreated myopia – this is what it would look like for someone with myopia if they weren't wearing their glasses or contact lenses.
- This activity can be completed as a whole class, individually or in small groups.
- The myopia simulation is at https://coopervision.co.nz/practitioner/clinical-resources/myopia-in-children/myopia-simulator
- Either pre-open this simulation on devices or ask students to search "cooper vision simulator" to find the app themselves.
- Once the activity is completed, discuss the results as a class.

Student instructions
1. Once the "myopia simulation" page is open, you will see a box at the top of the page with "Vision Simulator" written in it. Click on "Launch Simulator".
2. You will see a picture of a classroom. Below this picture is a slider with different numbers. These numbers represent the degree of myopia – numbers on the left are milder myopia, and numbers towards the right are severe myopia.
3. Click on the different numbers, then wait for the picture to load. What happens to the picture?
4. On the bottom right of the page, there are options for "school science lab" and "school sports hall". Click on these options to see what having myopia is like in these situations.

Discussion
- What else could be difficult to do if you had myopia?
- If children in the class have myopia and are willing, discuss the following:
  - What is it like?
  - What do you find difficult?
  - How do your glasses help?
  - Do you know what your glasses prescription is? Which number on the simulator is like what you can see without your glasses?
  - Who has family members or friends with myopia?

Slide 6: Astigmatism


Discuss with the class what astigmatism is.

Astigmatism:

- Astigmatism affects the shape of our cornea. Usually our cornea is round and shaped more like a basketball or soccer ball, but with astigmatism the cornea is an uneven shape and is shaped more like a rugby ball.

- This means that light is focused in two different places. Often one is in front of the retina and one is behind.

- These two places are often at right angles to each other.

- This means that things often appear blurry both close up and far away as it is hard for the eye to focus.

Slide 7: Astigmatism Video
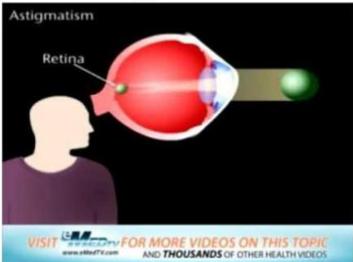
Watch this short video explaining astigmatism (31 seconds). Discuss with the class to ensure the children's understanding.

Slide 8: Colour Blindness

Discuss with the class what colour blindness is.

Colour blindness:
- Problem with the cone cells in the retina
  - There are 3 types of cone cells - blue, green and red.
- In colour-blindness, you have a problem with one type of cone cells, so you see colours in a different way. For example, a problem with your green cone cells means you are less sensitive to green light, but it affects how you see all colours.
- There are lots of different types of colour-blindness, and it can be mild, moderate or severe.
- Affects about 8% of males and 1% of females.
- It is inherited from your parents - you are born with it. Boys often inherit it from their grandfathers.
- Can be mild, moderate or severe.
- 99% of colour-blindness is red-green colour-blindness (actually includes 4 types).
  - This means that people have a problem with either their red or green cone cells, so are less sensitive to red or green light. Some people don't have red or green cone cells at all!
  - They have difficulty distinguishing between reds, greens, browns and oranges, and also commonly confuse blue and purple.

Which colours look similar in the picture?

Slide 9: Activity - Colour Blindness Simulation

What you need

- iPad, tablet or computer, with internet access.
- Items of different colours e.g. coloured pencils, felts, paper.

Teacher instructions

- This activity can be completed as a whole class, individually or in small groups.
- The colour blindness simulation is at https://www.colorblindsim.com/
- Either pre-open this simulation on devices or ask students to search "color blind sim" to find the app themselves.
- Once the activity is completed, discuss the results as a class.

Student instructions

1. Once the "color blind sim" page is open, click on "Get Started".
2. On the left side of the page is a list of the different types of colour blindness.
3. Click on the first type of colour blindness and hold the device over the different coloured items. What happens to the colours? Are they all different or only some of them?
4. You can click on the "eye" symbol on the screen to change back to normal vision as a comparison.
5. Try this with all the types of colour blindness.

Discussion

- Which types of colour blindness were similar?
- Do you know anyone who is colour blind?
- How could being colour blind affect someone in their daily life?

Learning Intentions

There are two options for evaluating the learning intentions from this unit: teacher or peer assessment.

1. Teacher assessment: the teacher can photocopy this page and evaluate these intentions with each child
2. Peer assessment: the children can evaluate their level of learning with a peer.

CHILD'S NAME:	CLASS:		
LEARNING INTENTIONS **We all see differently**	**ACHIEVEMENT LEVEL**		
	YES	NO	PARTLY
Have a basic understanding of myopia, hyperopia, astigmatism and colour blindness			
Experience how untreated myopia can affect learning in the classroom and science lab, and someone's ability to play sports			
Experience the different types of colour blindness			

Vision Health Module
Technology and Vision

Brief Description

Students will explore useful technology that can be used by individuals with visual impairment: iPad vision accessibility features, Siri, VoiceOver and Seeing AI.

Duration: 45 minutes

Year Level: 7

Topics: Technology for visual impairment (iPad accessibility, Siri, VoiceOver, Seeing AI).

Preparation: 25 minutes

Overview

| Whole class | PowerPoint slides and learning, including class discussions | 15 minutes |
| Small groups | Activities x 4 (individually or in small groups) | 30 minutes |

TECHNOLOGY AND VISION		
Topic	**Info/learning**	**Related activity**
Overview	• Table of apps for visual impairment	• Brainstorm – what are some things that it might be hard to do if you couldn't see very well? • Have they heard of any of the things on this list?
iPad accessibility	• Teacher demonstration of how to access this feature.	• Divide up features for children to explore in groups and report back to class.
Siri	• What is Siri?	• Test out tasks on Siri in pairs/groups, with eyes closed
VoiceOver	• What is VoiceOver?	• In pairs, find an app that your partner has chosen, with eyes closed using VoiceOver.
SeeingAI	• What is Seeing AI? • Watch video on Seeing AI	• Divide up tasks to test between groups, report back to class.

Equipment and Preparation

<u>Equipment</u>

- Google Slides PowerPoint link
- Computer and screen to display PowerPoint
- Whiteboard and pen
- Coloured pencils or felt pens
- iPads (enough for children to work individually or in small groups)
- *Vaseline/petroleum jelly and lab glasses.
- School books with handwriting
- Printed books (fiction or non-fiction)
- Children to bring a food packet or can with a barcode on it (preferably a can)

This is optional. As alternatives to lab glasses children could bring their sunglasses. An alternative to both items would be for children to simply close their eyes to simulate visual impairment. However, using glasses and Vaseline will give the richest effect of visual impairment.

<u>Preparation</u>

- Become familiar with material and activities
- Download Seeing AI app onto iPad
- Ensure children can access the simulations with school internet restricted settings

Slide 1: Title

Slide 2: Technology for Visual Impairment

There is a lot of technology around that can help people who have eye conditions or visual impairment. This table is an example of some technologies that are available on iPads/iPhones, and their equivalent Android phones and or tablets.

Brainstorm with the class (write on the board):
- What are some things that might be hard to do with your phone or iPad, if you couldn't see very well?
- What are some general daily things that might be hard to do?

Make sure the following are included in the list:
- Knowing what time it is, or what day / date it is
- Seeing which Apps are which to open them
- Sending texts or emails
- Reading emails or texts
- Knowing what colour things are e.g. pens or your clothes.
- Reading food labels eg on cans

Slide 3: Activity - iPad Accessibility

There is a lot of technology around that can help people who have eye conditions or visual impairment. The vision accessibility features available on an iPad or iPhone are one example of technology that has been developed to assist those with visual impairments. Students will explore these features and reflect on their usefulness to someone who has difficulty seeing.

Vision accessibility features include:

- VoiceOver
- Zoom
- Magnifier
- Display and Text Size
- Motion
- Spoken Content
- Audio Descriptions

Teacher instructions

- These activities can be completed individually, or in pairs or groups. It may work best to divide up the accessibility features between groups and get the groups to report back to the class.

- Before starting the activity, brainstorm with the class on the board:

  - What are some things that might be hard to do with your phone or iPad, if you couldn't see very well?

  - What are some general daily things that might be hard to do?

  - For example: knowing what time it is, seeing apps to open them, sending texts or emails, reading texts or emails, knowing what colours things are e.g. pens or your clothes, reading food labels.

- **Note**: *exploring VoiceOver is completed in a separate activity*.

Student instructions

1. Open your iPad settings

2. Go into "General", then "Accessibility", then "Vision".

3. Explore the features available. Think about the following:

   a. How do they work?

   b. What kind of things would they help with?

   c. Are they easy to use?

d. Would they be easy to use for someone who had a visual impairment?

Discussion

Questions to reflect on:

- Which features would be most useful if someone had visual impairment?
- Were there any problems with them?
- What did you find the easiest to use?
- For which activities on the list you made, could the accessibility features help with?

Slide 4: What is Siri?
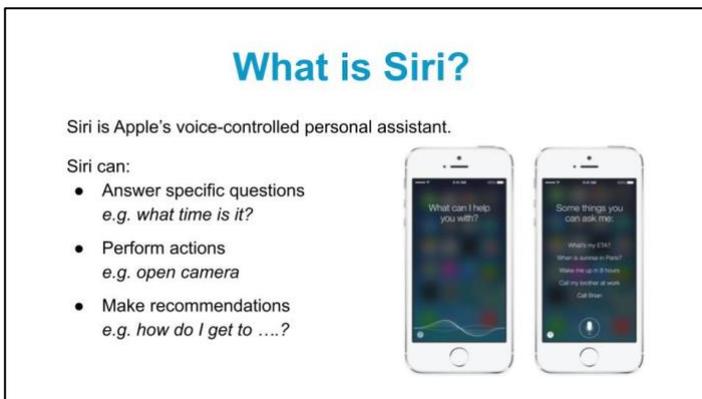
Ask the children who knows what Siri is?
How many people have used Siri before?

Siri is Apple's voice-controlled personal assistant. Siri can:
- Answer specific questions
    o Tell you how much battery is left on your phone
    o Tell you the time or date
    o Tell you the weather forecast

- Perform actions
    o Open apps eg "open camera"
    o Set an alarm, reminder or calendar appointment
    o Phone or text people
    o Read out and reply to emails

- Make recommendations
    o Give you directions to get somewhere
    o Where is the best place to eat

Slide 5: Activity – Using Siri

Teacher instructions
- These activities can be completed individually, or in pairs or groups. Activities could be allocated to groups of students, with groups reporting on their findings to the class.
- The aim is for the children to explore ways that Siri could help someone with visual impairment.
- To simulate visual impairment, children can either wear sunglasses smeared with Vaseline, or close their eyes.

How to use Siri:
- Before using Siri, you need to make sure she is activated. Go to "Settings", then "General", then "Siri", then "ON".
- Hold down the Home button, for approximately 1-2 seconds. Take your finger off the home button, then speak/ask your question. Siri will reply.
- Test out the following, using Siri as though you have a visual impairment:
  - How much battery is left on the iPad?
  - What date is it?
  - What time is it?
  - Opening apps
  - Reading a text or email
  - Sending a text or email
  - What is the weather like today?
  - Where is the nearest park?

Discussion
Questions to reflect on:
- Which tasks would be most useful if someone had visual impairment?
- Were there any problems with them?
- What did you find the easiest to use?
- For which activities on the list you made, could Siri help with?

Slide 6: What is VoiceOver?

VoiceOver is Apple's screen reader, which will describe aloud what is on your screen. It has been designed especially for people who have visual impairment or dyslexia.

Watch the following video introducing Voiceover (3 mins 57 seconds)

Slide 6: VoiceOver Summary

Demonstrate to the class how to turn Voiceover on/off, and how to use it on the screen.
Make sure all children turn Voiceover on, and have a brief go using it.

Instructions:
Turning on VoiceOver
- Make sure VoiceOver is enabled under accessibility settings.
- Either:
    - Ask Siri to turn on VoiceOver "Siri, turn on VoiceOver"
    - OR Press the "Home" button three times quickly (if this feature is enabled).

Using VoiceOver
- Tap/touch an app and VoiceOver will read it out.
- Move your finger around the screen for VoiceOver to read other apps.
- Tap an app twice and VoiceOver will open it.
- Use three fingers to swipe to another page/screen.

Slide 8: Activity – Using VoiceOver

Teacher instructions

- This activity is designed to be completed in pairs or threes.
- The aim is for the children to explore ways that VoiceOver could help someone with visual impairment. To simulate visual impairment, children can either wear sunglasses smeared with Vaseline, or close their eyes.
- Demonstrate to the class how to turn Voiceover on/off, and how to use it.

Student instructions:

1. Turn on VoiceOver on your iPad.
2. Get your partner to choose an app for you to find.
3. With your eyes closed, use VoiceOver to navigate around the iPad and find the correct app.
4. Swap roles and try various apps.

Discussion

Questions to reflect on:

- How easy was it to use VoiceOver to find and open apps?
- What else do you think VoiceOver could help with?

Slide 9: What is Seeing AI?
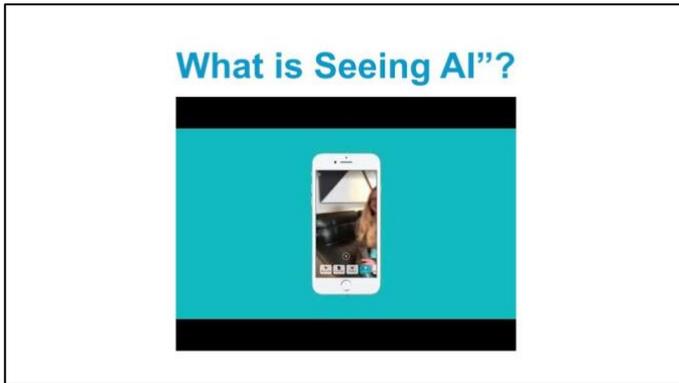
Seeing AI is a free iPhone app that narrates the world around you. It has been designed especially for people with visual impairment, and it has different channels that do different things. It works with iPhone 6 or later.

Channels include:

- Short text: reads out text that you hold your phone over e.g. an envelope or sign. Also works for some food packets.

- Document: takes a photo of a larger volume of text and reads it out e.g. a document, book.

- Product: scans a barcode on a product and tells you what it is e.g. can of tomato soup

- Currency: tells you what type of bank note you have (note: doesn't work for NZ currency)

- Colour: tells you what colour an item is. Not very accurate.

- Person: describes a person and roughly how far away they are from you. You can teach the app to recognise your friends.

- Scene: describes a scene e.g. "person sitting at a table in front of a laptop"

- Handwriting: takes a photo of handwriting and reads out the text

- Light: emits a tone – higher tone when there is lots of light, lower town when it is dark. Useful to identify windows, doors etc.

Watch the following video about Seeing AI (1 min 32 seconds).

Which of the activities in your original list, does Seeing AI claim to help with?

Slide 10: Seeing AI Summary

Seeing AI Summary

Seeing AI is a free iPhone/iPad app that uses the device's camera to do things like read out written text, describe people, identify colours and scan food barcodes.

How to use Seeing AI
1. Make sure VoiceOver is on
2. To open Seeing AI:
   a. Use Siri: "open seeing ai"
   b. OR use VoiceOver to double tap app to open it.
3. Tap bottom of screen to activate channels.
4. Swipe up from bottom of screen to move to a channel on the right.
5. Swipe down towards bottom of screen to move to a channel on the left.
6. To go back to the main screen from a channel: at the top left corner of the screen is the back button – tap this once, then tap twice.

Channels
- Short text   - Document
- Product   - Person
- Currency   - Scene
- Color   - Handwriting
- Light

Briefly demonstrate to the class how to use Seeing AI. You do not need to demonstrate each channel if time is limited. Make sure each child has turned Voiceover on and has opened Seeing AI. These instructions could be printed out for children if necessary.

Seeing AI Summary:

How to use Seeing AI

1. Make sure VoiceOver is on

2. To open Seeing AI:

   a. Use Siri: "open seeing ai"

   b. OR use VoiceOver to double tap app to open it.

3. Tap bottom of screen to activate channels.

4. Swipe up from bottom of screen to move to channel on the right.

5. Swipe down towards bottom of screen to move to channel on the left.

6. To go back to the main screen from a channel: at the top left corner of the screen is the back button – tap this once, then tap twice.

Slide 11: Using Seeing AI

What you need

- iPad/iPhone
- Lab glasses/sunglasses (optional)
- Vaseline (optional)
- Food packets
- Food cans
- School books – with handwriting
- Newspaper or magazine article

Exploring Seeing AI:

Using Seeing AI, complete the tasks below either wearing the Vaseline-smeared glasses, or with your eyes closed.

- **Read out a sign in the classroom and/or the title of a book**
  - o Use the "Short text" channel
  - o Hold the phone over the text and it will automatically read it out.
- **Scan the barcode on your food packet or can**
  - o Use the "Product" channel
  - o Hold the phone over the barcode, it will beep when it sees the barcode and then read it out.
- **Read your handwriting in a schoolbook**
  - o Use the "Handwriting" channel
  - o Tap button once, then twice to take a picture. The phone will then read out the text.
- **Describe a classmate**
  - o Use the "Person" channel
  - o Hold up the phone towards a person, the phone will tell you roughly how far away the person is.
  - o Tap screen once, then tap twice to take a picture. The phone will then describe the person with their rough age and facial expression.

- **Describe a scene**
  - Use the "Scene" channel
  - Hold phone towards a scene (e.g. classroom, group of people doing something)
  - Tap screen once, then tap twice to take a picture. The phone will then describe the scene.
- **Identify the colour of something** (e.g. a pen, your jersey)
  - Use the "Colour" channel
- **Scan a page of text and read it out** (e.g. from a book)
  - Use the "Document" channel
  - Hold phone over the text, the phone will direct you to make sure it can see the edges.
  - Press button once to activate the camera, then twice to take a photo. The phone will then read out the text.
- **Find the windows in the classroom**
  - Use the "Light" channel
  - Move around the room (guided by a friend to avoid collisions). The phone will emit a tone (noise), which will sound higher when there is lots of light. Listen to this tone and find you way towards the windows.

Discussion

Questions to reflect on:

- How easy was it to use the different channels?
- Which tasks worked well?
- Which channels do you think would be the most useful if you had a visual impairment?
- What other tasks can you think of that Seeing AI could help with?

Learning Intentions

There are two options for evaluating the learning intentions from this unit: teacher or peer assessment.

3. Teacher assessment: the teacher can photocopy this page and evaluate these intentions with each child
4. Peer assessment: the children can evaluate their level of learning with a peer.

CHILD'S NAME:	CLASS:		
LEARNING INTENTIONS **Technology and Vision**	**ACHIEVEMENT LEVEL**		
	YES	**NO**	**PARTLY**
Explore iPad accessibility features			
Investigate how Siri can help with visual impairment			
Understand what VoiceOver is and how it can help people with visual impairment			
Experiment with the Seeing AI app and how it can help people with visual impairment			

Vision Health Module
Child-to-Child Vision Screening

Brief Description

Students will screen each other's vision in groups of three using the Child-to-Child Vision Screening Toolkit. All learning is hands-on except for a brief video introducing the Child-to-Child Vision Screening Toolkit.

Duration: 90 minutes

Year Level: 7

Topics: Vision screening, optical illusions, review of learning from Lessons 1 and 2.

Preparation: 20 minutes

Overview

Whole class	Introduction to Child-to-Child Vision Screening Toolkit (video and class discussion)	15 minutes
Small groups	Vision screening (groups of 3)	75 minutes

Equipment and Preparation

Equipment

- Google Slides PowerPoint link
- Computer and screen to display PowerPoint
- Vision testing equipment
    - 5 x flipcharts (so 5 groups of children can be tested at once)
    - 1 x result sheet per child
    - 1 x masking tape roll
    - 1 x 1-metre ruler

Preparation

- Become familiar with completing the vision screening.
- Read teacher instructions.

Teacher Notes

A picture of each slide is included with teacher notes below. These teacher notes are included in the Google Slides presentation as well.

Title slide:

Slide 2:

- Work in groups of three
- 1 person has their vision tested (points the direction of the E's)
- 1 person tests someone's vision (holds the flipchart)
- 1 person records the results
- There are 2 tests in total - each eye is tested separately (cover your other eye so you can't see)
- Each test is colour-coded
- Swap roles, so each person gets their vision tested

Note: it is recommended not to have more than 5 groups of children (15 children) testing each other's vision at once. This allows the teacher to effectively monitor each group of children to ensure they are completing the testing accurately.

<u>Slide 3:</u>

<u>Person having their vision tested (pointing the direction of the E's)</u>
- If they usually wear glasses, it is essential that children wear them for this exercise. This excludes reading glasses as they are to improve near vision and won't be needed for this far vision testing.
- Stand on the line of tape, 4m away from the person holding the flipchart. These lines will be measured and marked out with tape.
- This vision test uses the letter E. Children will be asked to point with their arm the direction that the branches of the E are facing. It is important that they do this very SLOWLY so the person screening them, and the results keeper can clearly see what direction they are pointing.
- We are testing both left and right eyes in turn. When testing children's left eye for example they will need to cover their right eye with their hand enough to block their vision from that eye. It's important that they can't see anything out of the eye they are covering.
- It is important to read the chart from left to right (start on the side with the red numbers).
- Even if children can't see a letter very well, they can have a guess as to which way the E's are facing.

Get the children to point the direction of the top line of E's on the screen, to ensure their understanding.

Note: you may notice that the E's that are pointing left and right, are facing opposite ways on the charts for the person being screened and the person testing/recording the results. For example, an E which is facing to the right for the tester and person recording the results, will face to the left for the person being tested. This is because if a child points to his/her left, it will look like they are pointing right for the tester and person recording the results.

Slide 4:

Person testing someone's vision (holding the flipchart)
- Make sure they hold the chart up straight, at the top and bottom so they are not covering any of the letters.
- Make sure the person having their vision tested is covering the correct eye.
- Read out the number of each row before the person being tested starts pointing, e.g., "row 1".
- They need to turn each page AWAY from them.
- Make sure the person being tested reads the row from LEFT to RIGHT.
- If the person being tested gets a direction wrong, they can ask them to repeat that line.

Hold up a flipchart to demonstrate the correct way to hold it. Demonstrate turning the pages over the correct way.

Slide 5:

Person recording the results
- Their job is to carefully watch the person who is getting their vision tested, and which way they are pointing, for the limbs of the "E's".
- If they point in the correct direction, draw a "tick symbol" in the box.
- If they point in the wrong direction, draw an "X" in the box.
- When they have finished the row, circle "yes" or "no" for whether they have gotten two or more ticks for that row.
- Start at row 1 and go through each line of the chart.
- Make sure you are recording the results for the correct test.
- Make sure you complete both tests.
- If the person being tested gets a direction wrong, you can ask them to repeat that line.

Hold up a results sheet to show the children

<u>Slide 6:</u>

Ask children if they know what fair testing is?

- A way to investigate a scientific question
- Variables must be kept the same, except for the variable you are investigating (children's vision in this case)
- Means they need to follow the instructions exactly
  - e.g. stand on the 4m line
  - If someone pointed too fast and you didn't see which way they pointed you need to ask them to repeat that line
- Fair testing also means that they need to be honest with their results and not help each other to see the E's.

<u>Why is fair testing important?</u>
- Otherwise it might make it easier or harder for someone to see the E's.
- It might mean our results aren't accurate
- Someone might not get glasses when they need them - eyesight could get worse

Emphasize that it's not about having "good" or "bad" vision but about understanding that everyone sees differently.

Ask the children if they have any questions and clarify any confusion regarding the vision screening process.

Use the masking tape and metre ruler to measure and mark the 4m lines. When children are doing the screening, the person being tested will stand behind the tape on one side and the tester and results recorder will stand opposite them behind the second masking tape line.

Slide 7:

This can be completed by children in their groups of threes (utilising peer-to-peer teaching) or can be led by the teacher (the whole class summarizes their results together).

The children need to calculate their final score for each test, so they can fill in the results summary table on their results sheet.

- Their final score for each test/page, is the number of the most difficult line that they got two or more correct (two or more ticks).
- The most difficult line is row 6; the easiest line is row 1.
- Look at the scores for row 6 first.
    - E.g. If they got 2 or more ticks for row 6, then their score is 6.
    - E.g. If they got 0 or 1 tick for row 6, look at how many ticks they got for row 5. If they got 2 or more ticks for row 5, their score is 5. If they got 0 or 1 or tick, look at row 4 etc. Continue as far up the chart as necessary.
    - The majority of children will score 6's and not need referring for visual impairment.
- When they have worked out their score for a test, circle the score number in the results summary chart.
- Complete this process for both charts.

Explanation of the scores:
- A score of 0-4 = refer. This means that the child may have some problems with their vision, so it is recommended that they go to the optometrist for a more detailed eye examination.
- A score of 5-6 = pass. This means that the child's vision is within normal range.
- For further information on interpreting "refer" scores, see "Child-to-child vision screening toolkit - further information".

<u>Slide 8:</u>

Once children have had their vision screened and have summarized their results, they need to record these results in two places:

1. <u>Excel spreadsheet</u>

There is an excel spreadsheet template available for teachers to download from the Science Learning Hub, for the children to input their results into. Teachers will then have a record of children's overall results.

2. <u>Vision Screening Results letter</u>

This letter will go home with the child to their parents. The "Pass" and "Refer" letters are intentionally printed in the same colour so that children's results are less obvious to their peers.

Overall result *"Pass"*
• Children simply need to write their name at the top of the "Vision Screening Results – Pass" letter.

Overall result *"Refer"*
• Children need to write their name at the top of the "Vision Screening Results – Refer" letter.
• They then need to tick the boxes on the letter for which tests they had a "refer" score (0-4).

Learning Intentions

There are two options for evaluating the learning intentions from this unit: teacher or peer assessment.

1. Teacher assessment: the teacher can photocopy this page and evaluate these intentions with each child
2. Peer assessment: the children can evaluate their level of learning with a peer.

CHILD'S NAME:	CLASS:		
LEARNING INTENTIONS **Child-to-Child Vision Screening**	**ACHIEVEMENT LEVEL**		
	YES	**NO**	**PARTLY**
Understand how to use the Child-to-Child Vision Screening Toolkit accurately			
Have your vision tested by a peer using the Child-to-Child Vision Screening Toolkit			
Test the vision of a peer using the Child-to-Child Vision Screening Toolkit			
Record the vision screening results of a peer using the Child-to-Child Vision Screening Toolkit			

The Child-to-Child Vision Screening Toolkit: Further Information

The information provided below is intended as supplementary information for the teacher, and it is recommended that the teacher reviews it before using the child-to-child vision screening toolkit. It may also be used to aid the teacher in ensuring the children complete the vision screening accurately, or to troubleshoot any problems that arise.

Interpreting "refer" results

Refer score:
- This child is having a lot of difficulty seeing things clearly that are far away. They may have myopia and/or astigmatism and need glasses. It is essential that they visit an optometrist to confirm this.

Refer score in one eye only:
- This child may have anisometropia (a difference in power between their two eyes). They may also have astigmatism. It is essential that they visit an optometrist to confirm this. Both these conditions can cause headaches and difficulty concentrating.

Troubleshooting

Ambiguous results
In this situation, a child may have incorrect answers/low scores for an easier row but correct answers/higher scores for a higher row, or scores may be inconsistent. This may occur for the following reasons:

- The environment is too noisy, and the child being tested is finding it difficult to concentrate
  - *Solution: ensure a quiet environment, and that not too many children are being tested at once.*

- The child being tested is pointing too fast, so the results being recorded are inaccurate
  - *Solution: emphasize that children need to point SLOWLY*

- The child being tested does not fully understand which way to point for limbs of the E.
  - *Solution: before starting the screening, get the class to practice pointing the correct direction for the limbs of the E's, to ensure understanding.*

Stigma surrounding glasses and vision problems
- This may also result in children not being honest about their results or being embarrassed about other children knowing their results.

- Stigma is a widespread issue which is not easily solved; however, children are encouraged to discuss and reflect on attitudes towards glasses in the unit "looking after your eyes". It is important that teachers normalize visual impairment and wearing glasses and reassure children that wearing glasses is not "bad".

<u>Children with hearing, reading, writing or other learning difficulties</u>
- This vision screen has been designed to cater for the needs of all children. The difficulties listed should not prevent children being able to participate in the vision screening.

- Dyslexia
  - ➢ Ensure they practice pointing the correct direction for the limbs of the E's first, and that they point SLOWLY. Lines may be repeated if necessary. Teacher supervision may be required.

- Hearing impairment
  - ➢ All instructions are also in printed text and there is the video demonstration of completing the vision screen.

- Reading impairment or limited English
  - ➢ "Tumbling E's" have been utilized for this specific purpose; it is not necessary to be able to read letters of the alphabet. For children unable to read the instructions at the top of each page, the video demonstration is provided. Their peers are also able to assist by demonstrating, for example, which eye to cover.

- Writing impairment
  - ➢ The only writing necessary for completing the vision screen is filling in the front page of the results booklet. This could be completed by another student or teacher if necessary.

<u>Difficulty with summarizing results</u>
- The teacher will know which students are likely to have difficulty understanding how to summarize their results to the table on the front page.
- It is suggested to utilize peer-to-peer teaching; encourage more able children to assist those who are less able. The teacher can also assist those children who are finding this aspect difficult.

Bibliography and Acknowledgements

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Bibliography

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