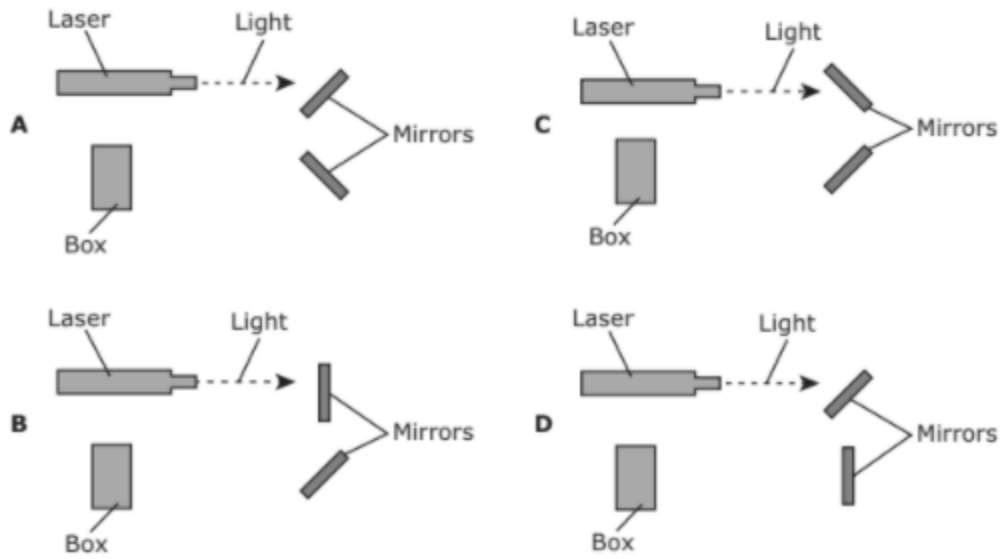
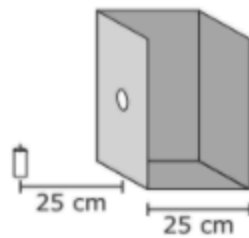


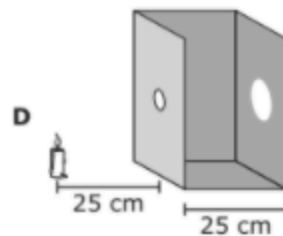
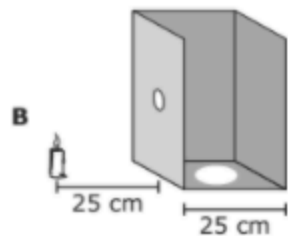
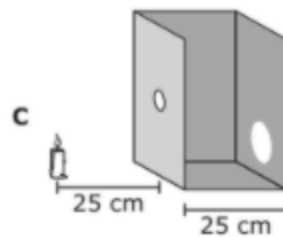
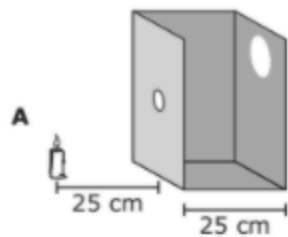
- 3 Lasers produce a beam of light that can be focused on a small area. A teacher uses two mirrors to shine a beam of light from a laser onto a box. Which diagram shows how the teacher should position the two mirrors?



- 33** A teacher takes the top and a side off a box. She cuts a hole in another side and puts a candle outside the box, as shown below.

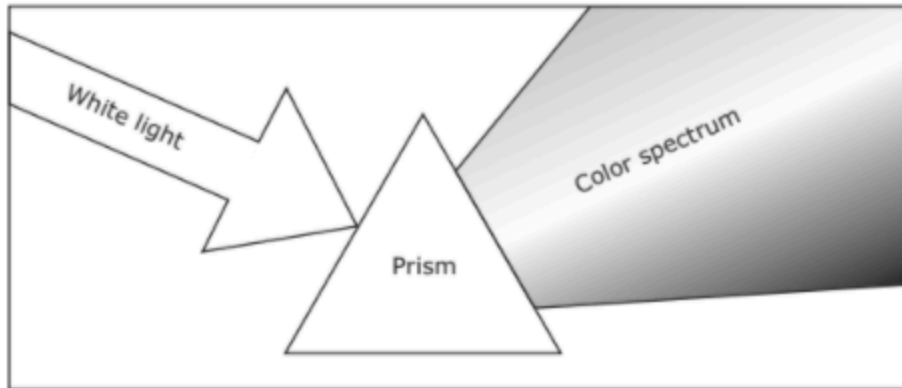


When the teacher lights the candle in a dark room, some of the candlelight shines through the hole. Which diagram best shows how the light appears on the opposite wall of the box?



- 4** Which of these best demonstrates the reflection of light?
- F** Looking through the glass of a large window
 - G** Looking at an image formed on a silver spoon
 - H** Looking at a lightbulb that is glowing
 - J** Looking at a star on a clear night

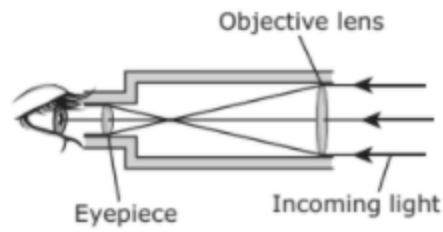
23 When light travels through air into a prism, it bends and separates into many colors.



In which other situation does light bend?

- A** When light moves through air into water
 - B** When light hits a wall
 - C** When light passes through outer space
 - D** When light hits a mirror
- 4** Which of these best demonstrates the reflection of light?
- F** Looking through the glass of a large window
 - G** Looking at an image formed on a silver spoon
 - H** Looking at a lightbulb that is glowing
 - J** Looking at a star on a clear night

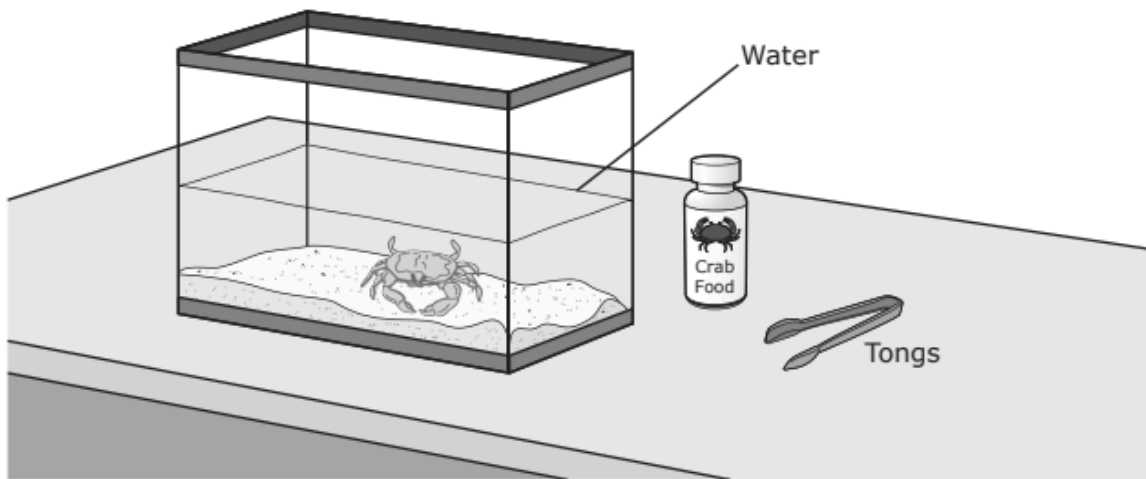
- 31** Scientists use telescopes to make distant objects appear closer. Some parts of a telescope are shown below.



Which of the following best describes how the objective lens of this telescope helps a scientist observe the moon?

- A** The objective lens produces light.
- B** The objective lens blocks light.
- C** The objective lens reflects light.
- D** The objective lens refracts light.

- 12** Some students are feeding a crab in an aquarium. They use tongs to place the food directly in front of the crab.

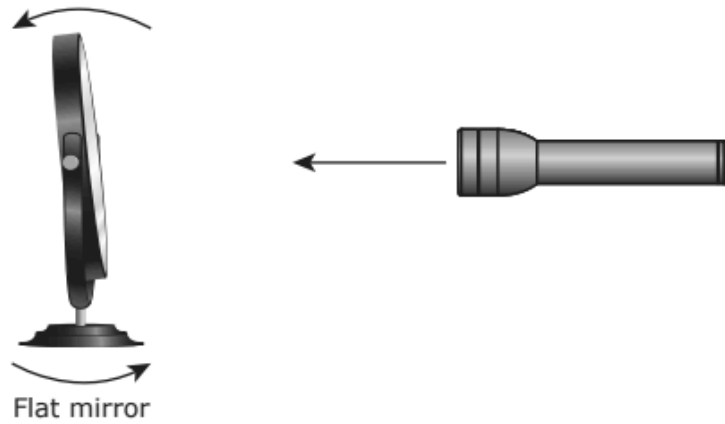


The students look through the side of the aquarium. They notice that the image of the tongs appears to break as the tongs enter the water.

Which property of light are the students observing in this situation?

- F** Light can be refracted and separated into different colors as it moves from air to a different medium.
- G** Light is refracted as it moves from one medium to another medium.
- H** Light travels in a straight line and can be reflected off the surface of water.
- J** Light is absorbed by water and reflected off glass.

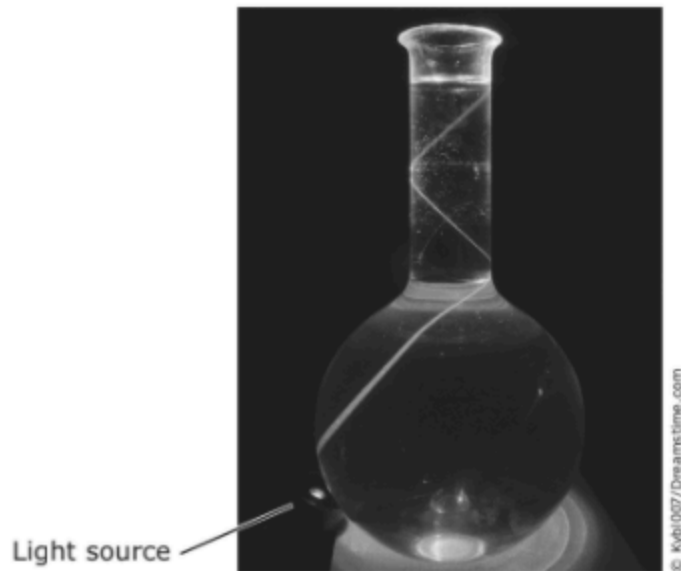
- 24** A student conducts an investigation by shining a flashlight toward a flat mirror. The student changes the angle of the mirror and observes the path of the reflected light.



As the mirror changes direction, the light reaching the mirror can reach the ceiling because the light —

- F** travels in straight lines and reflects from the surface of the mirror
- G** refracts in the glass of the mirror and is spread out all over the room
- H** enters the mirror and changes direction when it is refracted by the back of the mirror
- J** travels through air and does not change its direction in air

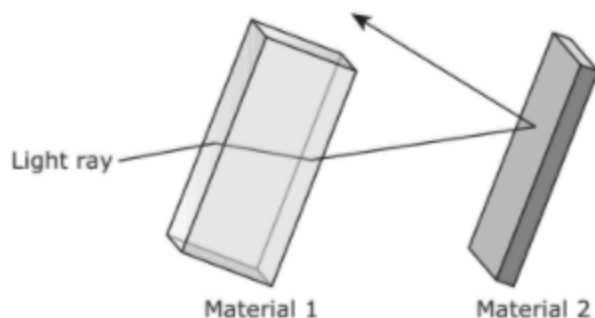
9 A thin beam of light is shown in this picture.



What does the picture demonstrate about light?

- A Light and its reflections travel in straight lines.
 - B Light cannot reflect from more than one surface.
 - C Light that goes through water cannot travel in straight lines.
 - D Light can travel in a circular path.
-

17 The picture shows how a light ray behaves with two different types of materials.



Which table best describes the behavior of the light ray as it encounters the materials?

A

Material 1	Material 2
The light ray is scattered in all directions.	The light ray is refracted.

B

Material 1	Material 2
The light ray is absorbed.	The light ray is reflected.

C

Material 1	Material 2
The light ray is transmitted.	The light ray is refracted.

D

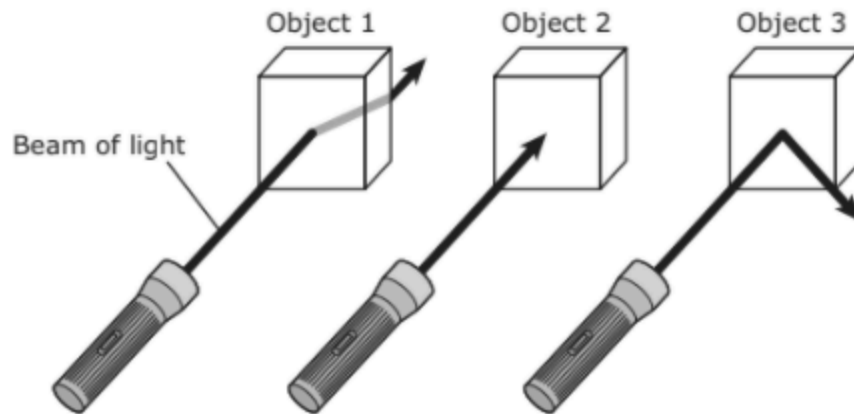
Material 1	Material 2
The light ray is refracted.	The light ray is reflected.

3 For a class demonstration a student turned off the lights in the classroom. The student then shined light from a flashlight through a hole in a piece of cardboard. The class saw the narrow beam of light continue until another student placed a mirror in the light's path.

The light did not continue past the mirror because —

- A light cannot travel very far
- B the mirror absorbed all the light
- C the light was refracted back to the light source
- D light travels in a straight line and cannot go around objects

24 A student uses a flashlight to shine a beam of light on three different objects.



Which table describes what happens to the light beam as it interacts with each object?

F

Object	Light Beam
1	Scattered
2	Absorbed
3	Reflected

H

Object	Light Beam
1	Reflected
2	Absorbed
3	Refracted

G

Object	Light Beam
1	Refracted
2	Absorbed
3	Reflected

J

Object	Light Beam
1	Absorbed
2	Refracted
3	Scattered

- 16 This photograph shows a girl using a lab instrument during an investigation on light. A teacher asks the other students in the class to look carefully at the girl's eye and give reasons for its appearance.



Which table correctly identifies the reasons for the appearance of the girl's eye through the lab instrument?

Reasons for Eye's Appearance

F	Magnification by the instrument	<input checked="" type="checkbox"/>
	Refraction through the instrument	<input type="checkbox"/>
	Reflection off the instrument	<input checked="" type="checkbox"/>
	Light moving in straight lines	<input checked="" type="checkbox"/>

Reasons for Eye's Appearance

G	Magnification by the instrument	<input checked="" type="checkbox"/>
	Refraction through the instrument	<input checked="" type="checkbox"/>
	Reflection off the instrument	<input type="checkbox"/>
	Light moving in straight lines	<input checked="" type="checkbox"/>

Reasons for Eye's Appearance

H	Magnification by the instrument	<input type="checkbox"/>
	Refraction through the instrument	<input checked="" type="checkbox"/>
	Reflection off the instrument	<input checked="" type="checkbox"/>
	Light moving in straight lines	<input type="checkbox"/>

Reasons for Eye's Appearance

J	Magnification by the instrument	<input checked="" type="checkbox"/>
	Refraction through the instrument	<input checked="" type="checkbox"/>
	Reflection off the instrument	<input checked="" type="checkbox"/>
	Light moving in straight lines	<input type="checkbox"/>

32 The picture shows an area of Yosemite National Park.



Which statement about light is supported by this picture?

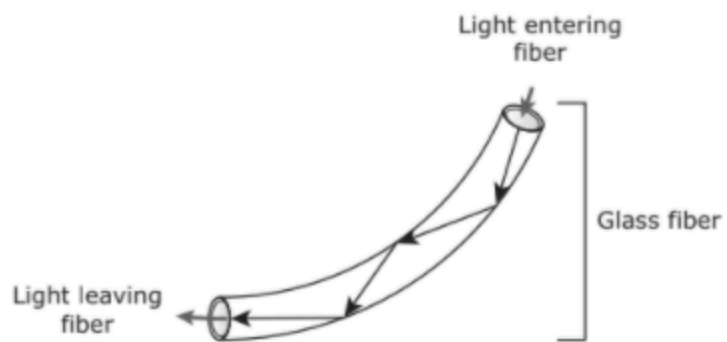
- F** Light travels in straight lines until it enters a different material like water in a lake.
- G** Light can refract in air and in clear water.
- H** The water in the lake is blue because light forms an image.
- J** Light is reflected off the smooth surface of the lake.

- 4 The picture below shows a child standing in a swimming pool.



- Why does the lower part of the child appear so much different in size from the upper part?
- F The light rays that travel through water and then into air are refracted.
 - G The light rays that travel through water and then into air are enlarged.
 - H The light rays that travel through air and then into water are reflected.
 - J The light rays that travel through air and then into water are reduced.
- 22 Some students paint the inside of several boxes. They paint each box a different color. They observe that the inside of the box painted white looks brighter than the others. What is the most likely reason this box looks brighter?
- F More light is reflected off white paint.
 - G More light is refracted by white paint.
 - H More light passes through white paint.
 - J More light is absorbed by white paint.

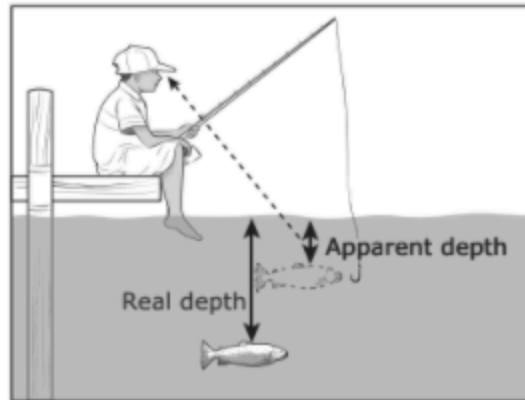
- 40 The model shows a special glass fiber that is thinner than some metal wires. When light enters one end of the fiber, it moves through the fiber as shown.



After the light leaves the fiber, it travels —

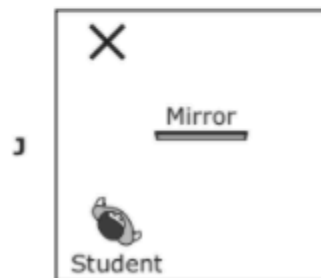
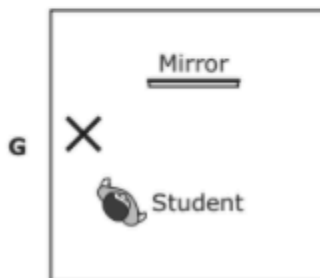
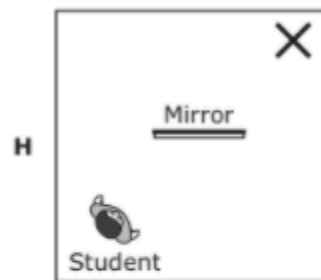
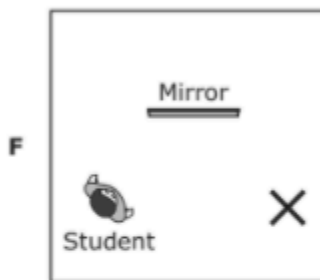
- F** in a straight line
- G** back into the fiber
- H** around the fiber
- J** in a curve

- 19 The diagram below shows a fish being viewed from above the water.



The fish appears to be closer to the surface than it really is. What causes this difference?

- A Light is reflected.
 - B Light is refracted.
 - C Light is focused.
 - D Light is blocked.
- 6 A student looks into a mirror and sees an image of an object. Which diagram shows an X where the object is most likely located?



19 The student is observing part of a plant with a microscope.



Which statement describes a behavior of light in the microscope?

- A Light travels through the microscope lens without changing direction.
- B Moving in straight lines causes light to increase in brightness.
- C Light refracts through the lens of the microscope.
- D Moving in straight lines keeps light from reflecting.

3 A student is looking directly at a lit nightlight through two different cardboard tubes as shown.



Through which tube, if any, will the light be seen and why?

- A The bent tube only because the light bounces off the sides of the tube and travels through the tube to the student's eye
- B The straight tube only because the light travels in a straight line directly to the student's eye
- C Both tubes because light travels equally well along straight and curved paths
- D Neither tube because both tubes absorb all of the light