**Background – waves/concave/convex mirrors**

**"Prentice Hall Physical Science", Dean Hurd, Myrna Silver, Angela Bornn Bacher, Charles William McLaughlin, Englewood Cliffs, New Jersey, 1988.**

**" How Light Works", http://science.howstuffworks.com – Extra Reference**

**Waves:**

When a pebble is dropped into a still pond, the surface of the water is disturbed. The disturbance moves outward along the surface of the water as a series of waves. The disturbance is caused by energy traveling through the water. This energy is kinetic energy because it is moving (energy of motion). Some of its kinetic energy is transferred to nearby particles of water. These particles start to move as a result of the energy. Their movement transfers energy to neighboring water particles, which in turn move.

As the water particles move, a wave is produces across the surface of the water.

**Wave: disturbance that transfers energy through matter or space.**
Always a result of energy moving form one place to another. Only the energy that produces the wave moves with the wave.

A **medium** is any substance or region through which a wave is transmitted. Water is a medium for ocean waves. Air is a medium for sound waves. As wave moves past an object, the object moves up and down, energy is transmitted, matter is not.

Two properties affect speed of wave:

1) density – waves move slower in denser medium – harder to get the particles of a denser medium to respond to the energy of the wave and start moving
2) elasticity – the ability of a medium to return quickly to its original shape after being disturbed.

Motion of the medium is at right angles to the direction of the wave is a transverse wave

Crest – high point of wave
Trough – maximum displacement downward of the particle of medium (lowest point of wave)

Amplitude – energy of that wave, max distance molecules are displaced form rest position

Wavelength – distance between two consecutive crests of troughs

Frequency – number of complete waves, or complete cycles per unit time (number of crests/troughs produced per unit time) - Hz (Heinrich Hertz first to study waves)

1 Hz = 1 wave/sec.

speed = frequency x wavelength

**Concave Mirror:** point in front of the mirror where the reflected rays meet is the focal point. The distance between the center of the mirror and the focal point is the focal length.

**Convex lens:** parallel rays of light pass through a convex lens, they are bent toward the center, the thickest par of the lens. The light rays converge at the focal point. The amount of refraction depends on the degree on which the lens is curved. A very curved lens will refract light more than a lens whose surface is only slightly curved. The converging rays will meet at a focal point closer to the lens. The focal length of a very curved lens is shorter than that of a slightly curved lens.