

Uses and applications of electromagnetic waves

6.6.2.4 · Physics · revision notes

The practical uses of each part of the electromagnetic spectrum. Expect 'give a use' recall questions.

Key facts

- Radio waves: television and radio
- Infrared: electrical heaters, cooking food, infrared cameras
- Ultraviolet: energy-efficient lamps, sun tanning
- Microwaves: satellite communications, cooking food
- Visible light: fibre optic communications
- X-rays and gamma rays: medical imaging and treatments

Notes

Uses of each type of EM wave

- **Radio waves:** television and radio.
- **Microwaves:** satellite communications; cooking food.
- **Infrared:** electrical heaters; cooking food; infrared cameras.
- **Visible light:** fibre optic communications.
- **Ultraviolet:** energy-efficient lamps; sun tanning.
- **X-rays and gamma rays:** medical imaging and medical treatments, such as killing cancer cells.

How to answer each type of question

Give a use of a type of EM wave

1 mark each

Grade 3

1. Give one specific use, as listed in the specification.
2. Make sure it matches the wave named in the question.

Example. Give **one** use of each type of electromagnetic wave.

- (a) infrared
- (b) ultraviolet
- (c) microwaves

Model answer. (a) Electrical heaters / cooking food / infrared cameras (1)
(b) Energy-efficient lamps / sun tanning (1)
(c) Satellite communications / cooking food (1)

Don't lose marks

- ✗ Mixing up infrared and ultraviolet uses, e.g. saying 'ultraviolet cameras' for seeing warm objects in the dark.

More tips

Memory tricks

- Walk along the spectrum saying one use for each: radio for radio and TV, micro for satellites and cooking, infrared for heaters and cameras, visible for fibre optics, ultraviolet for lamps and tanning, X-rays and gamma for hospitals.

Exam technique

- For 'give a use', one specific use is enough, e.g. 'satellite communications' for microwaves.
- Learn the uses exactly as the specification lists them: they are the answers examiners expect.

What each grade needs

What you need to be able to do, from the first marks up to the top grade.

Grade 3

Match each EM wave to a use

E.g. radio waves: television and radio; X-rays: medical imaging.

Grade 4

Give two uses of microwaves

Satellite communications and cooking food.

Grade 4

Give three uses of infrared

Electrical heaters, cooking food and infrared cameras.

Grade 5

Give uses of visible light and ultraviolet

Visible light: fibre optic communications. Ultraviolet: energy-efficient lamps and sun tanning.

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