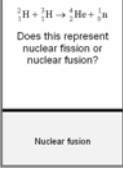


<p>“Test yourself” cards.</p> <p>Print onto card and cut out, Cover the answers (grey portion) with your fingers as you hold the pack of cards</p>  <p>Check your answers!</p>	${}_{92}^{235}\text{U} + {}_0^1\text{n} \rightarrow {}_{54}^{140}\text{Xe} + {}_{38}^{94}\text{Sr} + 2{}_0^1\text{n}$ <p>Does this represent nuclear fission or nuclear fusion?</p>	${}_1^2\text{H} + {}_1^3\text{H} \rightarrow {}_2^4\text{He} + {}_0^1\text{n}$ <p>Does this represent nuclear fission or nuclear fusion?</p>	<p>What does 12 stand for in the symbol</p> ${}_{6}^{12}\text{C} ?$
<p>What is the effect of lowering the control rods in a nuclear reactor?</p>	<p>What are the two forms of strontium known as?</p> ${}_{38}^{88}\text{Sr} \text{ and } {}_{38}^{94}\text{Sr}$	<p>Calculate the number of neutrons in uranium</p> ${}_{92}^{235}\text{U}$	<p>What is fission?</p>
<p>Control rods absorb neutrons and are lowered to absorb neutrons to reduce the no. of nuclear reactions</p>	<p>Isotopes (of strontium)</p>	<p>Neutrons = 235 – 92 = 143</p>	<p>Splitting a large nucleus into smaller ones</p>
<p>${}_{17}^{35}\text{Cl}$ & ${}_{17}^{37}\text{Cl}$</p> <p>Why are these isotopes of chlorine?</p>	<p>There are more neutrons produced than used in a fission reaction in a reactor. What is the role of these neutrons?</p>	<p>In the sun a nuclear reaction takes place between deuterium nuclei and tritium nuclei. Name this type of reaction</p>	<p>What do you call atoms with the same number of protons (atomic number) but different numbers of neutrons (mass number).</p>
<p>They both have the same atomic number and so they are the same element</p>	<p>Extra neutrons collide with other U nuclei to produce a chain reaction</p>	<p>fusion</p>	<p>isotopes</p>
<p>${}_0^1\text{n}$</p> <p>What is this particle?</p>	<p>Why the fusion process is difficult to reproduce on Earth</p>	<p>How do stars produce their energy?</p>	<p>What are isotopes?</p>
<p>A neutron</p>	<p>Enormous temperatures needed to combine nuclei - are difficult to generate & to contain the reaction in a suitable vessel</p>	<p>Stars produce their energy by nuclear fusion</p>	<p>Atoms with the same number of protons but a different number of neutrons or mass number</p>

What material are control rods often made of?	What is the role of the moderator / moderator rods, in a nuclear reactor?	What can you say about the <i>sum</i> of the atomic numbers before and after a nuclear reaction?	What can you say about the <i>sum</i> of the mass numbers before and after a nuclear reaction?
boron	To slow down fast moving neutrons (only slow moving neutrons can bring about further fission reactions)	They are the same	They are the same
What does the 92 stand for in ${}_{92}^{235}\text{U}$?	What is the name of this particle? ${}^4_2\text{He}$	What is the name of this particle? ${}^0_{-1}\text{e}$	How many protons are there? ${}^{30}_{15}\text{P}$
Atomic number / number of protons	Alpha particle	Beta particle	15
What change occurs in a nucleus when a beta / β particle is emitted?	In a fission reaction involving neutrons and uranium, how many neutrons are produced each time a U atom splits?	Name these two isotopes of hydrogen ${}^2_1\text{H}$ ${}^3_1\text{H}$	What occurs during nuclear fusion?
A neutron turns into a proton	2 (or sometimes 3)	Deuterium Tritium	Two lighter / smaller nuclei are combined to form a heavier / larger one
${}_{92}^{235}\text{U} + {}^1_0\text{n} \longrightarrow$ ${}_{30}^{72}\text{Zn} + {}_{x}^{160}\text{Sm} + Y {}^1_0\text{n}$ What is the value of Y?	${}_{92}^{235}\text{U} + {}^1_0\text{n} \longrightarrow$ ${}_{30}^{72}\text{Zn} + {}_{x}^{160}\text{Sm} + Y {}^1_0\text{n}$ What is the value of X?	What is the name of this particle? ${}^1_1\text{p}$	${}^4_2\text{He} + {}^x_{13}\text{Al} \longrightarrow {}^{30}_{15}\text{P} + {}^1_0\text{n}$ Calculate x
$235 + 1 = 72 + 160 + 4$ There are 4 neutrons, $y = 4$	$92 + 0 = 30 + 62 + (4 \times 0)$ $X = 62$	A proton	$31 - 4 = 27$ $x = 27$