Light And Matter

1. **Luminous objects –** provide or gives off their own light (e.g. sun, light bulb)

2. **Non-Luminous objects** – do not emit their own light (e.g. moon reflects the light from the sun)

Materials can be classified by how they interact with light.

<u>Transparent materials</u>
A substance that allows light to pass through it easily, so a clear image can be seen through it. E.g. clear glass or shallow water.

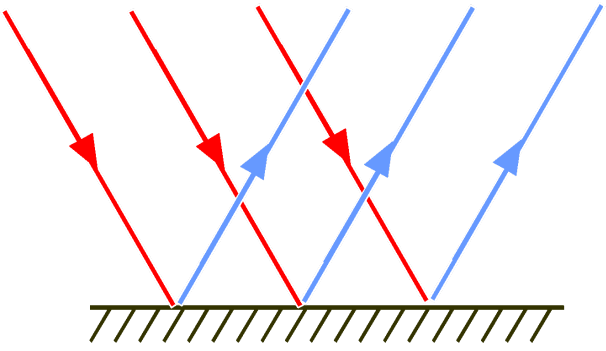
<u>Translucent materials</u>
A substance that some light can pass through and some of the light is scattered, so no clear image can be seen through it. E.g. wax paper or frosted glass.

<u>Opaque materials</u>
A substance that absorbs and/or reflects all the light that strikes it, so no image is seen through it. E.g. wood or concrete.

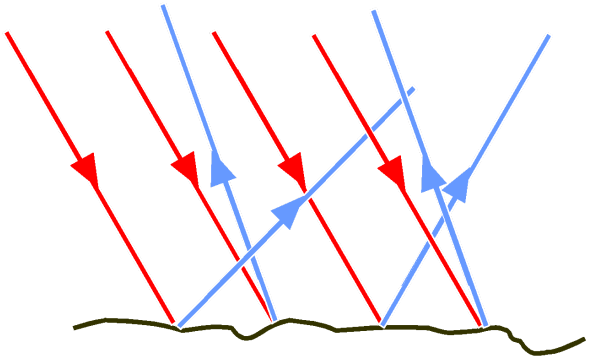
<u>Reflection</u>

Smooth, shiny surfaces have a "***clear***" **reflection**.

Rough, dull surfaces have a
Diffuse reflection **(**when light is scattered in different directions)



Clear Reflection



Diffuse Reflection

Shadows - The dark region behind an object due to blocked light

Shadows provide a good indication that light travels in straight lines (shadow edges aren't fuzzy) and that light is extremely fast (try to outrun your shadow)

Ray Model of Light

- Since light travels in straight lines we can use ray diagrams to discover what happens when light strikes an object.
- A ray diagram has straight arrows pointing away from the source of light

Point source Large source

Ray diagrams illustrate how the size of the shadow is related to the size of the object and the distance the object is from the light source

With different light sources different parts of a shadow are created

Point Source Large source

Parts of the shadow

- Umbra – the totally dark area of the shadow
- Penumbra – the area of the shadow where only some of the light is blocked