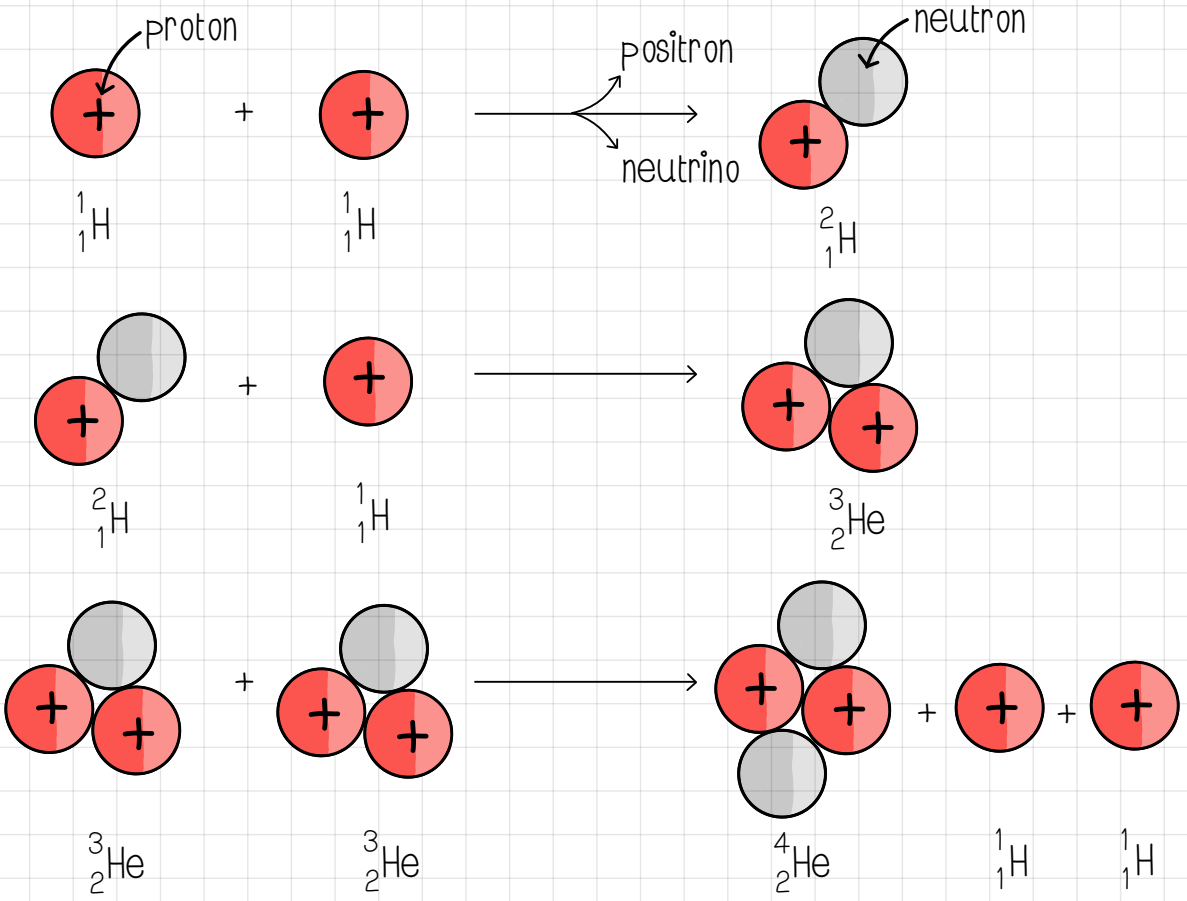
Nuclear fusion

The interior of the Sun

The temperature of the Sun's core is 15 million K (approximately).
This is hot enough for thermonuclear reactions to take place involving the fusion of hydrogen nuclei into helium nuclei.
The high temperature overcomes the natural electrostatic repulsion of the positively charged nuclei.



You do not need to learn to learn this reaction

Fusion reactors

Fusion reactions are done on Earth at higher temperatures (100 million K) and lower pressures than the Sun.

The plasma (super heated gas) is contained using a doughnut shape (torus) magnetic field.

No long term radioactive waste is generated. However at the moment more energy is supplied to maintain the reaction than the reaction produces. As the reactor size is increased, more energy will be produced.