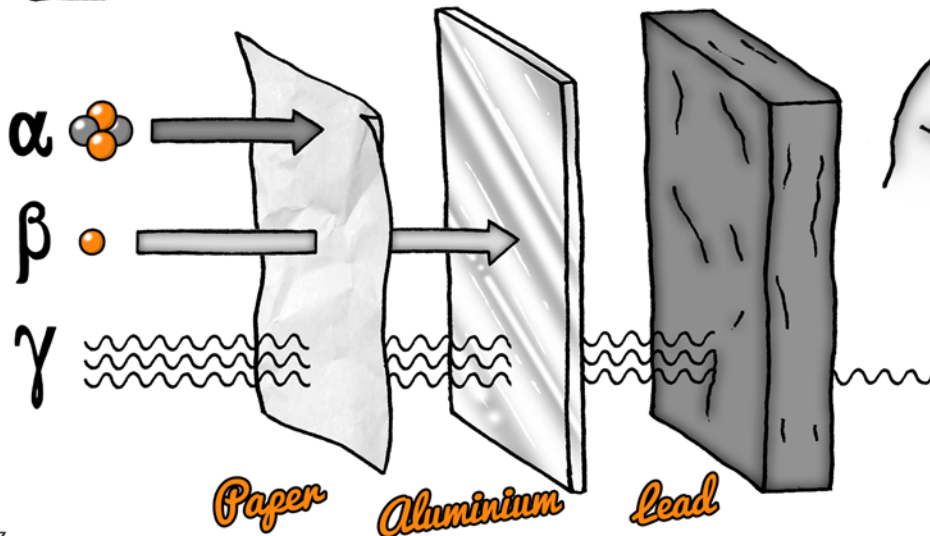


**LIFE ?**

**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.