**PFC2 Chapter 10 Section 1 Guided Reading**

1. In 1808, John Dalton published his atomic theory. List the four main ideas in Dalton’s theory, as found on page 244.
2. Name two examples of exceptions to Dalton’s theory that were discovered in the years following the publication of his theory.
3. We now know that three main types of particles make up all atoms. The particle with a negative charge that was discovered by English physicist J. J. Thomson is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. Several scientists, led by Ernest Rutherford, performed an experiment that helped improve our understanding of the inside of an atom by demonstrating that there was a small inner core to each atom that housed most of its mass. This inner core has a special name, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. The two particles that make up most of the mass of the atom are called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. Complete the following table using the information on page 246.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Occurrence | Relative charge | Mass (g) | Relative mass |
| Electron |  |  |  |  |
| Proton |  |  |  |  |
| Neutron |  |  |  |  |

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an electrical property of particles that causes them to attract and repel each other.
2. Electrons occupy a region of space around the nucleus called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. Electrons are bound to the nucleus by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ holds the nucleus together. It works only at extremely small distances.
5. The presence of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a nucleus helps the attraction of the strong magnetic force counteract the protons’ repulsive electromagnetic force so that the nucleus stays together.
6. Match the fundamental forces below with a scientist who contributed to our understanding of it:

|  |  |
| --- | --- |
| **Force** | **Scientist** |
| 1. Electromagnetic force | a. Henry Cavendish |
| 2. Strong nuclear force | b. Charles-Augustin de Coulomb |
| 3. Weak force | c. Hideki Yukawa |
| 4. Gravity | d. Enrico Fermi |

1. The number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is different for each element and is known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ number.
2. Atoms of the same element may have different numbers of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the nucleus.
3. What are *isotopes* of an element?
4. The mass number of an isotope is the number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plus the number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. The mass of an atom is usually given in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. One amu is equal to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kg, or one-twelfth of the mass of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ atom.
6. Do the Your Turn problems on page 250. Show your work. Check your solutions against the answers provided at the end of the chapter.