SIGHT AND LIGHT

Pathology of vision: Blindness

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1 Blindness and Braille — Listening

Listen and complete the chart.

Extent of blindness

	Can tell light from dark	Can recognize shapes
Absolute	(1)	no
(2)	(3)	(4) .....

Possible causes of blindness

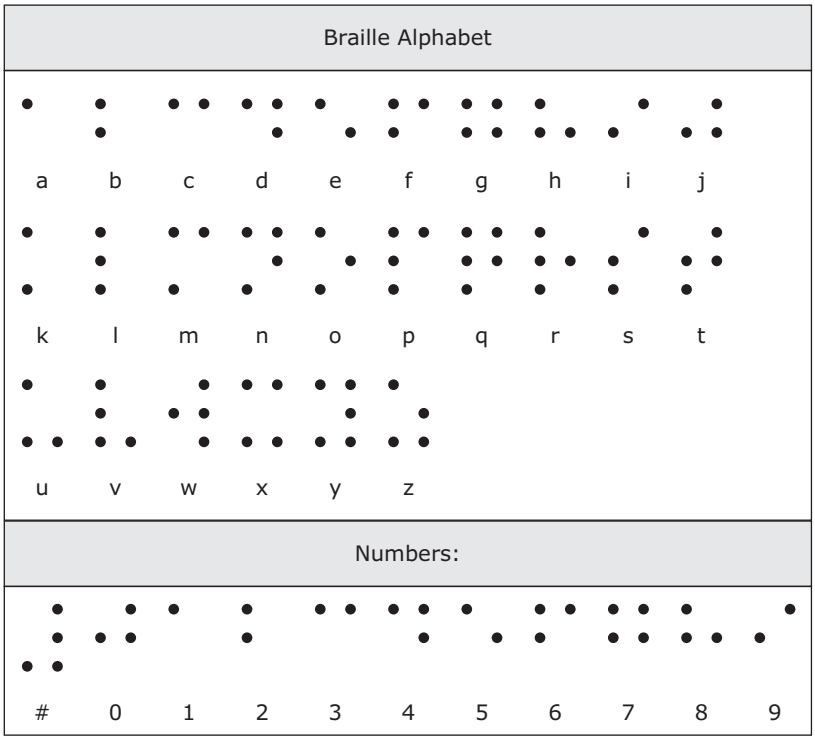
Innate
Damage during pregnancy
(6) .....

(5) .....
Disease / malnutrition
(7) .....
Injury

How many dots are used to form each letter of the Braille alphabet? (8) .....

2 Using Braille — Reading, Writing

Work in pairs. Look at the Braille alphabet.



Using a pen, make dots on paper to spell out a short sentence using the Braille alphabet.

Give your sentence to your partner, and try to read your partner's sentence.

Write your partner's sentence here, then check.

Now spell a word in Braille, using something sharp like a pin or a pen to press dots onto a card.

Can you read the word with your eyes closed? Can you read your partner's word with your eyes closed?

3 Questions for discussion

Speaking

1 Would you prefer to wear glasses or contact lenses? Why?

2 What differences would it make to your everyday life if you went blind?

3 Is the eye like a camera? What are the similarities and the differences?

4 How do you think animated images and films trick the eye into seeing continuous motion?

Pathology of vision: Blindness

SCIENCE

Teacher's Notes and Answer Key

This worksheet will take over an hour to complete. It is suitable for secondary school students of general science, biology or physics and could follow on from a general introduction to light and vision. It could also be used independently or could follow on after the pathology of vision worksheet on difficult vision problems which focuses on astigmatism and glaucoma.

1 Blindness and Braille — Listening

Aims

- **to understand a simple classification of blindness**
- **to complete a table from a listening with specific information**

Read this script out twice or more to allow students to complete their tables.

Blindness

There are two types of blindness: one is called absolute – people cannot see any difference between dark and light. The other one is relative – people can distinguish light from dark, and sometimes even determine the source of the light, but cannot recognize shapes properly.

Either kind of blindness can be innate (present from birth) or acquired during your life. Innate blindness could be due to damage caused during pregnancy to the brain, the optic nerve or the eye itself. Innate blindness might also be due to genetic defects inherited from your parents.

Acquired blindness can happen at any stage of your life. A major cause of acquired blindness is disease, sometimes caused by malnutrition, or glaucoma. Sometimes blindness is caused by stresses or trauma to the eye or the head – a very good reason to protect your eyes…!

Blind people can read and write using a special alphabet designed to be felt with the fingers, made up from patterns of six dots. This alphabet is named after its author – the Frenchman Louis Braille – who lost his sight at the age of 4 after an accident. Through the Braille alphabet letters and numbers can be spelt out, and commonly used words also have special symbols.

Key:

1 no; 2 Relative; 3 yes; 4 no; 5 Acquired; 6 genetic defects; 7 glaucoma; 8 six.

2 Using Braille

Reading, Writing

Aims

- **to learn about Braille and understand blindness better**
- **to fix ideas with a memorable and enjoyable activity**
- **to give an opportunity to recall vocabulary and produce language freely**

Students work in pairs and follow the instructions. They will need some card and some pins. If no pins are available they can press hard with pens. They may want to blindfold one another to be sure they are not cheating.

They can use any sentences and any words they like, but you might want to suggest that if they are short of ideas they should look back at the vocabulary from the worksheet.

3 Questions for discussion

Speaking

Aims

- **to reflect on the implications of what has been learned**
- **to engage in discussion and contribute opinions within a large group**

Each of these questions may be used as the basis of extended discussion if there is time and enthusiasm for it.

Reasons to consider contact lenses

- Contact lenses move with your eye, allow a natural field of view, have no frames to obstruct your vision and greatly reduce distortions
- They do not fog up, nor do they get splattered by mud or rain
- Contact lenses do not get in the way of your activities
- Many people feel they look better in contact lenses
- Contact lenses generally offer better sight .

Reasons to consider glasses

- Glasses are often cheaper than contact lenses
- Glasses do not require you to be as careful in cleaning
- Some people feel they look better in glasses

- Some people find contact lenses uncomfortable
- When contact lenses fall from the eye or are dropped, they can be easily lost.

The eye and the camera

Similarities	Differences
Lens - same type of lens. Both eye and cameras need to change their focus: on things close to you or far from you but not at the same time. Both have a control of how much light enters.	In camera, the focus is on a piece of film, in eyes it is on the retina. No blind spot in cameras. Only one type of receptor in a camera, not one for colour and one for black and white.

Students might have other ideas as well – eg, pupils dilate depending on mood – no mood in cameras, etc.

How do movies and animations trick the eye?

In both cases the principle is similar. Images are projected onto the screen very fast – 24 images (frames) per second – and this creates the illusion of movement.