



KS3 Science

Light

Mark Scheme

Time available: 35 minutes

Marks available: 51 marks

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Mark schemes

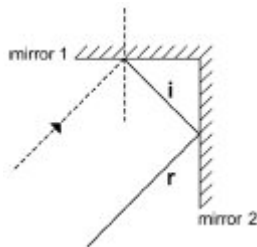
1.

(a) • true false

for **all four** correct, award two marks
 for **any two** or **three** correct, award one mark
 for **one** correct answer, award no marks
 if more than one box is ticked in any row, do not give credit for that row

2 (L6)

(b) (i) •



award one mark for approximately equal angles of incidence and reflection at mirror 1
 award one mark for a continuous ray that is reflected off mirror 1 and mirror 2
both rays are required for the mark rays must be drawn as straight lines
 ignore any arrows

2 (L7)

(ii) • rays 'i' and 'r' correctly labelled on diagram as shown above
both rays, correctly labelled, are required for the mark

1 (L7)

(c) any **two** from

- white light is a mixture of colours
- the red book absorbs all of the colours of light except red
accept 'the other colours are absorbed'
- only red light is reflected
'red light is reflected' is insufficient

2 (L7)

(d) •

	red	green	black
red filter	✓		
green filter			✓

both ticks are required for the mark
if more than one tick is placed in any row, award no mark

1 (L7)

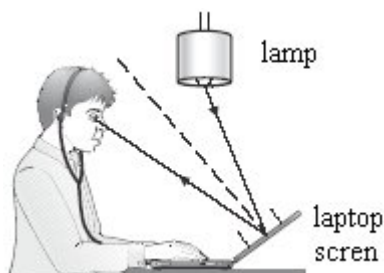
[8]

2.

(a) (i) • a continuous straight line from the lamp to the screen **and** from the screen to George's eye

1 (L5)

- angle of incidence approximately equal to the angle of reflection



accept a reflection anywhere between the dotted lines on the laptop screen

1 (L5)

- arrows in the correct direction on the incident and reflected ray
accept one arrow on a continuous ray showing reflection

1 (L5)

(ii) the reflected ray **or** the light image misses George's eyes
accept 'the ray of light is reflected at a different angle'
accept 'it moves down'

'the lamp is not shining in his eye's is insufficient'
do not accept responses referring to scattering
'it changes' is insufficient
do not accept 'the ray of light is reflected above his eye'

1 (L6)

- (b) from electrical energy to sound energy
both answers are required for the mark
answers must be in the correct order

1 (L5)

[5]

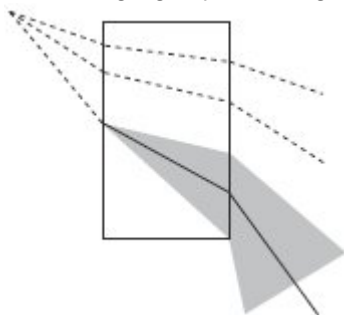
3.

- (a) refraction **or** refracting

1 (L6)

- (b) • a ray bending towards the normal at the first surface
accept a ray that is within the shaded area
both sections of the ray must be straight and continuous
ignore any arrows

- an emerging ray bending away from the normal at the second surface

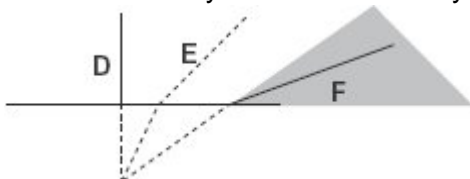


accept an emerging ray that is within the shaded area
the emergent ray does not have to be parallel to the incident ray

2 (L7)

- (c) • a continuous straight line for ray D
ignore any arrows
ignore any reflected rays

- a continuous ray F that bends away from the normal



accept a ray drawn within the shaded area
do not accept an emergent ray that does not refract

2 (L7)

[5]

4.

- (a) • a straight line from the snail to the surface and from the surface to the fish

the line must reach the fish within the tolerance shown below the ray must be continuous ignore an incident ray towards the snail ignore rays refracted at the surface

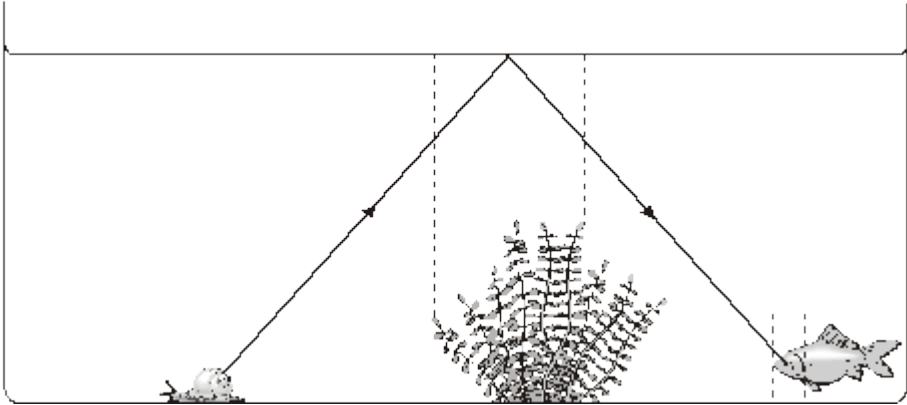
1 (L5)

- the angle of incidence should be approximately equal to the angle of reflection

the line must reach the surface of the water within the tolerance shown below

1 (L6)

- arrow pointing towards the fish **or** away from the snail
*accept a single arrow in the correct direction on either the incident **or** the reflected ray if two arrows are drawn, they must both be in the correct direction*

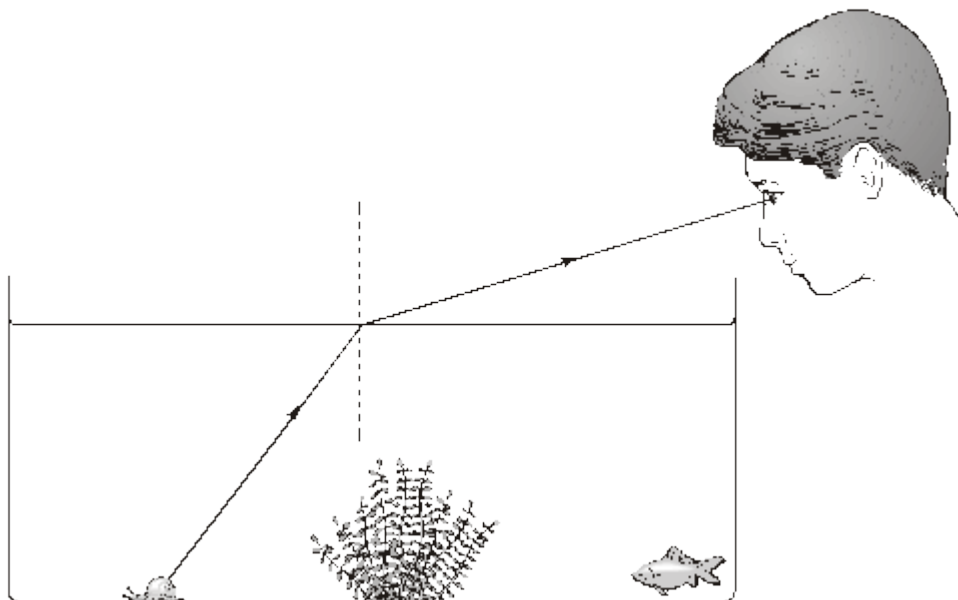


1 (L5)

- (b) (i) • a ray from the snail to Andrew's eye bending at the surface
both parts of the ray must be straight and must slope upwards and to the right
the ray must be continuous
ignore any incident rays drawn towards the snail
the ray must bend further away from the normal at the surface as it goes from water to air

1 (L6)

- an arrow pointing towards Andrew on any part of the ray
if two arrows are drawn, they must both be in the correct direction



1 (L6)

- (ii) • refraction

1 (L6)

[6]

5.

- (a) • 65
 it is different from the angle of incidence **or** all the others are the same

*accept 'number 4' **or** 'the fourth'*

*accept 'it is not 60°' **or** 'it should be 60°'*

accept 'the angle of reflection and the angle of incidence should be the same'

accept 'it is 5° out'

accept 'they are not the same'

both the answer and the correct explanation are required for the mark

award a mark for '60°' if the explanation is correct

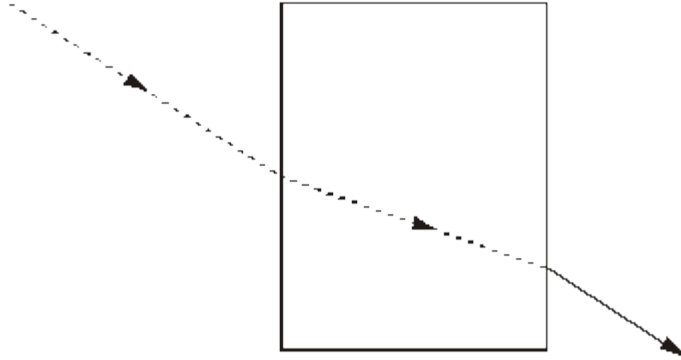
'they go up in tens' is insufficient

'it does not fit the pattern' is insufficient

1 (L5)

- (b) (i) • a number from 30 to 32 1 (L5)
- (ii) • greater than
accept 'greater' or 'bigger' 1 (L5)

(c)



accept a continuous straight line that bends away from the normal
accept a line without an arrow
The ray need not be parallel to the incident ray

1 (L6)

[4]

6.

- (a) (i) • only red light passes through the filter
accept 'the other colours are filtered out or absorbed'
'red light passes through' is insufficient
a mark for this answer may be awarded in either a i or a ii provided there is no contradiction 1 (L7)

- the ball reflects red light
accept 'white objects reflect all colours' 1 (L7)

- (ii) black
accept 'you cannot see it' 1 (L7)

any **one** from

- the green ball does not reflect red light or the light that passes through the filter
- the ball absorbs red light
accept 'no green light reaches the ball' 1 (L7)

(b) two red spots

accept 'red black red'
'two spots' is insufficient
'red spots' is insufficient
do not accept 'only red light'

1 (L7)

[5]

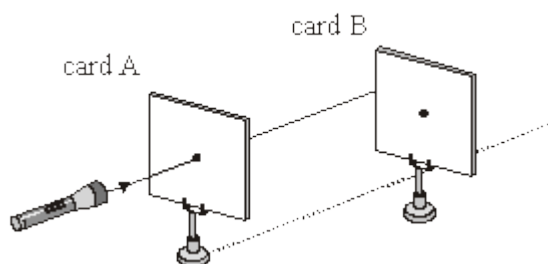
7.

(a) • Light travels in straight lines. ✓

if more than one box is ticked, award no mark

1 (L3)

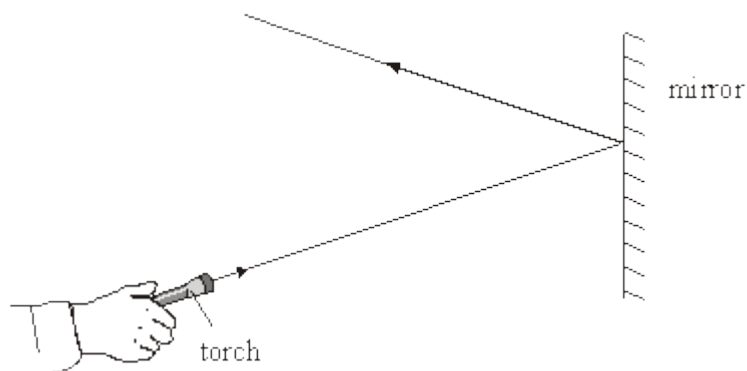
(b)



accept a continuous line drawn across card A and reaching card B
award a mark for a straight line from the existing ray passing through the hole in card A and reaching card B
the ray must not go beyond card B

1 (L3)

(c)



award one mark for a continuous straight line that reflects off the mirror
award one mark for an angle of reflection approximately equal to the angle of incidence
award one mark for a correct arrow on the reflected ray

3 (L4)

(d) Add another battery. ✓

if more than one box is ticked, award no mark

1 (L3)

[6]

8.

- (a) (i) A and C
answers may be in either order
both answers are required for the mark

1 (L6)

- (ii) any **one** from

- B
- D

1 (L6)

- (b) any **one** from

- not all the light is reflected
- some of the light is refracted
- some of the light is absorbed
- light is scattered by the glass
accept 'it splits into two rays' or 'it splits'

1 (L6)

[3]

9.

- (a) the light is scattered by the ball
accept 'it is scattered or reflected
or bounces off the ball'

1 (L5)

some of the light from the ball enters Naomi's eye
accept 'it goes into or gets to her eye'

1

- (b) (i)

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

do not accept 'pink' or 'light red'

1 (L6)

do not accept 'light green'

1 (L6)

- (ii) any **one** from

- it absorbs all the light
accept 'it absorbs light'
- it does not scatter any light
accept 'it does not reflect light'

1 (L6)

(c) equal to 1 (L6)

equal to

accept 'equals' or 'the same as'

1 (L6)

(d) **one mark is for describing scattering and one mark is for describing reflection**

scattering sends **or** reflects light in all directions

accept 'scattered light goes all over the place'

or *'the light from the paper goes off in lots of rays'*

or *'no image can be seen in the paper'*

1 (L6)

reflection sends light in one direction **or** to one point

accept 'the light from the mirror is all in one ray or beam'

or *'reflected light goes at one exact angle'*

or *'an image can be seen in the mirror'*

1 (L6)

[9]