

## Year 11 Physics - Radioactivity Notes

### What is Radioactivity?

Radioactivity is the spontaneous emission of radiation from the nucleus of an unstable atom.

### Types of Radiation:

- Alpha: 2 protons and 2 neutrons (like a helium nucleus).
- Beta: A high-speed electron emitted from the nucleus.
- Gamma: A wave of energy, not a particle.

### Properties of Radiation:

Radiation Type	Penetrating Power	Ionising Power	Range in Air
Alpha	Low (stopped by paper)	High	A few cm
Beta	Medium (stopped by metal)	Medium	Up to a metre
Gamma	High (needs thick lead)	Low	Very long

### Half-Life:

The time taken for the activity (radiation) of a radioactive substance to decrease by half.

Example: If a sample starts with 100 units and has a half-life of 6 hours:

- After 6 hours -> 50 units
- After 12 hours -> 25 units
- After 18 hours -> 12.5 units