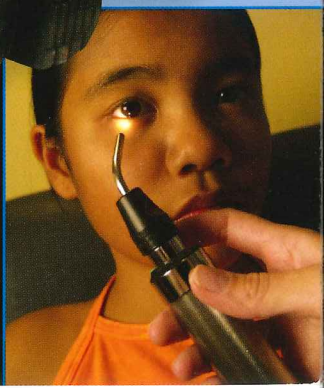
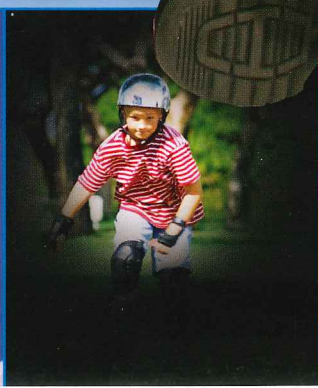
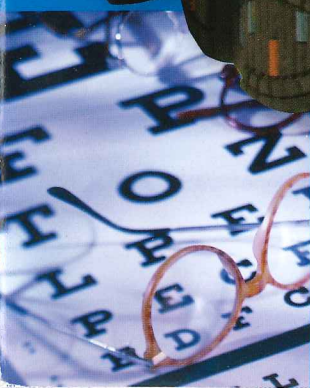
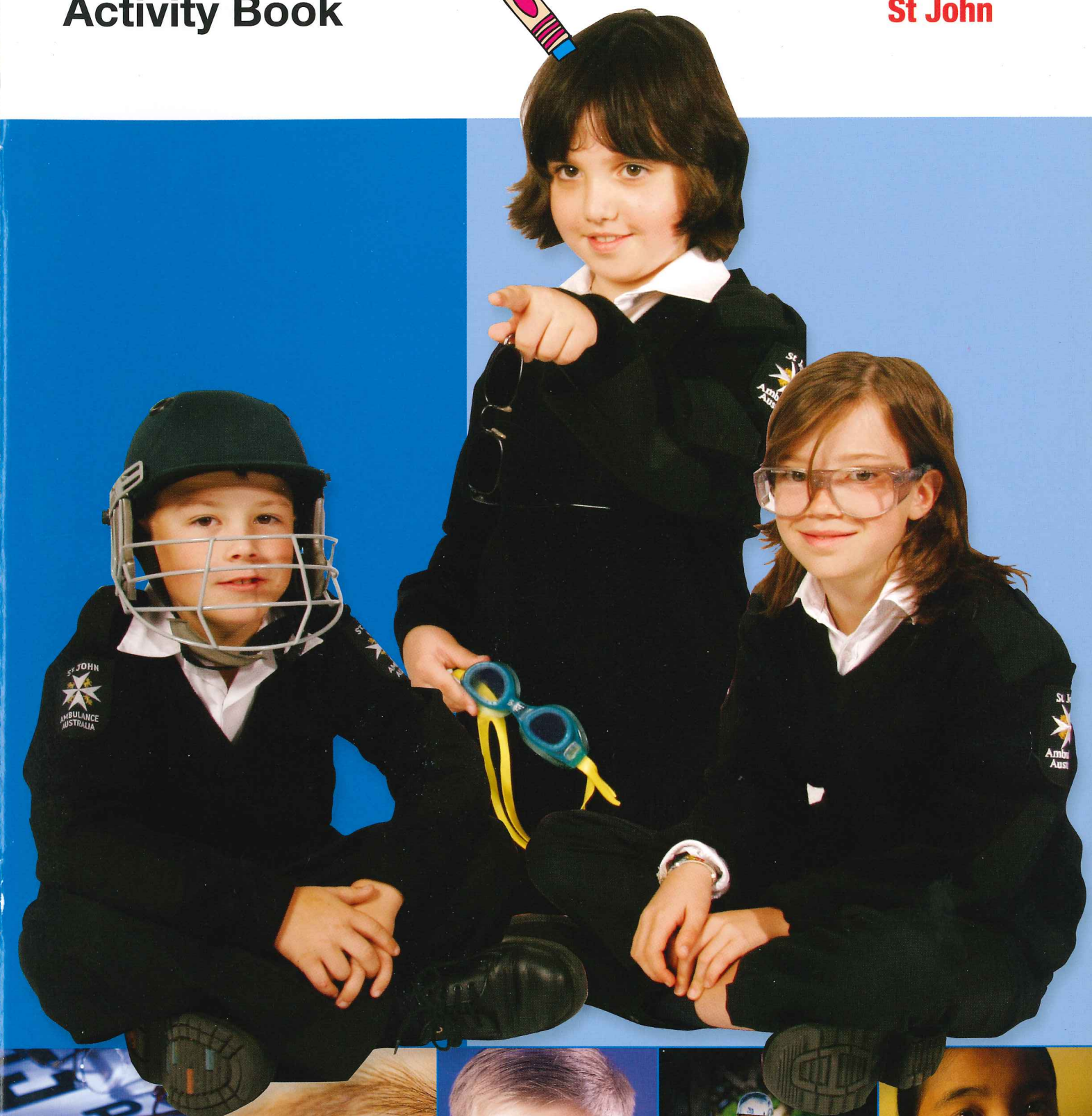


St John Juniors

Eye Health

Activity Book



St John Ambulance Australia
Canberra Avenue
Forrest ACT 2603

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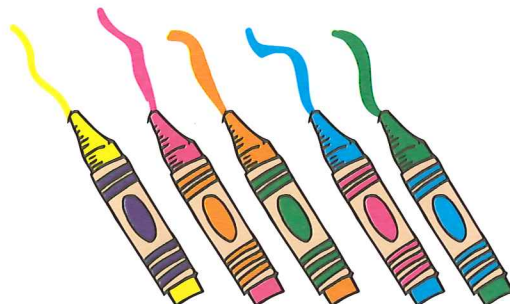
My Eye Health Activity Book

When I complete all the activities in this book,
I will earn the Eye Health Junior Interest Badge.



My Name:

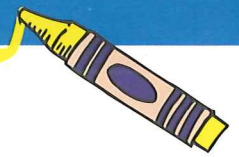
My Division:



Record your progress!

When you have completed each part of this book, colour in the title with the colour shown. It's easy.....when you have finished 'The best Camera in the World', colour the title using a Yellow colour pencil or crayon..... and so on until all topics have been finished. Each topic has a different colour!

The Best Camera in the World



Are your eyes in good working order? If so, did you know you have the best camera in the world? It is your own eye! Our eyes operate just like a camera. Most of the time we take movie shots, but we can take still shots too if we blink quickly enough. And it's all in beautiful colour. If we use our memory we can play back anything we have seen in our minds.

Eye sight is one of our five senses. Do you know what the other senses are?

Sense of	Sight

All of our senses take messages to the brain (nerve vessels take these messages back to the brain).

This drawing shows the areas of the brain responsible for		
	A	touch
	B	sight
	C	hearing
	D	taste and smell

Let's make the simplest form of camera

a **PINHOLE CAMERA**

Can you help your leader collect the materials needed?

- A small cardboard box (no lid required)
- Some grease paper or baking paper
- Sticky tape
- Black paint
- A hammer and nail
- Scissors
- A jumper or blanket

Watch closely as your leader makes the Pinhole Camera. The leader may ask you to help with some of the work.

Instructions

- 1 With a hammer and nail, punch a hole in the centre of the bottom of the box.
- 2 Paint the inside of the box with flat black paint and allow paint to dry.
- 3 Pull grease paper tightly over open end of box using sticky tape to attach it firmly.



Now you are ready to use your Pinhole Camera

Start looking around. It works better if you have a jumper or blanket draped over your head. Peek through the drape with your camera. Point the pinhole toward the object you wish to 'photograph' and watch it appear on the grease paper screen.

(It can be a little tricky, so be patient)

Some Questions for Small Group(s)

Did you see an image?

Was it the right way up?

What is the 'film' in the Pinhole Camera?

All cameras have apertures (shutters) which allow the light into the chamber and onto the film.

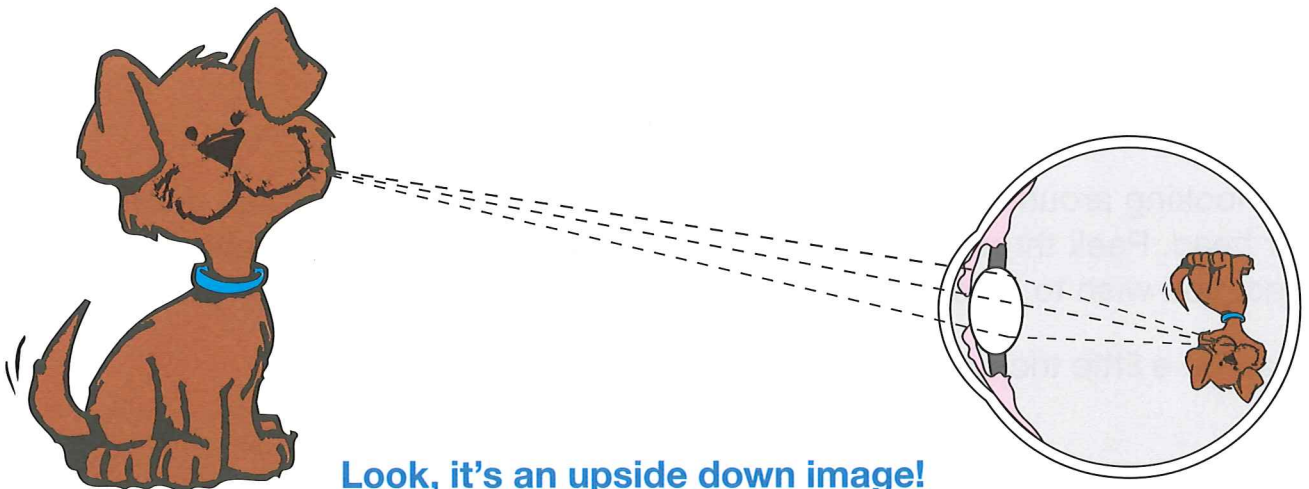
What is the aperture on a pinhole camera?

Was the image strong or weak, fuzzy or clear?

Real cameras have a

which allows a sharp image to be formed.

Our eyes work in much the same way—light from an object enters the 'pinhole' and is projected onto the back of the inside of the eyeball.



Parts Of The Eye

The eye has many parts. It is like a football or netball team. All of the parts team up. When they all work together we can see!

It starts with the **EYE LASHES** and **EYE LIDS**. The lashes help keep the dust out of the eyes and the eye lids blink to wipe fluid over the front of the eye—to keep it clean. Cool windscreen wipers! The **SCLERA** is the white wall of the eye ball—you can easily see the white part of a friend's eye. It is the outside of the whole eye ball. The **CORNEA** is right in the middle of the front of the eye. It is known as the 'window of the eye' because it is clear (see-through). Looking through the cornea, you can see the coloured IRIS. The iris has muscles which make the **PUPIL** bigger or smaller to control the amount of light entering the eye. The **PUPIL** is the central black opening in the middle of the iris.

The **CONJUNCTIVA** is a thin layer of tissue which covers the Sclera and the inside of the eyelids.

Did you know?

Conjunctivitis is an inflammation of the conjunctiva which causes redness, itching and discharge and is caused by bacteria, viruses or allergies.

Treatment: regular cleansing and possibly prescribed eye drops.

Now let's pass through the little hole in the iris (the **PUPIL**). The next eye part is the **LENS**. It is also attached to muscles and changes shape so we can see close up objects more clearly and far distant objects more clearly. The lens casts an upside down image on the inside rear wall of the eyeball.

Try this experiment! An Upside Down Image



Hold a magnifying glass about 40 cm away from your eye and point it to an object. Do you notice that the object is upside down? The magnifying glass is a type of lens like the one in our eye. Our eye lens is cleverer though—it changes shape to make near or far objects clearer.

The **RETINA** of the eye is the ‘film’ or ‘picture card’ of this very special camera. It is situated as a lining on the inside back wall of the eye ball. It contains over 100 million light sensitive cells (photoreceptors). Close by is the optic nerve which transmits the messages (the images on the retina) to the brain. The brain understands that the upside down image needs to be turned ‘right way around’.

There is no air in the eye ball—just special fluids.

Are you ready to label the eye parts?

See how many you can get right. Use a very light pencil at first. Then check to see that you’ve labelled the eye parts correctly.

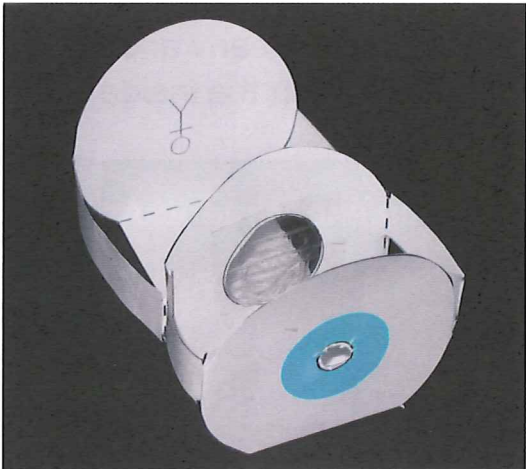
A	
B	
C	
D	
E	
F	
G	

Making a Model of ‘The Eye’

You can make your own eye model. Read the instructions carefully (see centre lift-out pages of this booklet). Take your time and you should have an eye model of your own—just like the one in the photo. The idea is to cut out each segment (cutting along the continuous lines and bending at the dotted lines) and paste them together. Seek help from your leader if needed.

See the little image on the retina? It is upside down as we learned earlier. The brain turns it the right way up!

Our eye model is a simplified model of the eye. It will come in handy when we discuss a number of eye problems. We will be able to see what parts of the eye are affected.



*A model that’s simple as A-B-C
 Displays the parts of the eye to me
 For me it’s a start
 To know each part
 And learn how I can see!*

The St John Eye Model

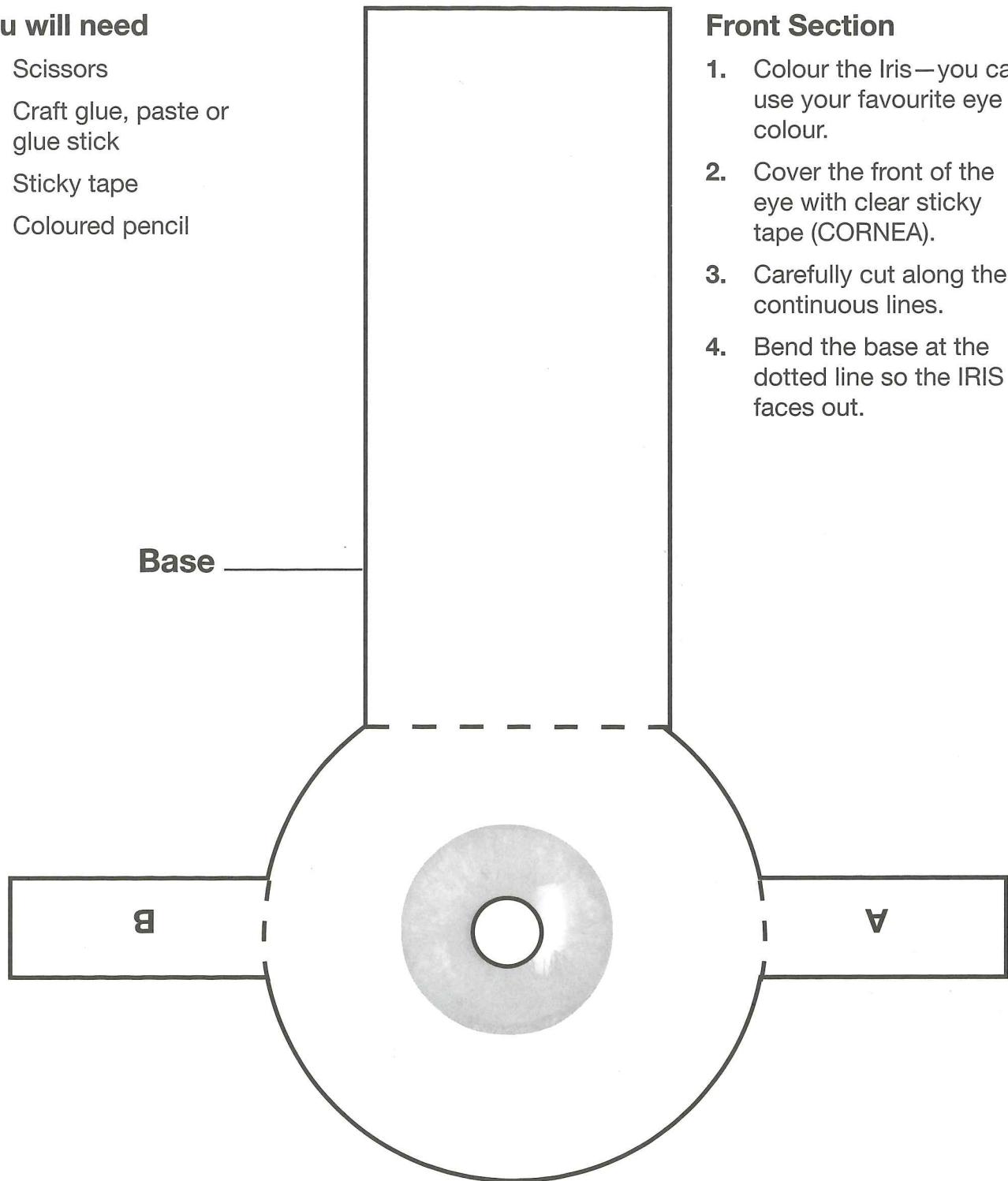
Can you follow these instructions? Your Leader can help you.

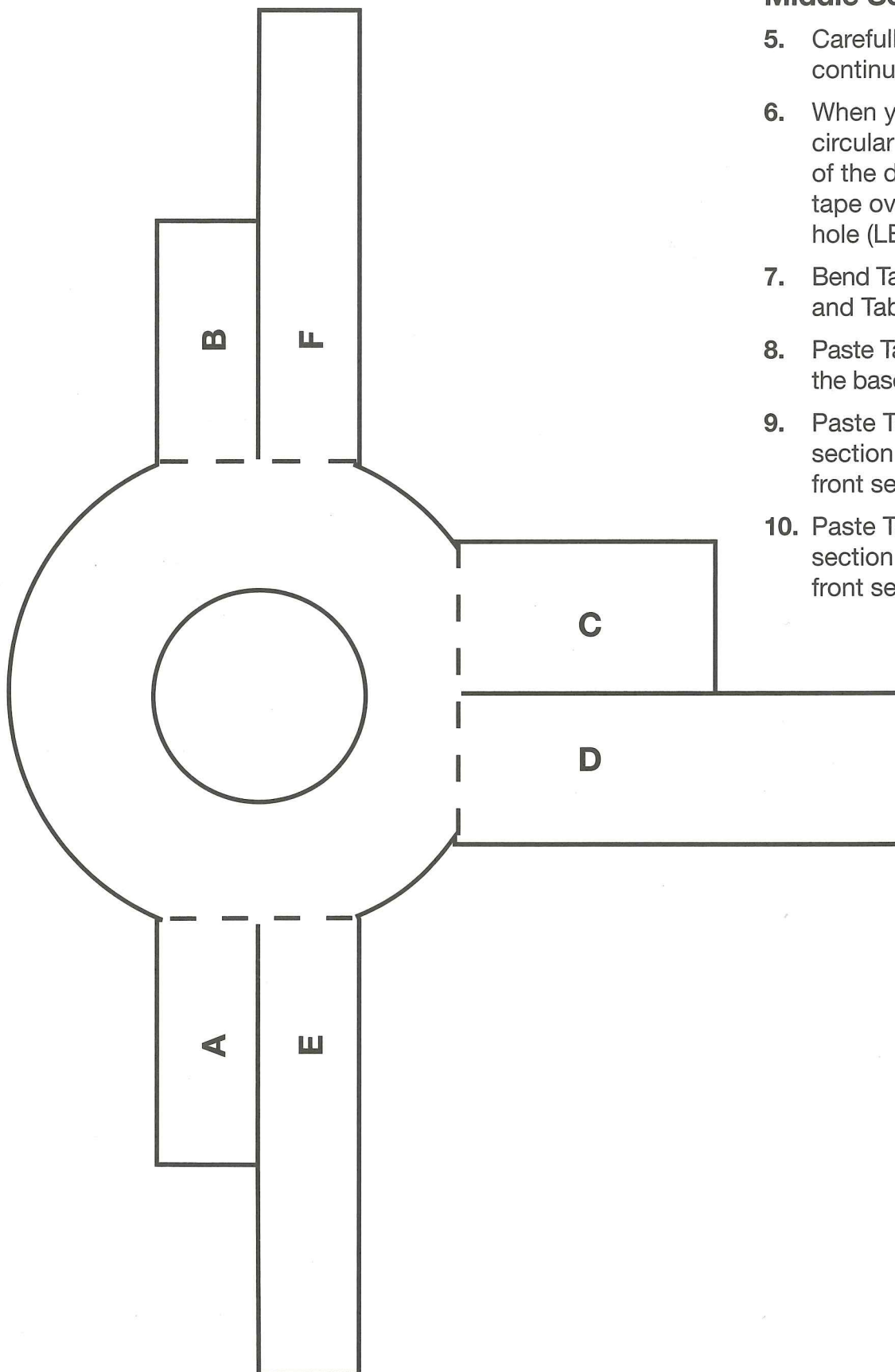
You will need

- Scissors
- Craft glue, paste or glue stick
- Sticky tape
- Coloured pencil

Front Section

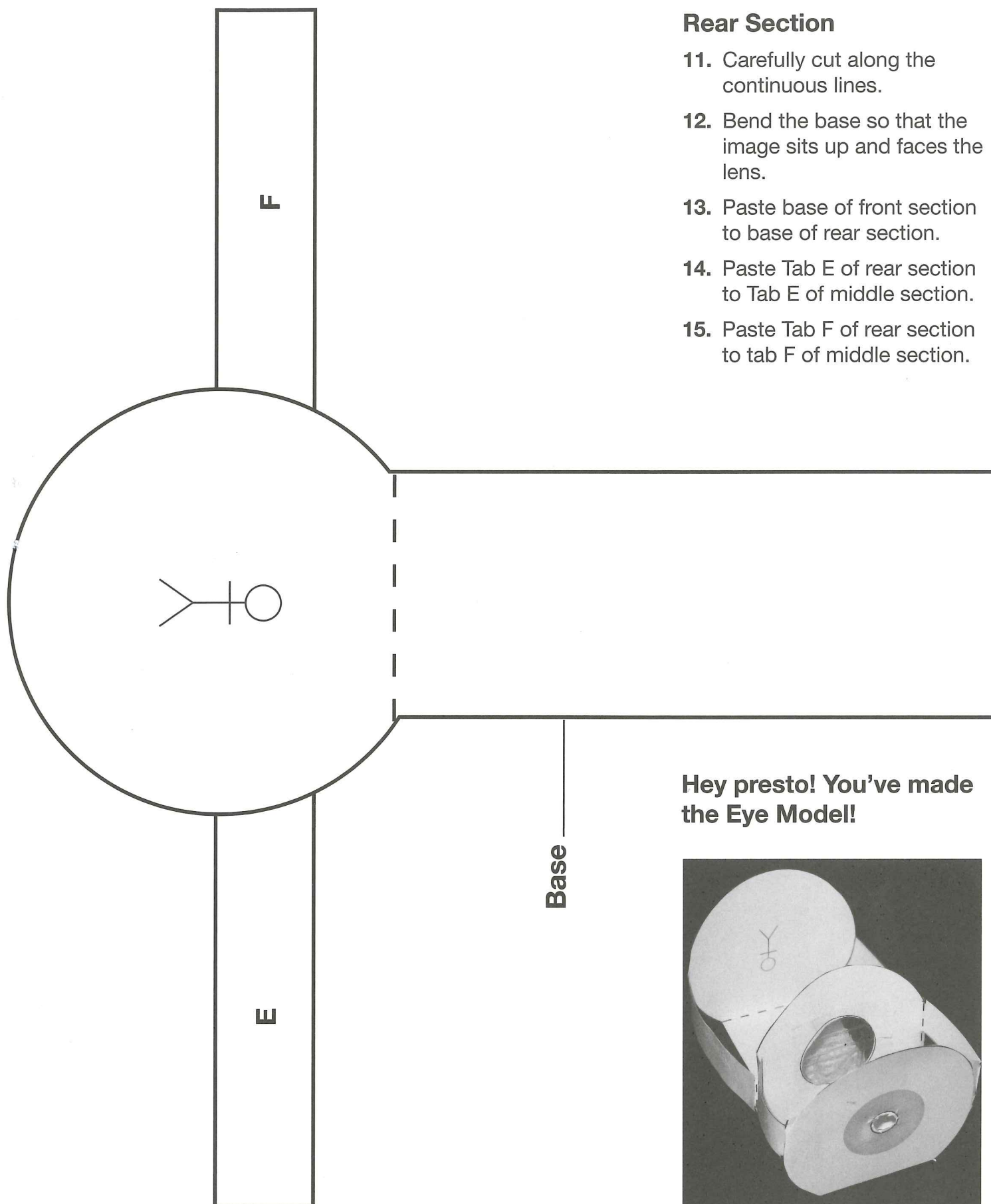
1. Colour the Iris—you can use your favourite eye colour.
2. Cover the front of the eye with clear sticky tape (CORNEA).
3. Carefully cut along the continuous lines.
4. Bend the base at the dotted line so the IRIS faces out.





Middle Section

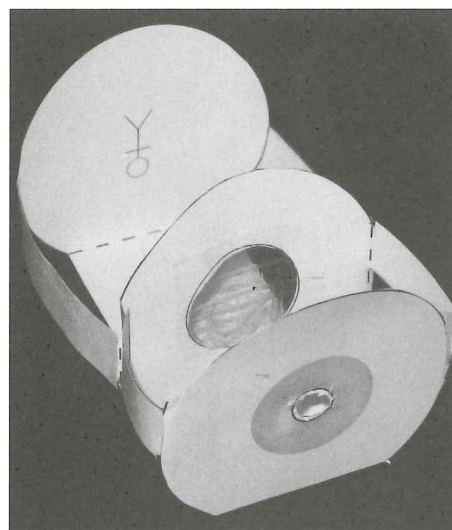
5. Carefully cut along the continuous lines.
6. When you have cut out a circular hole in the middle of the disc, apply sticky tape over both sides of this hole (LENS).
7. Bend Tab C toward the front and Tab D toward the rear.
8. Paste Tab C and Tab D to the base of the front section.
9. Paste Tab A of the middle section to Tab A of the front section.
10. Paste Tab B of the middle section to Tab B of the front section.



Rear Section

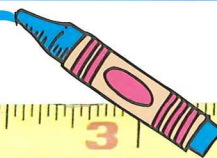
11. Carefully cut along the continuous lines.
12. Bend the base so that the image sits up and faces the lens.
13. Paste base of front section to base of rear section.
14. Paste Tab E of rear section to Tab E of middle section.
15. Paste Tab F of rear section to tab F of middle section.

Hey presto! You've made the Eye Model!



Rear Section

Try These Experiments



Pupil Sizes

Pair up with a friend. You will each need a note pad (or piece of paper) and a black pencil.

Take turns to complete the following:

Sit outside in the daylight or in a bright room (preferably with plenty of sunlight coming in). Look into the eyes of your friend and check the size of the pupils. On a piece of paper draw the actual size of the pupil and shade it in with your black pencil.

Now go to a darker room and repeat the experiment. Draw the actual size of the pupils again.

My friend's pupil size in bright conditions		My friend's pupil size in darker conditions	
What did you notice?			

Swap places with your friend and do the experiment again—this time your friend will measure your pupils.

Isn't the brain wonderful!

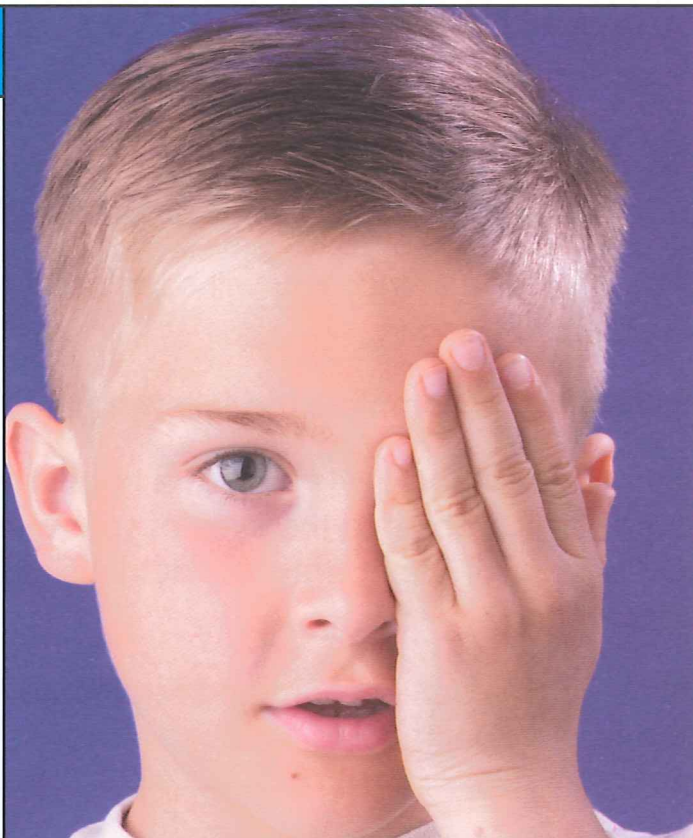
It does so many things for us. When the light is bright, the brain tells the muscles in the iris to reduce the size of the pupil (opening). That means less light enters the eye. The retina is protected from too much light.

When it turns dark outside, the eye needs to let in more light. The brain tells the muscles of the iris to enlarge the pupil.



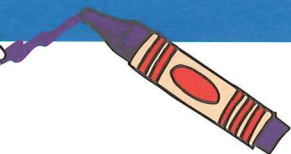
Two Eyes are Useful!

Cover your LEFT eye with your hand and look at the dot in the figure below with your RIGHT eye. The cross can be seen out the corner of your eye. Hold the paper out in front of you with your arm stretched out. Slowly bring the paper towards you as you continue to look at the dot. Suddenly the cross will disappear. Its image has fallen on the blind spot where there is no retina. Bring the paper still closer and the cross can be seen again. Now find the blind spot in your other eye by repeating the experiment. This time cover your RIGHT eye and look at the cross.



So make sure you look after both eyes! Having two eyes, means that we can see both of the above objects at any stage. Blind spots are dealt with by the other eye. Having two eyes also gives us a better sense of depth in our vision (three dimensional vision).

Eye Chart



Ever used an Eye Chart?

Eye charts are used to see how sharp a person's vision is—in each eye. One eye is covered while the other does all the work. You can see how sharp your vision is in each eye by using the chart. Place this page upright on a shelf and stand back about 3.5 metres. How many lines could you read accurately?

F

B C

P T E O

B Z F E D

O F C L T B

T E P O L F D Z

L P C T Z D B F E O

Z O E C F L D P B T

E T O L E B Z E F D C

B O F C P T E B L F B E Z C O P E

Sometimes our eyes need help

Form small group(s) and discuss the following problems. What do you suggest as a solution? Check your answers with your leader afterwards.

How do you deal with a problem like	Write the solution here
Other people can read the whiteboard at school but I can't.	
A scientist wants to have a better look at the tiny features on the body of an insect.	
A submarine crew wants to search for the enemy on the sea but doesn't want to bring their submarine to the surface.	
An astronomer wants a better view of the stars and planets.	
A spectator in the top level of the grandstand wants to see the expression on the face of a champion sportsman.	
You snorkel under water but sometimes the vision is cloudy to the naked eye.	




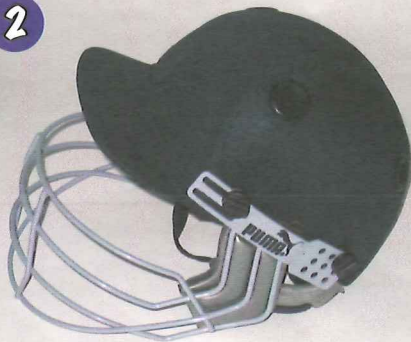

Did you know? If you haven't got a telescope, you can use binoculars to view the night sky.




Check out the moon for a start! You'll see its craters like never before! Look into the Milky Way and get a better glimpse of its wonders.

Sometimes we need to protect our eyes – crazy if we don't!

Check out the eye protectors on this page. Answer the following questions for each;

- A What is their name?
- B Have you seen people using them?
- C Have you worn them yourself?
- D In what situation, should they be used?

<div>1</div> 	<div>2</div> 	<div>3</div> 
<div>A</div>	<div>A</div>	<div>A</div>
<div>B</div>	<div>B</div>	<div>B</div>
<div>C</div>	<div>C</div>	<div>C</div>
<div>D</div>	<div>D</div>	<div>D</div>

<div>4</div> 	<div>5</div> 	<div>6</div> 
<div>A</div>	<div>A</div>	<div>A</div>
<div>B</div>	<div>B</div>	<div>B</div>
<div>C</div>	<div>C</div>	<div>C</div>
<div>D</div>	<div>D</div>	<div>D</div>

Form small groups and discuss each of the following situations. What do you suggest as a solution? Check your answers with your leader afterwards.

How do you deal with a situation like	Write the solution here
You are off to the beach on a bright sunny day. You know the white sand will be glary.	
You're off to play a game of squash where there is always a danger of eye injury.	
Mum or Dad are mowing the lawn and want to be protected against small stones flying up into their face.	
You know an adult member of St John who needs to protect his eyes from a casualty's body fluids.	
You are a batsman and want to protect yourself from fast bouncers.	
You are off to the local pool and want to protect your eyes from chemicals.	

Let's look at some Eye Problems



Here's a chance to learn about some other eye problems. Your leader will select a couple of the following eye problems and help you understand them.

A Patchy Retina—Age Related Macular Degeneration



This is one of the common forms of blindness in Australia. It is a 'mouthful' of a name, isn't it! It is a disease of the retina. Often people affected begin to notice a dark blob in their vision. It occurs mainly in older people.

There is little that can be done to prevent 'Age Related Macular Degeneration' ...but its good to know that eating vegetables is good for our retinas.

Sometimes the use of magnifiers helps.

Activities for your small group

Pick up your Model of the Eye and point to the area of the eye which is affected by Age Related Macular Degeneration.

Put on a pair of swim goggles with a tiny disk stuck to the middle of each lens. What has this done to your vision?

Does your vision for reading improve with the use of a magnifying glass?

Cloudy Lenses—Cataracts



A cataract is a cloudiness which forms in the lens of the eye. As the cloudiness increases, the vision becomes less clear. Colours are less bright and reading becomes more difficult.

The treatment is removal of the natural lens which is replaced by an artificial plastic lens.

Activities for your small group

Pick up your model of the eye and point to the area of the eye which is affected by Cataracts.

Pretend that one of you is Grandpa who refuses to see an eye doctor. The only way he can read his newspaper is under a strong light. He complains that it is getting worse. He knows nothing about the Eye. Help him by explaining what might be the problem and try to convince him to see the eye doctor.

Put on a pair of swimming goggles with strands of cotton sticky taped to the outside of the lenses. What has this done to your vision? Is reading more difficult?

Cataracts change the quality of life. What would you miss out on?

A Warped Window—Focus Problems



The cornea (window of the eye) helps us to focus. It allows light to pass through and be focused by the lens on the retina. If the cornea is scarred or misshapen we will see less clearly. Sometimes the focus affects our vision of far objects and sometimes it affects our vision of close objects such as reading a book, magazine or computer screen.

People with focus problems need to see their optometrist who will give them glasses or contact lenses.

Activities for your small group

Pick up your model of the eye and point to the area of the eye which is affected by Focus Problems.

Is there anyone around you who has prescription glasses? They most likely have them for focus problems. Ask them to tell you their story.

What are some daily living dangers of having focus problems?

Discuss the advantages and disadvantages of contact lenses as an alternative to prescription glasses.

Advantages:

Disadvantages:

A Scarred Window—Trachoma



Trachoma causes scarring of the cornea—the window of the eye. It's hard to see from behind a scarred window! Dust, flies and small insects can be carriers of infection—rubbing and scarring the surface of the cornea. It is painful and there is often swelling and distortion of the eyelids. The eyelashes turn in and scratch the cornea. The person can't see comfortably in bright situations.

Trachoma is treated with medicine for the infection or by an operation on the eyelids.

Activities for your small group

Pick up your model of the eye (the one you cut out and assembled) and point to the area of the eye which is affected by Trachoma.

If you lived in an area which had occasional sandstorms, how would you protect your eyes to avoid Trachoma?

Would you advise a person to rub their eyes? Why not.

Put on a pair of swimming goggles and smear the outside with dirt and vaseline. What has this done to your vision?

Trachoma is an infectious eye disease. What does that mean?

Pressure inside—Glaucoma



This is a common eye complaint and usually affects older people. The optic nerve becomes damaged because of too much fluid pressure inside the eye. There will be loss of side vision and headaches—blindness can develop.

Medicated eye drops help in the treatment of Glaucoma.

Activities for your small group

Pick up your model of the eye and point to the area of the eye which is affected by glaucoma.

Modify the swimming goggles once more. Place a piece of paper on each goggle lens. Make sure that each piece has a hole 1 cm in diameter in the middle. Now try on the goggles.

What has this done to your vision?

Why do you think people refer to Glaucoma as 'tunnel vision'?

How would untreated Glaucoma affect the ability of a car driver?

Time to show off what you have learned so far!

Here's a crossword for you to work on. Have a go by yourself. Then work with a friend to find more answers. If you're still not there, work in a small group. By then it should be solved!

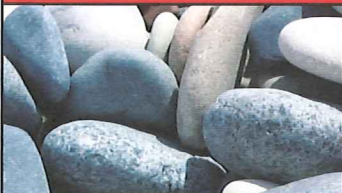






Down Clues		Across Clues	
1	Pinhole (or opening) in the eye	5	Coloured part of eye
2	Eye problem due to increased fluid pressure	6	Infectious disease of eye
3	Window of the eye	9	Part of eye behind the iris
4	Used by scientists to view small objects	11	Known as the 'camera film' of the eye
7	Coudiness that form in lens of eye to create a problem	12	One of the other senses
8	Used by scientists to view stars and planets	13	Name of nerve taking eye messages to brain
10	Moist layer in eyelids	14	... degeneration (common eye disease)

	1						2		3	
			4							
	5									
		6			7					
	8									
9									10	
					11					
			12							
						13				
				14						

How do Eye Injuries Occur?



Take the clue in the left hand column and explain in the right hand column how different eye injuries can occur.

Clue		How can the eye be injured?
	Stones	
	Balls	
	Sticks	
	Chemicals	
	Sunlight	
	Lasers	
	Dirt or sand	
	Bits of wood or metal	

Discuss in small groups how these accidents can be prevented.
Remember—prevention is better than cure!

Depending on the seriousness of the injury, you may need to call 000 for an ambulance.

Eye Wash



Some eye injuries such as dust (or other particles), chemical or heat burn injuries can be treated by an eye wash. You can practise the washing of an eye by using a manikin.

But first!

You need to

(for your own safety)

and wash

and

wear

to prevent infection.

These are important preparation steps which you should include when you practise the eye wash.

Be kind and gentle. Explain to the casualty what you are going to do and give some encouragement along the way.

Use saline if available, otherwise use clean luke warm tap water from a very clean jug. Hold the jug just a few centimetres from the eye being irrigated. Do not touch the eye.

Your leader will show you how to remove and dispose of your gloves when you have finished.



Practise! Practise! Practise!

Penetrating Eye Injury

Not a nice thing to talk about but

What objects can penetrate the eye?

--	--	--

If an object penetrates in the eye, it is a serious eye injury requiring immediate medical aid.

It is important that the casualty lies down and remains very still.

Why?

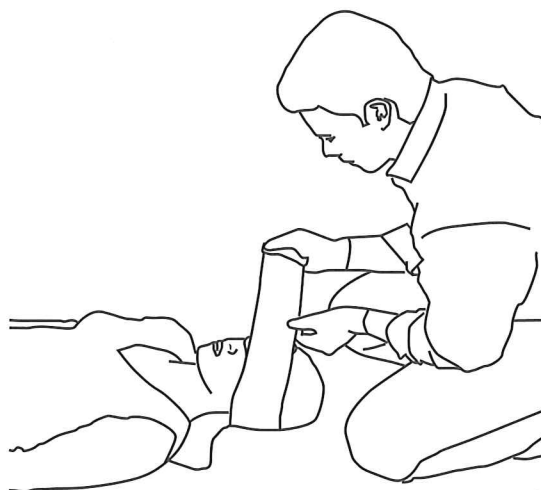
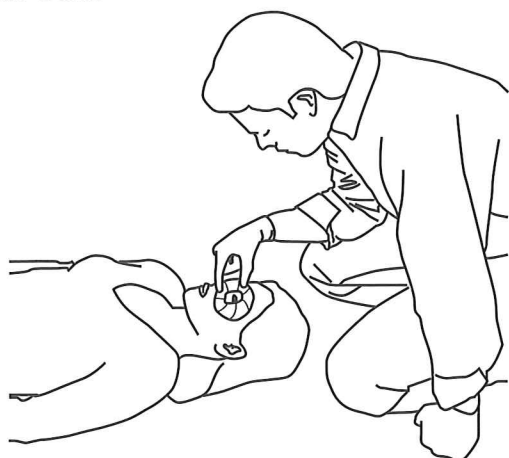
Do you think the casualty will need reassurance?

--

After checking for danger and calling an ambulance, you can protect the eye from further injury by applying a pad around the eye and secure it with a roller bandage.

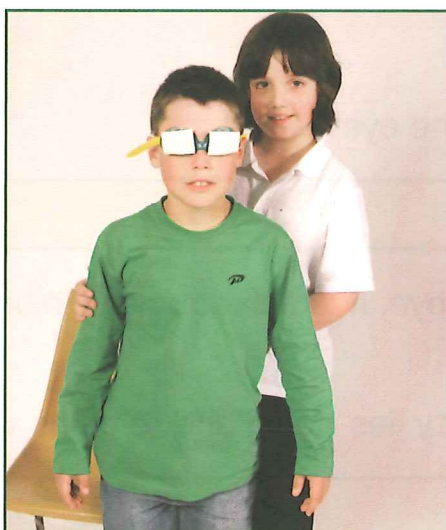
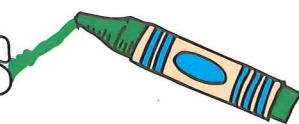
A Doughnut pad (made with a triangular bandage) can be a very effective pad because when placed over the eye, there is no pressure on the eye lid or the eyeball.

Try making a doughnut pad and securing it with a roller bandage. Your leader will show you how. Don't forget to reassure the casualty and encourage him or her to remain still.



Practise! Practise! Practise!

Helping a Person with Sight Problems



If you see a person with vision impairment needing help, you can be of great practical assistance. Helping a person up some stairs, through a doorway, into a lift or to locate and sit on a chair are just a few examples.

Ask the person if he or she would like some assistance. Listen to the person who might suggest the best way you can assist. Make sure you concentrate and take great care until the task is finished.

You can practise helping a person with vision impairment. Work in pairs and place a pair of swimming goggles on the person to be assisted. Place post-it paper on the outside of the goggles. Assist the person to walk safely around objects in the room.

Remember people like to be independent. Giving them more help than they need may not be appreciated.

Practise! Practise! Practise!

There are lots of aids to help people with sight problems:

• prescription glasses	• magnifying glasses	• talking books
• contact lenses	• voice-activated computer	• braille books
• braille keyboard.	• specialised watches and clocks (including braille and talking)	• software which magnifies text on a computer
• large print books	• white cane	• studded footpaths
• large numbers for phone	• seeing eye dogs	• beeping traffic lights

Braille—a simple but great invention

Braille is a system of tactile (touchable) alphabet characters. Each dot is slightly raised on the page of a book or on a keyboard—allowing a person with poor sight to feel rather than see the characters. People can become very fast and accurate in the use of braille.

a	b	c	d	e	f	g	h	i	j	k	l	m
•	• •	• •	• • •	• •	• • •	• • • •	• • • •	• •	• • •	• •	• • •	• • •

n	o	p	q	r	s	t	u	v	w	x	y	z
• • •	• •	• • •	• • • • •	• • • •	• • •	• • • •	• • • •	• • • •	• • •	• • • • •	• • • • •	• • • •

Write your name in braille here:

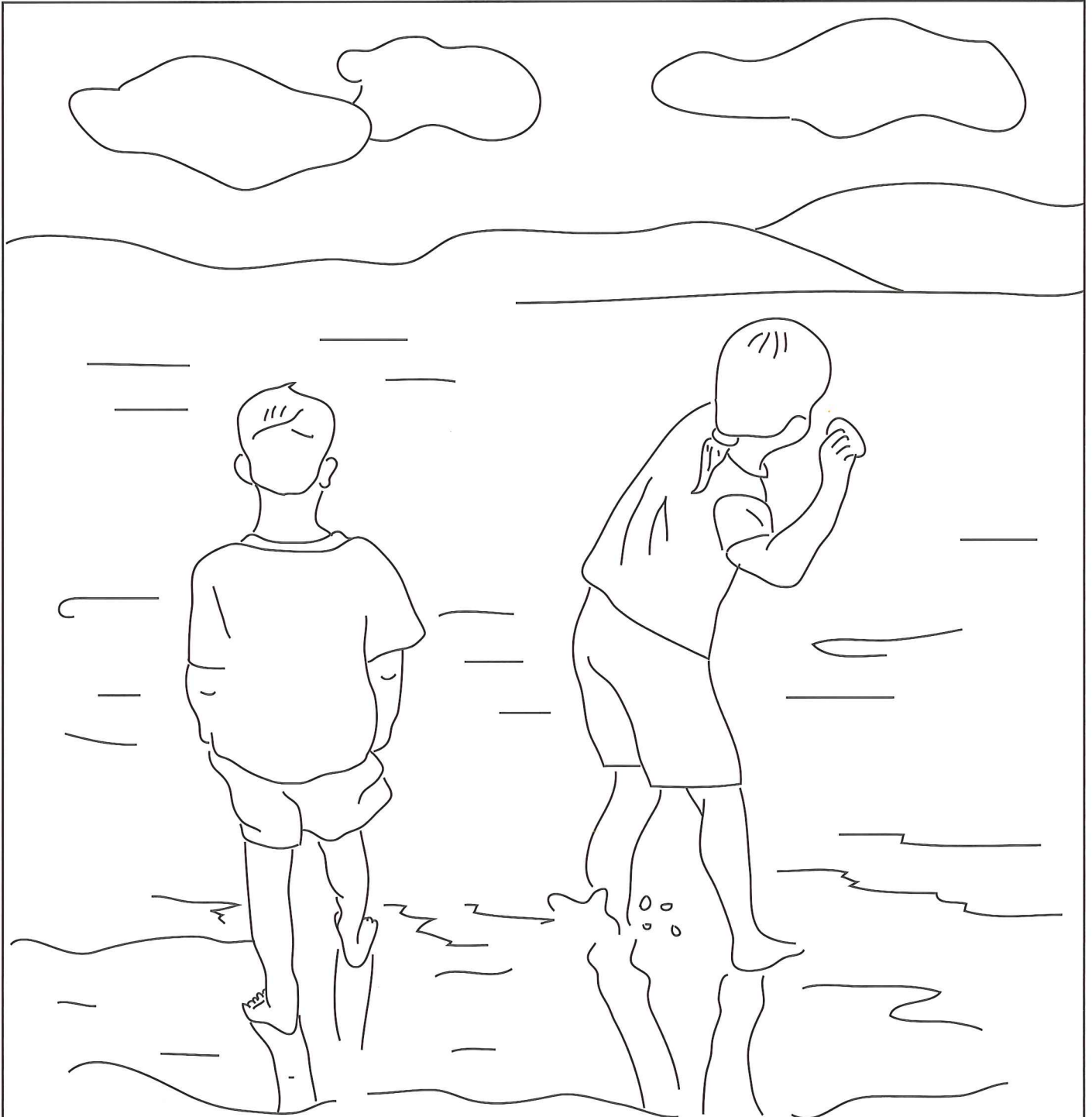
Write a short message to your friend here:

Colouring-in Competition

With your friends, plan and conduct a colouring-in competition.

You will need to decide:

- who can enter (and whether there are age categories)
- deadline for entries
- who will judge the entries
- prize(s)
- how the prize(s) will be purchased



Throw objects away from others. If too dangerous, don't do it!

Congratulations

Provided you have successfully completed all activities you will receive the

Eye Health badge



All badges available are shown below.
Circle the badges you have already received.

ANZAC Heritage 	Caring for Animals 	Casualty Simulation 	Child Care 	Computer Studies 
Cookery and Nutrition 	Cycling 	Environment 	Eye Health 	Fire Safety 
Family Care 	Handicrafts 	Health Care 	Home Craft 	Indigenous Studies 
Knowledge Of The Order 	Personal Safety 	Road Safety 	Sports 	

