

Topic: Light

Lesson	Lesson Title
1	Introduction to light
2	Reflection
3	Periscope
4	Refraction
5	Lenses and the eye
6	Dispersion and seeing colour
7	Filters

The two links below take you to The Oak National Academy Lessons.  
The lessons are an introduction to Light and ray diagrams.  
The video lessons include tasks which are clearly explained.

<https://classroom.thenational.academy/lessons/light-waves-c5h38c>

<https://classroom.thenational.academy/lessons/reflection-c5jp2r>

<https://classroom.thenational.academy/lessons/refraction-71hkgd>

<https://classroom.thenational.academy/lessons/colour-cru3at>

**Questions for you to complete and then mark.**

**Q1.**

Thunder and lightning happen at the same time.

- (a) We see the flash of lightning before we hear the thunder.  
Give the reason for this.

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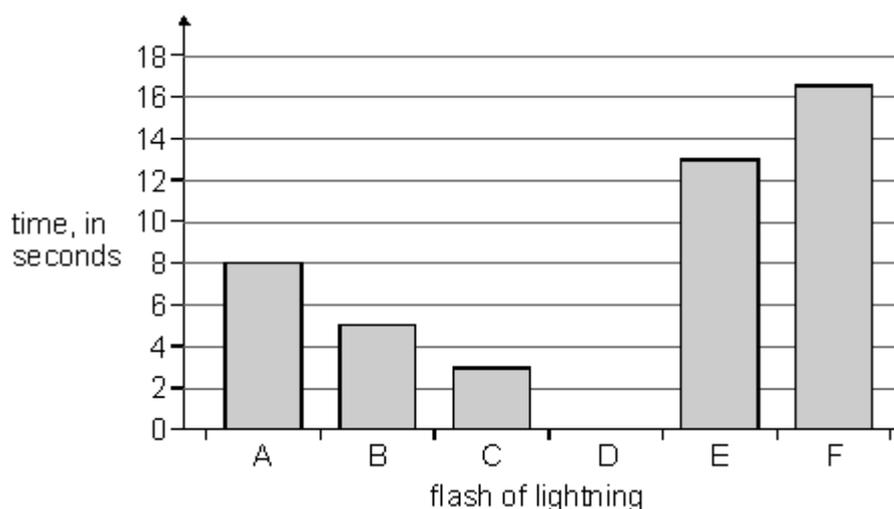
.....

1 mark

- (b) Omar investigated the movement of a storm. He measured the time between seeing a flash of lightning and hearing the thunder. He did this six times. Omar put his results in a table.

flash of lightning	time between seeing the lightning and hearing the thunder, in seconds
A	8.0
B	5.0
C	3.0
D	9.0
E	13.0
F	16.5

Omar drew a bar chart of his results as shown below.



- (i) On the bar chart, draw a bar for flash D. Use a ruler.

1 mark

- (ii) Which flash of lightning was closest to Omar?  
Give the correct letter.

.....

1 mark

- (iii) Describe how the distance between the storm and Omar changed as the storm moved between flash A and flash F.

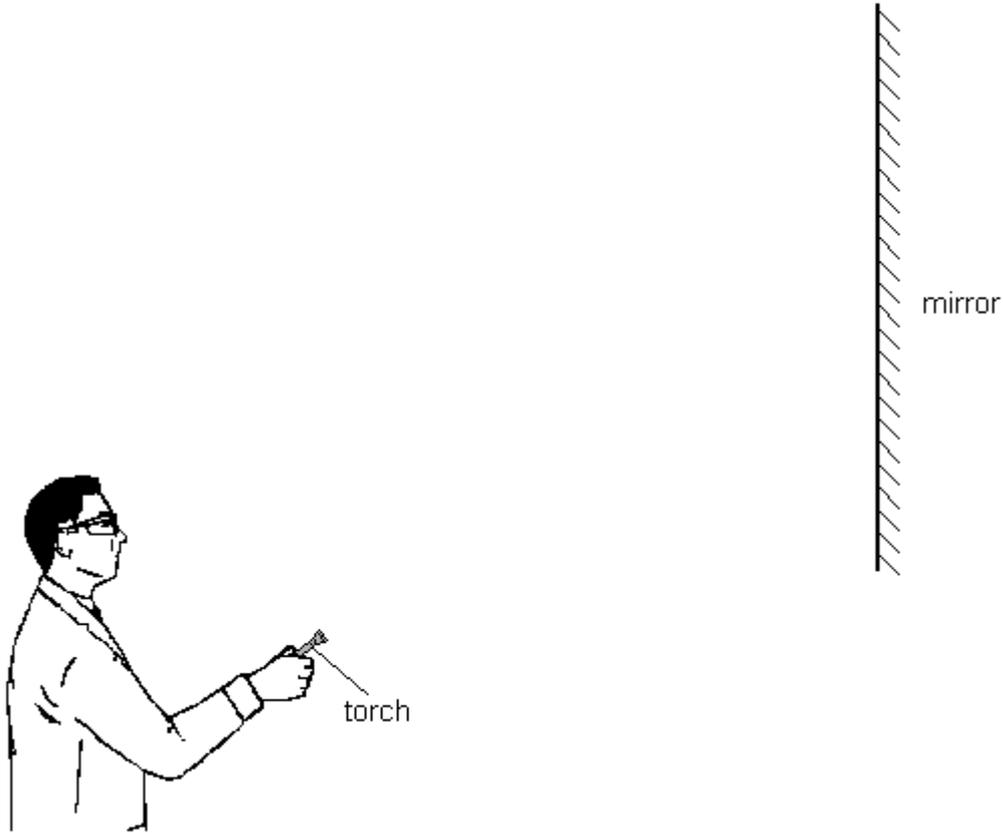
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1 mark

Maximum 4 marks

**Q2.**

A teacher has a small torch. He switches it on and points it towards a mirror.



(a) A ray of light from the torch reflects off the mirror. Use a ruler to draw the ray of light:

(i) from the torch to the mirror;

1 mark

(ii) reflecting off the mirror.

2 marks

Add arrows to the rays to show the direction of the light.

(b) A laser beam is a very bright and powerful beam of light. It is very dangerous to point a laser beam towards people or animals.

Which part of the body can be most easily damaged by a laser beam?

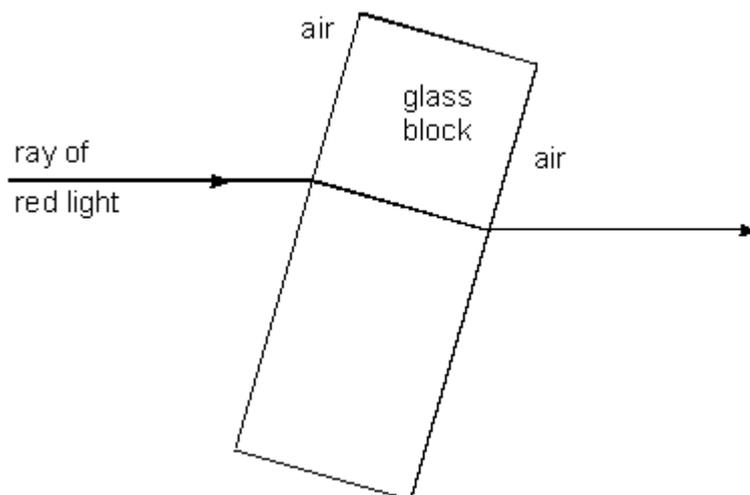
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1 mark

Maximum 4 marks

**Q3.**

(a) The diagram below shows a ray of red light entering a glass block.



(i) Most of the light goes into the glass block, but some does not. What happens to the light which does **not** go into the glass block?

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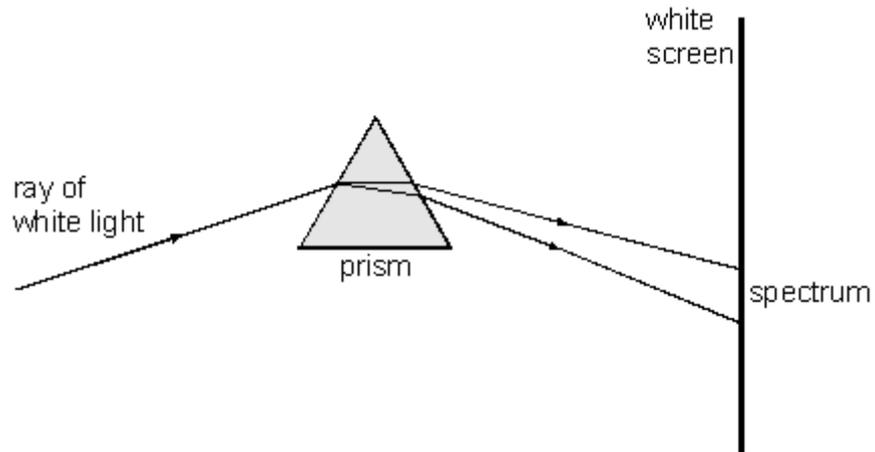
1 mark

(ii) As the light goes into the glass block, it changes direction. What is the name of this effect?

.....

1 mark

- (b) The diagram below shows white light passing through a prism and forming a spectrum on a white screen.



The spectrum contains light of all colours. Red is at one end of the spectrum. Write **blue**, **green** and **violet** below in the order of the spectrum.

\_\_\_\_\_ Red \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

1 mark

- (c) A pupil puts a green filter in the ray of white light. What happens to the spectrum on the screen?  
Tick the correct box.

The whole spectrum turns green.

The green part of the spectrum disappears, but the other colours stay the same.

The green part of the spectrum stays the same, but the other colours disappear.

The whole spectrum disappears.

1 mark  
Maximum 4 marks

**Q4.**

Light shines onto a ball. Naomi is looking at the ball.



- (a) Describe how light from the lamp lights up the ball and makes it visible to Naomi.

.....  
.....  
.....  
.....

2 marks

- (b) (i) Naomi uses different colours of light and different coloured balls.

Complete the table to show the colours that the balls appear to Naomi.

<b>colour of ball</b>	<b>colour of the light</b>	<b>the colour the ball appears to Naomi</b>
white	red	
green	white	

2 marks

- (ii) Why does a black object appear black in any light?

.....

1 mark

(c) Choose from the following terms to complete the sentences below.

**less than**                      **equal to**                      **greater than**

At a plane mirror, the angle of incidence is .....  
the angle of reflection. The distance from the object to the mirror is  
..... the apparent distance from the mirror to the image.

2 marks

(d) A beam of white light shines onto a sheet of white paper. An identical beam of light shines onto a mirror. The light is scattered from the paper and reflected from the mirror.

Describe how scattering by paper and reflection by a mirror are **different** from each other.

.....  
.....  
.....  
.....

2 marks  
Maximum 9 marks



