

# Edexcel GCSE Physics

## Topic 5.19P-5.24 - Uses and Dangers of EM Waves Flashcards

This work by [PMT Education](https://www.pmt.education) is licensed under [CC BY-NC-ND 4.0](https://creativecommons.org/licenses/by-nc-nd/4.0/)



What type of waves can be produced by oscillations in an electrical circuit?  
(Higher)



What type of waves can be produced by oscillations in an electrical circuit? (Higher)

Radio waves.



How can radio waves create an alternating current in a circuit? (Higher)



How can radio waves create an alternating current in a circuit? (Higher)

When radio waves are absorbed, they can induce oscillations in a circuit with the same frequency as the waves themselves.



# Where do gamma rays originate from?



Where do gamma rays originate from?

They originate from changes in the nuclei of atoms.



# What health effects can ultraviolet waves cause?





# What health effects can ultraviolet waves cause?

- They can cause the skin to age prematurely
- They can increase the risk of developing skin cancer



# What health effects can X-rays and Gamma rays cause?



# What health effects can X-rays and Gamma rays cause?

- They are ionising radiation so can cause mutations in genes
- They can lead to increased risk of developing various cancers



# What health effects can infrared rays cause?



What health effects can infrared rays cause?

Infrared waves can cause burns to skin/tissue.



How does electromagnetic radiation affect electron arrangement in atoms?



How does electromagnetic radiation affect electron arrangement in atoms?

Absorption or emission of electromagnetic radiation can cause electron arrangement to change. (It can remove electrons from the atom or move electrons further from the nucleus)



# How do atoms become ions?





# How do atoms become ions?

By losing an outer electron.



What are the effects of body cells absorbing radiation?



What are the effects of body cells absorbing radiation?

Large amounts can damage cells.

Smaller amounts cause mutation, causing cells to divide rapidly, which can lead to **cancer**.



State and explain a use of radio waves



State a use of radio waves

Communications, because radio waves are long wavelength and can travel long distances without losing quality.



State and explain a use of microwaves



State and explain a use of microwaves

Cooking, as microwaves are absorbed by and heat fat/water in foods.



State and explain uses of infrared radiation





State and explain uses of infrared radiation

Cooking food (as it transfers thermal energy) infrared cameras, short range communication.



State and explain uses of visible radiation



State and explain uses of infrared radiation

Illuminating (i.e. seeing) and fibre optics, as they reflect best in glass (other waves have wavelengths that are too long/short).



# State and explain uses of UV radiation



State and explain uses of UV radiation

Sterilisation, as it kills bacteria, energy efficient lamps, as it radiates low heat but high energy, and sun tanning etc.



# State and explain uses of X rays



## State and explain uses of X rays

Medical imaging and treatment, because they are very high energy and can easily penetrate body tissues.



State and explain uses of gamma rays





State and explain uses of gamma rays

Gamma rays are used in medical treatments, such as radiotherapy in the treatment of cancer.



Which waves of the EM spectrum are regarded as most dangerous?



Which waves of the EM spectrum are regarded as most dangerous and why?

Gamma and X rays, as they have the highest energy.

