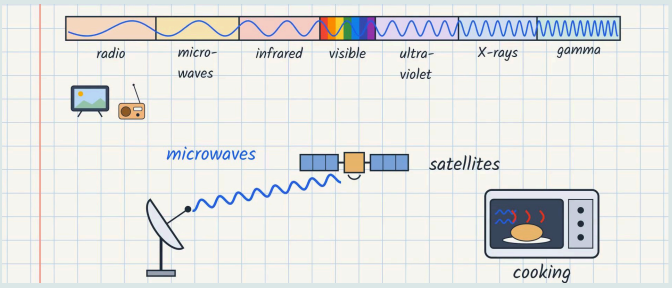
Uses of EM waves

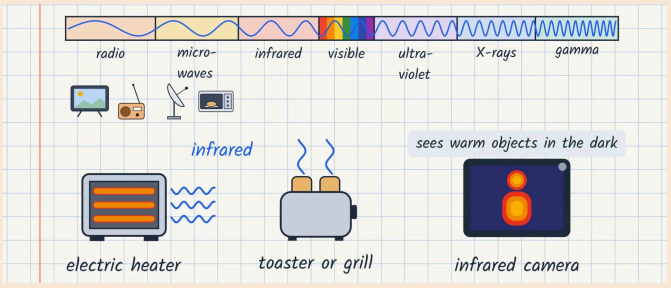
The right wave for the job

1 The long-wave end



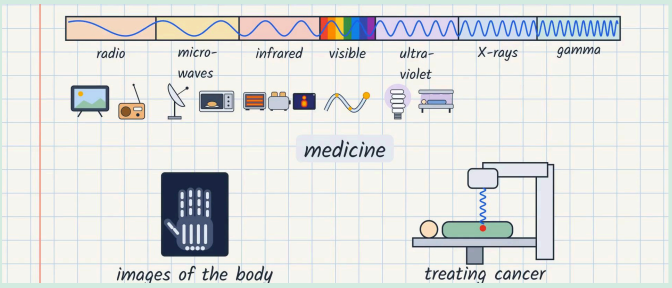
- **Radio waves**: television and radio signals.
- **Microwaves**: satellite communications and cooking (microwave ovens).

2 The middle



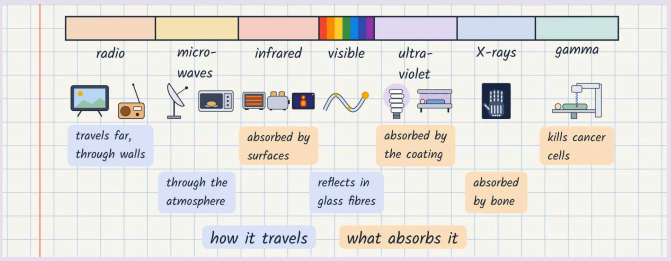
- **Infrared**: electric heaters, cooking (toasters, grills) and infrared cameras that see warm objects in the dark.
- **Visible light**: fibre optics. Pulses of light carry data along thin glass fibres.

3 The short-wave end



- **Ultraviolet**: energy-efficient lamps and sunbeds (tanning).
- **X-rays and gamma rays**: medical imaging and cancer treatment.

4 Why each suits its job (Higher)



- Radio travels far and through walls; microwaves pass through the atmosphere and are **absorbed by water** in food; infrared is **absorbed by surfaces** and heats them.
- Light reflects inside glass fibres; a lamp coating absorbs UV and gives out light; X-rays pass through soft tissue but are **absorbed by bone**; high doses of gamma kill cancer cells.

Exam tip

Asked why a wave suits its use? Link the property to the job: "X-rays are absorbed by bone, but pass through soft tissue, so bones show up."

Check yourself

- 1 Which type of EM wave does a TV remote control use?
- 2 Name two uses of microwaves.

Answers: 1. Infrared 2. Satellite communications and cooking