

CAIE Physics IGCSE

Topic 3.3 - Electromagnetic Spectrum

Flashcards

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State the 7 electromagnetic waves found in the electromagnetic spectrum in order of increasing wavelength.



State the 7 electromagnetic waves found in the electromagnetic spectrum in order of increasing wavelength.

Gamma, X Ray, UV, Visible, Infrared,
Microwaves, Radio



What is the highest frequency
electromagnetic wave?



What is the highest frequency electromagnetic wave?

Gamma waves



What is the highest energy
electromagnetic wave?



What is the highest energy electromagnetic wave?

Gamma waves



What is the speed of EM waves in a vacuum? (supplement)



What is the speed of EM waves in a vacuum?
(supplement)

3×10^8 m/s



A wave transmits energy from...



A wave transmits energy from...

...source to absorber.

e.g. from a light source to the eye



What range of frequencies of electromagnetic waves can be detected by the human eye?



What range of frequencies of electromagnetic waves can be detected by the human eye?

400-700 nanometres



What properties are shared by all electromagnetic waves?



What properties are shared by all electromagnetic waves?

- They are all transverse waves
- They all travel at the same speed (10^8 m/s)
- They can travel through a vacuum



State and explain a use of radio waves.



State and explain a use of radio waves.

Communications, because radio waves are long wavelength and can travel long distances without losing quality.



State and explain a use of microwaves.



State and explain a use of microwaves.

Cooking, as microwaves are absorbed and heat fat/water in foods.



State uses of infrared radiation.



State uses of infrared radiation.

Cooking food (as it transfers thermal energy), infrared cameras and short range communication.



State and explain uses of visible radiation.



State and explain uses of infrared radiation.

Illuminating (i.e. seeing) and fibre optics, as they reflect best in glass (other waves have wavelengths that are too long/short).



State and explain uses of UV radiation.



State and explain uses of UV radiation.

Sterilisation, as it kills bacteria, energy efficient lamps, as it radiates low heat but high energy, and sun tanning etc.



State and explain uses of X rays.



State and explain uses of X rays.

Medical imaging and treatment, because they are very high energy and can easily penetrate body tissues.



State and explain uses of gamma rays.



State and explain uses of gamma rays.

Gamma rays are used in medical treatments, such as radiotherapy in the treatment of cancer.



How does UV radiation affect body tissue?



How does UV radiation affect body tissue?

- UV radiation can cause cancer when skin is exposed to it.
- It can cause blindness if eyes are overexposed to UV radiation.



How do X-rays affect body tissue?



How do X-rays affect body tissue?

X-rays are ionising so they can damage or kill cells and cause mutations that could lead to cancer.



How do gamma rays affect body tissue?



How do gamma rays affect body tissue?

Gamma rays are even more ionising than X-rays, so they can cause cell mutations (which can lead to cancer) and cell death.

