Light

STUDENT A

Stefka Kitanova

one stop clil

SCIENCE

1 Waves and beams of light

Listening

Which one is different from the others? Why?

Microwaves	Sound waves	X-rays	Red light

Put these in order of wavelength (longest waves first). Then listen to your teacher again and check.

Blue light _____

Infrared _____

Microwaves _____

Radio waves _____

Ultraviolet _____

Yellow light _____

X-rays _____

Now fill in the gaps with the correct word. Then listen to your teacher again and check.

1 Waves _____ energy and information in space and time.

2 Electromagnetic radiation does not need a _____.

3 All electromagnetic radiation always travels at the same _____ in a vacuum.

4 The different wavelengths of _____ light are different colours.

5 Waves can be reflected back or _____ (bent).

6 A beam of white light is a _____ of all the visible wavelengths.

2 Eyes and light

Vocabulary, Speaking

Read the rules and play the quiz.

Work in groups. Sit with the students who have the same worksheet as you. There are two groups in the class. Each group has half of the answers. You are in Group A.

One group reads the first quiz question aloud. Only one of the groups has the answer. Put your hand up if you think you have the answer. Talk to the other students in your group until you agree.

When one group agrees that they have the answer, they read it out. If it is correct, that group reads out the next question.

1 What is spherical in shape, has three layers and an inner core?

2 What are different wavelengths of visible light?

3 What is the white of the eye, which gives the eyeball its shape?

4 What cause the eye to move?

5 What protects the retina from strong light?

6 What has the shortest electromagnetic wavelength?

7 What contains sensitive cells (for light and colour)?

8 What is a different colour in different people?

9 What is the bending of a beam of light that changes speed?

10 Which part of the eye refracts lights to focus it on the retina?

11 What is the point on the retina where there is the sharpest vision?

12 What carries impulses from the eye to the brain?

Answers

Colours	Optic muscles	Lens
Refraction	Retina	Sclera

Light

STUDENT B

Stefka Kitanova

one stop clil

SCIENCE

1 Waves and beams of light

Listening

Which one is different from the others? Why?

Microwaves	Sound waves	X-rays	Red light

Put these in order of wavelength (longest waves first). Then listen to your teacher again and check.

Blue light _____

Infrared _____

Microwaves _____

Radio waves _____

Ultraviolet _____

Yellow light _____

X-rays _____

Now fill in the gaps with the correct word. Then listen to your teacher again and check.

1 Waves _____ energy and information in space and time.

2 Electromagnetic radiation does not need a _____.

3 All electromagnetic radiation always travels at the same _____ in a vacuum.

4 The different wavelengths of _____ light are different colours.

5 Waves can be reflected back or _____ (bent).

6 A beam of white light is a _____ of all the visible wavelengths.

SCIENCE

2 Eyes and light

Vocabulary, Speaking

Read the rules and play the quiz.

Work in groups. Sit with the students who have the same worksheet as you. There are two groups in the class. Each group has half of the answers. You are in Group A.

One group reads the first quiz question aloud. Only one of the groups has the answer. Put your hand up if you think you have the answer. Talk to the other students in your group until you agree.

When one group agrees that they have the answer, they read it out. If it is correct, that group reads out the next question.

1 What is spherical in shape, has three layers and an inner core?

2 What are different wavelengths of visible light?

3 What is the white of the eye, which gives the eyeball its shape?

4 What cause the eye to move?

5 What protects the retina from strong light?

6 What has the shortest electromagnetic wavelength?

7 What contains sensitive cells (for light and colour)?

8 What is a different colour in different people?

9 What is the bending of a beam of light that changes speed?

10 Which part of the eye refracts lights to focus it on the retina?

11 What is the point on the retina where there is the sharpest vision?

12 What carries impulses from the eye to the brain?

Answers

Eyeball	Fovea	Iris
Optic nerve	Vascular layer	X-rays

Light

Stefka Kitanova

SCIENCE

Teacher's Notes and Answer Key

This worksheet has two different versions: one for Student A and one for Student B. It is suitable for secondary school students of general science, biology or physics, and provides a general introduction to wavelengths and how the eye processes light.

1 Waves and beams of light

Listening

Aims:

- **to learn about light and other kinds of waves**
- **to understand a basic scientific subject by listening to an English explanation**

As there are 3 parts to this activity, it would be best for you to read it to the students at least 3 times ...

Teacher's script:

Waves transmit energy and information in space and time. There are two main kinds of waves: vibrations and electromagnetic radiation. Vibrations travel through a medium, like water or air. We can feel vibrations, or hear them as sound. Electromagnetic radiation does not need a medium – it can travel through a vacuum. The space between the stars is a vacuum, and we can see the stars because the light that comes from them is a kind of electromagnetic radiation.

All electromagnetic radiation always travels at the same speed in a vacuum: 299,792,458 metres per second. But the waves can have different lengths. The longest waves are radio waves, then microwaves, then infrared. Shorter waves than these can be seen as light. The different wavelengths of visible light are different colours. Red waves are the longest, then yellow, green, and blue. The shortest waves we can see are purple. Waves that are too short for us to see are ultraviolet light and X-rays.

Waves travel in straight lines, spreading out from a source like the ripples in a pond. They can be reflected back or refracted (bent) when they pass from one medium to another and change speed. In order to understand how light behaves, it is helpful to think of these straight lines as beams of light. A beam of white light is a mixture of all the visible wavelengths.

Key:

Sound waves are the odd one out because they are vibrations in a medium rather than electromagnetic radiation.

Radio waves – microwaves – infrared – yellow light – blue light – ultraviolet – X-rays

1 transmit

2 medium

3 speed

4 visible

5 refracted

6 mixture

2 Eyes and light

Reading, Speaking

Aims:

- **to consolidate learning of the concepts and language presented**
- **to practise reading definition questions**

If possible, get students to move so that all of them with the same worksheet are sitting together. The students with sheet 1 are group A, those with sheet 2 are group B. Explain that the groups have to discuss the answers in English until the whole group agrees whether they have the right answer on their sheet or not.

Key:

1 Eyeball (group B)

2 Colours (group A)

3 Sclera (group A)

4 Optic muscles (group A)

5 Vascular layer (group B)

6 X-rays (group B)

7 Retina (group A)

8 Iris (group B)

9 Refraction (group A)

10 Lens (group A)

11 Fovea (group B)

12 Optic nerve (group B)