Light PPT Outline

Basic Properties

* Light travels in straight “beams”
* beams = the length, height, and width of light

Basic Properties

* Light travels much faster than sound
* Speed of light = 983,571,056 feet per second!
* Speed of sound = 1087 feet per second
* Example: we see the explosion from a gunshot, then we hear the bang.

Basic Properties

* Shadows are formed when light is blocked by an object
* Examples: shadow hand puppets, shade from a tree, etc
* Basic Properties
* We see things because light beams reflect into our eyes

Light Interactions: Refraction

* Refraction occurs when light is bent through interactions with another medium
* This is due to a change in speed
* Examples: straw in a water glass, prisms, etc

Light Interactions: Reflection

* Occurs when light bounces evenly off an object at equal angles
* Examples: mirrors, smooth water surfaces, glass windows

Reflection: Convex Mirrors

* Reflective surface that curves outward and is thicker in the center than on the edges
* Light rays converge (are brought together)
* Image is upright, and reduced (smaller than the real object)
* Examples: Corner mirrors in stores, rearview mirrors, etc

Reflection: Concave Mirrors

* Concave mirrors have a reflective surface that curves inward
* Images in mirror appear upside down and smaller at further distances
* If closer to the mirror, images flip right-side up and appear larger

Light Interactions: Scattering

* When light hits a rough surface, the reflection of the image bounces off at different angles and scattering of the light occurs
* This is also called diffuse refraction

Light Interactions: Absorption

* When light strikes an object it not only reflects the light (the colors you see) but it also absorbs the light (the colors you don’t see)
* Example: blue jeans absorb all the colors of light except blue, which is the color reflected

Light Interactions: Absorption

* White is the presence of all colors
* No color is absorbed, all colors are reflected
* Black is the absence of all colors
* All color is absorbed, no color/light is reflected.

Absorption: Secondary Colors

* If the color you see is a secondary color (orange, green, purple) then it reflects a combination of the primary colors.
* Example: purple objects absorb orange, yellow, and green light, but they reflect red, blue, and purple light.

Absorption: Filters

* Filters can be used to “block out” or cancel different colors of light
* In regular lighting, red and blue are reflected
* In a red light filter, the shirt would continue to appear red, but the jeans would look black
* In a blue light filter, the jeans would look blue, but the shirt would appear black.

Transparent

* Light is able to travel through an object
* No scattering occurs
* Examples: clear windows, eyeglasses, plastic wrap, etc.

Translucent

* Some light is able to pass through an object but not all, and a light shadow is cast
* Objects you can partially see through
* Some light scattering occurs
* Examples: Tissue paper, tinted windows, clouds, etc.

Opaque

* Light is blocked by an object and a dark shadow is cast
* Cardboard, eyelids, aluminum foil, wooden door, etc.