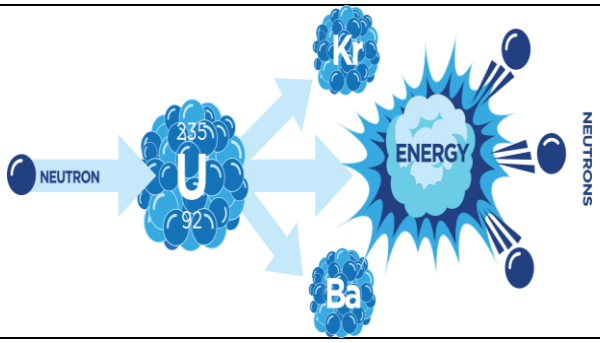
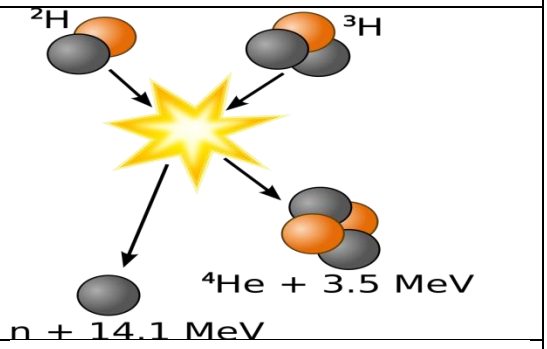
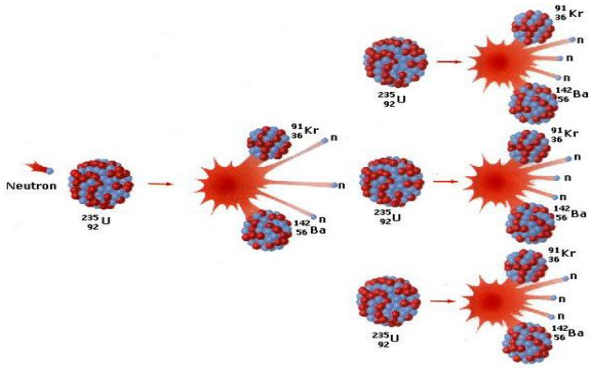
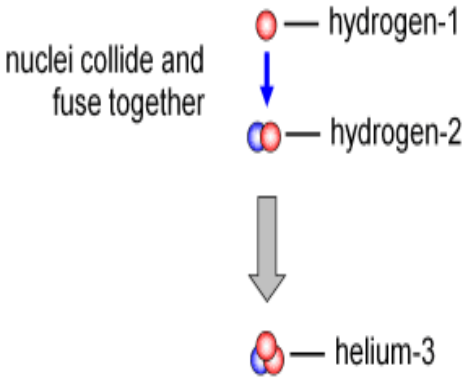
Nuclear Transformation Enriched Notes

Def: _____

_____

- When this occurs enormous amount of energy can be released.
- 1 kg of uranium produces as much energy as 2 500 000 kg of coal.

2 types of transformations

Type	Nuclear Fission	Nuclear Fusion
Def.		
How		
Picture 1		
Picture 2		

Equations for transformations

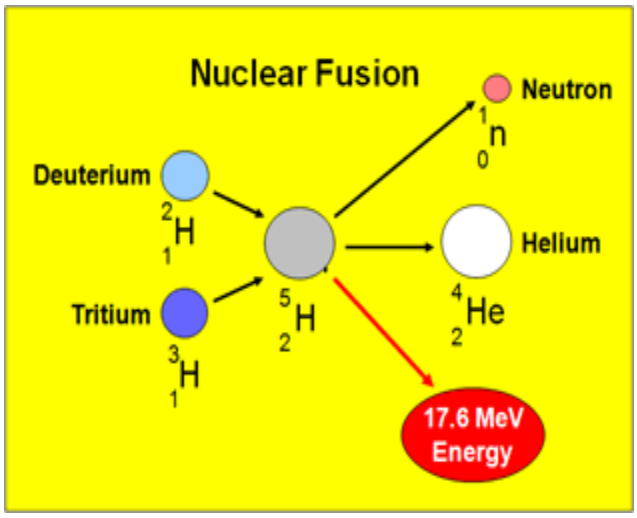
Nuclear Fission:

$$^{235}_{92}U + ^{1}_{0}n \longrightarrow ^{140}_{56}Ba + ^{93}_{36}Kr + 3\ ^{1}_{0}n$$

&

$$^{235}_{92}U + ^{1}_{0}n \longrightarrow ^{144}_{54}Xe + ^{90}_{38}Sr + 2\ ^{1}_{0}n$$

Nuclear Fusion:



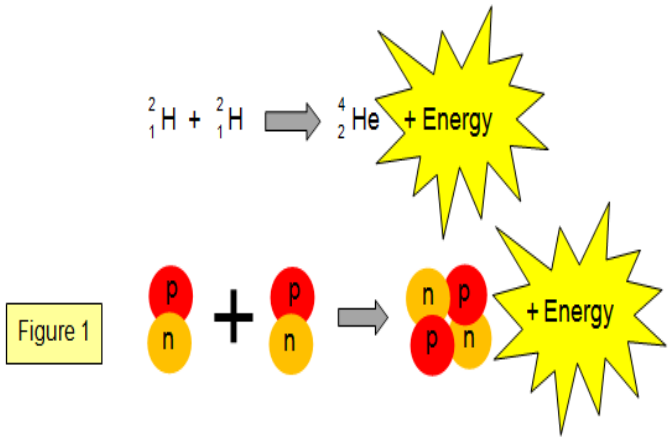


Figure 1

$$Li^{6}_{3} + n \longrightarrow He^{4}_{2} + H^{3}_{1}$$

The production of tritium from lithium deuteride.

Positives and Negatives of fusion and fission

Fission		Fusion	
Positive	**Negative**	**Positive**	**Negative**
- Some radioactive waste used in medicine. - Very little uranium produces a lot of energy. - Less air pollution.	- Nuclear reactor meltdown has devastating effects which lasts hundreds of years. - Radioactive waste buried in the ground. What happens if comes out?? - Expensive - Used as a threat from enemy countries	- Incredible amount of energy produced, more than fission. - Virtually no waste, radiation or pollution created.	- Does not exist yet. - Extremely expensive. - Must reach 1 million degrees Celsius and be able to control it.

Nuclear Stability

Nuclear stability means that the nucleus is stable and is not emitting any radioactivity.
If the nucleus is unstable it will emit some sort of radioactivity.
All atoms above 83 p^+ are unstable.

Why are some elements unstable?

1_____

2_____