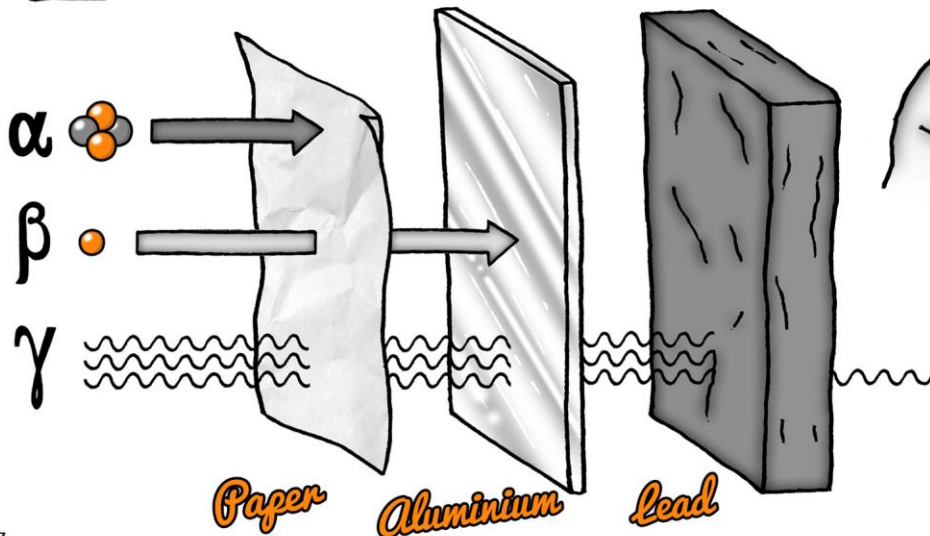


LIFE ?

**AQA GCSE
ATOMIC STRUCTURE
THINKIT!**



Structure of an atom:

- A proton and a neutron both have a relative atomic mass of 1. What is the relative mass of an electron?
- Describe to a peer the difference between an atom, an ion and an isotope of lithium.
- Produce a diagram to show how atoms can absorb electromagnetic radiation and re-emit this as a photon of light.
- Try to find out if there is a relationship between the atomic number and atomic mass of atoms.

Half life and radioactive decay:

- If you are measuring the count rate of an isotope, you will also be counting the background radiation. How would a scientist deal with this to find the true count rate of the isotope?
- If a sample of radioactive material has gone through 7 half lives, what fraction of the original activity will remain?
- Investigate how Carbon-14 decay is used to determine the authenticity of wooden carvings claimed to be thousands of years old.

Hazards of radioactive materials (physics only):

- Investigate the reasons why early researchers in radiation suffered from exposure to ionising radiations.
- Try to find out what a film badge dosimeter is and who uses them.
- Research why Welsh sheep farmers were not allowed to sell their animals for meat 20 years after the Chernobyl nuclear disaster in the Ukraine.

Development of the model of the atom:

- Two scientists involved in the development of the modern atom were James Chadwick and John Cockroft. Find out the contribution to nuclear physics these two scientists made.
- The name 'atom' is Greek meaning 'indivisible'. Why is this phrase not correct?
- Investigate why gold leaf was used by Rutherford when he carried out his experiments to determine the structure of an atom.

AQA GCSE Atomic structure

ThinkIT!

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Uses of nuclear radiation:

- Investigate how radioactive sources are used to control the thickness of paper as it is being manufactured. Which type of radiation would be used for this purpose?
- Many foodstuffs are sealed and then irradiated to kill any micro-organisms. Why are these foods not contaminated with radioactivity?
- With a peer, put arguments for and against the building of new nuclear power plants in the UK.

Atoms and nuclear radiations:

- The SI unit of radiation activity is the becquerel (Bq). This replaced an older unit of activity. Find out who this older unit was named after.
- The becquerel is a measure of the rate of radioactive decay. Why does this have to be measured using a specific mass of the radioactive material?
- Why are alpha particles more ionising than beta particles?

Nuclear equations:

- Why is an alpha particle described as a helium nucleus and not a helium atom?
- Carbon-14 has 6 protons. When it decays it forms nitrogen with an atomic mass of 7. What type of radioactive decay has it undergone?
- Uranium-236 has an atomic number of 92. It decays through the sequence $\alpha \beta \alpha$. What will the atomic mass of the end product be?

Nuclear fission and fusion (physics only):

- Nuclear scientists say that spontaneous fission is rare. Discuss what is meant by this statement.
- Discuss how a nuclear meltdown event could occur in a nuclear power station.
- Nuclear fusion in stars can produce more massive atoms than helium. Investigate how helium can produce larger elements in stars.