


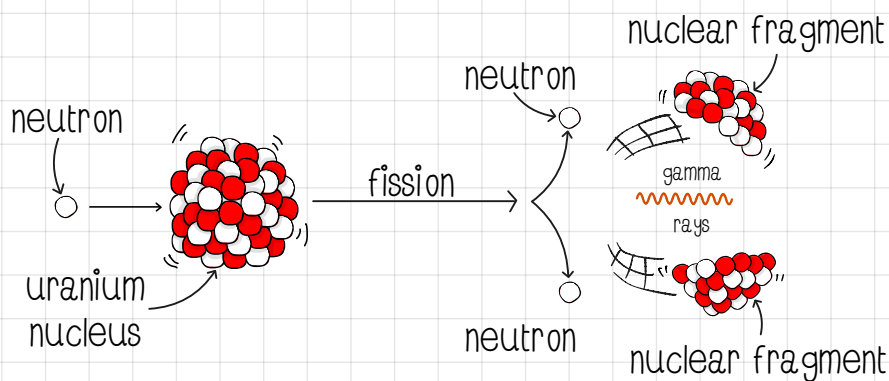



Nuclear fission

 Nuclear fission is the **splitting** of a large unstable **nucleus**, usually uranium or plutonium.


 Spontaneous fission is rare. Usually the unstable nucleus needs to absorb a neutron for fission to occur.


 The nucleus undergoing fission splits into two smaller nuclei, roughly equal in size, and **emits** two or three **neutrons** plus **gamma rays**.




 Most of the energy released is as the **kinetic** energy of the nuclear fragments. Other energy is transferred by the gamma radiation. The extra neutrons produced can go on to produce a **chain reaction** with other nuclei.

Controlled chain reactions

 A **controlled** chain reaction is used in nuclear **power stations**. Nuclear power stations use control rods to absorb neutrons and prevent the chain reaction going out of control. Graphite or heavy water are also used to slow the speed of neutrons.

 Nuclear reactors use Uranium - 235. A 1 inch pellet of Uranium - 235 will produce the same amount of energy as 1 tonne of coal.

Uncontrolled chain reactions

 **Uncontrolled** chain reactions are used in nuclear **weapons**. In bombs, a critical mass of nuclear material is required to ensure the chain reaction occurs.

 Atomic bombs are made with Plutonium - 239.

Nuclear fission...

