

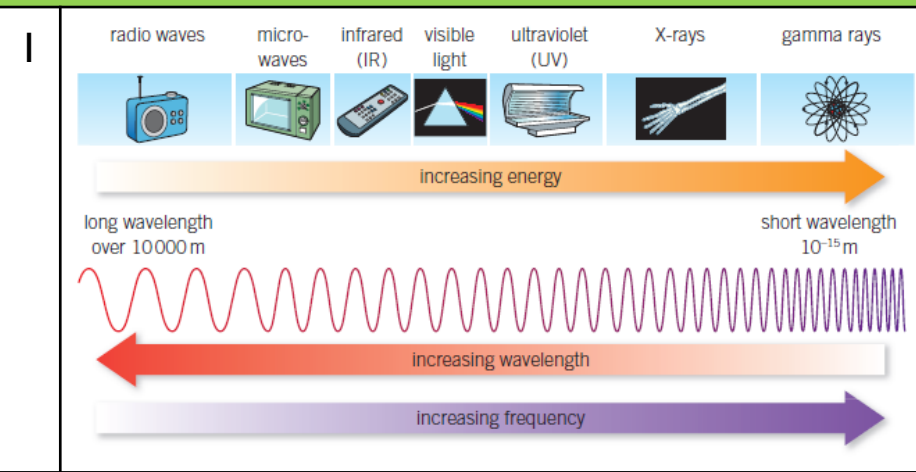
Sound Waves

1	Any wave transfers energy from one place to another.
2	Sound waves cause particles to vibrate backwards and forwards in the direction of the wave, this produces areas of high pressure (compression) and low pressure (rarefaction). As there are areas where the air pressure is different in a sound wave, we can call them a type of pressure wave.
3	Sound can be detected with a microphone, which will change air pressure into a changing potential difference.
4	Sound can be produced with a loudspeaker, the changing potential difference causes changes in air pressure. Changes in air pressure are caused by the diaphragm of the loudspeaker vibrating causing movement of the air particles.

Types of Waves

1	Transverse waves vibrate at 90° to the direction they are travelling. They move up and down as well as forward.
2	Longitudinal waves vibrate in the direction in which they are travelling.
3	When waves are put together they superpose (they will add together or cancel each other out). If they are in line, they add and increase the amplitude. If they are not in line they cancel each other out and decrease amplitude.

Electromagnetic Spectrum



Ultrasound

1	Humans can hear sounds with a frequency between 20-20000 Hz. Ultrasound is any sound with a higher frequency than 20000 Hz.
2	The high frequency causes particles it interacts with to vibrate more quickly so it can be used in ultrasonic cleaning and physiotherapy.

Ionisation

1	The higher the frequency, the higher the energy. High energy waves can lead to ionisation where electrons are knocked off of atoms in cells. This can cause mutations in cells if DNA is affected which leads to cancerous tumours.
2	The ionising waves in the electromagnetic spectrum are gamma, X-rays and ultraviolet rays.

Key Vocabulary

1	Ultrasound	Sound waves with frequencies higher than the human auditory range.
2	Ultraviolet (UV)	Waves with frequencies higher than light, which human eyes cannot detect.
3	Microphone	Turns the pressure wave of sound hitting it into an electrical signal.
4	Loudspeaker	Turns an electrical signal into a pressure wave of sound.
5	Waves	Vibrations that transport energy from place to place without transporting matter
6	Pressure Wave	An example is sound, which has repeating patterns of high-pressure and low-pressure regions.
7	Transverse wave	Where the direction of vibration is perpendicular to that of the wave.
8	Longitudinal wave	Where the direction of vibration is in the direction the wave is travelling.
9	Transmission	Where waves travel through a medium rather than be absorbed or reflected.