Date: _____ Name: _____

How do we write equations? Remember 2 things:

1) The mass number must be the same on both sides
2) Charges must be equal on both sides (atomic number)

**Practice:**

1. ${}^{235}_{92}\mathrm{U} + {}^{1}_{0}n \rightarrow {}^{140}_{54}\mathrm{Xe} + {}^{93}_{38}\mathrm{Sr} + 3{}^{1}_{0}n$

2. ${}^{235}_{92}\mathrm{U} + {}^{1}_{0}n \rightarrow {}^{132}_{50}\mathrm{Sn} + {}^{101}_{42}\mathrm{Mo} + 3{}^{1}_{0}n$

3. ${}^{235}_{92}\mathrm{U} + {}^{1}_{0}n \rightarrow {}^{128}_{51}\mathrm{Sb} + {}^{105}_{41}\mathrm{Nd} + 3{}^{1}_{0}n$

4. ${}^{235}_{92}\mathrm{U} + {}^{1}_{0}n \rightarrow {}^{137}_{56}\mathrm{Ba} + {}^{96}_{36}\mathrm{Kr} + 3{}^{1}_{0}n$

5. ${}^{235}_{92}\mathrm{U} + {}^{1}_{0}n \rightarrow {}^{90}_{37}\mathrm{Ra} + {}^{144}_{55}\mathrm{Cs} + 2{}^{1}_{0}n$

*Work with a friend. Use your textbook and/or phones to fill in the following information.*

| | **Nuclear Fission Weapons** |
|---|---|
| **Define *atomic bomb*** | - Known as a fission bomb, it uses uranium or plutonium to undergo the reaction – the reaction proceeds until all the material is used up |
| **How does it work?** | - The material is kept in two separate sections of the bomb and when it is meant to go off, the materials in these separate sections join together and the reaction starts – the reaction ends when all the material is used<br>- Or – a explosion causes a radioactive piece to be compressed so the reaction can go |
| **Give an example of when/how it was used** | - Gun-type method used on Hiroshima in Japan<br>- Implosion method used on Nagasaki in Japan |

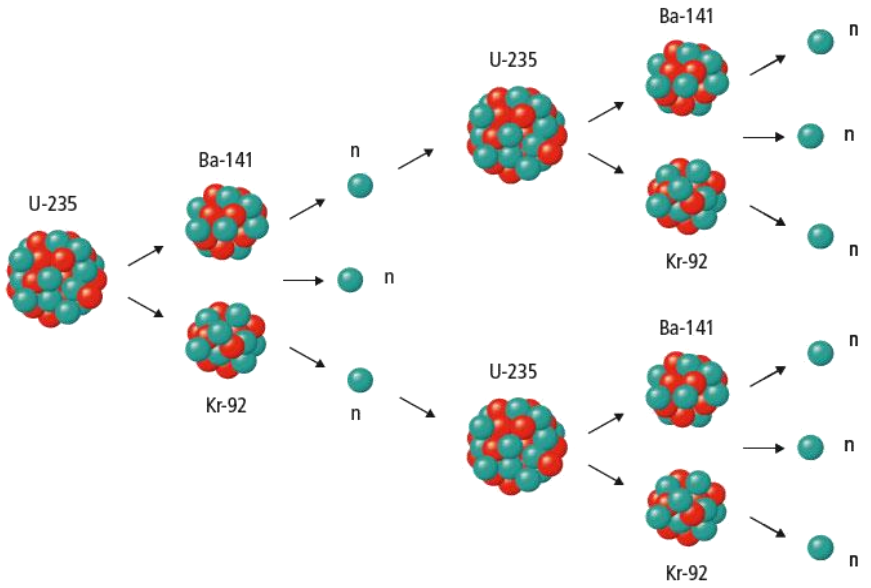
Think/pair/share: *Uranium-235 is unstable if **one** nucleus absorbs a neutron. It releases nuclear energy. What would happen if we had a **huge** amount of Uranium-235? (Hint: remember that 3 neutrons are released in the nuclear reaction)*

Each neutron would hit another isotope of uranium which would produce three more neutrons, and each of those would again hit three more atoms of uranium – lots of energy would be released!

Date: _____ Name: _____

*Define in your own words:* **Chain reaction**

A reaction that causes more reactions to occur – these types of reactions produce a lot of energy since many more reactions are occurring.




*Chain reactions produce **HUGE** amounts of **ENERGY** because of many nuclear fission reactions.

**Come up with your own analogy to remember how a chain reaction works.**

Dominos with many twists and turns

CANDU Reactors: **<u>controlled</u>** reactions; supplies **<u>electricity</u>** to Canadian consumers – uses nuclear fission and **<u>harnesses</u>** this energy.

*Why can this have negative effects? (Hint: what products are produced in the reaction?)*

**Radioactive wastes** are produced, and must be stored away. These materials can often take as much as 20 **half-lives** to break down. (thousands of years)