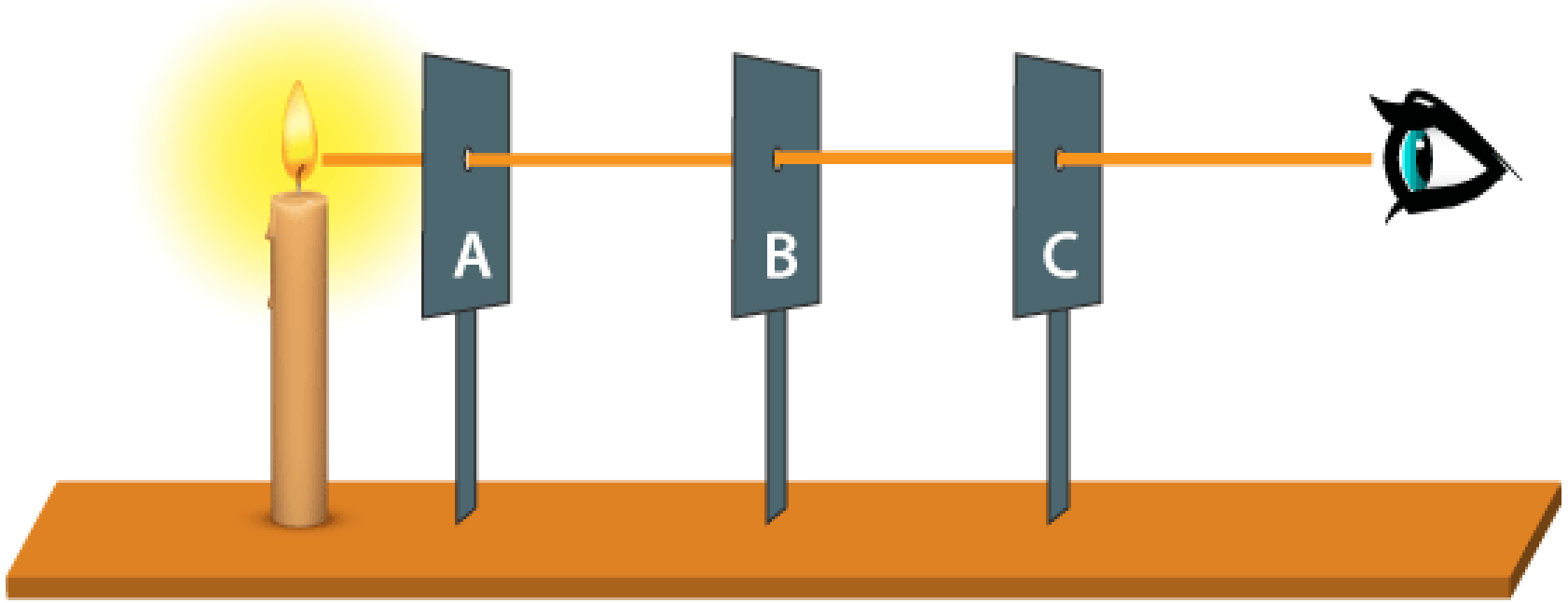
Physics – Grade 10

Unit Three – Optics



Chapter 9 – Propagation of light

Prepared and Presented by: Mr. Mohamad Seif

OBJECTIVES

1. Distinguish between luminous & non-luminous objects
2. Apply the principle of rectilinear propagation of light.
2. Distinguish between parallel, converging and diverging light beams.

Luminous & non-Luminous objects

What is Luminous objects?

The bodies which emit light are called luminous bodies.

Example:

The sun, the flame of a candle and the glow lamp produce their own light. We call them luminous objects.

Luminous & non-Luminous objects

What is non – Luminous objects?

The bodies which does not emit light are called non-luminous bodies.

Example:

A stone, a table, and the moon are examples of non-luminous objects.

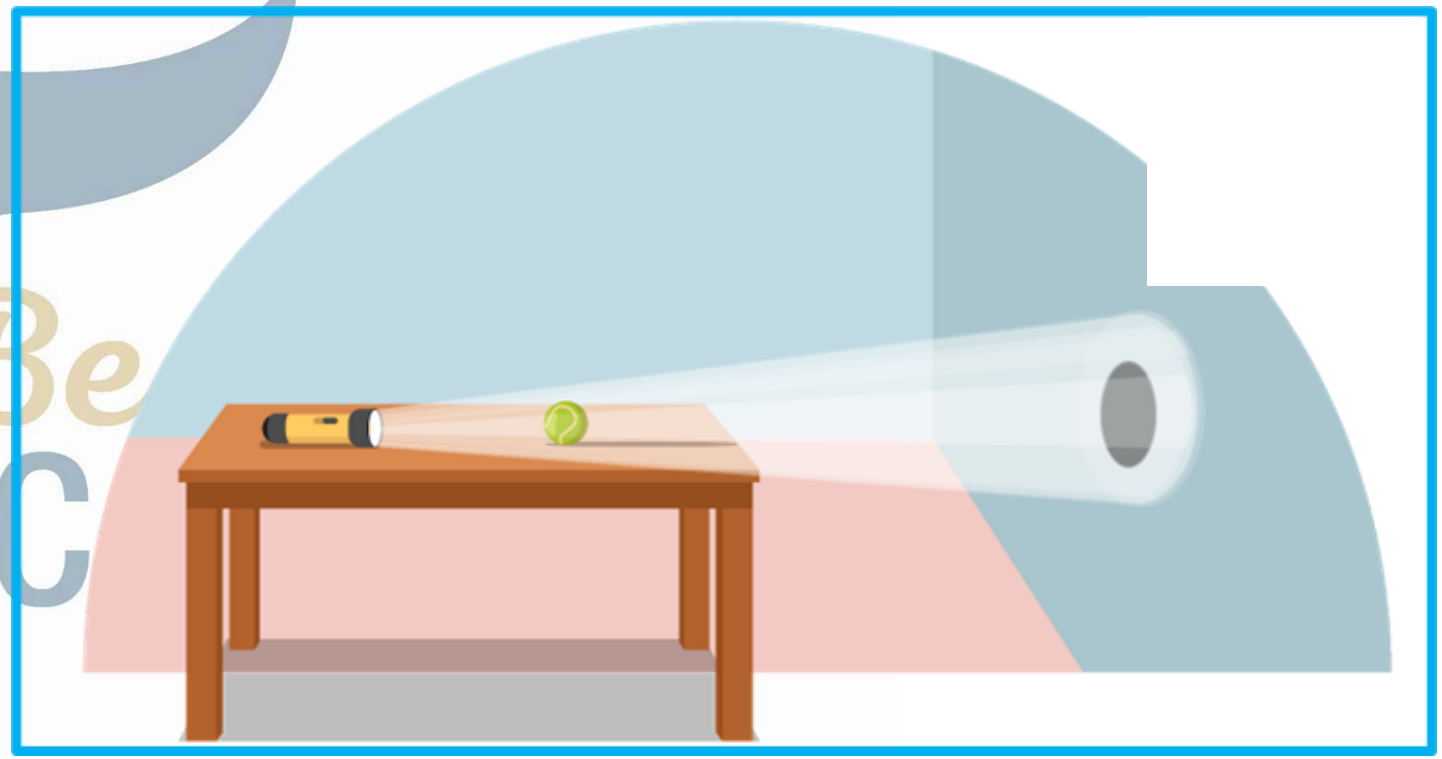
These objects become visible when they reflect off light, incident on them from luminous objects.

Rectilinear Propagation of Light

What rectilinear propagation of light?

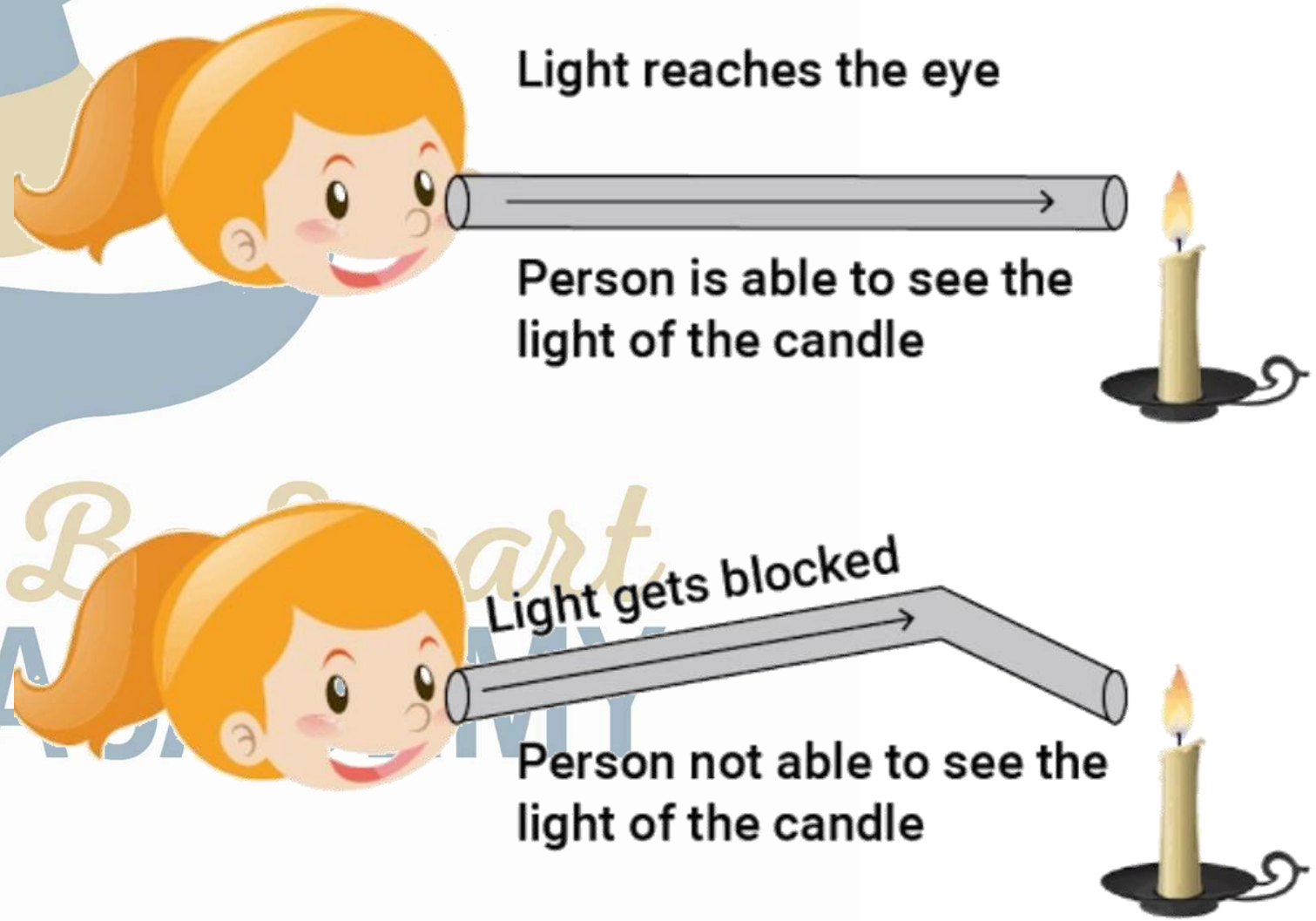
The rectilinear propagation of light is a phenomenon which tells that light travels in a straight line.

The concept of rectilinear propagation of light is used to understand the various optical phenomena.



Rectilinear Propagation of Light

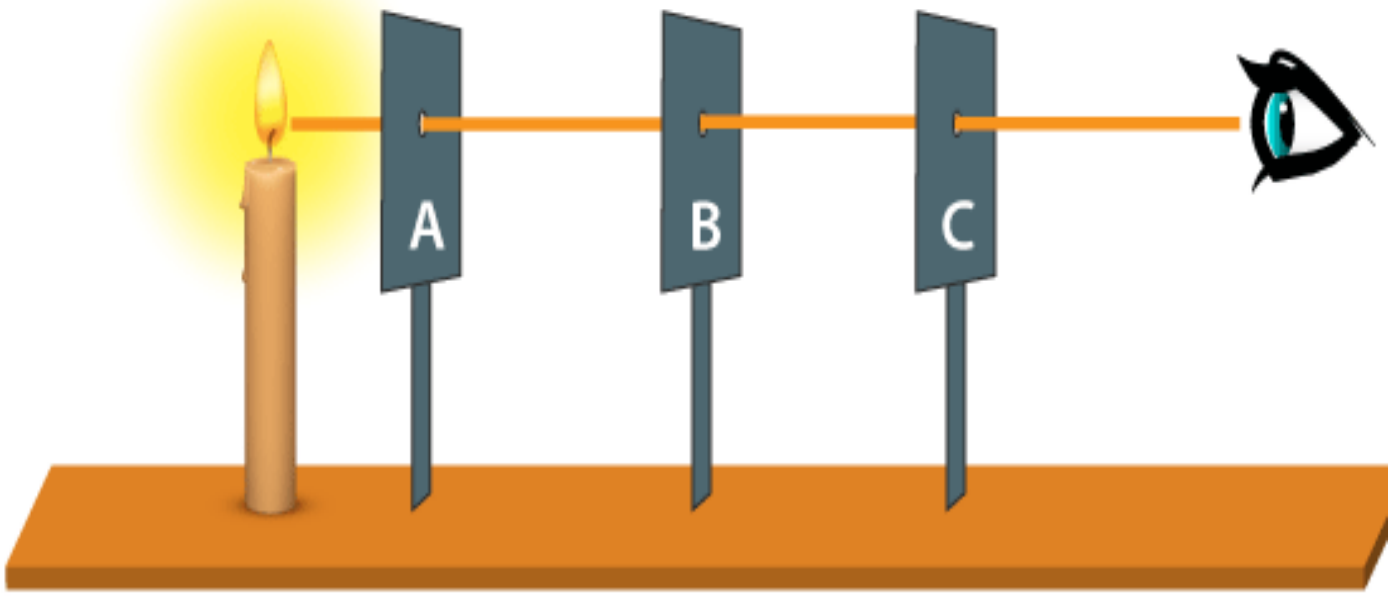
Light can changes its direction only when either it is reflected from a surface or change its medium of propagation.



Rectilinear Propagation of Light

Place the three cardboards, A, B and C, parallel to each other.

Look at the flame of the candle through the three holes.

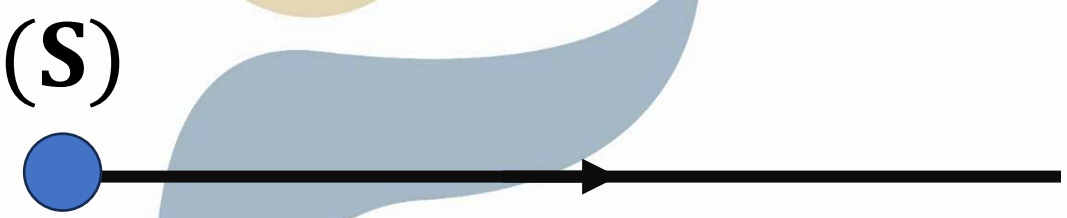


You can observe the flame only if your eye, the three holes, and the flame are on the same straight line.

Beam of Light

What is Light ray?

The light ray is a straight line that emitted from the source of light.



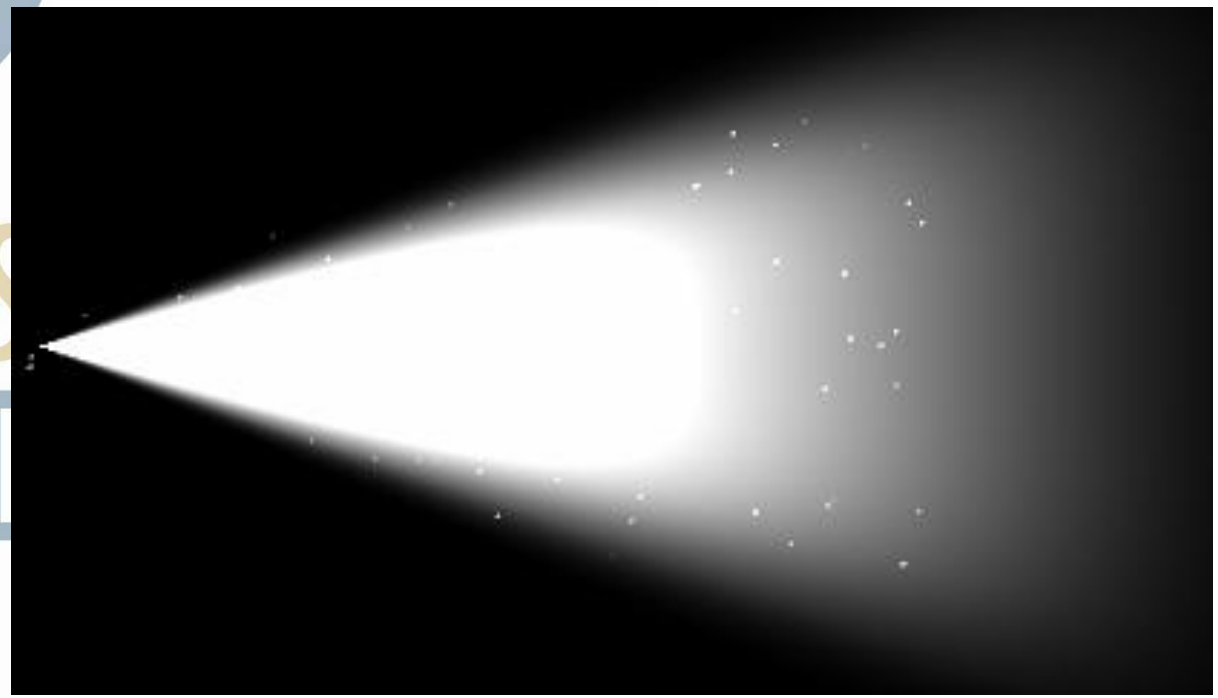
Source of Light

It carries an arrow that indicates the direction of propagation of light.

Beam of Light

What is Beam of Light?

Light beam is a group of light rays that emitted from a certain source of light.



Beam of Light

Light beam can be parallel beam, converging beam or diverging beam.

1)Parallel light beam:

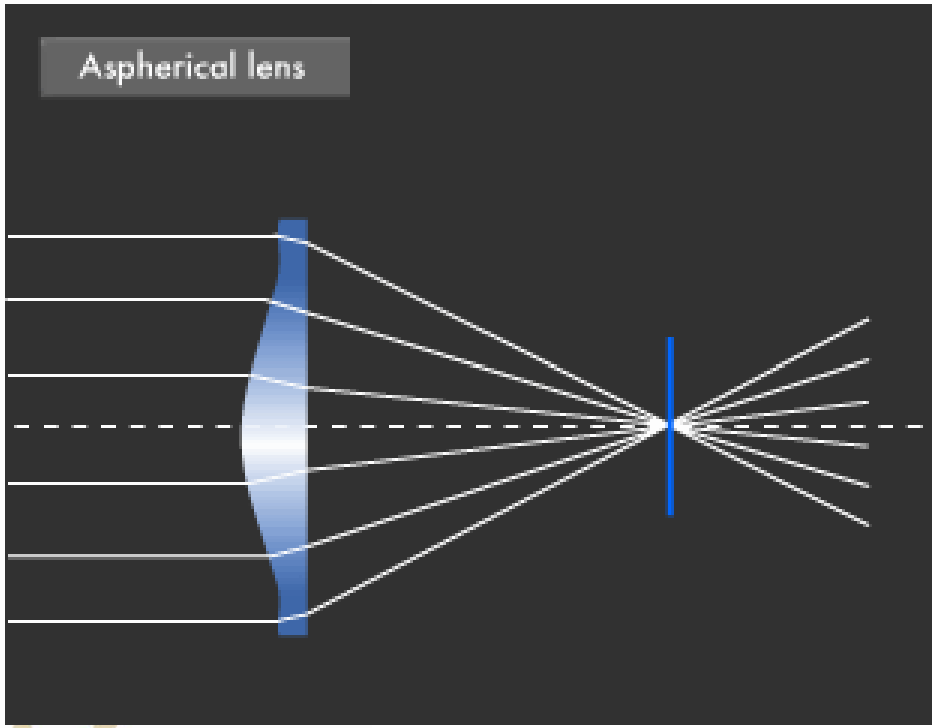
In which the rays of light are parallel to each other.

Beam of Light

2)Converging light beam:

The rays are directed and collected in one point.

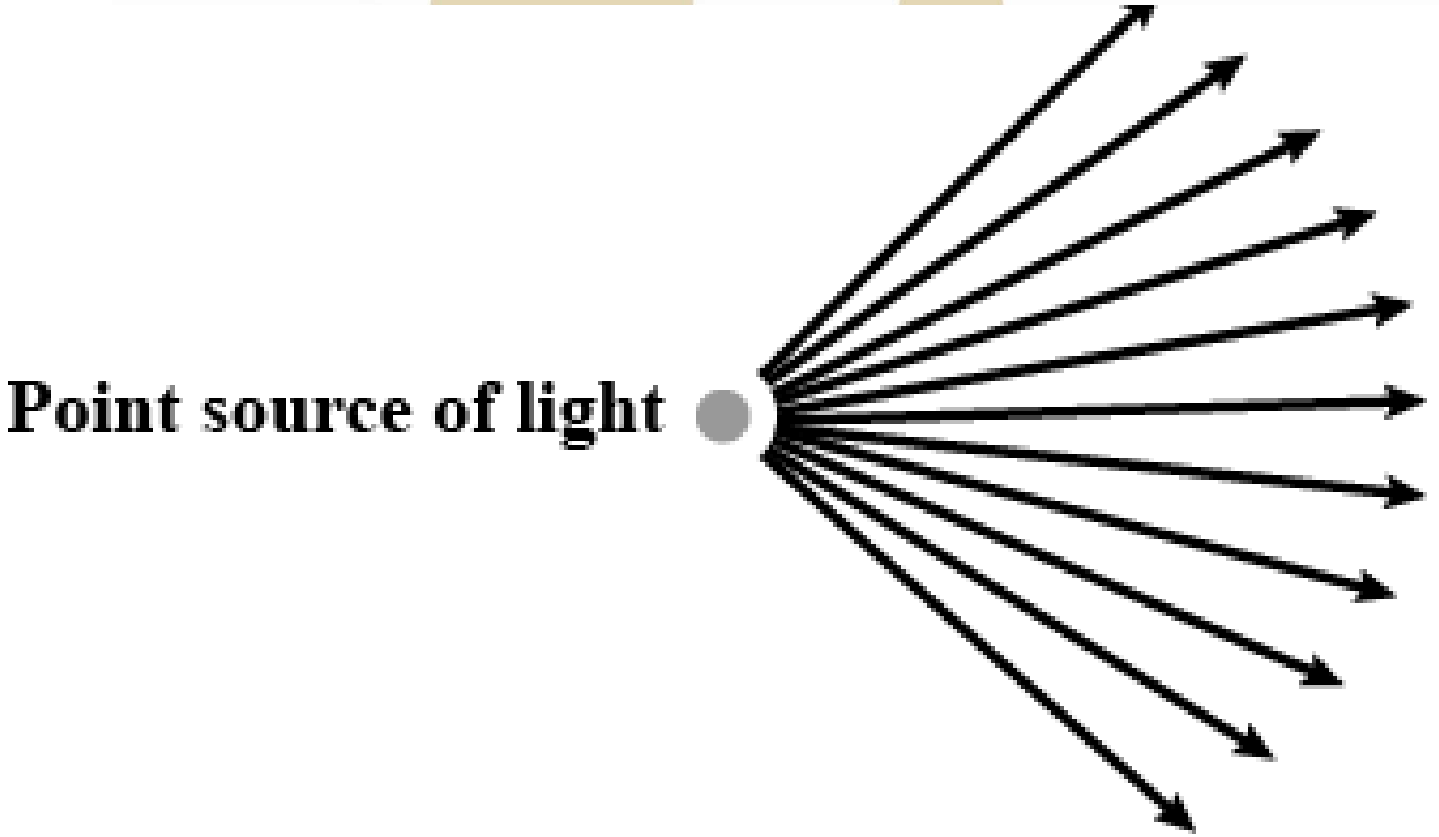
A parallel beam incident from the sun on a magnifier emerges converging.



Beam of Light

3)Diverging light beam:

The rays spread apart from one point.



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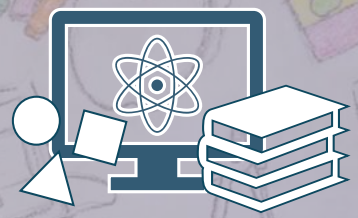

Physics – Grade 10

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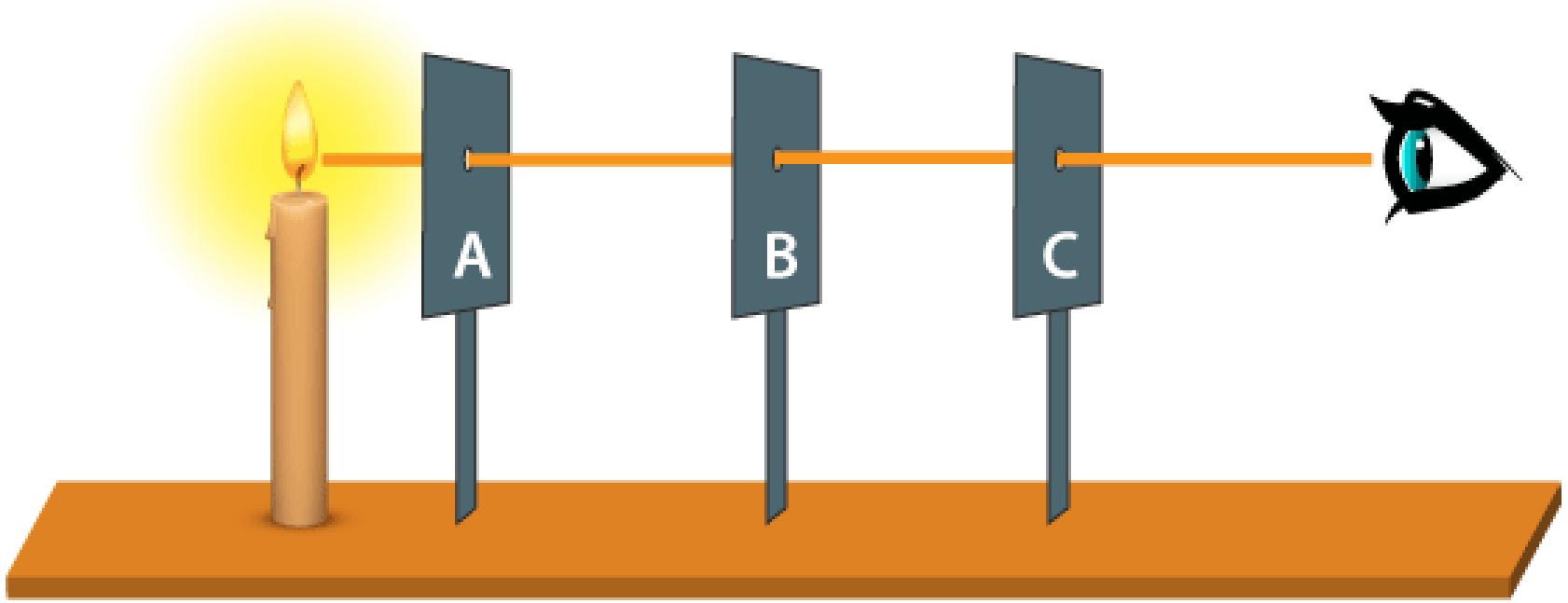


Chapter 9 – Propagation of light

Prepared and Presented by: Mr. Mohamad Seif

OBJECTIVES

1. Distinguish between objects and image
2. Distinguish between real and virtual images..
2. Formation of shadow

Object and image

What is object?

An object is any source of light falling on an optical system. The Sun, a candle, a lamp, etc., are examples of objects.

Sun

Candle

Torch

Object and image

What is an image?

If you stand in front of a plane mirror, you see your "image“ through the mirror.

This image is of the same shape and size as you are.

Object and image

What is an image?

Look to a pigeon through the camera, you see the image of the pigeon.

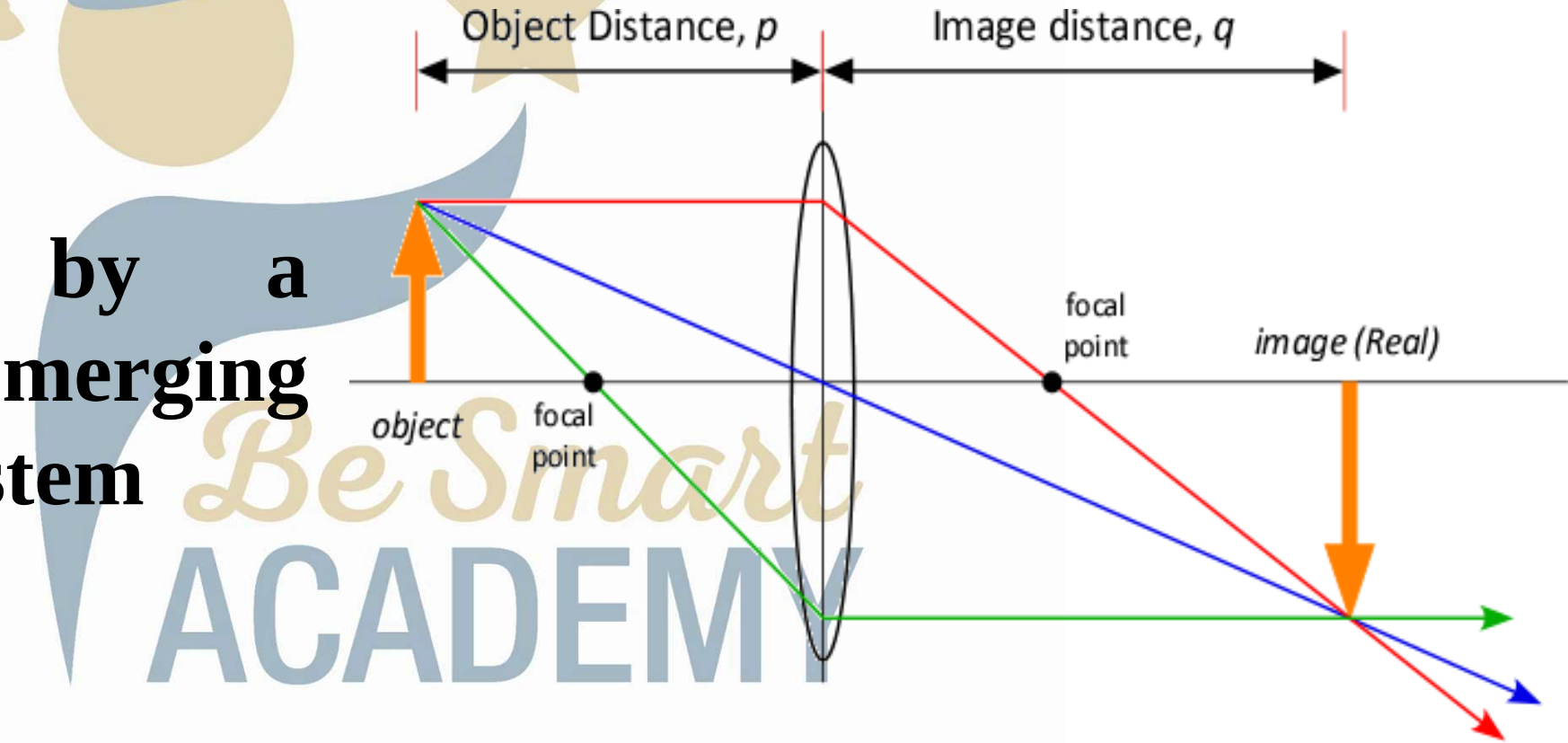
This image is not of the same size as the pigeon.

In these two cases, what you see is called the image of the object given by the optical system (the mirror or the lens of the camera).

Real and Virtual image

What is Real image?

A real image which can be collected on a screen as shown in the figure.



It is formed by a converging beam emerging from the optical system

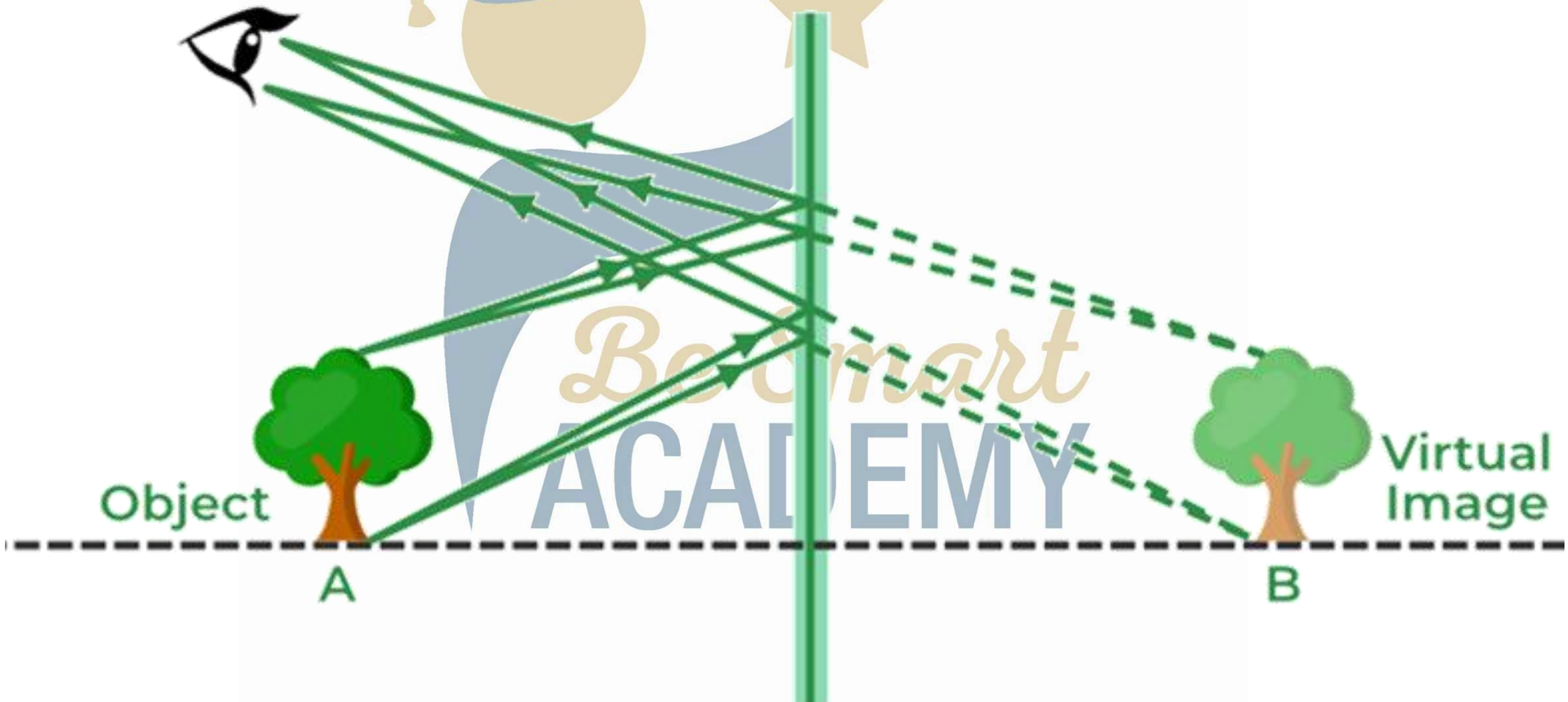
Real and Virtual image

What is virtual image?

A virtual image cannot be collected on a screen, like your image in the plane mirror.

Real and Virtual image

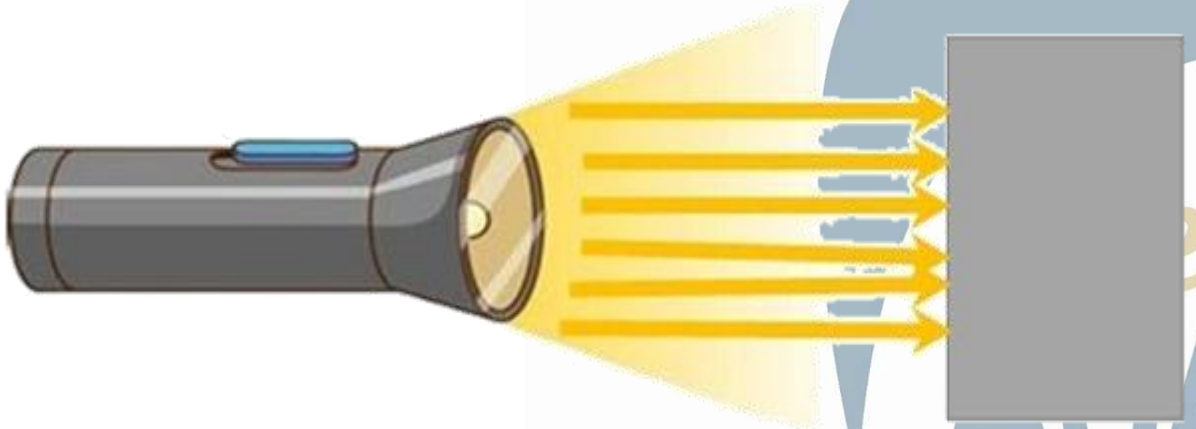
The ray emerging from the optical system (the mirror) form a divergent beam.



Formation of shadow

1) Opaque material:

An opaque material does not allow light to pass through it.



2) Translucent material:

A translucent material allows part of the light to pass through it.

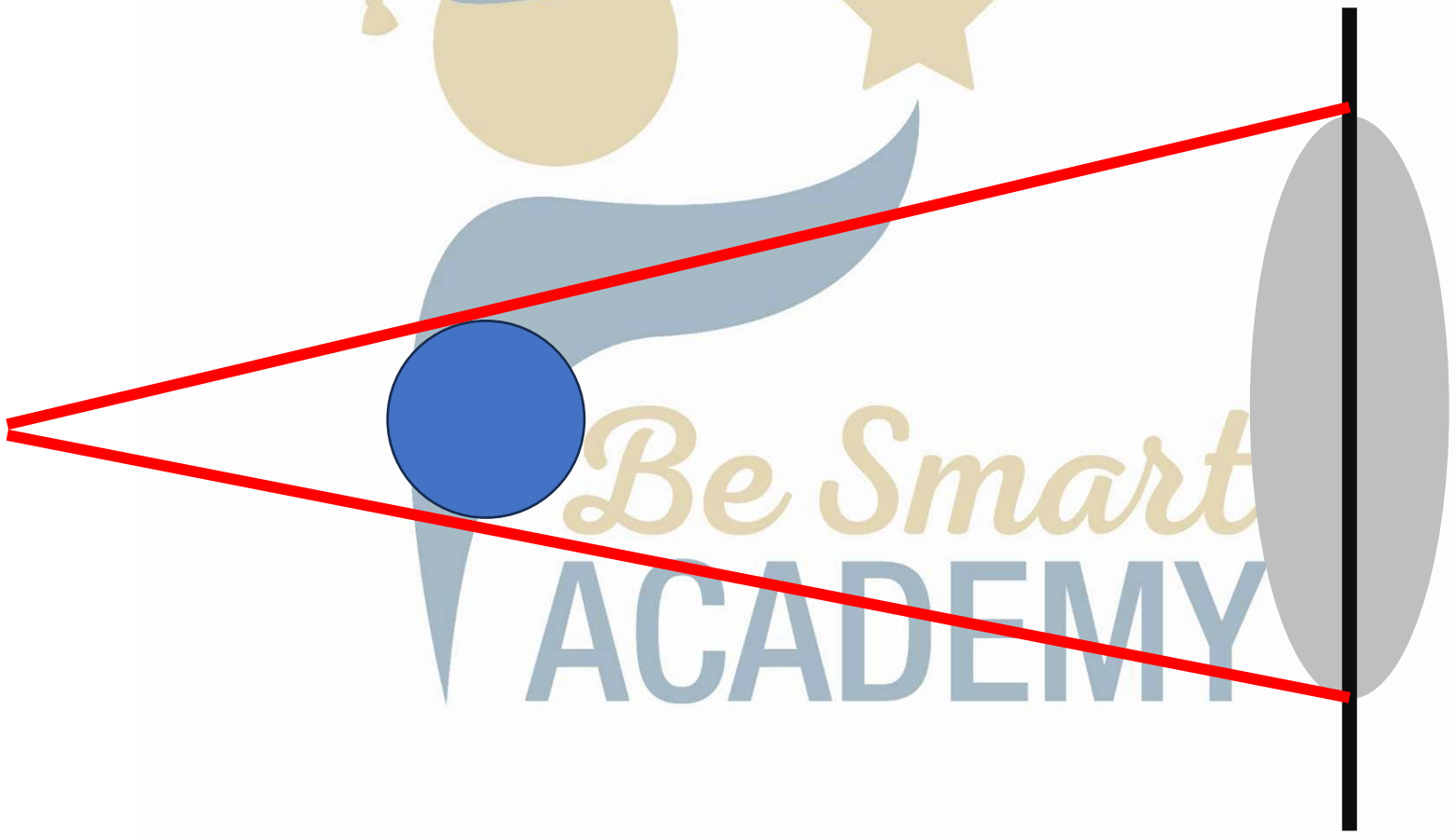
Formation of shadow

3) Transparent material:

An transparent material allow light to pass through it.

Formation of shadow

A shadow is formed when light issued from a source is blocked by an opaque or a translucent material.



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