**Worksheet #5**

**Name: Period: Seat#:**

 **DO NOT LEAVE THIS UNTIL THE LAST MINUTE! THIS IS A BIG ASSIGNMENT!**

**Directions:** In this web quest, you will explore nuclear chemistry in real-world situations. You will learn about fusion and fission, types of radiation, its effects on humans, and how nuclear power is produced as well as its repercussions and disasters.

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| **Link #1 - Introduction to Atomic Physics -** [**https://tinyurl.com/5fxkyn8c**](https://tinyurl.com/5fxkyn8c)  |
| 1. What is the smallest particle of matter that maintains the properties of that element?
 | 1. Sir Ernest Rutherford concluded what two things about atomic structure? Include some sketched pictures to help describe.
 |
| 1. The diameter of an atom is usually measured in Angstroms. One Angstrom equals how many meters?
 | 1. How many Angstroms across are most atoms?
 |
| 1. Fill in the chart showing the three basic subatomic particles, the charges on the particles, and who discovered each particle.
 |
|  | Charge | Mass | Who discovered it | Where is it? |
| Proton |  |  |  | * Nucleus
* Orbitals outside nucleus
 |
| Neutron |  |  |  | * Nucleus
* Orbitals outside nucleus
 |
| Electron |  |  |  | * Nucleus
* Orbitals outside nucleus
 |
| 1. The number of which subatomic particle determines the name/identity of the element?
 | 1. The number and arrangement of which subatomic particle determines most of the atom’s properties?
 | 1. Protons and neutrons are composed of even smaller subatomic particles called what?
 |
| 1. Define isotopes:
 | 1. Fill in the blanks:Isotopes have the same properties but very different

properties. | 1. Most isotopes are stable but some are:
 |
| 1. What is binding energy?
 | 1. What does binding energy determine?
 | 1. E = mc2, explains the relationship between the binding energy and mass defect. It shows that a small amount of: can produce a large amount of:
 |
| 1. Define radioactivity:
 | 1. Name the three scientists that discovered and researched radioactivity:
 | 1. List the three most common types of radioactive decay:
 |
| 1. Define half-life:
 | 1. List what is emitted during each decay type:

 - Alpha: - Beta: - Spontaneous fission: |
| **Link #2 - Nuclear Power -** [**https://tinyurl.com/y67jfcrh**](https://tinyurl.com/y67jfcrh) |
| 1. Discuss the release of energy by fission.
 | What is meant by uranium enrichment? |
| 1. Explain the role of control rods in a fission reaction.
 | 1. What is critical mass?
 |
| **Link #3 - Hydrogen Bomb -** [**https://tinyurl.com/9xh2vkcf**](https://tinyurl.com/9xh2vkcf)  |
| 1. What nuclei are fused in the nuclear reaction of a hydrogen bomb?
 | 1. What function does styrofoam perform in a hydrogen bomb?
 | 1. Why is a fission bomb needed as part of an H-bomb?
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| **Link #4 - Nuclear Weapons -** [**https://tinyurl.com/2cdzzrjy**](https://tinyurl.com/2cdzzrjy) |
| 1. Describe how an atom bomb works.
 | 1. Describe how radioactive fallout is produced by the explosion of a bomb.
 |
| 1. What are the health consequences of radioactive fallout particles?
 | 1. Briefly portray a nuclear winter scenario.
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| **Link #5 - Effects of Radiation on the Human Body -** [**https://tinyurl.com/yc7ep3zf**](https://tinyurl.com/yc7ep3zf) |
| **1.** | **2.** |
| **3.** | **4.** |
| **5.** | **6.** |
| **7.** | **8.** |
| **9.** | **10.** |
| **What are the 5 most interesting, important, relevant things you learned?**  |
| **1.** |
| **2.** |
| **3.** |
| **4.** |
| **5.** |