Gr.8 Natural Sciences

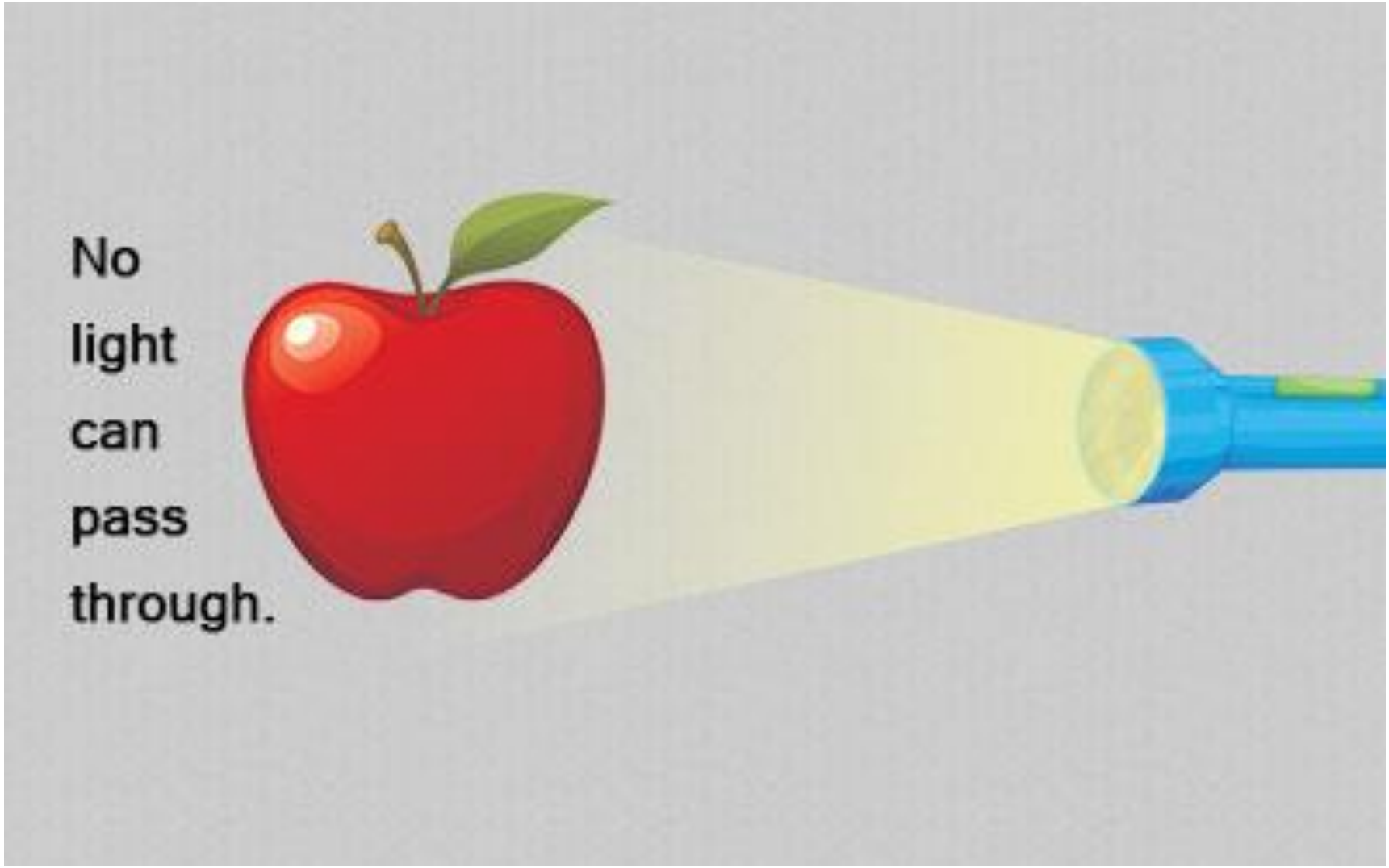
Visible Light

Opaque and Transparent substances:

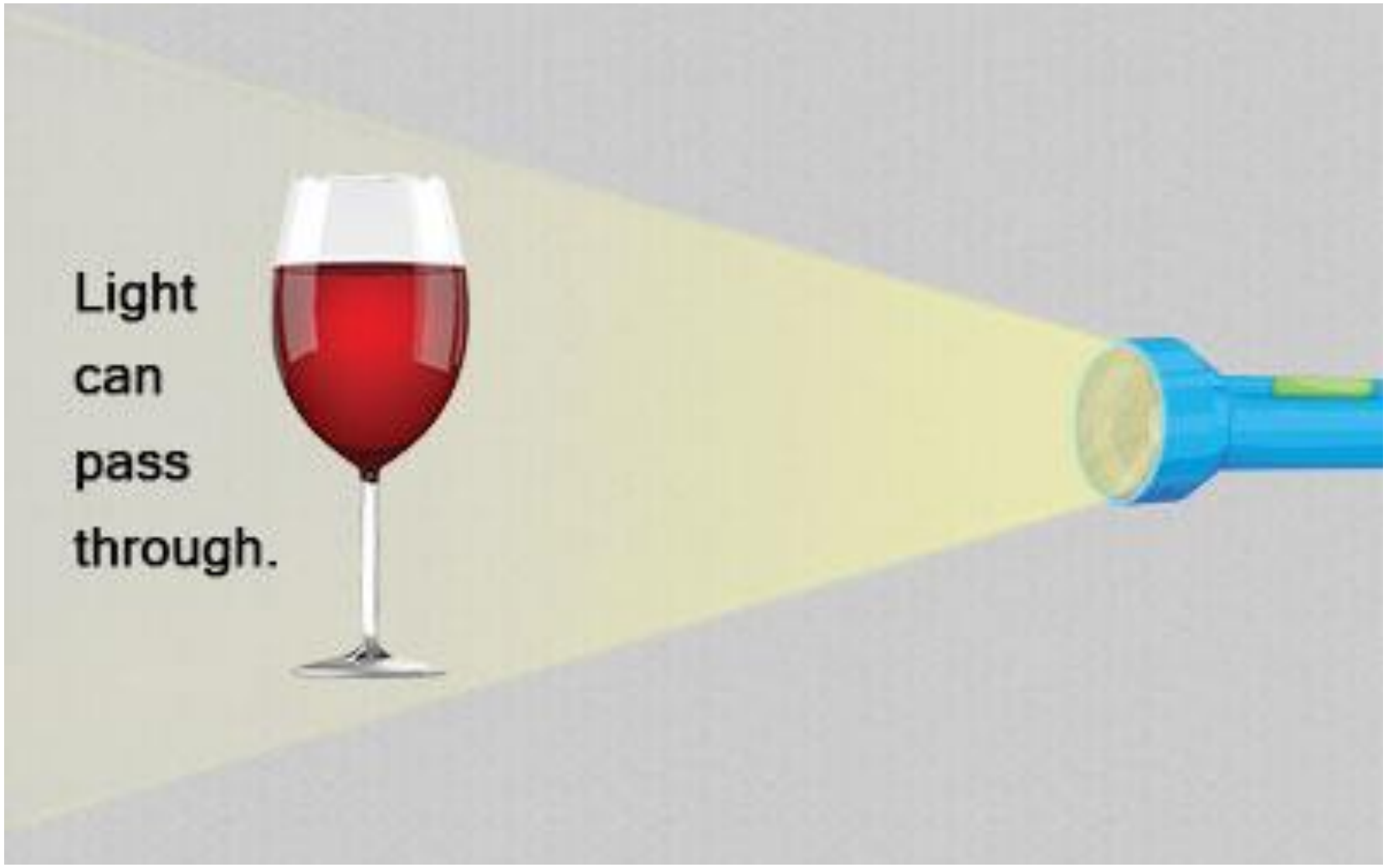
- light cannot pass through opaque surfaces (such as metal, clay, bricks, wall paint, cardboard), therefore it is either absorbed or reflected.
- opaque substances cast shadows on the side facing away from the light source.

- light passes through transparent substances (such as glass, clear plastic, cellophane, clean water), therefore some of the light is absorbed, some is reflected, but most passes through.

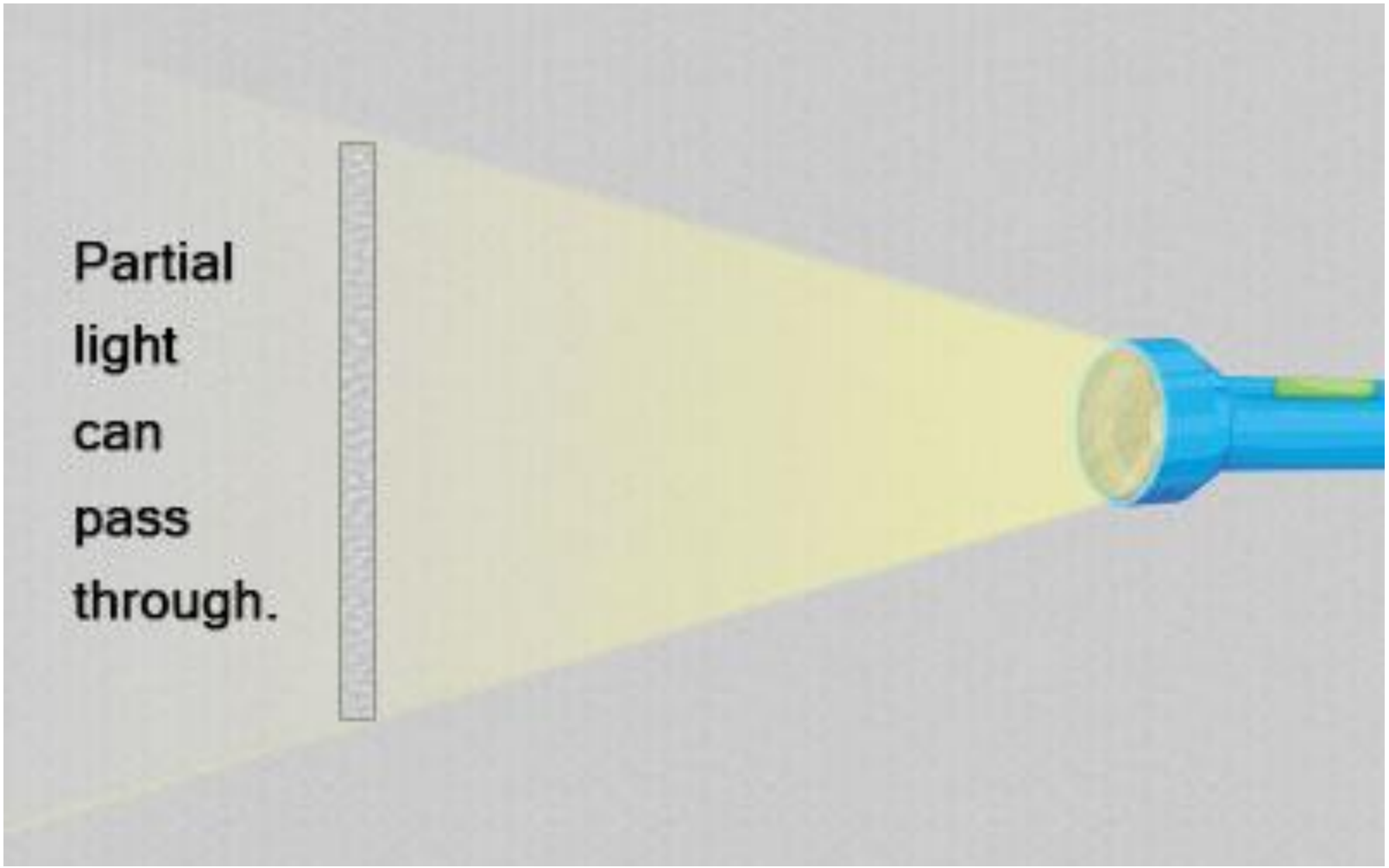
OPAQUE:

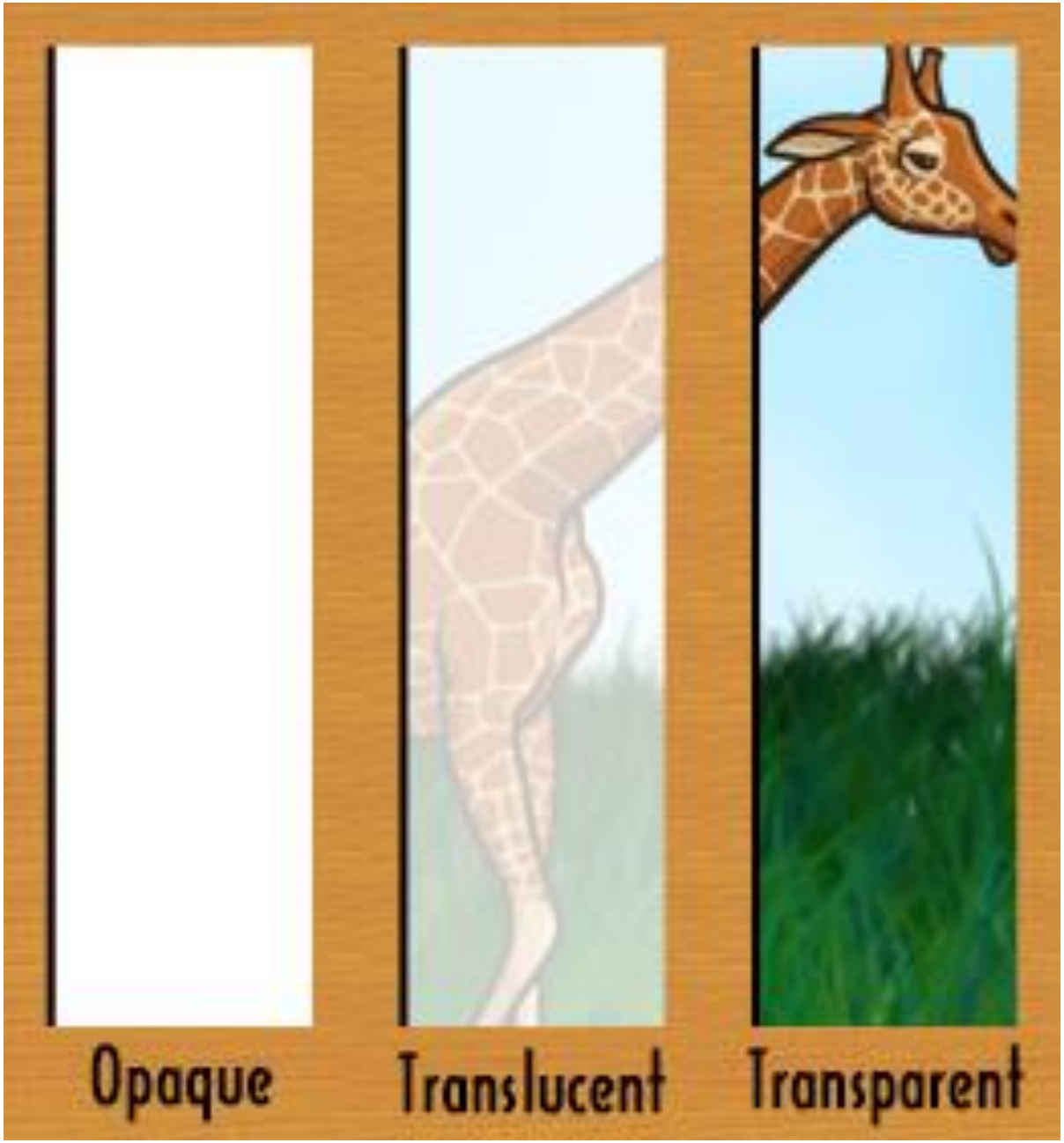


TRANSPARENT:



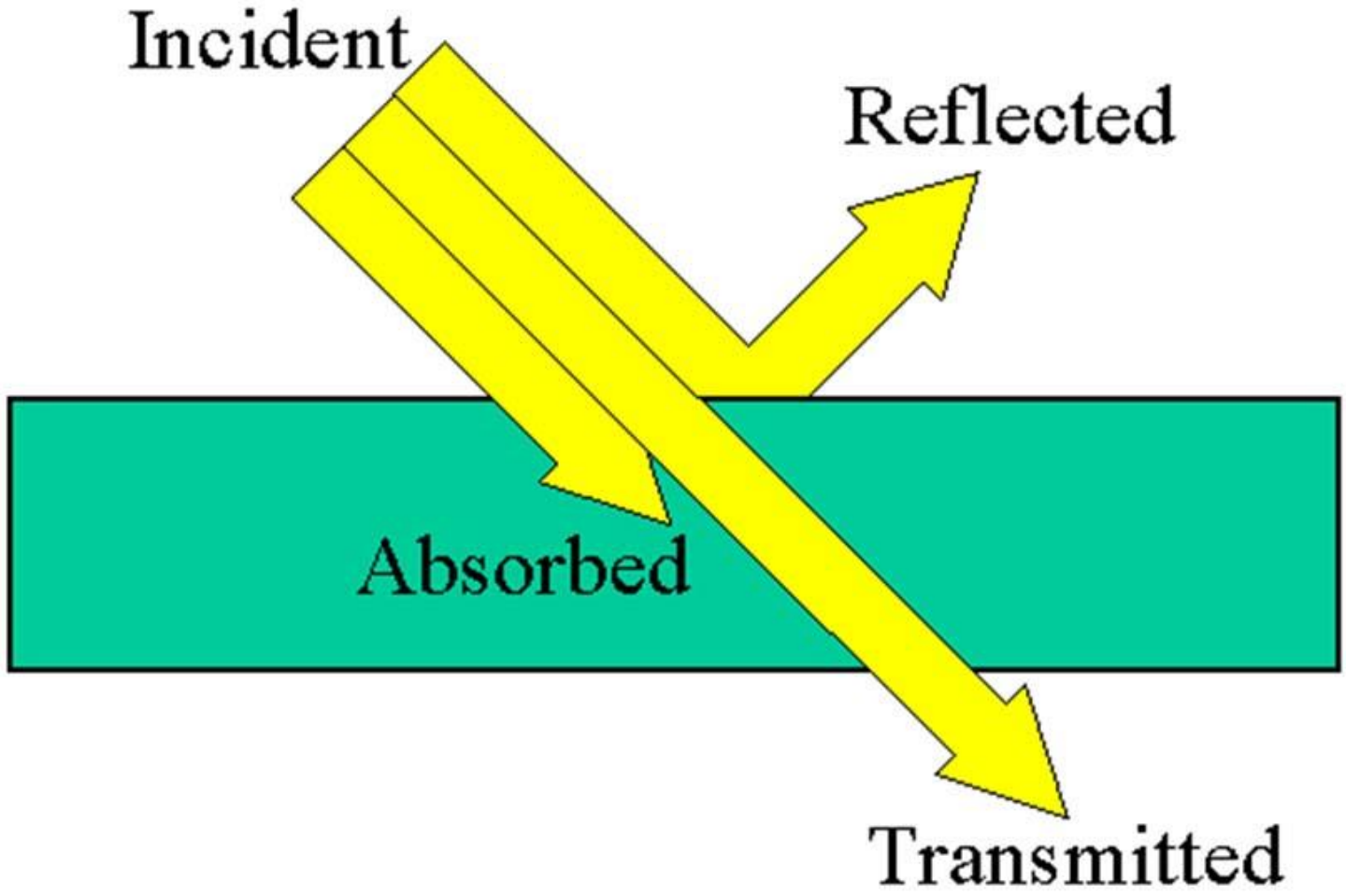
TRANSLUCENT:

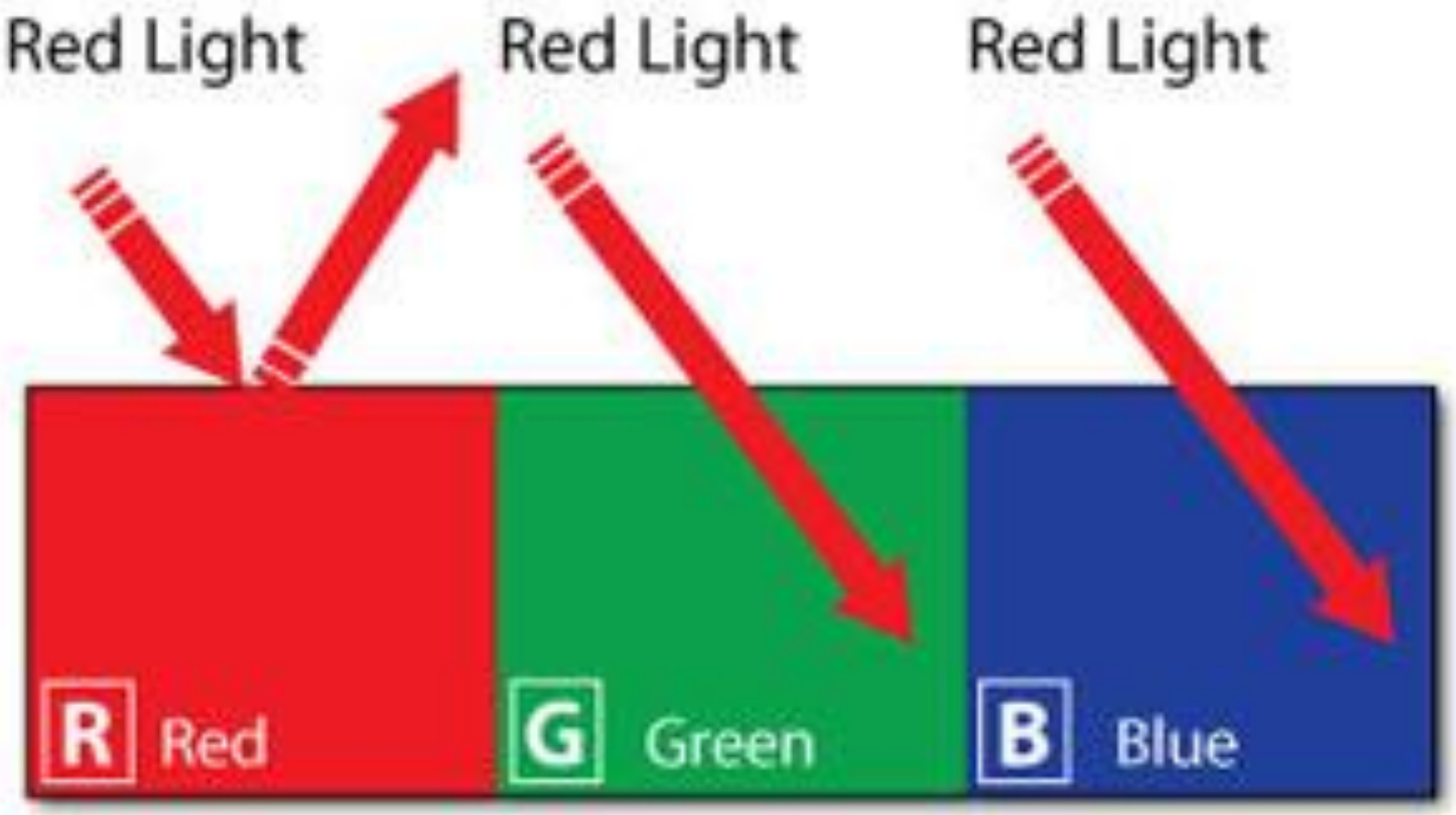



Opaque
Translucent
Transparent

Absorption of Light:

- light can be absorbed by surfaces of some materials.
- light is absorbed differently by different materials.
- a material has colour because it absorbs some of the colours in the spectrum (some of the frequencies) and reflects other colours.


Incident
Reflected
Absorbed
Transmitted


Red Light
Red Light
Red Light
R Red
G Green
B Blue

- the frequencies that are absorbed do not reach the eye:

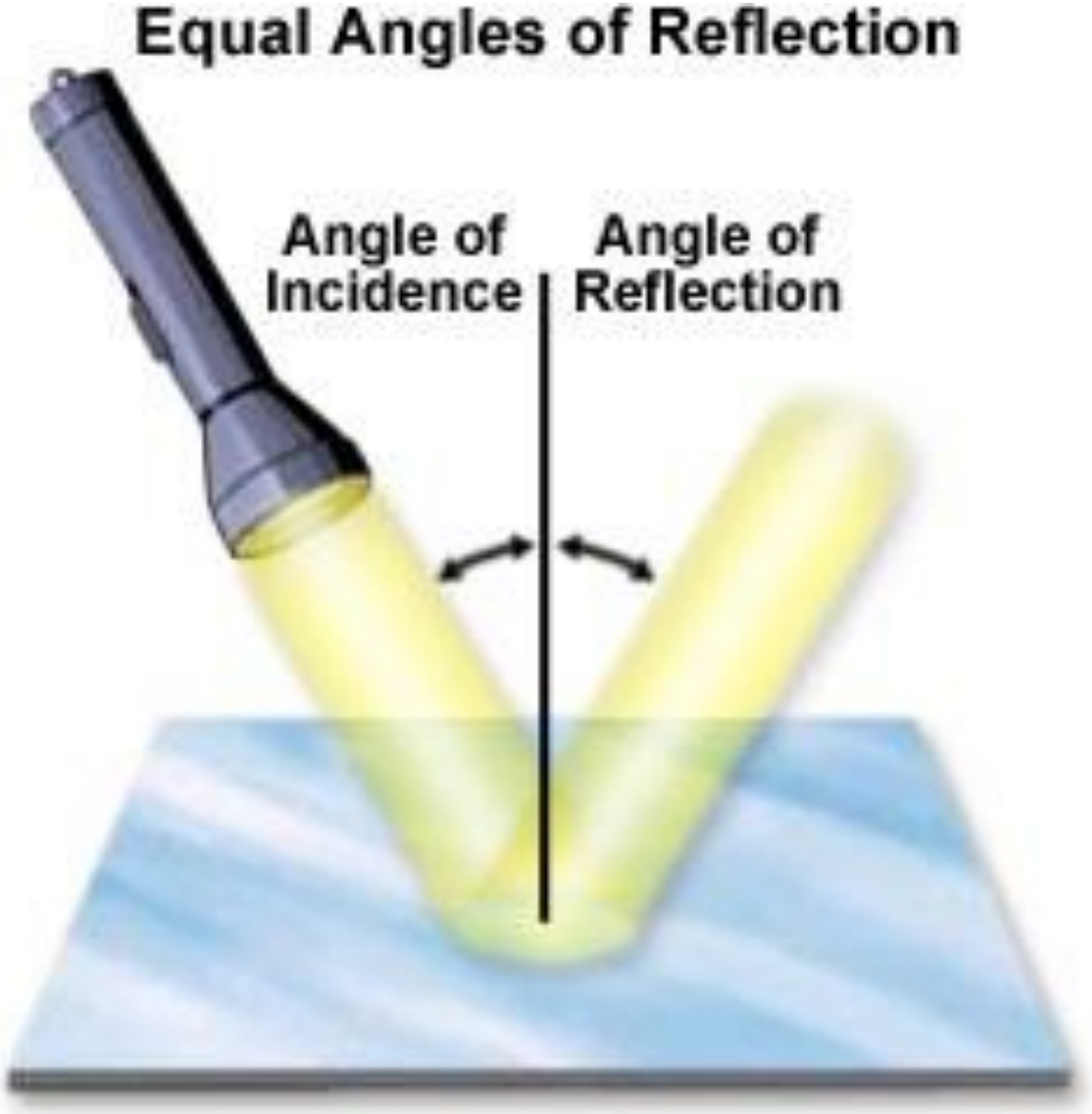
-- a red object reflects the frequencies we see as red and absorbs other frequencies (colours such as violet, indigo, blue, green)

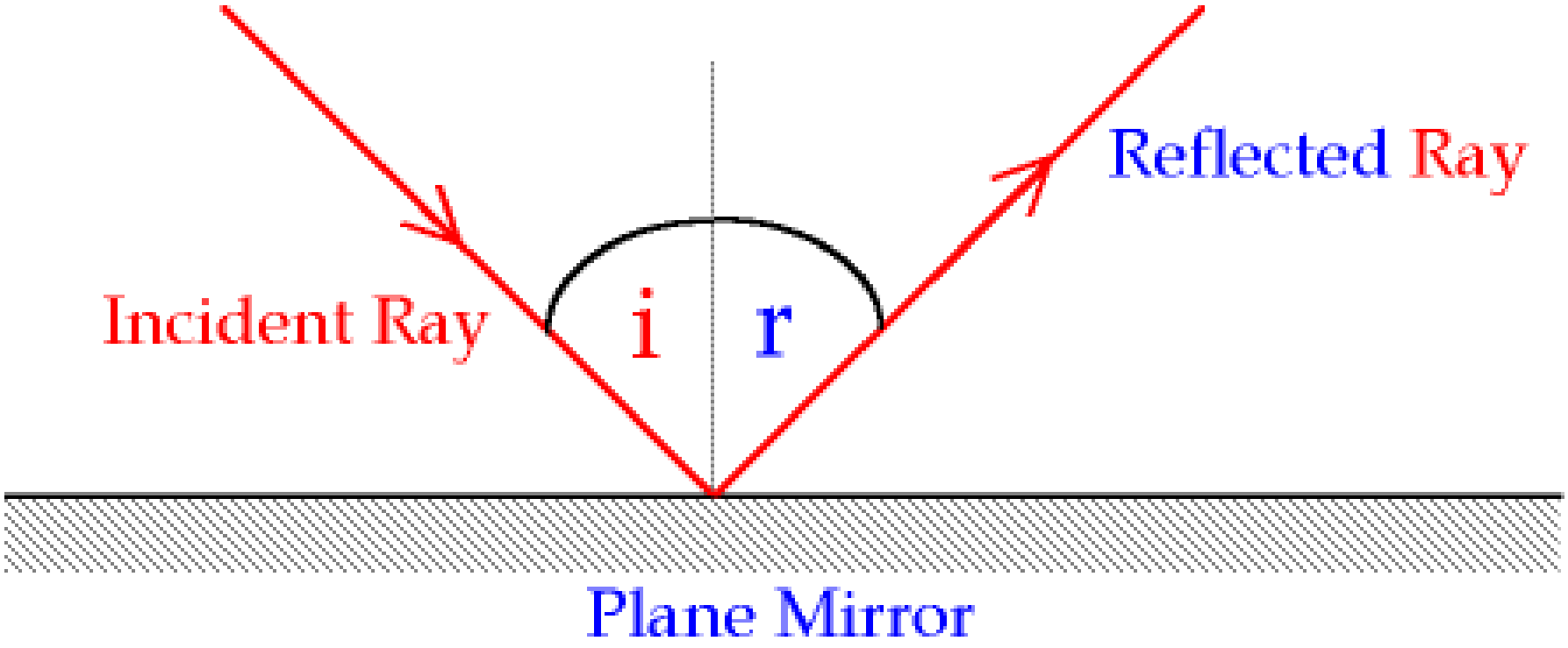
-- a black object absorbs all of the frequencies and therefore looks black.

-- a white object reflects all of the frequencies and therefore looks white.

Reflection of light:

- light is reflected off most surfaces, including mirrors.
- light can change its direction when it is reflected.
- in reflection, the angle of incidence and the angle of reflection are equal.


Equal Angles of Reflection
Angle of Incidence
Angle of Reflection


Reflected Ray
Incident Ray
i
r
Plane Mirror

- on smooth surfaces, all light is reflected in the same direction.
- on rough surfaces, reflected light is scattered.