

Grade 8
Physics
2nd Term Notes
Chapter 15
SPECTRA

Uses of Electromagnetic Waves

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Uses of Electromagnetic Waves

Electromagnetic waves have many uses. The main ones are summarized in the table below:

Wave	Use
Radio	<ul style="list-style-type: none"> ● Communication (Radio and TV)
Microwave	<ul style="list-style-type: none"> ● Heating food ● Communication (Wifi, Mobile phones, satellites)
Infrared	<ul style="list-style-type: none"> ● Remote controls ● Fibre optic communication ● Thermal imaging (medicine and industry) ● Night vision ● Heating or cooking things ● Motion sensors (for security alarms)
Visible light	<ul style="list-style-type: none"> ● Seeing and taking photographs/videos
Ultraviolet	<ul style="list-style-type: none"> ● Security marking (fluorescence) ● Fluorescent bulbs ● Getting a suntan.
X-rays	<ul style="list-style-type: none"> ● X-ray images (medicine, airport security and industry)
Gamma Rays	<ul style="list-style-type: none"> ● Sterilising medical instruments ● Treating cancer

Radio waves and microwaves

These two parts of the spectrum share a lot of similarities and uses. Their main uses concern **wireless communication** – in fact many things that people often assume use radio waves use microwaves (e.g. WiFi, radar, mobile phones, satellite communications...)

At very high intensity, microwaves can also be used to heat things: this is what happens in a **microwave oven**.

Infrared

Infrared light is used by electrical heaters, cookers for cooking food, and by infrared cameras which detect people in the dark.

Visible light

Visible light is the light we can see. It is used in fibre optic communications, where coded pulses of light travel through glass fibres from a source to a receiver.

Ultraviolet radiation

Ultraviolet radiation can kill bacteria that are present in water - this sterilises the water and makes it safe to drink. Ultraviolet radiation is also good for the skin as it helps to make vitamin D. However, too much exposure to UV can cause skin problems.

X-Rays

X-rays, Gamma rays and (to a lesser extent) ultra-violet are all ionising. This means that they can cause harm to living tissues: killing cells or possibly mutating them or causing cancer.

Whilst the levels used in most medical x-rays pose a minimum risk, hospitals are careful to minimise the amount of x-ray exposure that individuals (including hospital staff) receive.