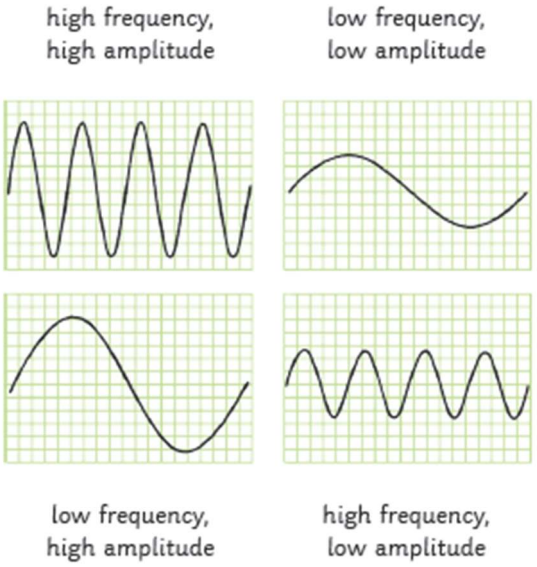
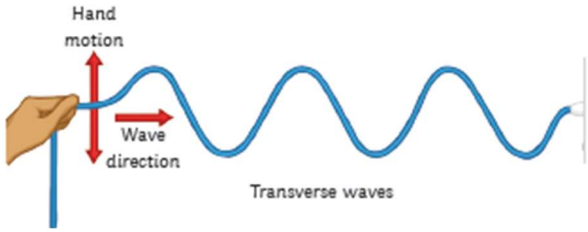
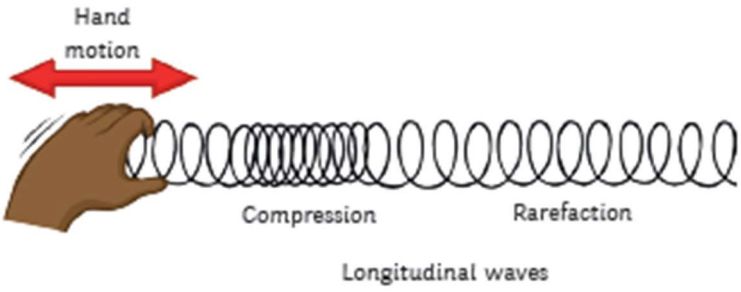
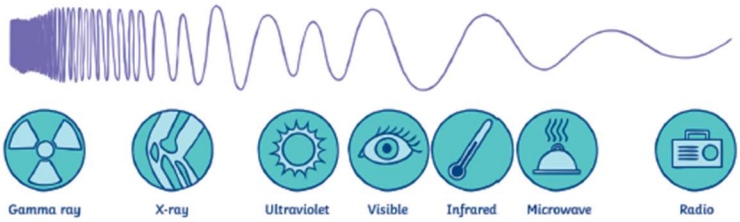
# KNOWLEDGE ORGANISER

Characteristics of a sound wave can be identified from an **oscilloscope** trace of the sound wave. The trace shows oscillations and wavelength of the sound wave. A **shorter wavelength** results in a **high-pitched** (high frequency) sound. A **greater height** of oscillations indicates a **higher amplitude** (volume) of the sound wave.




| Frequency | Wave | Use | Other Information |
|---|---|---|---|
| Low ↑ | radio waves | Communication via television and radio, and satellite communications. | Easily transmitted through air and can be reflected to change their direction. Harmless if absorbed by the human body. Are reflected back off the atmosphere and cannot pass through into space. |
| | microwaves | Communications including satellite communications and cooking food. | When the molecules absorb microwaves, their internal energy increases. This can be harmful when internal body cells become heated by over exposure to microwaves. Can pass through the atmosphere and into space. |
| | infrared | Short-range communications (remote controls), electrical heaters, cooking food, optical fibres, security systems and thermal imaging cameras. | It can cause burns to skin. |
| | visible light | Used for lighting, photography and fibre optics. | Frequency range that is detectable by the human eye. |
| | ultraviolet | Sterilising water and killing bacteria. Detecting forged bank notes. | Causes skin tanning and can lead to burns or skin cancer. |
| | X-rays | Medical imaging and airport security scanners. | Very little energy is absorbed by body tissues. Instead, it is transmitted through the body. These waves can lead to gene mutation and cancer. |
| ↓ High | gamma rays | Sterilising medical equipment or food and treatment for some cancers. | |

You can remember the order of the electromagnetic spectrum easily with the phrase:

**Roman men invented very unusual X-ray guns.**