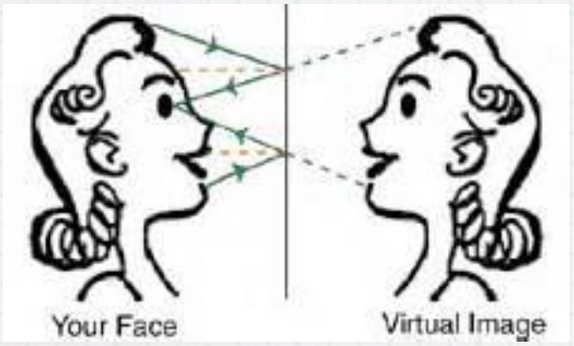
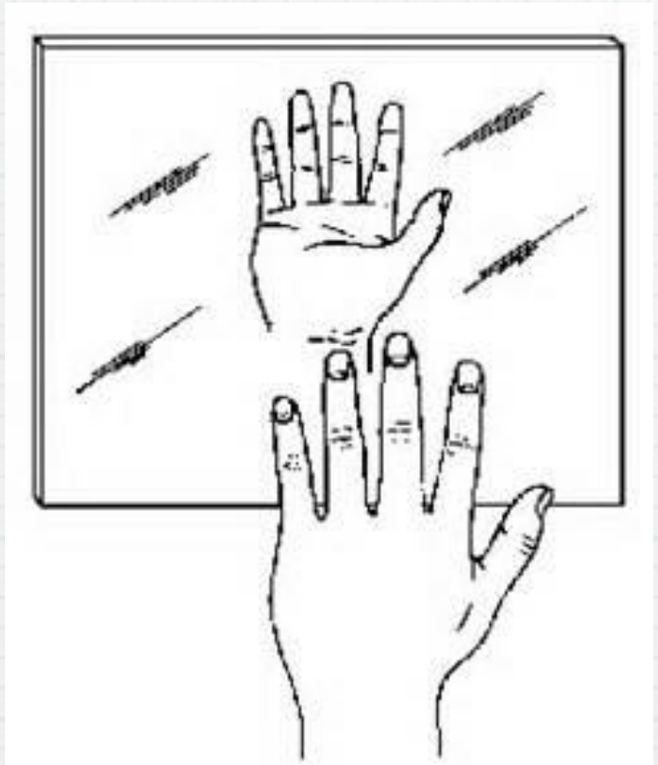
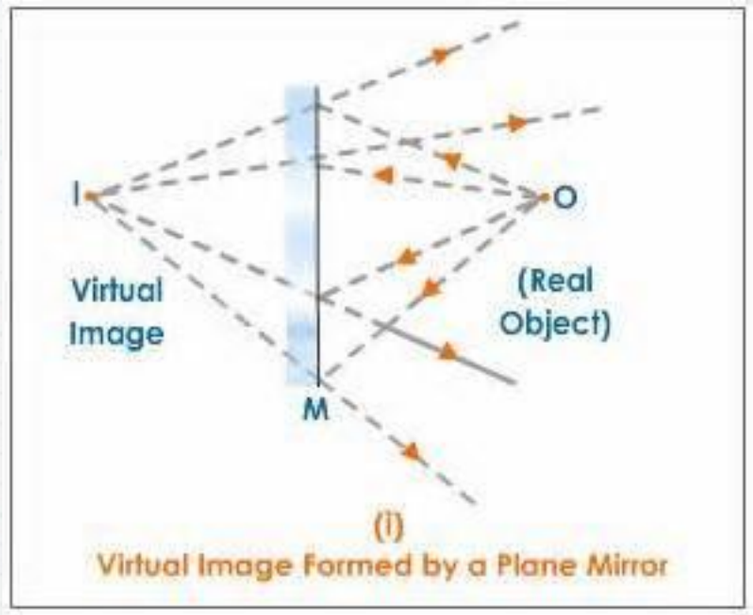
Try This!

Writing Reflectively (page 488)



11.7 IMAGES IN PLANE MIRRORS





Images in Plane Mirrors

- Have you ever stood in front of a mirror in the bathroom while brushing your teeth and wondered why the writing on your t-shirt seemed backwards?
- What exactly is going on here?

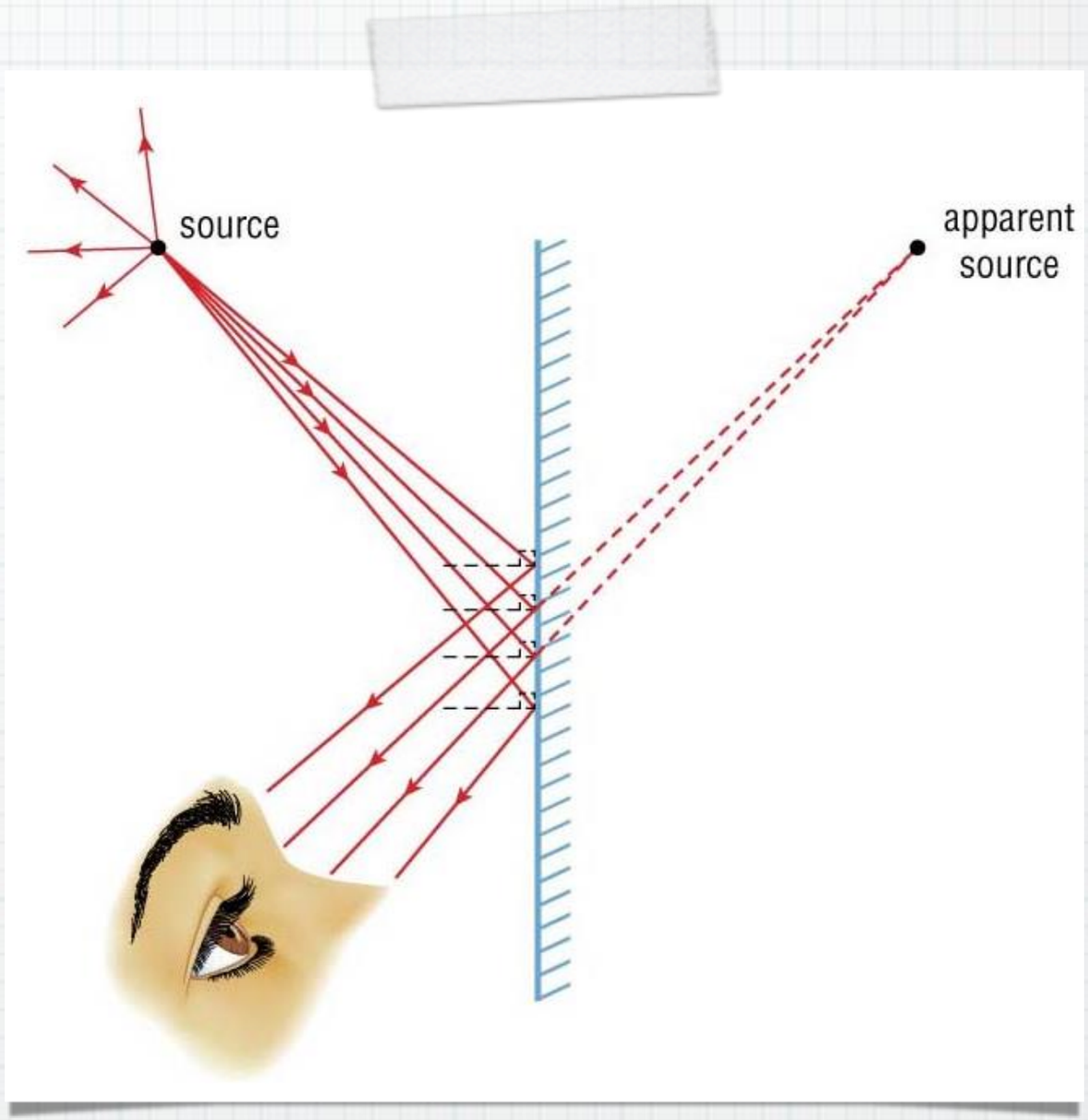
Remember... Light travels in straight lines

Using Light Rays to Locate an Image

* When your eyes detect reflected light from a plane mirror, your brain projects these light rays backwards in a straight line.

* Your brain THINKS that there is a light source behind the mirror and that is where the light rays originate from.

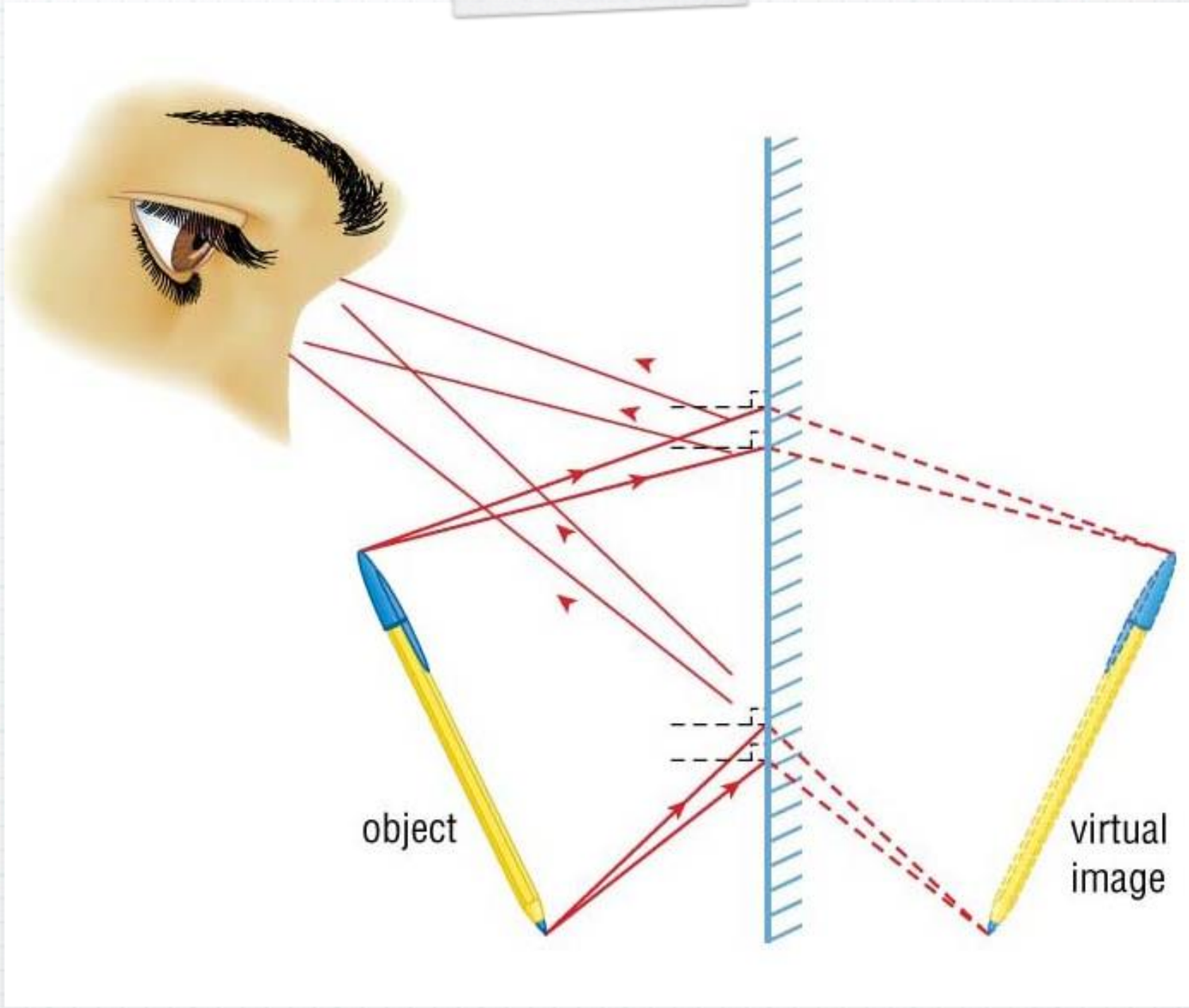
* Your eyes detect the light rays, but your brain determines where the image is located!



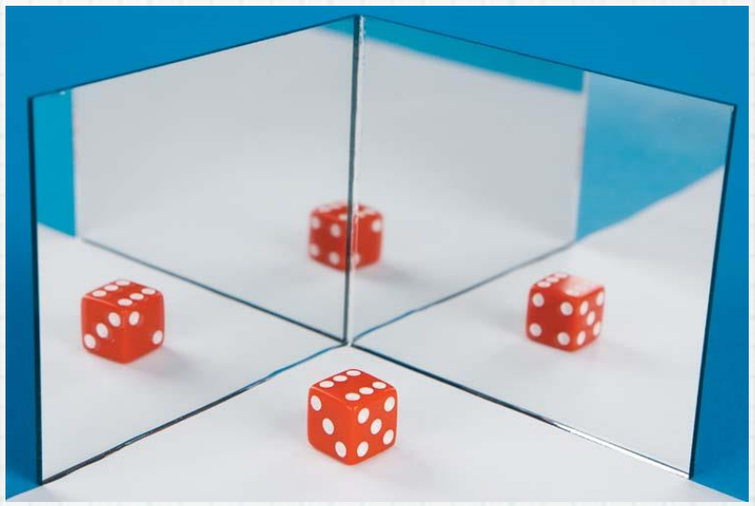
It is this apparent light source behind the mirror that results in you seeing an image behind the mirror.

There is, of course, no real light source behind the mirror because the mirror is opaque.

This kind of image is called a virtual image.



A **virtual image** is an image formed by light coming from an apparent source; light does not actually arrive at or come from the image location



The light only appears to come from the image.

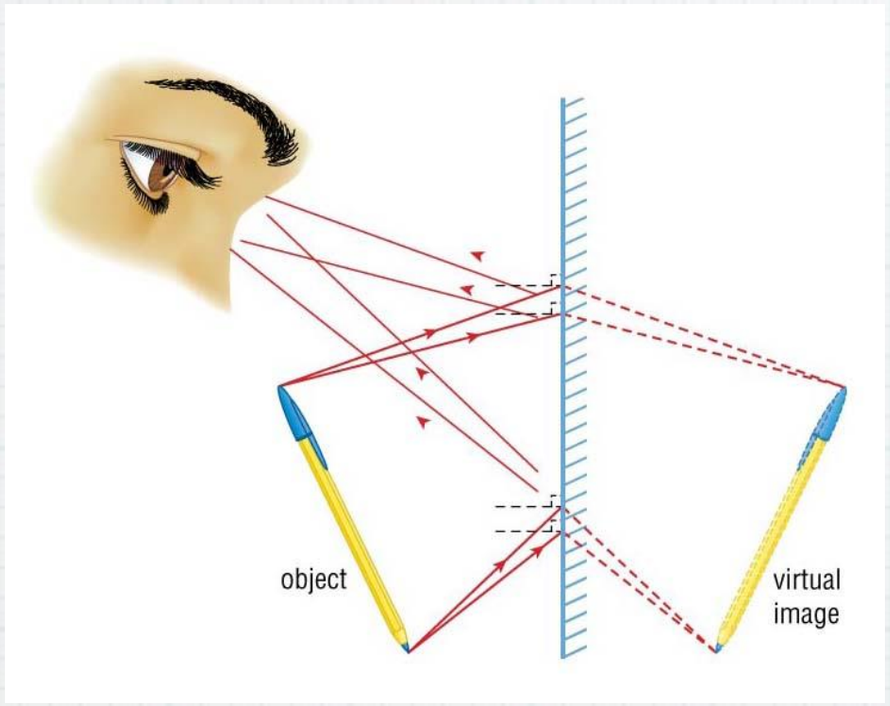
Note: Light rays behind the mirror are drawn as dashed lines. This indicates that these rays do not really exist.

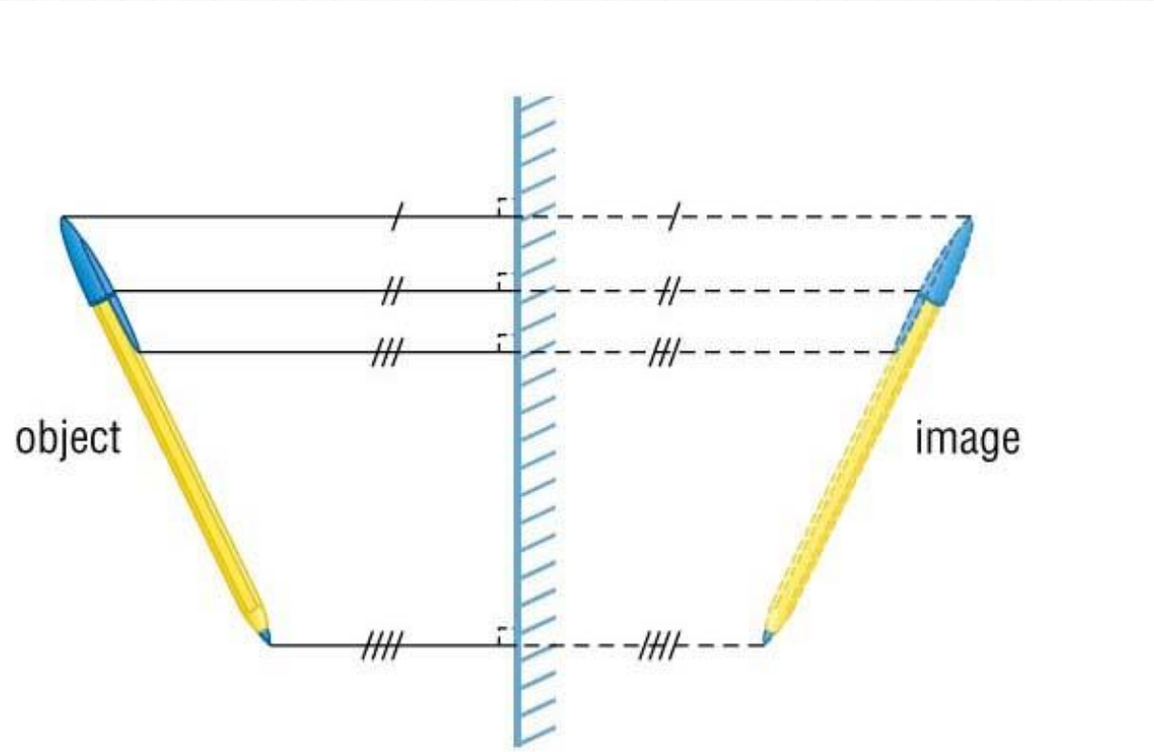
Your brain projects these rays behind the mirror and forms a virtual image behind the mirror

Locating an Image in a Plane Mirror

If you draw a line between the object and the image (an **object-image line)**, you will notice 2 things:

1. the distance from the **object** to the mirror equals the distance from the **image** to the mirror
2. The object-image line is **perpendicular** to the mirror surface

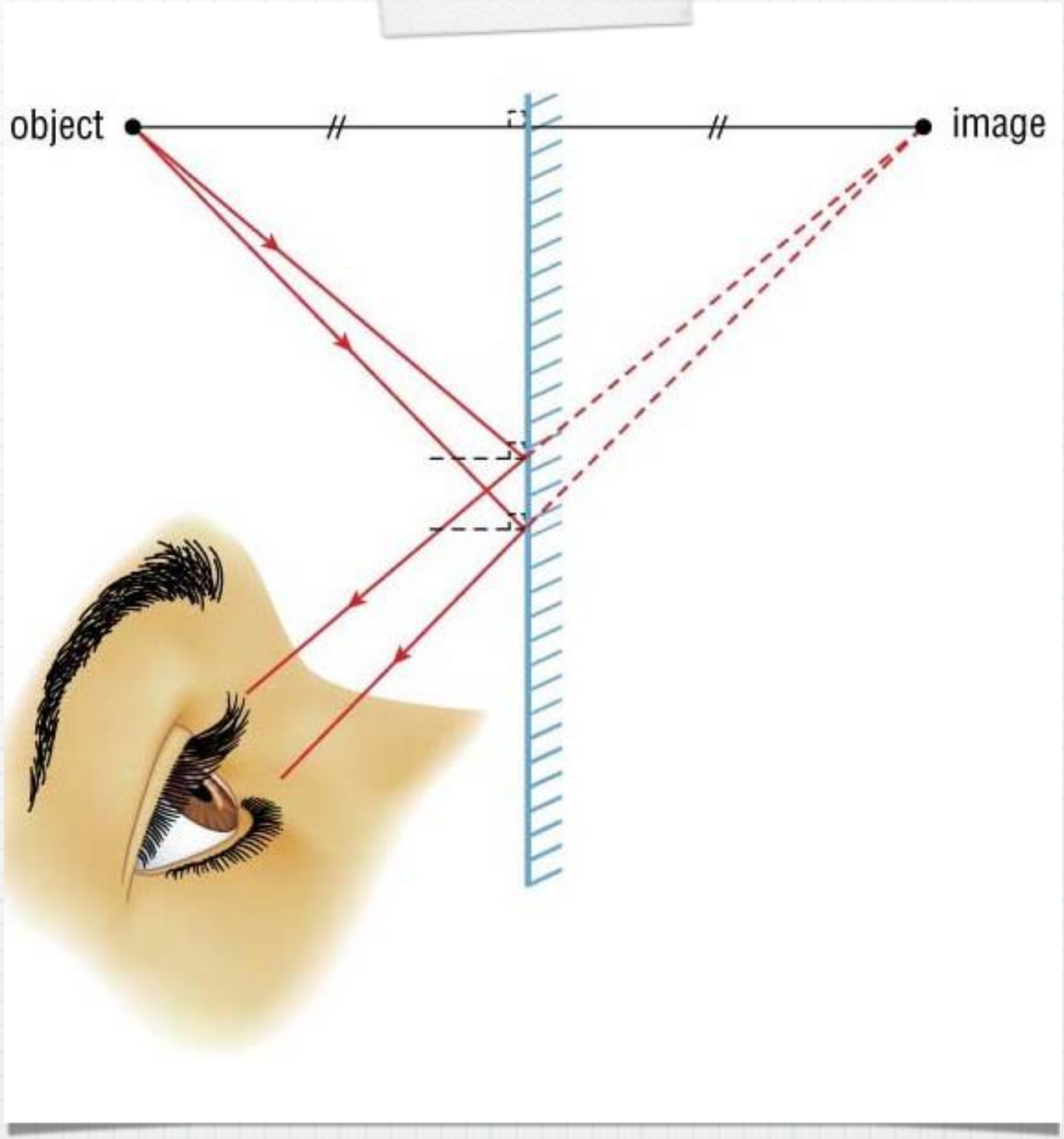




Using Equal Perpendicular Lines to Locate an Image

A plane mirror divides the object-image line in half and is perpendicular to that line.

This method can be used to locate the image of an object without using light rays.

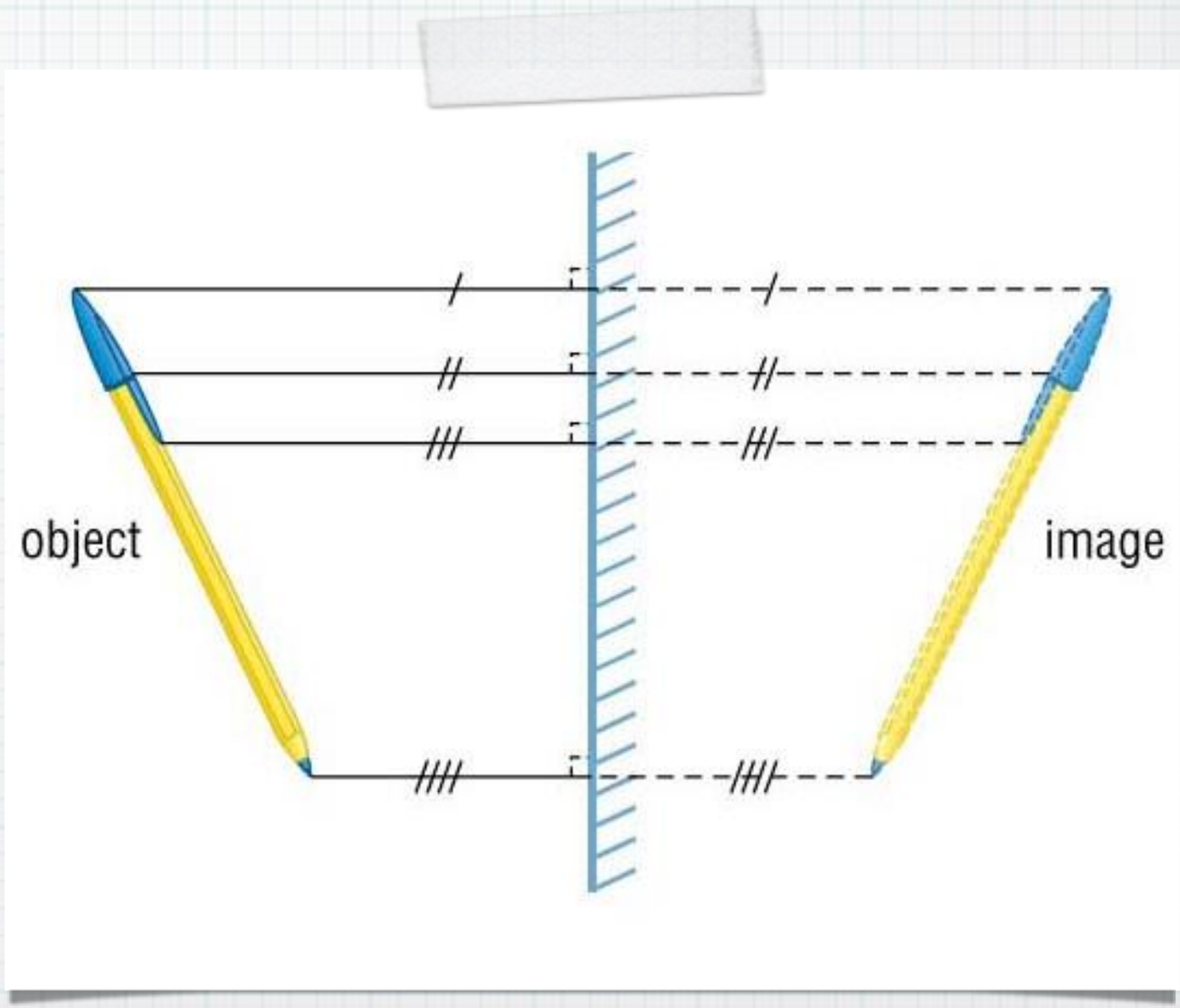


- As a result, we can draw the **virtual** image without drawing rays or measuring any angles of incidence and reflection.

- **VIRTUAL images are drawn as dotted lines!!**

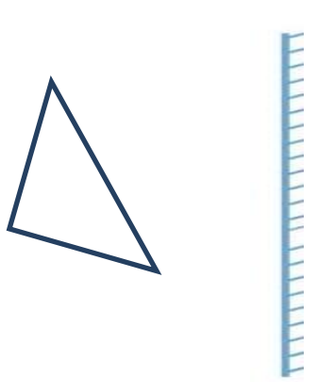
Steps:

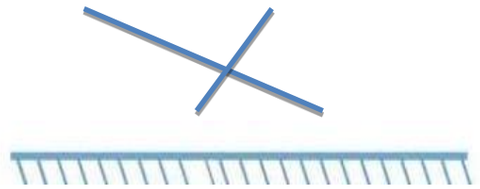
1. Choose several points on the object
2. Draw and measure a series of object-image lines
3. Draw lines of equal length behind the mirror that are perpendicular to the mirror
4. Draw the virtual image with dotted lines

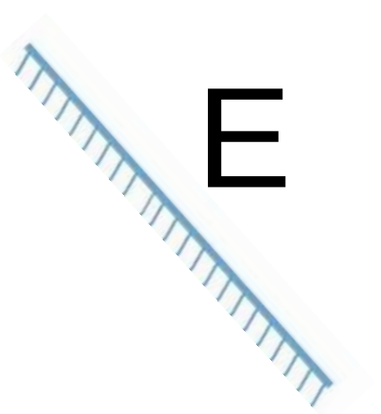


Locating an Image in a Plane Mirror

- Try drawing the virtual image for the following:

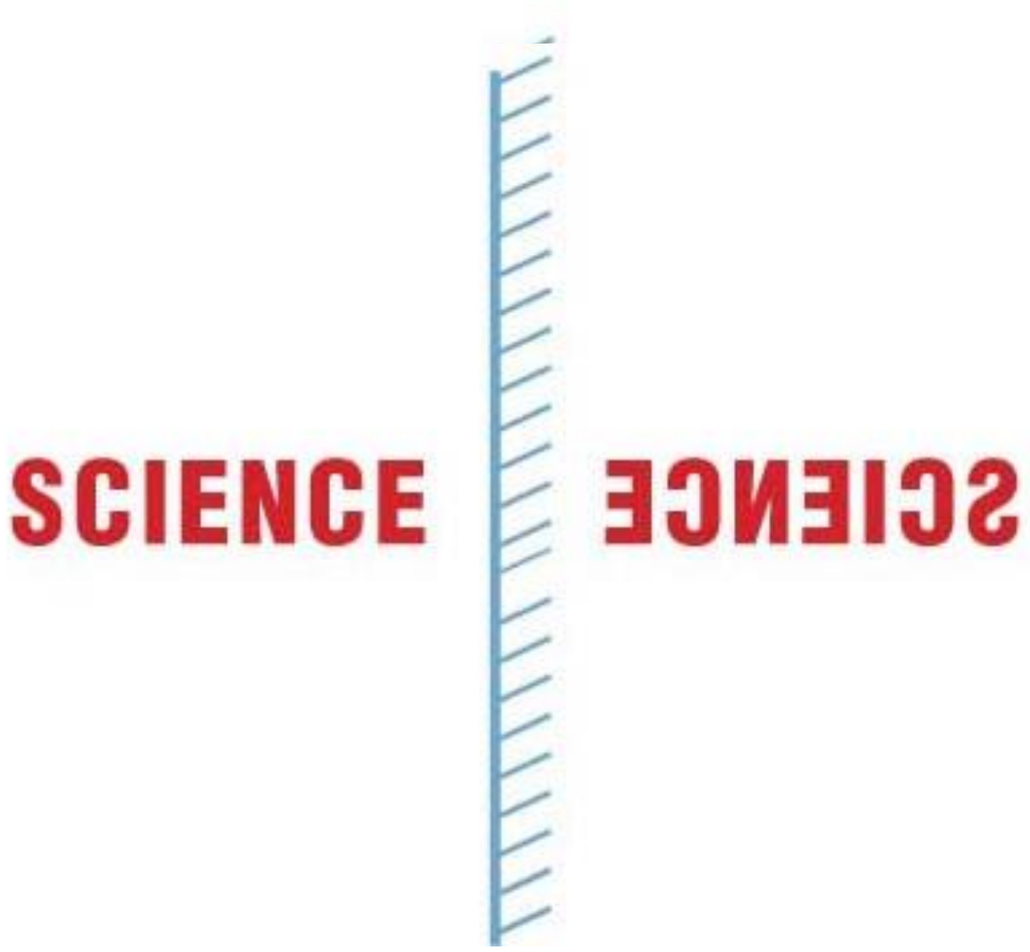






Characteristics of Images in a Plane Mirror

- **Lateral Inversion** occurs in plane mirrors
  - The orientation is BACKWARDS



  - The letters are flipped **horizontally** and are in **reverse** order

Looking Into a Plane Mirror

This is why the writing on the hood of an ambulance is reversed: so that it can be read when seen in a rear-view mirror

Image Characteristics

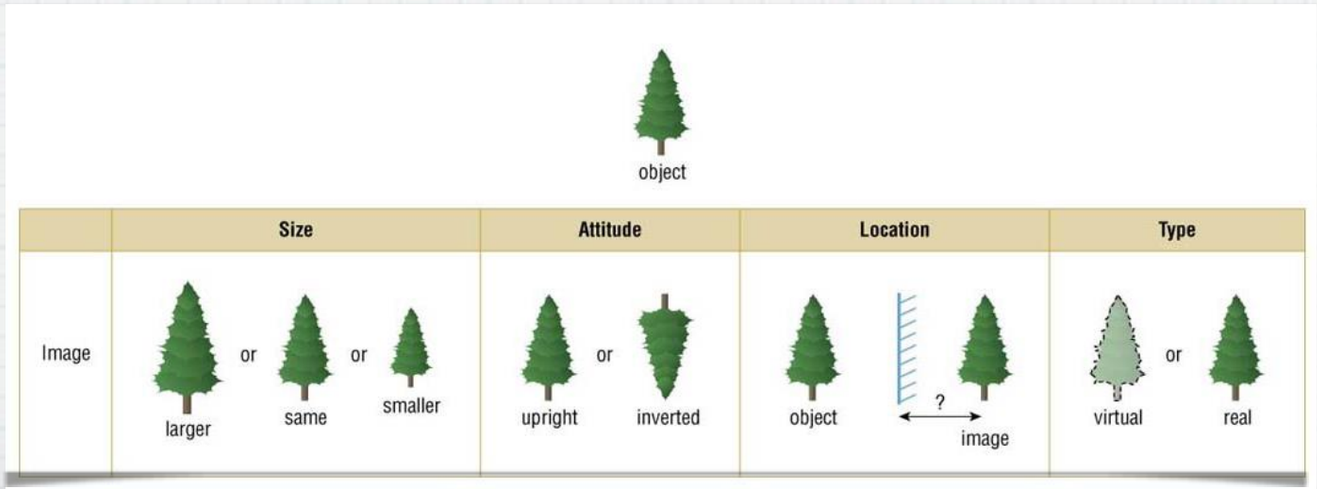
When you describe the properties of an image, you need to examine four characteristics...

* S - size of the image (compared to the object: same size, smaller, or larger)

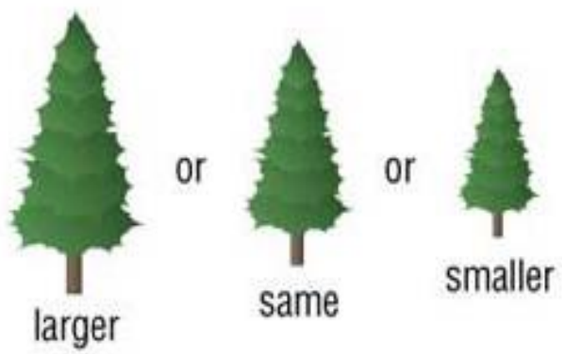
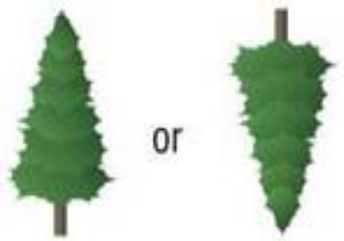
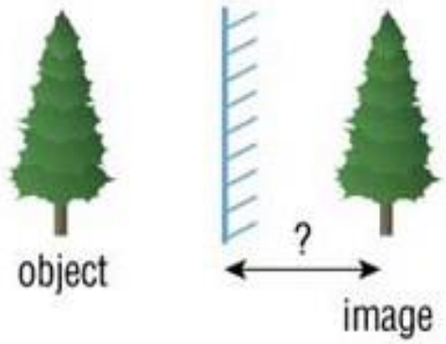
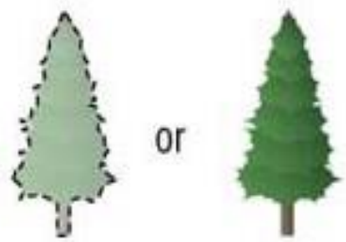
* A - attitude of image (which way the image is oriented compared to the object: upright or inverted)

* L - location of image (before or after the lens)

* T - type of image (real or virtual)... A real image is an image formed when light is actually arriving at the image location



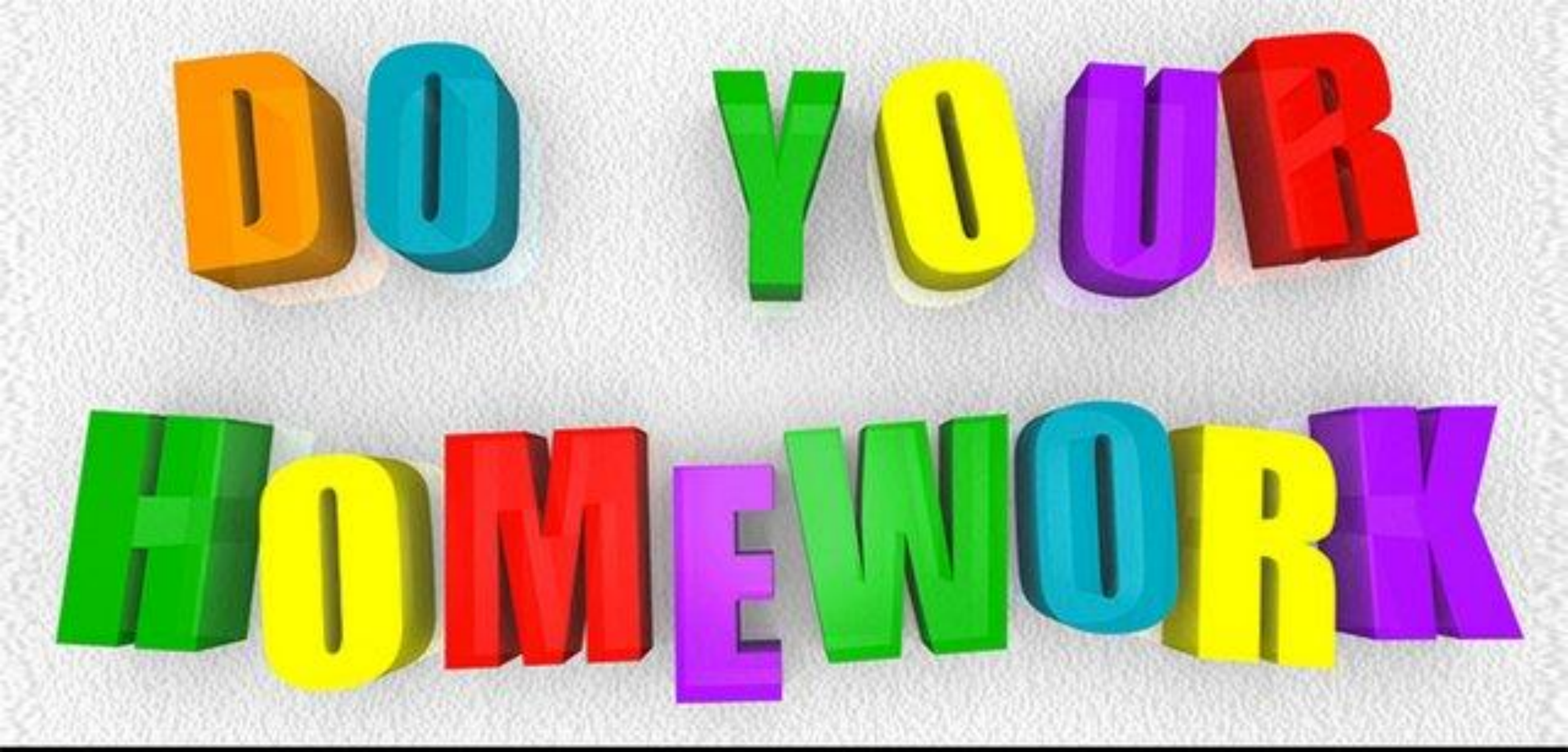
S.A.L.T.

	Size	Attitude	Location	Type
Image				

S.A.L.T.

In a plane mirror, the SALT characteristics are always:

S = same size as object
A = upright
L = behind mirror, same distance as object
T = virtual



Page 493 #5