Limehurst Science Department
Name: _____ Group:_____

Year 8

Foundation Pathway

End of Topic Assessment

Light

Analysis and Targets

No.	Score	Below/On/Above	Target for next Assessment. How will you achieve it?
1	___/4		
2	___/5		
3	___/6		
4	___/5		
5	___/5		
6	___/5		

Now complete the "Next Step" sheet you've been given and when finished attach it to the back of the paper.

Q1. Lamp

(a) At night, Ben switches on the lamp in his room.

There is a shadow of the chair on the floor.

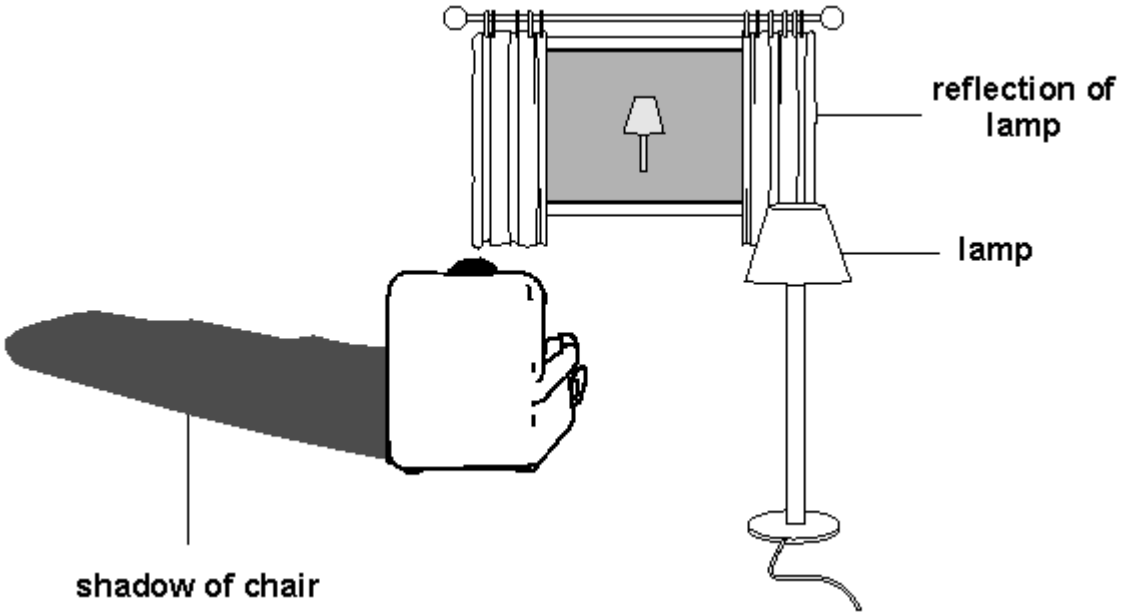
Explain how the shadow is formed from the light of the lamp.

.....

.....

2 mark

(b) Ben looks at the window, and sees a reflection of the lamp.



Why is there a reflection of the lamp in the window?

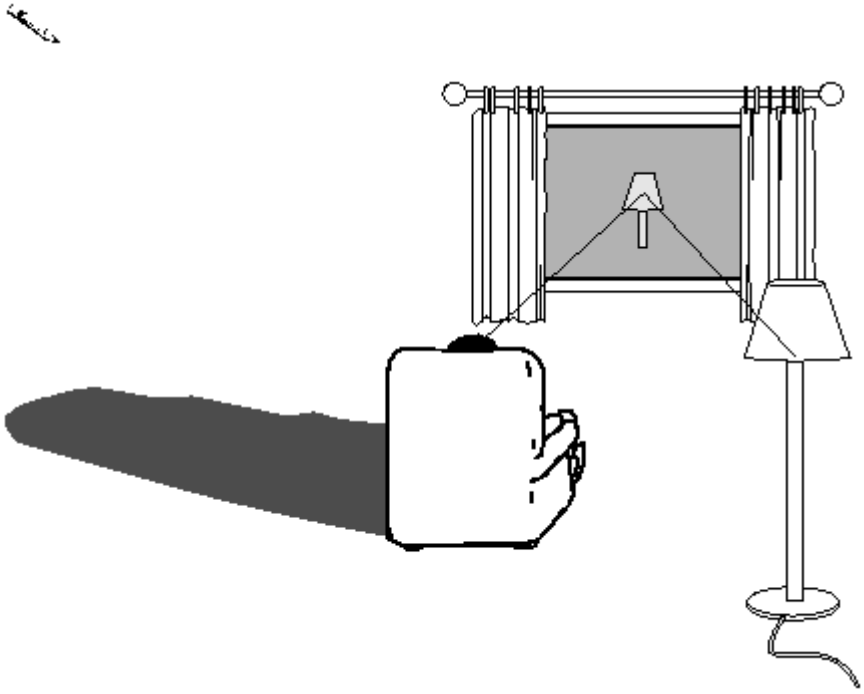
Tick **ONE** box.

There is a reflection of the lamp in the window because the window is . . .

shiny	☐	hard	☐
strong	☐	solid	☐

1 mark

(c) Draw **TWO** arrowheads on the lines in the picture below to show how light travels to let Ben see the reflection of the lamp.



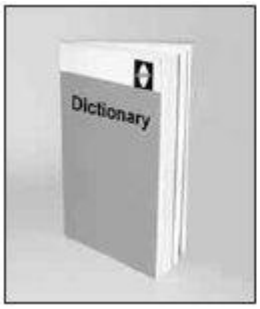
1 mark

Q2. Torch light

(a) Sanna is investigating which materials are good reflectors of light.
She shines a torch on different objects from a distance of 20 cm.

She looks at the objects to see how well each reflects light.

Tick **TWO** boxes to show which objects are the **best** reflectors.



Paper book ☐

Metal spoon ☐

Wooden spoon ☐

Woolly hat ☐

Glass jar ☐

Compact disc ☐

2 marks

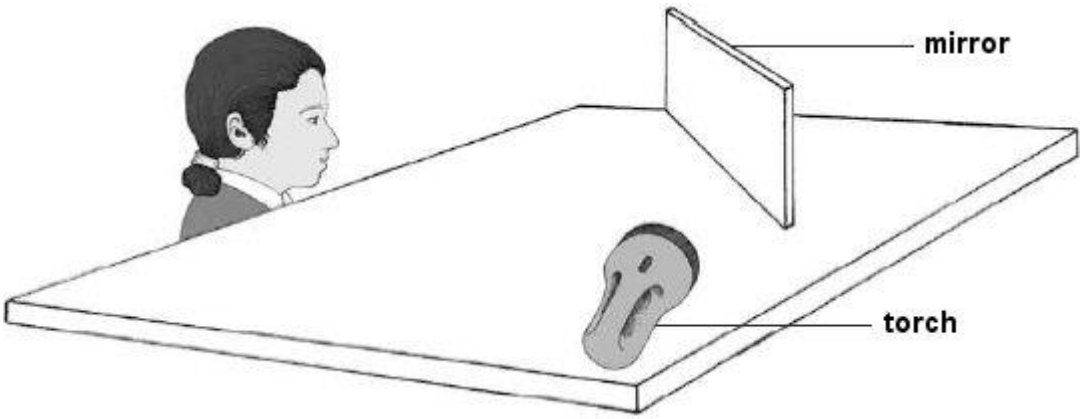
(b) Tick **ONE** box to show which of Sanna's objects does **not** make a dark shadow.

metal spoon	☐	wooden spoon	☐
woolly hat	☐	glass jar	☐

1 mark

(c) The picture below shows Sanna looking at the torch light reflected in a mirror.

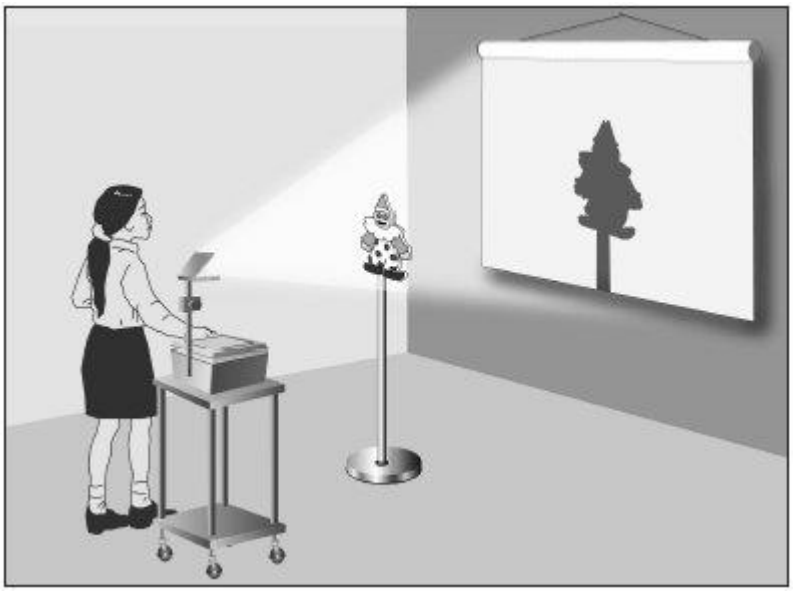
Draw **TWO arrows** to show the direction the light must travel for Sanna to see light from the torch in the mirror.



2 marks

Q3. Shadows

(a) Lucy makes a shadow of a puppet on a screen.
She investigates how changing the distance of the light from the puppet affects the size of the shadow.



What equipment should she use to measure the distance of the light from the puppet?

.....

1 mark

(b) What unit of measurement should she use to measure the distance of the light from the puppet?

Tick **ONE** box.

g ☐ °C ☐ cm ☐ km ☐ N ☐

1 mark

(c) What factor should she change as she carries out her test?

Tick **ONE** box.

where the children sit	☐	colour of the screen	☐
brightness of the light	☐	position of the light	☐
position of the screen	☐	the size of the puppet	☐

1 mark

(d) What factor should she measure to collect her results?

Tick **ONE** box.

The height of the...

light	☐	shadow	☐	table	☐
puppet	☐	screen	☐	reflection	☐

1 mark

(e) What factors must she keep the same as she carries out her test?

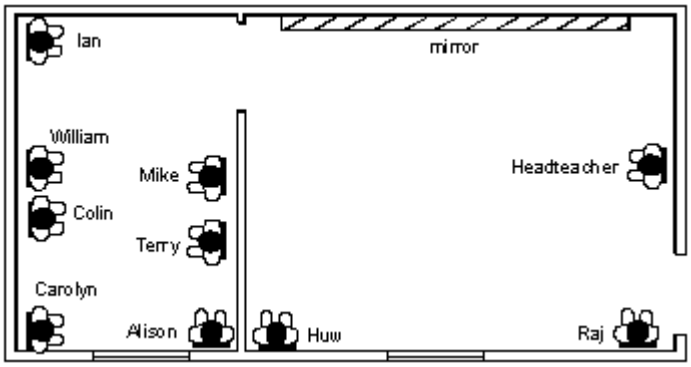
Tick **THREE** boxes.

where the children sit	☐	colour of the screen	☐
position of the puppet	☐	position of the light	☐
position of the screen	☐	size of the puppet	☐

2 marks

Q4. Sun and Light

This is a plan of a room.



There is a mirror on the wall.
The Headteacher can see only Huw, Raj and Ian, without looking in the mirror.

(a) Draw an arrow on the picture to show how light travels from Raj to the Headteacher.

1 mark

(b) Which **TWO** people can the Headteacher see **only** by reflection in the mirror.

(i) .....

1 mark

(ii) .....

1 mark

(c) Which **TWO** people can Colin see **only** reflected in the mirror?

(i) .....

1 mark

(ii) .....

1 mark

Q5. Light sensor

(a) The light in a classroom comes from different sources.

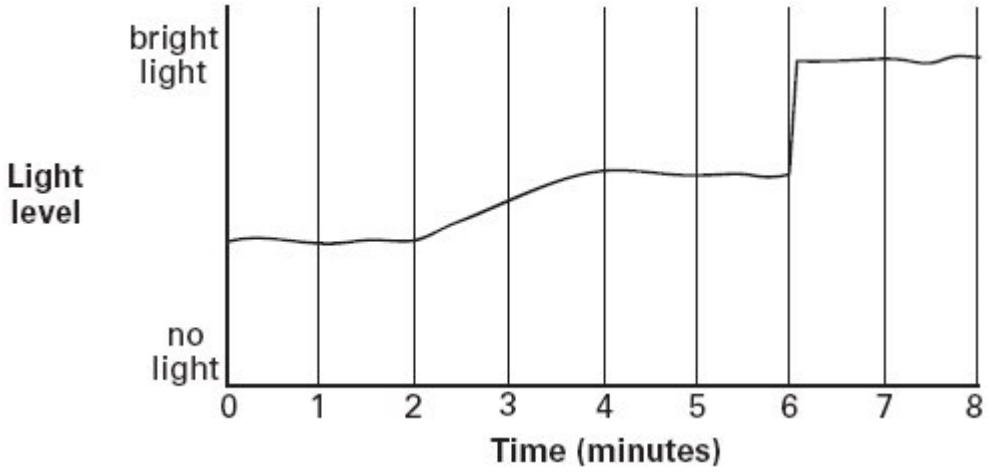
Tick **ONE** box below to show one possible source of light in a classroom.

plant	☐	mirror	☐
radiator	☐	computer screen	☐

1 mark

(b) Some children place a light sensor in the middle of the classroom.

The graph below shows how the light level changed over time.



Describe what happened to the light level between two and four minutes on the graph.

.....

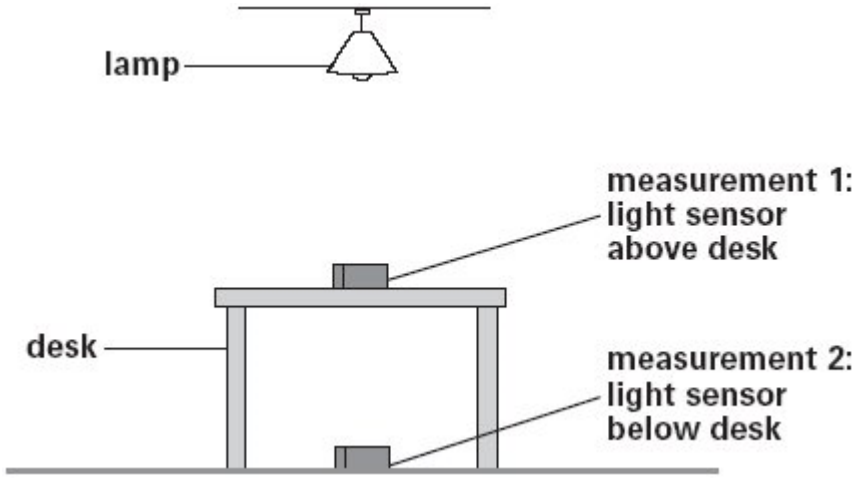
1 mark

(c) Describe **ONE** thing that could have happened in the classroom at six minutes to make the light level suddenly change.

.....

1 mark

(d) The children measure the light above a desk and below a desk.



George says: 'When the light sensor is under the desk, the reading on the sensor goes down.'

Write **true** or **false** next to each sentence below.

	True or **false?**
The light source is above the desk.	.....
The light cannot pass through the desk.	.....
There is a shadow underneath the desk.	.....

1 mark

(e) Complete the sentence using a word from the box below.

impermeable	opaque	transparent	solid

The sensor reading is lower when it is below the desk because

the desk is .....

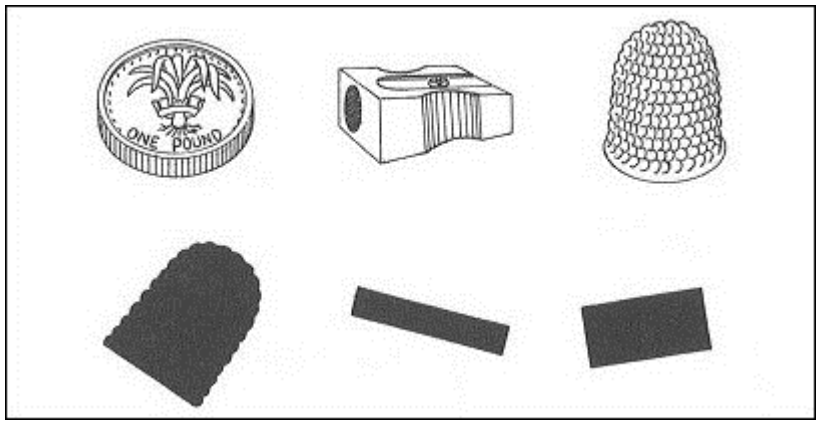
1 mark

Q6. Light

(a) The things below all make shadows in light.

Draw **ONE** line from each object to the shadow it could make.

Use each shadow **ONCE**.



1 mark

(b) Jenny investigates which materials allow light to pass through. She holds different materials out in the sun.

Complete the table below to predict Jenny's results.

Tick **ONE** box in each row. One has been done for you.

Material	Some light passes through	No light passes through
tissue paper	✓	
glass		
mirror		
clear plastic		
cardboard		
foil		

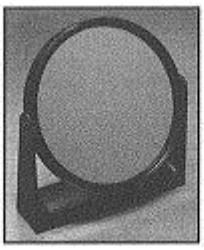
2 marks

(c) Jenny sits by a lamp.

A shadow forms.

She wants to see if any other objects will cause a shadow in a dark room. She turns the lamp off. She sits in front of these objects instead of the lamp:

television



mirror

plant

night safety jacket

(i) Which **ONE** of these four objects will cause a shadow of Jenny in a **dark** room?

.....

1 mark

(ii) Why does a shadow form when Jenny sits in front of this object?

Tick **ONE** box.

Because the object...

is translucent.	☐	reflects light.	☐
is a light source.	☐	is transparent.	☐

1 mark

Mark Scheme

M1. (a) Award **ONE** mark for an understanding that light cannot pass through opaque objects.

The response **must** make reference to **light** or **opacity**:

- the chair blocks (some of) the light (from the lamp);
- light cannot pass through the chair;
- the chair is opaque.

Allow:

- the light is blocked.

Do not *give credit for a response that includes incorrect science:*

- *light goes around the chair.*

Do not *give credit for an insufficient response that does not explain shadow formation:*

- *light cannot get past the chair [it passes on either side];*
- *light travels in straight lines [does not explain];*
- *the light cannot bend around the chair.*

1

(b) Award **ONE** mark for:

• shiny ☑ ☐ ☐ ☐

1

(c) Award **ONE** mark for arrowheads drawn in the following directions:

Do not *give credit if only one arrowhead is drawn correctly.*

1

[3]

M2. (a) Award **TWO** marks for **both** correct boxes ticked:

- ☐ ☑ ☐

- ☐ ☐ ☑

2(L3)

or

If you are unable to award two marks, award **ONE** mark for **any one** correct box ticked.

1(L3)

(b) Award **ONE** mark for:

- ☐ glass jar ☑

1(L4)

(c) (i) Award **ONE** mark for **two** lines (with or without the correct arrowheads) showing the correct path of light. The lines must go from the torch to the mirror and from the mirror to Sanna's eyes (between tip of nose and hairline on forehead):

•

[1 mark]

***ONE** mark may be awarded for one continuous line even where*

the arrowhead is incorrect:

•

[1 mark]

***Do not** give credit for an insufficient response where the direction of travel is shown only by one non-reflected arrow:*

•

1(L5)

(ii) Award **ONE** mark for **two** arrowheads showing the direction of light travel from the torch to the mirror and from the mirror to Sanna's eyes (between tip of nose and hairline on forehead):

•

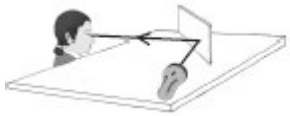
[1 mark]

•

[1 mark]

***ONE** mark may be awarded for **one** correct arrowhead together with **ONE** mark for a continuous line:*

•



[2 marks]

1(L5)

[5]

M3. (a) Award **ONE** mark for identifying the appropriate measuring equipment:

- ruler;
- metre rule;
- tape measure.

***ONE** mark may be awarded for:*

- *measurement stick;*
- *metre stick.*

***Do not** give credit for an insufficient response which could not be used to quantify distance:*

- *a piece of string.*

1(L4)

(b) Award **ONE** mark for:

- ☐ ☐ cm ☑ ☐ ☐

1(L4)

(c) Award **ONE** mark for identifying the independent variable (IV):

- ☐ ☐ ☐ position of the light ☐ ☑ ☐

1(L4)

(d) Award **ONE** mark for identifying the dependent variable (DV):

- ☐ shadow ☐ ☑

☐ ☐ ☐

1(L4)

(e) Award **TWO** marks for **all three** ticks correctly placed:

	☐		☐
• position of the puppet	✓		☐
• position of the screen	✓	size of the puppet	✓

2(L4)

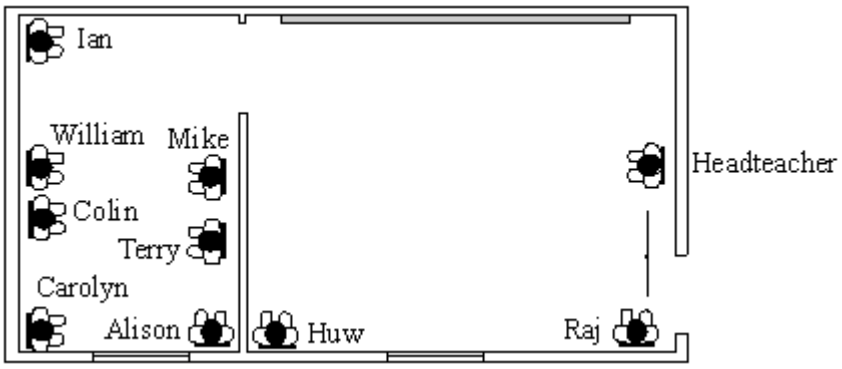
or

If you are unable to award two marks, award **ONE** mark for **any two** correct.

1

[6]

M4. (a)



*Line from Raj to Headteacher **must** indicate direction in which light travels.*

An indication of light source is not required.

1

(b) (i) Colin

1

(ii) William

1

(c) (i) Raj

1

(ii) Headteacher

1

[5]

M5. (a) Award **ONE** mark for:

☐		☐
☐	Computer screen	☑

1(L4)

(b) Award **ONE** mark for a description of the light level increasing:

- the light level increased;
- there was gradually more light;
- it got lighter/brighter.

***ONE** mark may be awarded for a response that may either refer to the graph or the light level:*

- *it went up/got higher;*
- *it went up smoothly/evenly/steadily.*

***Do not** give credit for an insufficient response explicitly referring to the graph line going up rather than the light level:*

- *the line went up.*

1(L4)

(c) Award **ONE** mark for a description of an event that could result in a sudden increase in the light level:

- a light was turned on;
- the Sun came out from behind a cloud;
- someone pulled the blind up;
- they moved a lamp next to the sensor.

***ONE** mark may be awarded for a response indicating that the sudden rise in the graph means the light has got brighter/there is more light, but with no description of what could have caused this:*

- *light from the Sun made it brighter;*
- *the light suddenly increased;*
- *it became brighter (outside);*
- *more light came into the classroom.*

Do not *give credit for an insufficient response which describes an event which would not necessarily result in a* ***sudden*** *increase in light:*

- *the Sun shone through the windows;*
- *the Sun shone in a different direction;*
- *the Sun came up;*
- *the Sun moved.*

1(L5)

(d) Award **ONE** mark for **all three** sentences correctly classified:

- The light source is above the desk. True
- The light cannot pass through the desk. True
- There is a shadow underneath the desk. True

1(L4)

(e) Award **ONE** mark for:

- The sensor reading is lower when it is below the desk because the desk is **opaque**.

Do not *give credit for an insufficient response giving an alternative term for opaque:*

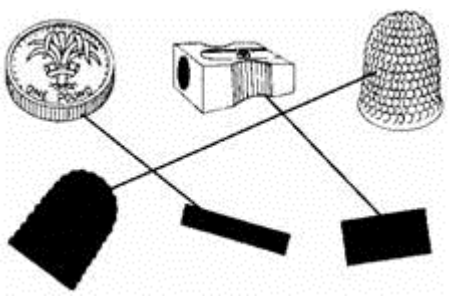
- *not see through.*

1(L4)

[5]

M6. (a) Award **ONE** mark for **all three** lines correctly matched:

•



1

(b) Award **TWO** marks for correct classification of all **five**:

Material	Some light passes through	No light passes through
tissue paper	✔[given]	
glass	✔	
mirror		✔
clear plastic	✔	
cardboard		✔
foil		✔

2

or

If you are unable to award two marks, award **ONE** mark for any **three** or **four** correctly classified.

1

(c) (i) Award **ONE** mark for an unambiguous indication of:

- television.

Do not *give credit for a response that includes incorrect science:*

- *mirror [will not cause a shadow to form in a dark room].*

Do not *give credit for an insufficient response naming other light sources not depicted.*

1

(ii) Award **ONE** mark for:

•	☐	☐
is a light source.	✔	☐

1

[5]