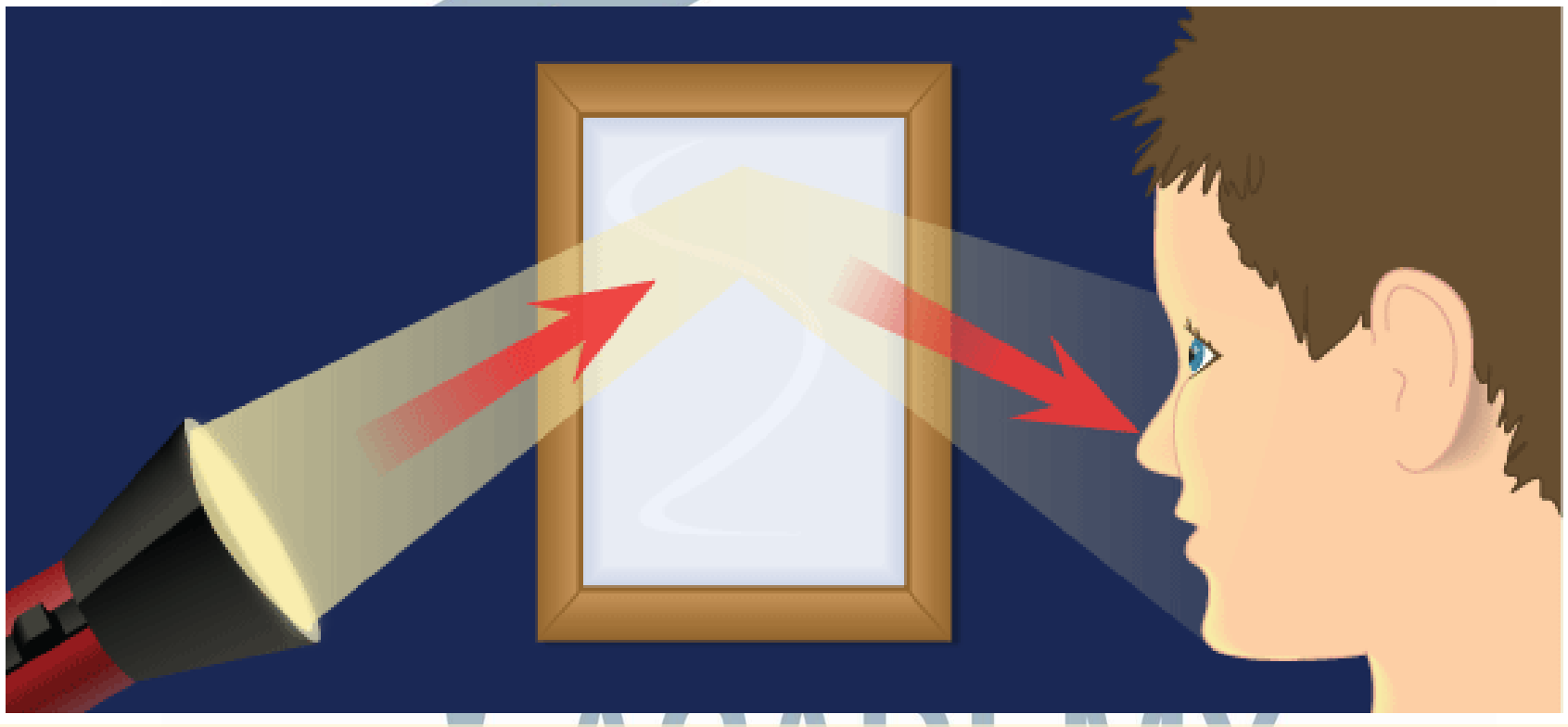
Physics – Grade 10

Unit Three – Optics



Chapter 10 – Reflection of Light

Prepared and Presented by: Mr. Mohamad Seif

OBJECTIVES

1. Define the reflection of light
2. Distinguish between the different types of reflection
2. State and apply laws of reflection of light

Define reflection of light

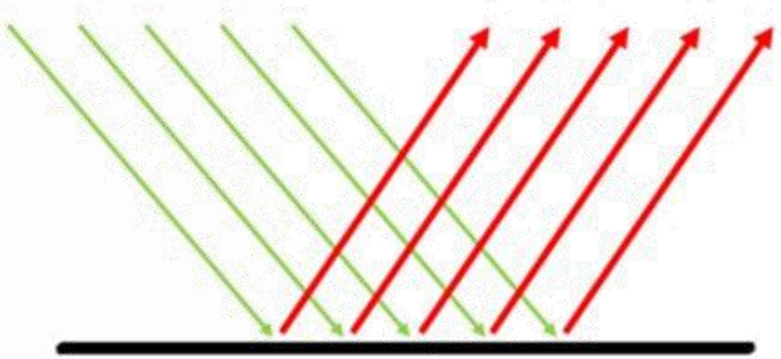
What is the reflection of light?

The reflection of light is the phenomenon of bouncing back of light rays when they strike an opaque surface.

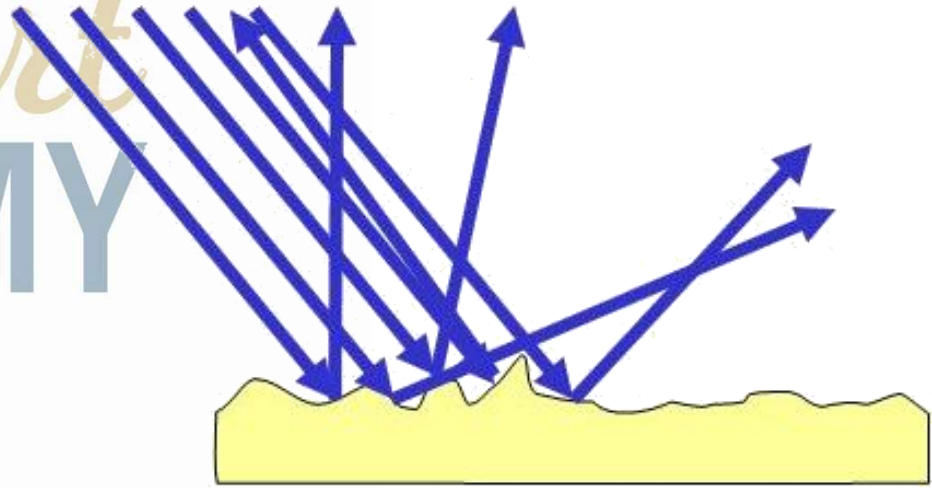
The figure below shows a light issued from a source, striking a surface then bouncing back

Types of reflection of light

We have two types of reflection: regular reflection and irregular reflection



Regular reflection: occurs when light reflects off a smooth surface such as a mirror or the surface of still water.



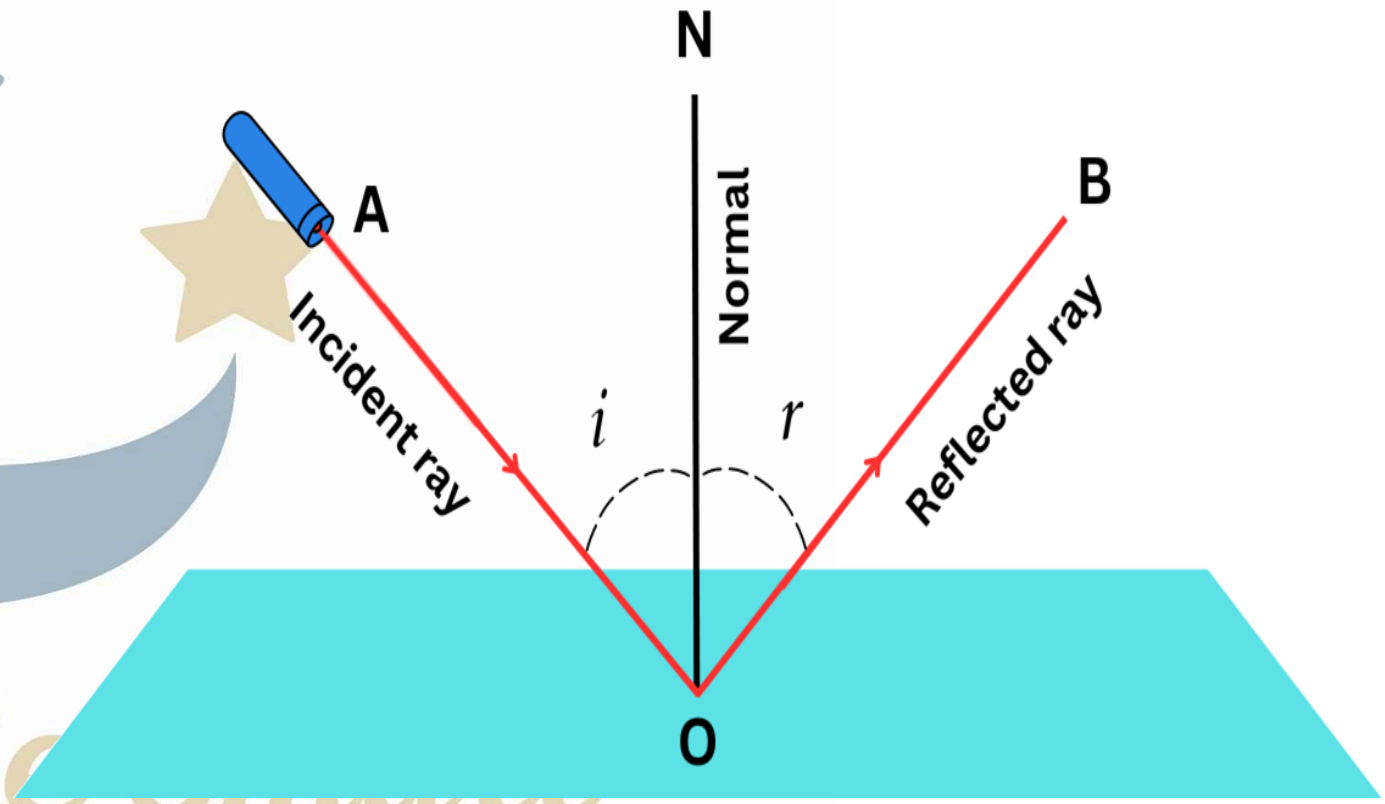
Irregular (diffuse reflection): occurs when light reflects off a rough surface such as a paper, cloth and frosted glass.

Laws of reflection of Light

AO: incident ray

NO: normal to the surface at the point of incidence O.

***i*:** incident angle, the angle between the incident ray and the normal.



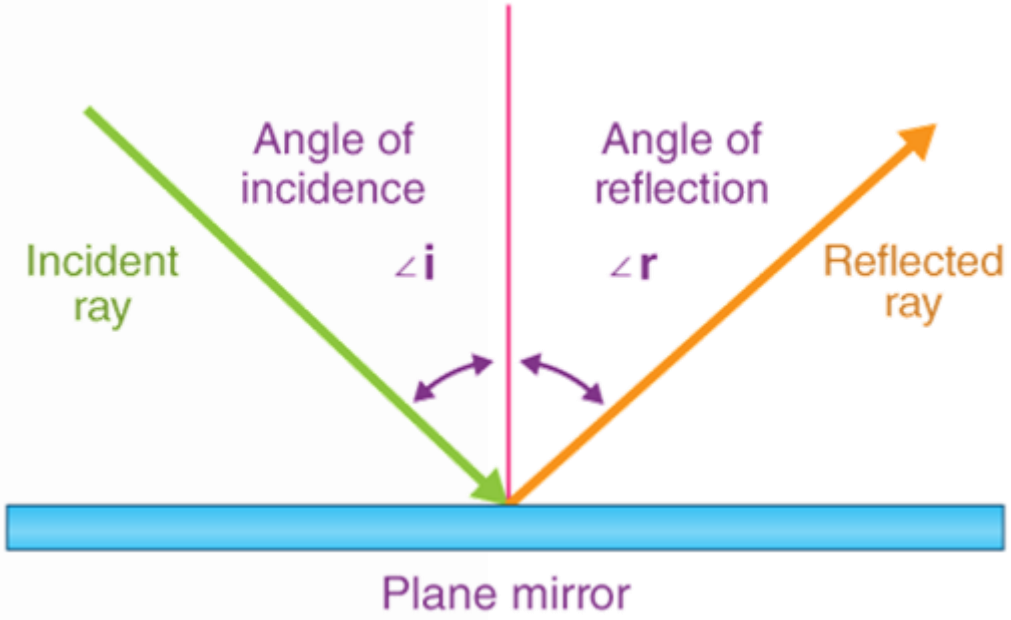
OB: reflected ray

***r*: angle of reflection,** the angle between the reflected ray and the normal.

Laws of reflection of Light

The first law of reflection:

The incident ray, the reflected ray and the normal to the surface at the point of incidence lie in the same plane.

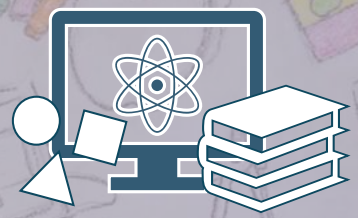


The second law of reflection:

The angle of incidence $\hat{i}$ is equal to the angle of reflection $\hat{r}$.

$$\hat{i} = \hat{r}$$

The End



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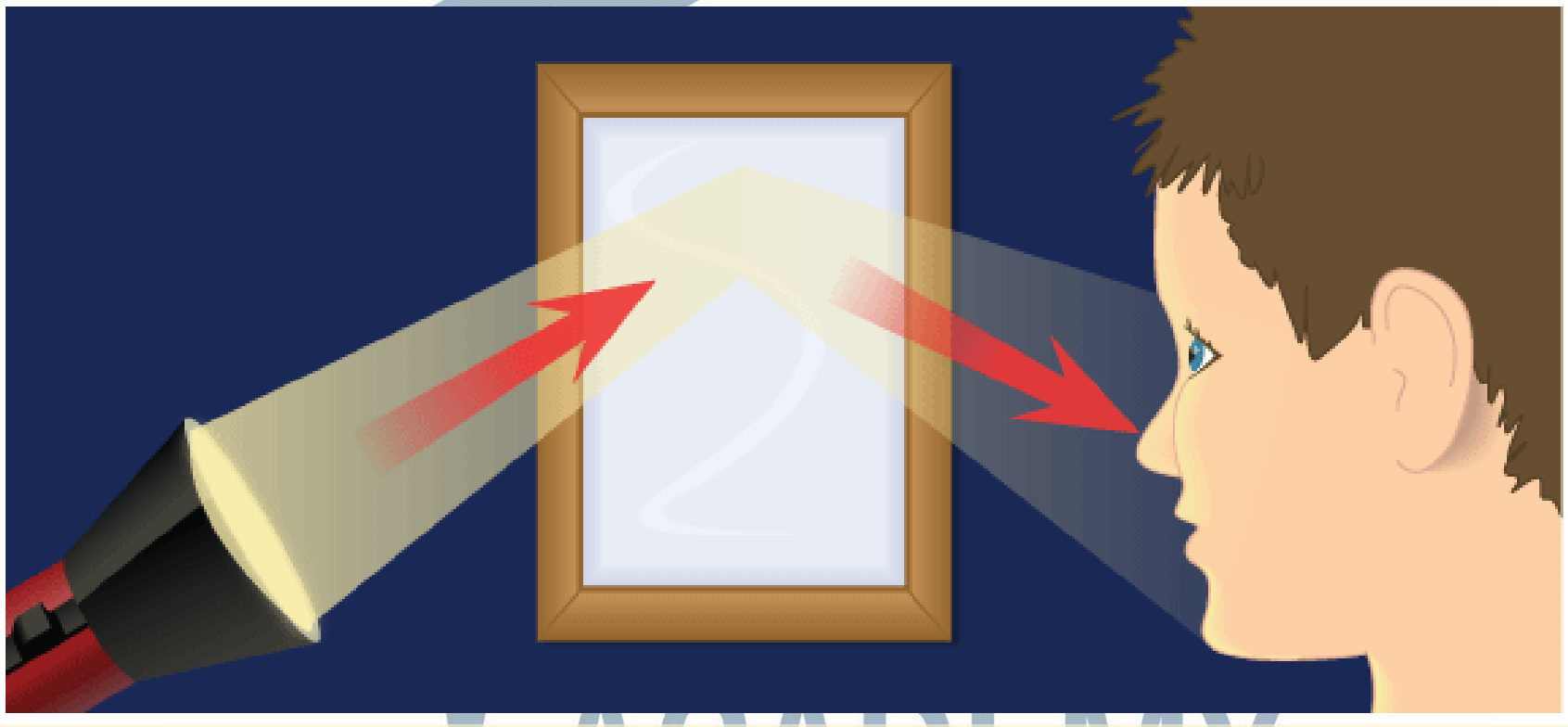


Chapter 10 – Reflection of Light

Prepared and Presented by: Mr. Mohamad Seif

OBJECTIVES

4 State and apply the law of reversibility of light

5 List the characteristics of the image given by a plane mirror

Principle of reversibility of Light

What is reversibility of light?

The principle of reversibility states that light follows the same path if the direction of light is reversed.

This means that the path of light does not depend on its direction of propagation.

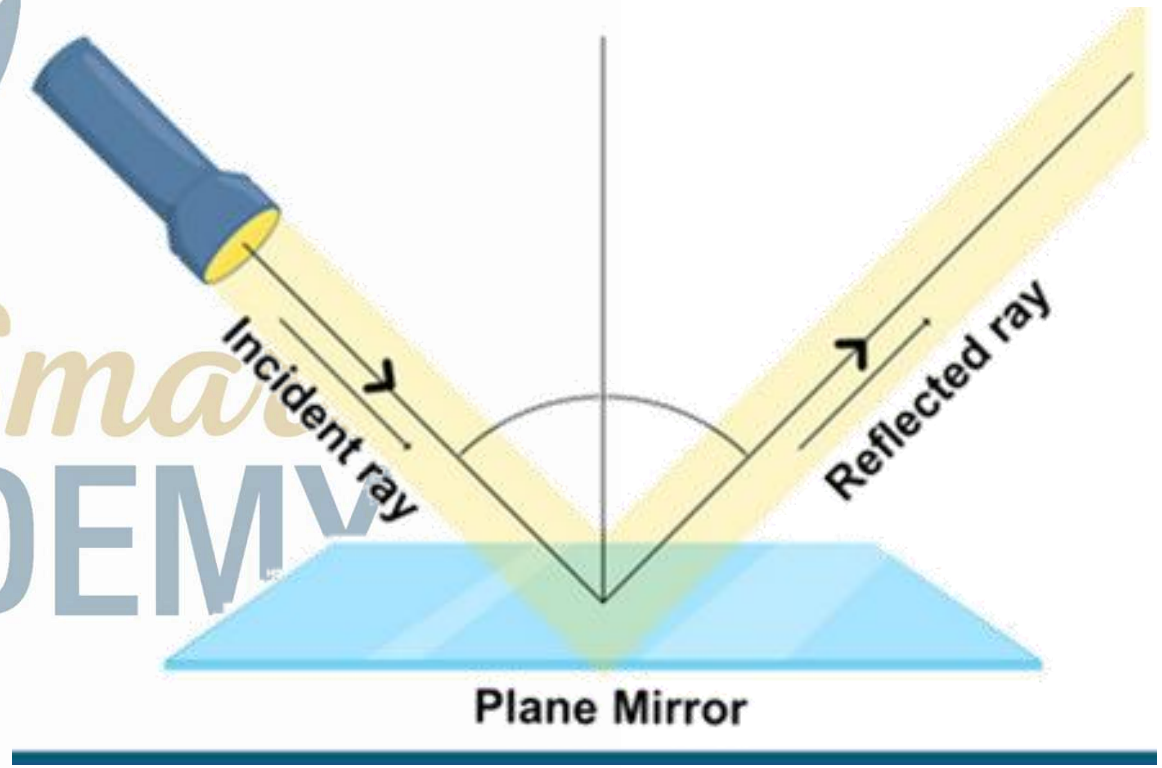
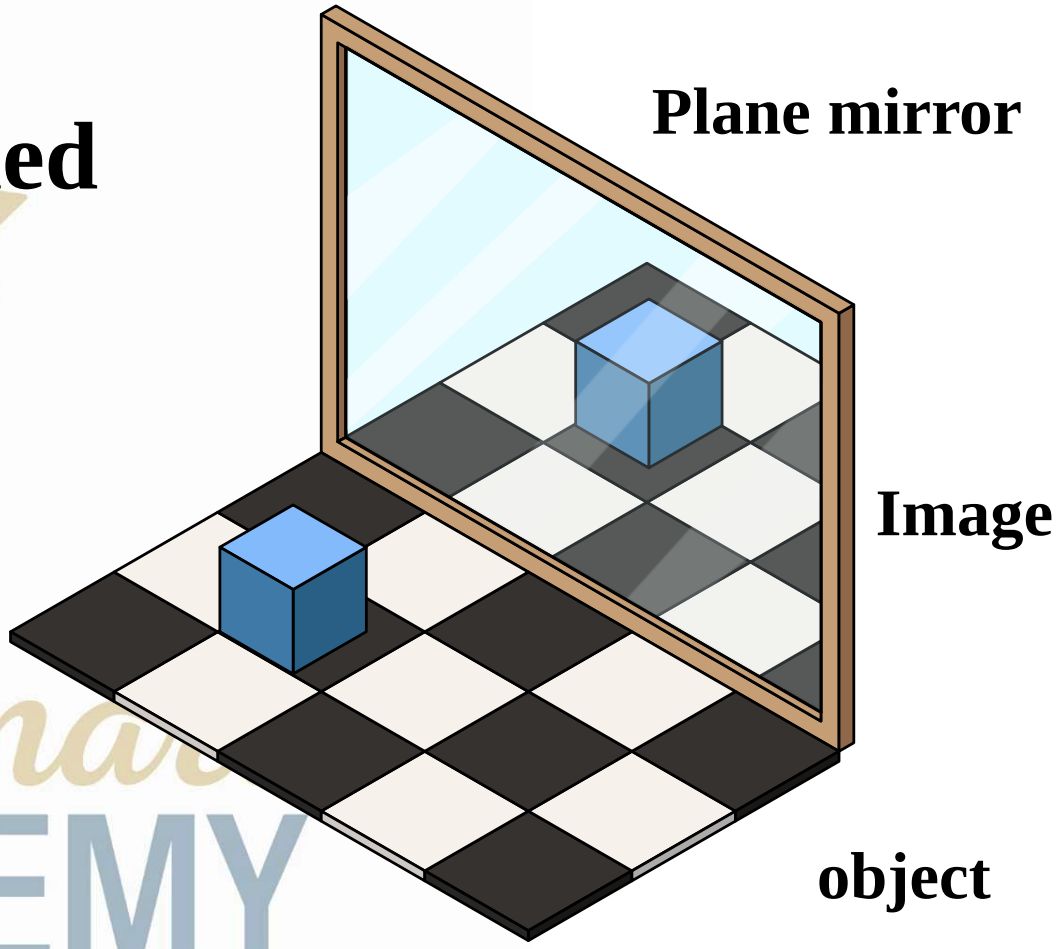


Image formed by a plane mirror

What is plane mirror?

A plane mirror is a flat polished reflecting surface.



The ordinary mirror is made by depositing a thin layer of metal on one side of a piece of glass.

The metal layer is then coated with paint to protect it.

Image formed by a plane mirror

The adjacent figure shows an image of a man formed by a mirror.

But how can it be constructed?

What are the characteristics of this image?

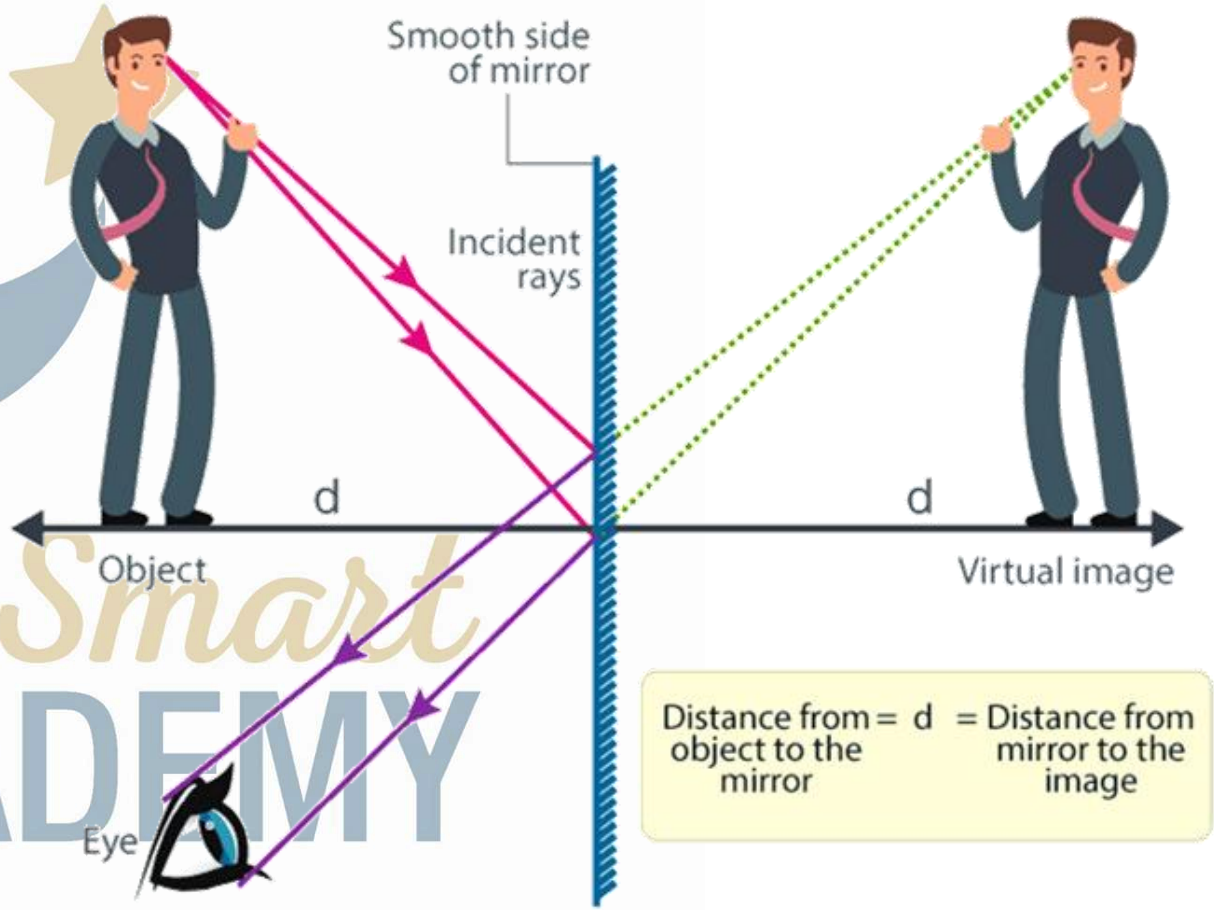


Image formed by a plane mirror

Where is the image in a Plane Mirror?

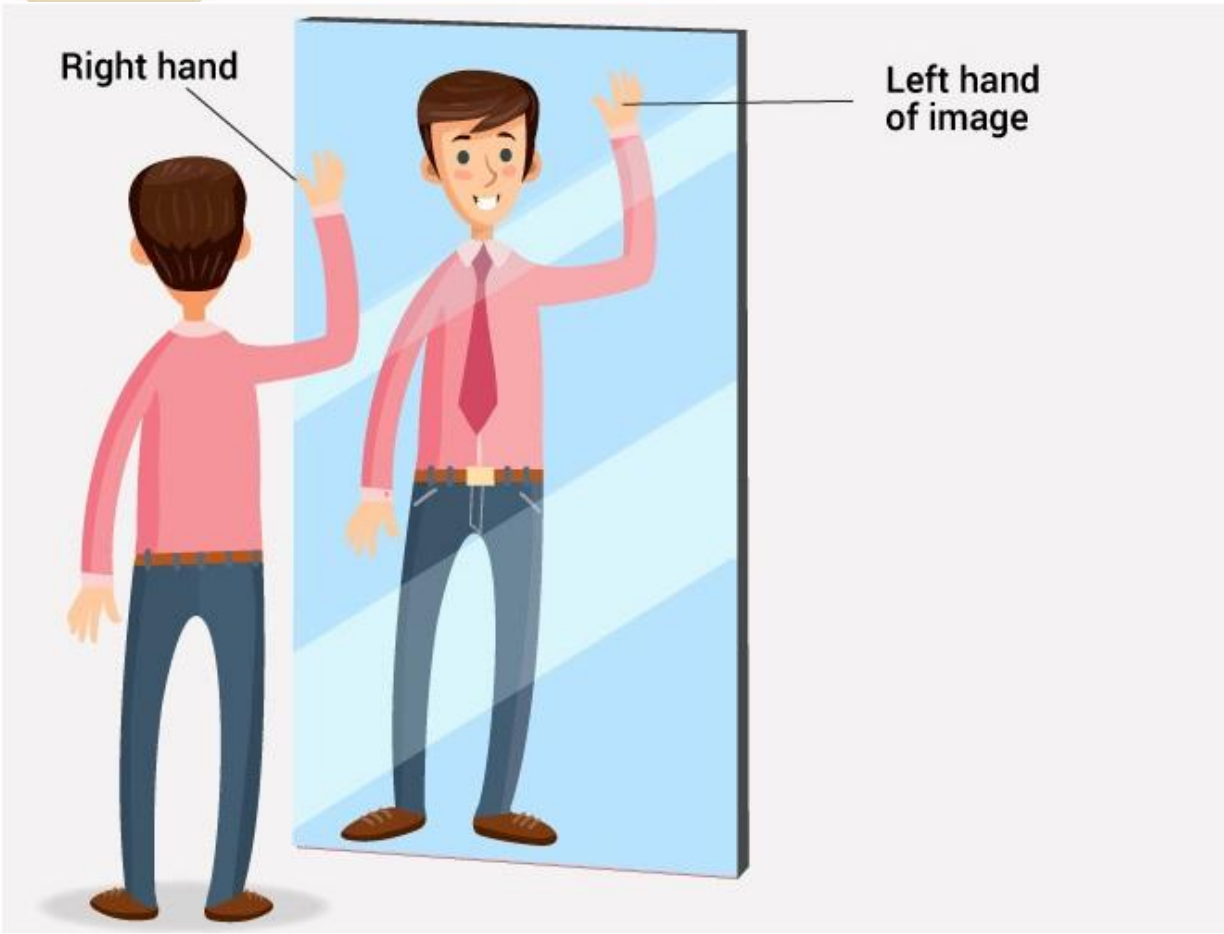


Image formed by a plane mirror

We need to draw the image of this lamp!

Lets start!!

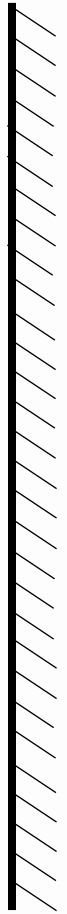
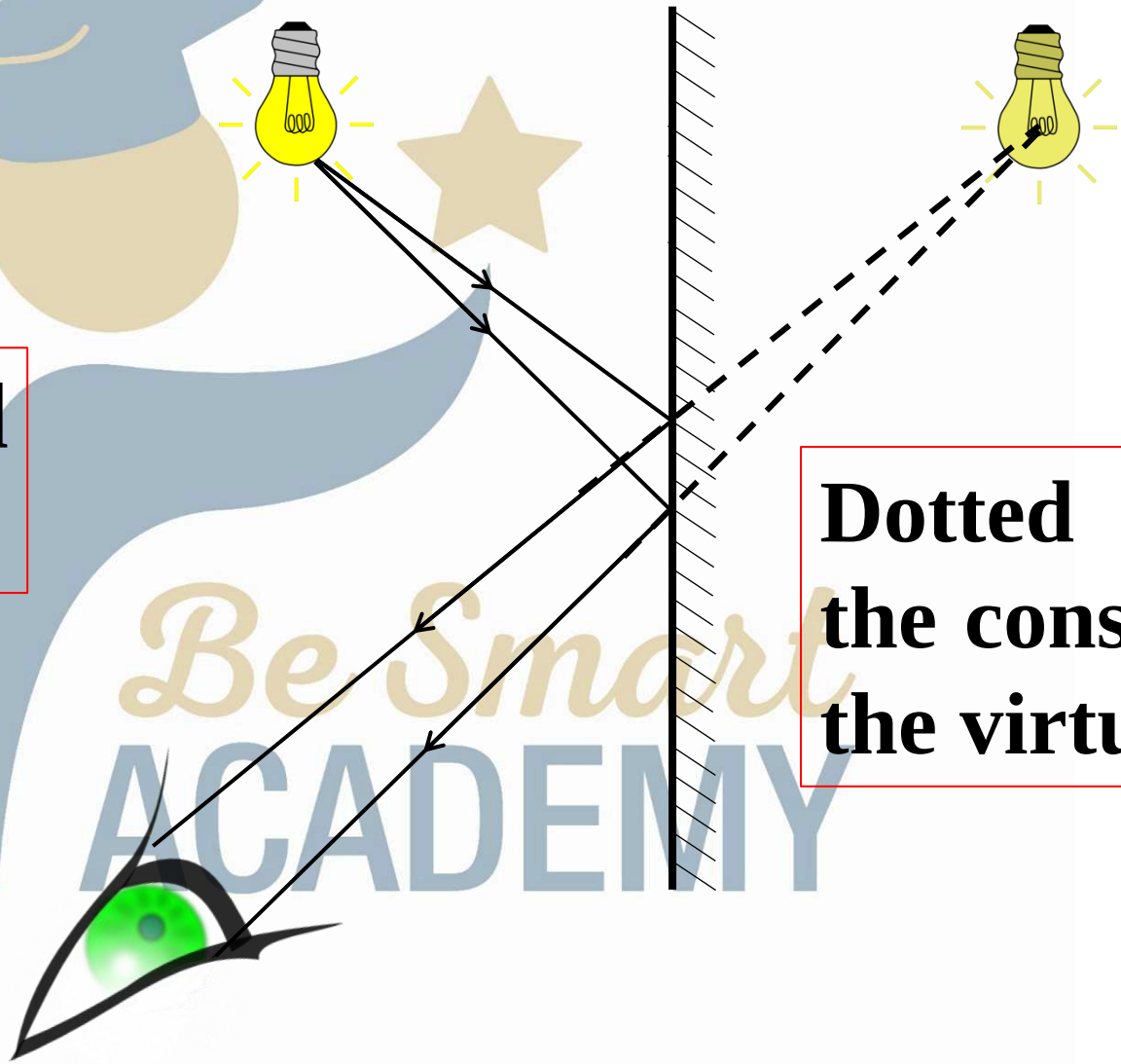


Image formed by a plane mirror

Two rays issued from the lamp:

Each one is reflected by the mirror

The two rays seem to be issued from the eye



Dotted lines show the construction of the virtual image)

Image formed by a plane mirror

Characteristics of the image:

The image has the same size as the object

The image is at the same distance away from the mirror as the object

The image is virtual (doesn't really exist).

The image is laterally inverted (left - right).

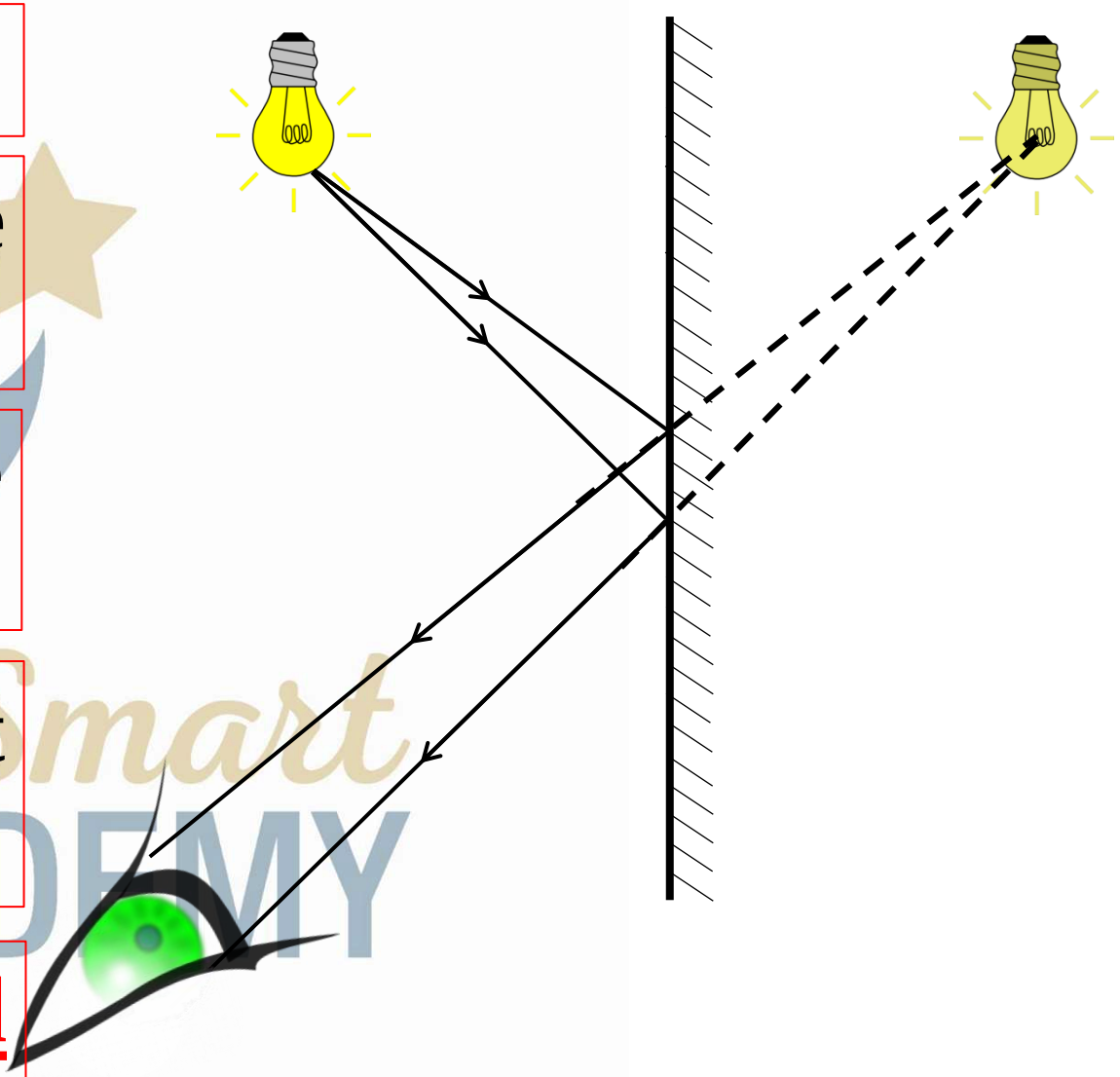


Image formed by a plane mirror

Normal view from the front.

Normal view from the front.

Same view as seen in the rear view mirror of a car.

The word AMBULANCE is laterally inverted so that it reads correctly when seen in a driving mirror.

The End