

# Reflection of Light

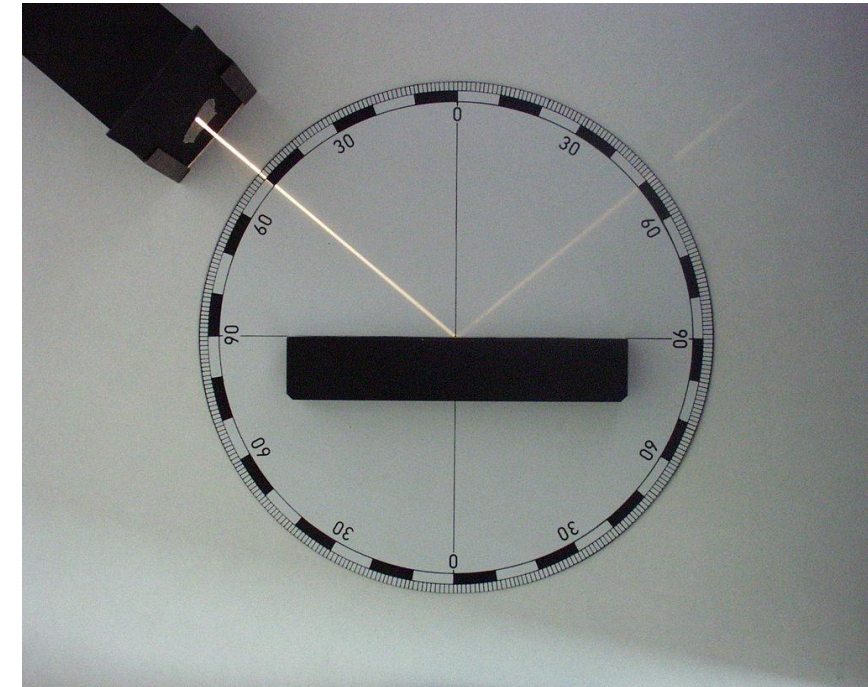
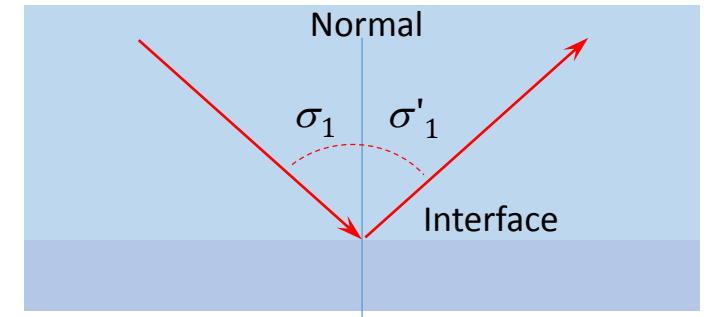
Reflection is the change in direction of light at an interface between two different media, so that light returns into the medium from which it originated.

The **law of reflection** is as follows:

- The incident ray, the reflected ray and the **normal to the reflection surface** at the point of the incidence lie in the same plane.
- The angle which the incident ray makes with the normal is equal to the angle which the reflected ray makes to the same normal.

$$\sigma_1 = \sigma'_1$$

Mirrors and planar surfaces exhibit **specular reflection**, and creates a virtual image of objects.



By Zátanyi Sándor (ifj.) - Own work, CC BY-SA 3.0,  
<https://commons.wikimedia.org/w/index.php?curid=10035697>

The reflection of Mount Hood in Mirror Lake  
<https://www.fhwa.dot.gov/byways/photos/62736>

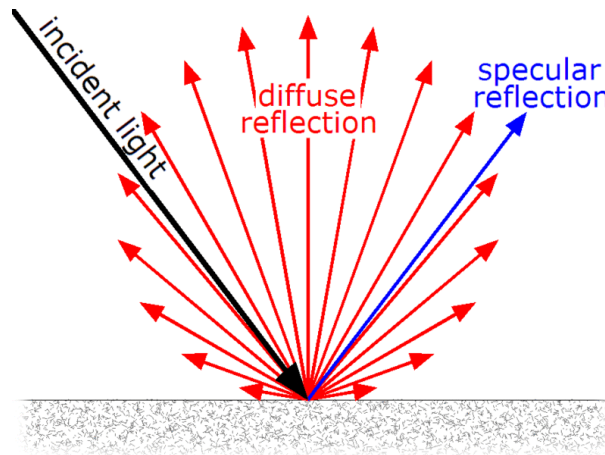
# Specular and Diffuse Reflection

Reflection of light can be either **specular reflection** (mirror-like) or **diffuse reflection** (losing the image) depending on the nature of the interface.

Specular reflection is produced when the surface can be polished to eliminate irregularities comparable with light wavelength (a fraction of a micrometer).

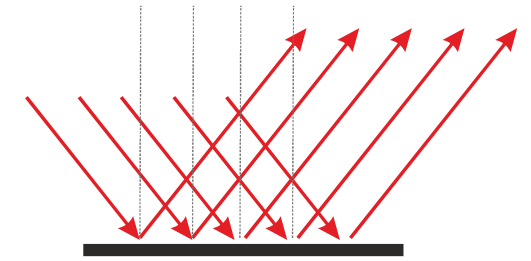
Diffuse reflection occurs due to irregularities in the reflection surface, or by scattering centers beneath the surface. The vast majority of visible objects are seen primarily by diffuse reflection.

An ideal diffuser that shows luminance from all directions is named as **Lambertian diffuser**.

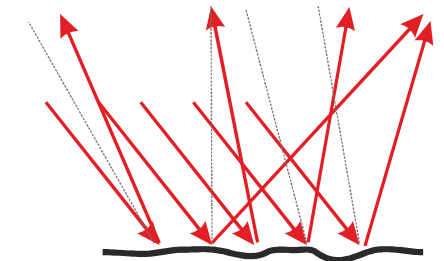


Lambertian diffuser

<http://en.wikipedia.org/wiki/File:Lambert2.gif>



Specular reflection



Diffuse reflection

Specular and diffuse reflection of sunlight in still and in curl waters

<http://cosmos.physast.uga.edu/iSong/node/88>

