

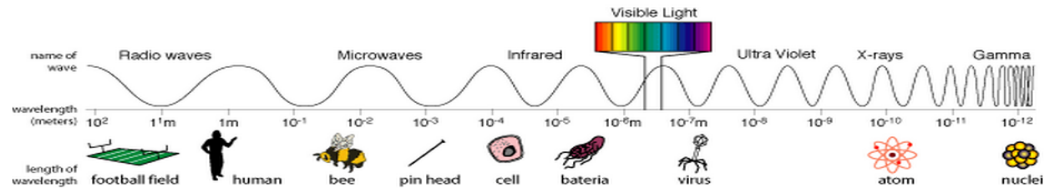
## Light and Optics

6.P.1.2: Explain the relationship among visible light, the electromagnetic spectrum, and sight.

### Visible light and all its relatives...

Radiowaves, Microwaves, Infrared rays, Visible light, Ultraviolet rays, X-rays, Gamma rays

These waves \_\_\_\_\_  
have to travel through a  
medium (solid, liquid, gas).  
These waves CAN travel  
through a vacuum/nothing (ex.  
Space).



### Opaque

• \_\_\_\_\_: Light can not pass through, thus creating a shadow.

Examples: \_\_\_\_\_

### Transparent

• Transparent materials: Allows almost all the light to pass through with \_\_\_\_\_. You can see through it. Examples: eyeglasses, empty clear glass, clear window.

### Translucent

• Translucent Material: Allows \_\_\_\_\_, yet scatters and bends the rays. You can see through it, but not clearly.

Examples: \_\_\_\_\_

### Reflection

\_\_\_\_\_ : When light hits a particular surface and \_\_\_\_\_.

Reflected light can be either partially or completely reflected based on the elasticity of the material. For this reason, metals make good reflective surfaces.

### Refraction

• \_\_\_\_\_ : The \_\_\_\_\_ due to a change in its speed. The differences are caused by the changing speed of the light as it transitions to different \_\_\_\_\_.

• Example: A straw appears bent in a glass of water. A swimming pool appears shallower than it really is.

• Light (like all waves) travels at constant speed within a medium.

• The speed changes as light changes medium.

• Light travels \_\_\_\_\_ in \_\_\_\_\_.

• Moves \_\_\_\_\_ in \_\_\_\_\_.

### Convex Lens

\_\_\_\_\_ : Are \_\_\_\_\_ then on the edges. Light is refracted **inward** causing the rays to converge- changing the focal point.

### Concave Lens

• \_\_\_\_\_ : Are \_\_\_\_\_ then in the middle. Light refracted outward causing the rays to diverge- changes the focal point.

• A \_\_\_\_\_ refracts light rays inward. If held \_\_\_\_\_ to a person's eyes, they will see an image that is \_\_\_\_\_ than the actual object. If held \_\_\_\_\_ from a person's eyes, they will see an image \_\_\_\_\_.

• A \_\_\_\_\_ refracts light rays spreading them outward producing an image that is \_\_\_\_\_ than the actual object.