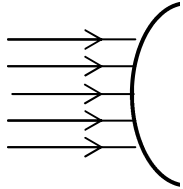
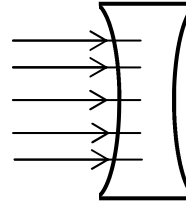


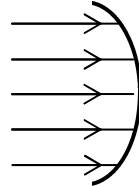
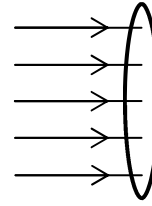
2009-10 Light 3

- Use the **lens** at the right to answer the following.
 - Is it concave or convex?
 - Draw what will happen to the parallel light rays.
 - Is it convergent or divergent?
 - Does it have a real or virtual focal point?
 - Which side is real?



- Use the **mirror** at the left to answer the following.
 - Is it concave or convex?
 - Draw what will happen to the parallel light rays.
 - Is it convergent or divergent?
 - Does it have a real or virtual focal point?
 - Which side is real?

- Use the **lens** at the right to answer the following.
 - Is it concave or convex?
 - Draw what will happen to the parallel light rays.
 - Is it convergent or divergent?
 - Does it have a real or virtual focal point?
 - Which side is real?

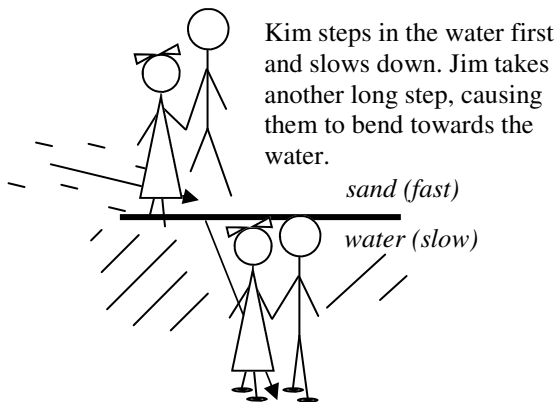


- Use the **mirror** at the left to answer the following.
 - Is it concave or convex?
 - Draw what will happen to the parallel light rays.
 - Is it convergent or divergent?
 - Does it have a real or virtual focal point?
 - Which side is real?

- Does light reflect from or go thru a mirror?
 - Does light reflect from or go thru a lens?
- The light rays shine from a light on the left side of a mirror or lens.
 - The light rays will end up on which side of a mirror: left or right?
 - The light rays will end up on which side of a lens: left or right?
 - So, which side of a mirror is real?
 - Which side of a lens is real?
- Concave mirror (CCM), convex mirror (CVM), concave lens (CCL), or convex lens (CVL)?

A. ___ Is divergent and reflects.	E. ___ Has a real focal point and reflects.
B. ___ The middle is thicker than the ends and refracts.	F. ___ Is divergent and the right side is real.
C. ___ Has a virtual focal point and the left side is real.	G. ___ Bends toward the light source and reflects.
D. ___ Is convergent and the right side is real.	

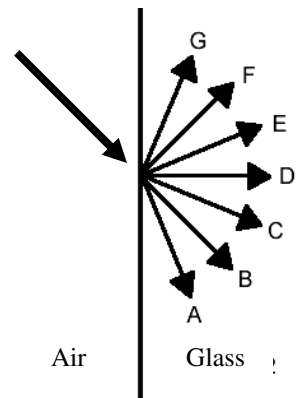
The following picture is for those of you that need a reminder of why light refracts.

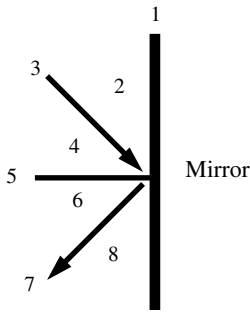


- For optics, what is the "normal"?

- The diagram at the right shows a light ray coming from air into glass.

- If the light does not refract at all, it would go straight. Write "straight" next to the correct letter.
- Which letter is the normal?
- Now it should be easy to figure out which path the light takes in the glass.

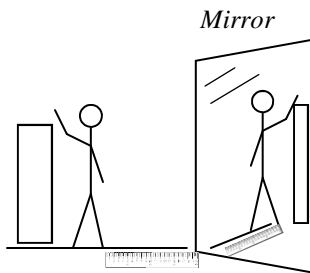
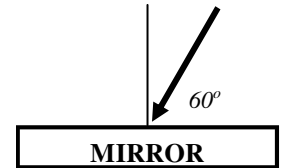




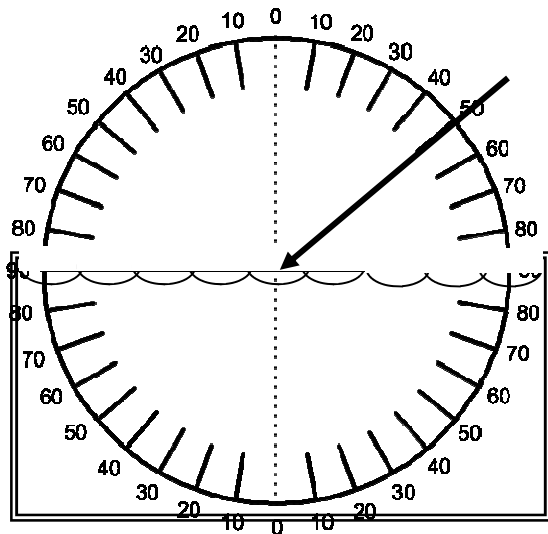
From "Optics Basics". Remember back to forces. The "normal force" is a force perpendicular to any surface. Likewise, in optics, the "normal" is an imaginary line perpendicular to a mirror or lens. In all optics equations, the angles are always measured from the normal.

10. The diagram at the left shows a light ray hitting a flat mirror.
- Is it concave or convex?
 - _____ Which is the incident ray?
 - _____ Which is the angle of reflection?
 - _____ Which is the normal?
 - _____ Which is the angle of incidence?
 - _____ Which is the reflected ray?

11. For the mirror at the right,
- What is the angle of incidence?
 - What is the angle of reflection?
 - Draw the reflected ray.



12. Slim Jim is standing in front of a flat mirror and has a meter stick between him and the mirror (he is one meter in front of the mirror).
- How far inside the mirror is his image?
 - How far is Jim from his image?
 - Is his image a real or virtual image?
 - Why?



From your "Refraction" notes:

13. Light traveling thru air strikes water as shown at the left.
- What is the angle for light in air?
 $\theta_1 =$
 - What is the index of refraction of air (see notes)?
 $n_1 =$
 - What is the index of refraction of water?
 $n_2 =$
 - Use Snell's Law to calculate the angle the light refracts in water.

And Do the TAKS Homework