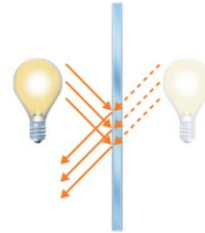


Bouncing and Bending of Light

Reflection of Light

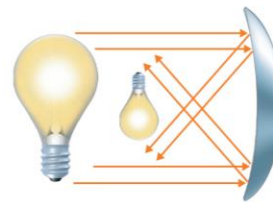
Reflection is the bouncing of a wave off a surface. Objects that reflect off of a flat surface observe the *law of reflection*: the angle of an incoming light ray equals the angle of the reflected light ray.

Flat Mirrors When you look in a flat mirror, the image you see appears to be behind the mirror. Of course, you are not really behind the mirror. It seems like light rays are coming out of the mirror, but in fact you are seeing rays that reflect off the mirror.

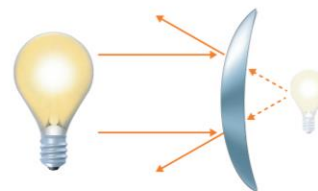


flat mirror

Concave Mirrors A mirror that is curved inward is a concave mirror. Light rays that strike this type of mirror bounce inward. The image you see depends on how close you stand to the mirror. If you stand very close, your image will appear larger than you are. If you stand far away, your image will be upside down and smaller than you are.



concave mirror



convex mirror

Convex Mirrors A mirror that is curved outward is a convex mirror. Images in this type of mirror always appear smaller, and they always appear to be behind the mirror.

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Reflected images may appear behind the mirror (faded bulbs) or in front of the mirror (bright bulbs).

Refraction of Light

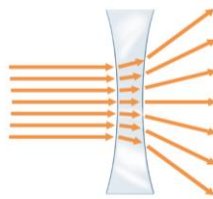
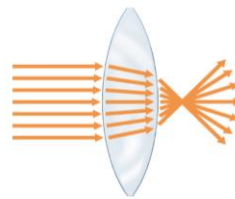
Refraction is the bending of a wave as it changes angle, passing from one substance to another. Light slows down when it moves from one material into a denser material. This decrease in speed causes the light's angle to change, or its direction to bend. Light speeds up when it moves into a less dense material. This increase in speed causes the light to bend in the other direction.

Science File

Flat Lens A clear piece of glass or plastic through which light travels is called a lens. Light slows down when it enters a lens and speeds up when it exits the lens. If the lens is flat, the light's path shifts a little, but its final direction does not change.

Concave Lens A lens that is thinner in the middle is a **concave lens**. Light that passes through a concave lens spreads outward. Objects always look smaller when you look at them through a concave lens.

Convex Lens A lens that is thicker in the middle is a **convex lens**. The image that you see when you look at an object through a convex lens depends on how far away the object is. Up close, the lens will cause the object to look bigger. Far away, the image will appear upside down and will be smaller.

*flat lens**concave lens**convex lens*

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Transparent, Translucent, and Opaque

Light that strikes a material may pass through it. Materials that allow most light to pass through are called **transparent**. Clear glass and plastic are transparent. You can clearly see objects when you look at them through a transparent material.

Materials that blur light as it passes through are called **translucent**. Wax paper and frosted glass are examples of translucent materials. If an object allows little or no light through, it is called **opaque**. A wooden door with no window and a textbook are examples of opaque objects.