Name_____
Period:_____Date:_____

Fission/Fusion Worksheet _K

Nuclear Weapons

There are two main types of nuclear weapons: atomic bombs, which are powered by **fission reactions** similar to those in nuclear reactors [power plants], and hydrogen bombs, which derive their explosive power from **fusion reactions**.

An **atomic bomb** slams together two pieces of fissionable material, usually uranium-235 or plutonium-239, creating **critical mass**. This releases its energy instantaneously as atoms inside it split in an uncontrolled **chain reaction**. On August 6, 1945, an atomic bomb called Little Boy was dropped on the Japanese city of Hiroshima, followed three days later by another, called Fat Man, on Nagasaki.

Hydrogen bombs fuse together hydrogen atoms to form heavier helium atoms, releasing far more energy than a fission bomb. Two **isotopes** of hydrogen are used – deuterium (2 neutrons) and tritium (3 neutrons). Hydrogen bombs have never been used in war and are thousands of times more powerful than atomic bombs.

Directions: Identify each as a **fusion** , **fission** , or **both** kinds of reactions:

1. Used in nuclear power plants: _____

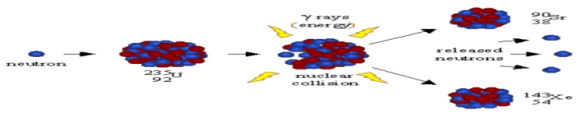
2. Occurs on the sun: _____

3. More power per gram: _____

4. A larger nucleus divides to make a smaller nucleus: _____

5. Two hydrogen atoms fuse to make a helium atom: _____

6. A critical mass is necessary to explode: _____

7. 

: _____

8. An atomic bomb: _____

9._____ is the minimum amount of material needed to sustain a nuclear reaction.

10. _____ are used in nuclear power plants to keep the reaction under control.

11. _____ is a series of fission/fusion reactions.

12. Why can't we use fusion reaction in a nuclear power plant? _____

13. What is the downside to fission reactions used in power plants? _____