Waves

P3.3 Electromagnetic spectrum

Electromagnetic Spectrum

Invent your **own** mnemonic to help you memorise the order

e.g. Raging Martians Invaded Venus Using X-ray Guns

Increasing Frequency:
Radio → Microwave → Infrared → Visible → Ultraviolet → X-ray → Gamma

Increasing Wavelength (opposite):
Gamma → X-ray → Ultraviolet → Visible → Infrared → Microwave → Radio

Speed of Electromagnetic Waves

All electromagnetic (EM) waves travel at the same speed in a vacuum: 3.0×10^8 m/s (300 000 000 m/s). They travel at approximately the same speed in air

Applications of EM Waves

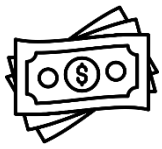
Radio waves:
Radio and TV transmissions
Radar

Microwaves:
Satellite TV
Mobile phones
Microwave ovens

Infrared (IR):
Remote controls
Thermal imaging

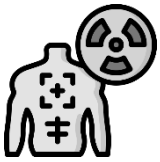
Visible light:
Vision
Photography

Ultraviolet (UV):
Detecting fake bank notes



X-rays:
Medical scans
Airport security

Gamma rays:
Detecting and treating cancer



Harmful Effects of EM Radiation

Ultraviolet:
Skin damage, skin cancer
Eye damage

X-rays and Gamma rays:
Mutations in DNA
Cell damage