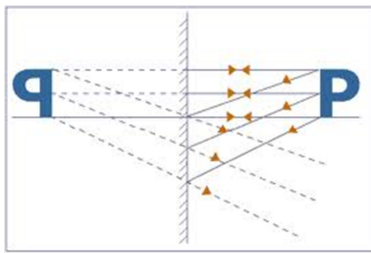


5.B.1 Plane Mirrors



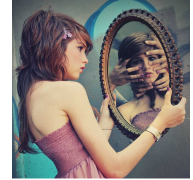
Images in Mirrors

Image: visual counterpart of an object produced by a reflection (mirrors) or by refraction (lenses).

The geometry of a mirror's surface affects size, orientation, and type of image.

A virtual image appears behind (inside) a mirror.

A real image appears in front of the mirror, and must be shown on a screen or other surface (next subunit).



Beware! The world inside the mirror awaits.

Mirrorial Measurements

Object distance (s_o)(why s?):

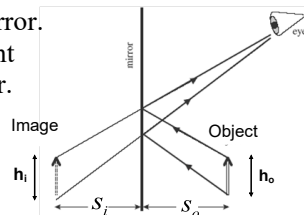
distance from object to mirror.

Image distance (s_i): apparent distance of image to mirror.

Object height (h_o): actual height of an object.

Image height (h_i): apparent height of an object.

The Latin word for distance is 'spatium': thus the symbol is 's', not 'd'.

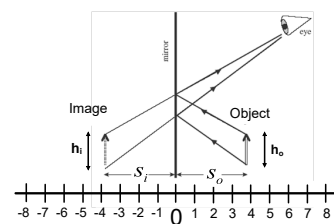


Plane Mirror Relations

In a plane mirror, $s_o = |s_i|$, and $h_o = |h_i|$.

Why the absolute value sign?

Reference frame: the mirror marks zero on a number line, anything 'inside it' is negative.



Magnification

Magnification (M): image height vs. object height.

$ M = \frac{h_i}{h_o} = \frac{s_i}{s_o}$ <p>AP Equation</p>	s_o = object distance
	s_i = image distance
	h_o = object height
	h_i = image height

Without absolute value, M is plus or minus.
+ image is right side up; - is upside down.

Plane mirrors: **M = +1** (not magnified).

In plane mirrors, lateral inversion (mirror imaging) occurs.



Plane Mirror Examples

An object with an image height of 10.0 cm is placed 15 cm in front of a mirror.

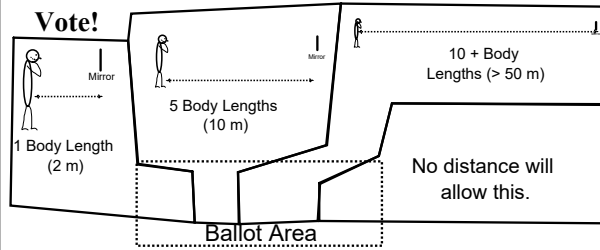
1. What is its actual height of the object?
2. Where does the object's virtual image appear?
3. What is the magnification factor of the mirror?

Answers:

1. 10.0 cm: in plane mirrors, $h_o = h_i$.
2. 15 cm: 'inside' the mirror: $s_i = s_o$.
3. +1: plane mirror images are upright, unmagnified.

4. Physics Democracy Field Trip!!

You can't see your entire self in the 1' X 1' mirror at close range, but you can see your peers entirely. Standing upright, how far from the mirror would you have to stand to see your entire reflection?

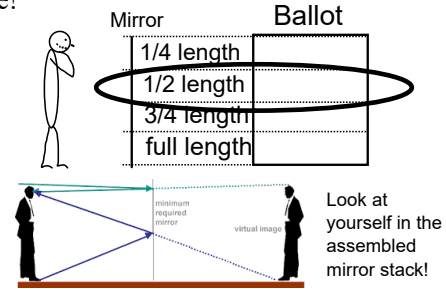


Answer: No distance is far enough.

5. Minimum Mirror Physics Democracy

What's the minimum size of mirror needed to see your whole body in the reflection?

Vote!



Find a test-subject to measure height markings on the mirror.

Homework

5.B.1 Problems.
Due: Next Class