WJEC (Eduqas) Physics GCSE

6.4: Colour and Frequency

Detailed Notes

(Content in **bold** is for higher tier **only**)

Visible Light

Visible light sits in the middle of the electromagnetic spectrum and runs from **red** with a **longer** wavelength and **low** frequency to **violet** with a **shorter** wavelength and **higher** frequency. Each colour sits within a specific frequency range between red and violet:

Red
Orange
Yellow
Green
Blue
Indigo
Violet

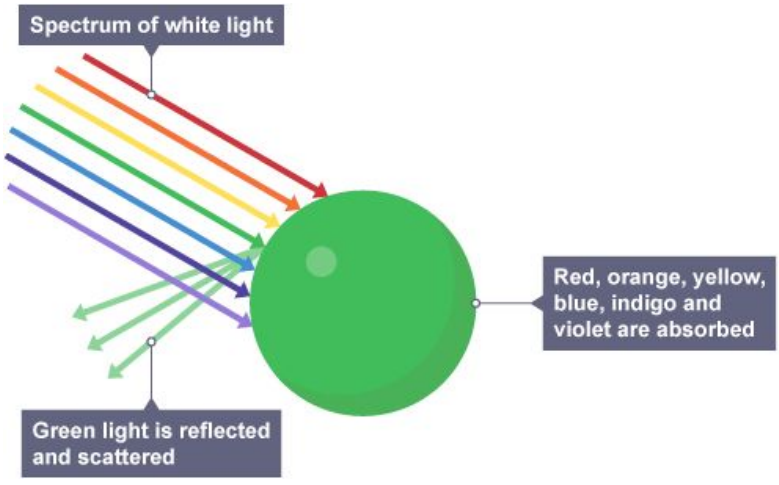
White light contains waves of each wavelength and frequency meaning it **contains every colour** of the visible light spectrum.

Coloured Objects

Absorption & Reflection

When waves are incident on an object, they can be **absorbed**. This absorption **transfers energy** to the particles in the object **increasing** their internal energy.

When **white light** shines on an object, some of the frequencies (colours) of light are **absorbed** and some are **reflected**. The reflected frequencies are then **detected by our eyes**. Therefore we see the object as that colour of light that is reflected.

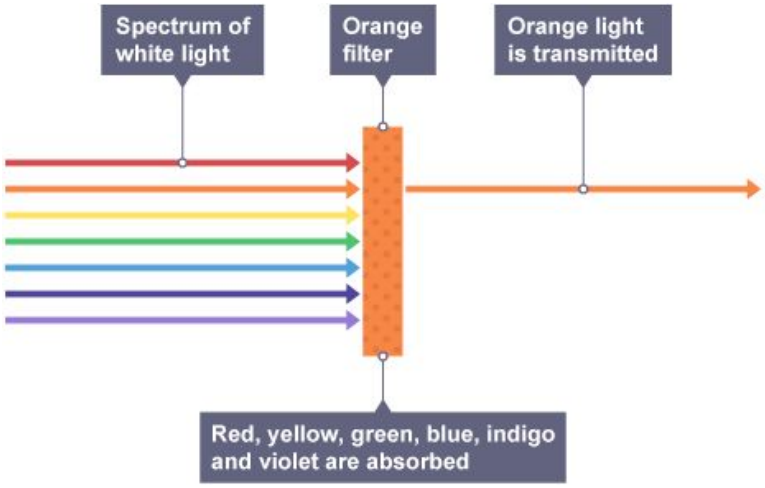


Absorption and reflection of light frequencies on an object (bbc.co.uk).

Transmission

At material boundaries, waves can also be **transmitted**. This means that a frequency of light **passes through** the material. White light through a **transparent** object such as a glass window will be completely transmitted meaning **all frequencies** of light pass through.

For **translucent** objects and **colour filters**, only **some** of the frequencies of light are allowed to pass through and the rest are **absorbed**.



Transmission of light frequencies through an object (bbc.co.uk).

Black objects absorb **all** frequencies of light so none are absorbed or reflected.