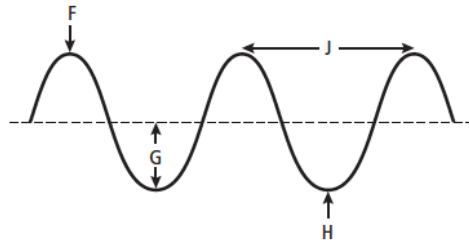


Optics

1. Name each of the following for the diagram below:

- a) F: _____
- b) G: _____
- c) H: _____
- d) J: _____



2. State the law of reflection:

3. What size and orientation does an image seem to have in a plane mirror?

Size:

Orientation:

<p style="text-align: center;"><u>Concave Mirror</u></p> <p>Diagram with 3 light rays:</p> <p>Opaque, translucent or transparent?</p> <p>Light converges/diverges?</p>	<p style="text-align: center;"><u>Convex Mirror</u></p> <p>Diagram with 3 light rays:</p> <p>Opaque, translucent or transparent?</p> <p>Light converges/diverges?</p>
<p style="text-align: center;"><u>Concave Lens</u></p> <p>Diagram with 3 light rays:</p> <p>Opaque, translucent or transparent?</p> <p>Light converges/diverges?</p>	<p style="text-align: center;"><u>Convex Lens</u></p> <p>Diagram with 3 light rays:</p> <p>Opaque, translucent or transparent?</p> <p>Light converges/diverges?</p>

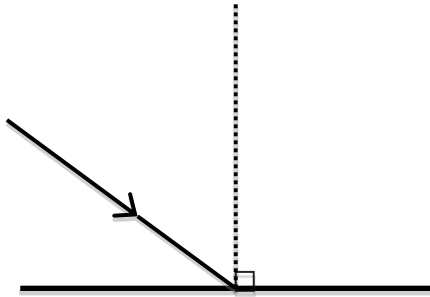
4. Match the term with the descriptor. Each descriptor can only be used once.

Term	Descriptor
___ lens	A. Equal to angle of reflection for a plane mirror
___ mirror	B. A piece of transparent material that bends light
___ convex lens	C. Light rays spreading apart
___ concave lens	D. Material that scatters light
___ diverging	E. Material that curves outwards and reflects light
___ converging	F. A lens that is thicker in the middle than at the edge
___ upright	G. How an image appears when looking at a faraway object through a convex lens
___ inverted	H. Material that curves inwards and reflects light
___ concave mirror	I. Point where the converging light rays meet
___ convex mirror	J. Material that is flat and smooth and reflects light
___ plane mirror	K. How an image appears when looking through a concave lens
___ opaque	L. Measured between the refracted ray and the normal
___ transparent	M. A material that reflects light
___ translucent	N. Material that allows all light rays to pass through
___ focal point	O. Light rays coming together
___ normal	P. An imaginary line that passes through the materials at a right angle
___ angle of refraction	Q. A lens that is thinner in the middle than at the edge
___ angle of reflection	R. Angle between reflected ray and the normal
___ angle of incidence	S. Material that absorbs or reflects light

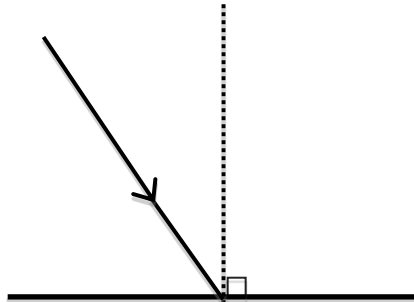
5. Draw a line representing a flat mirror. Draw a light ray approaching and then touching the mirror. Then add a normal. Complete the ray diagram showing the ray's reflection. Label the incident ray, normal, reflected ray, angle of incidence, and angle of reflection in your diagram.

6. Measuring Angles:

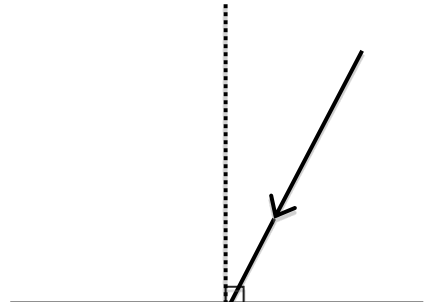
A) Angle: _____



B) Angle: _____



C) Angle: _____



7. Use the following diagram to fill in the table below:

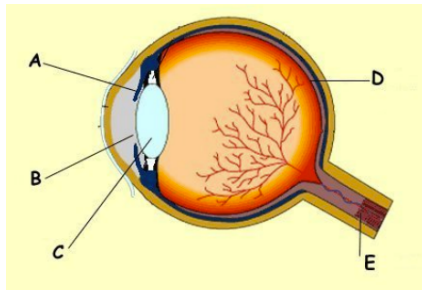


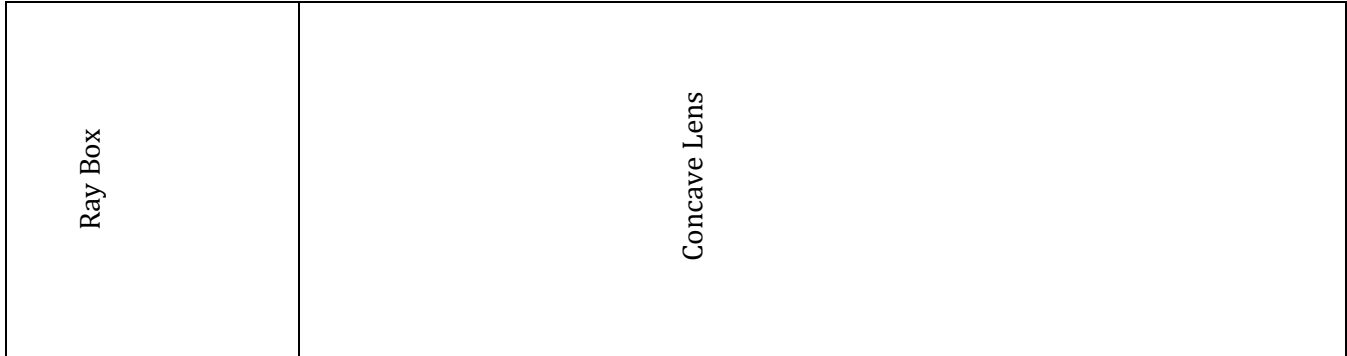
Diagram	Structure	Function
A		
B		
C		
D		
E		

8. Vision problems:

Type of vision problem	Description	Diagram	Diagram of how to fix problem with the appropriate lens
Near-sighted vision			
Far-sighted vision			

For the following, draw the rays that emerge from the ray box and through the concave or convex lens. Make sure to use a ruler for all straight lines.

Concave Lens



Are the rays converging or diverging?

Where is the focal point?

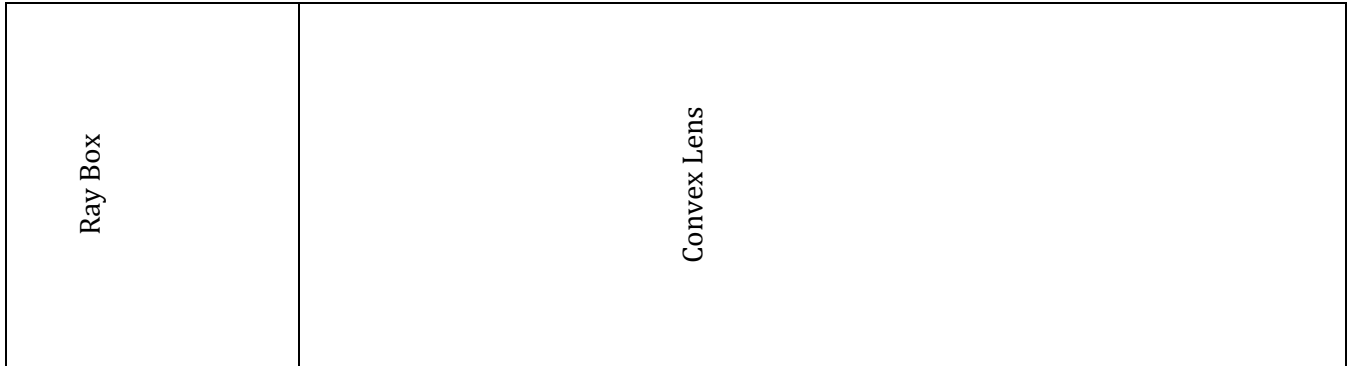
Now take a **circular concave lens** and answer the following questions.

- Hold the lens a few inches from your eye to look at an object. Make sure the image is focused.
 - Does the object look smaller or larger?
 - Does the object look upright or inverted (upside down)?
-

Now comparing to a concave MIRROR...

- Do the rays converge or diverge? _____
- If the object is far from the concave mirror, it will appear... _____
- If the object is close to the concave mirror, it will appear... _____

Convex Lens



- The focal length is the distance between the lens and the focal point. Can you measure the focal length? Yes/No If so, what is the focal length in cm? _____
 - Are the rays converging or diverging?
-

Now take a **circular convex lens** and answer the following questions.

- Look through the lens at an object on the other side of the classroom.
 - Does the object look smaller or larger?

 - Does the object look upright or inverted (upside down)?

 - Now look through the lens at the text on this paper. Make sure the text is in focus.
 - Does the text look smaller or larger?

 - Does the text look upright or inverted (upside down)?
-

Now comparing to a convex MIRROR...

- Do the rays converge or diverge? _____
- If the object is far from the convex mirror, it will appear... _____
- If the object is close to the convex mirror, it will appear... _____