**4.1 and 4.2 the Atom**

**Atom**

\_\_\_\_\_\_\_\_- smallest particle of an element that retains its identity in a chemical reaction

**Democritus’s Atomic Philosophy**

He reasoned that atoms are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Democritus did not have any\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, as well as explain the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of an atom.

**Dalton’s atomic theory**

2000 years after Democritus’s philosophy, Dalton transformed his philosophy of an atom to a theory through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dalton’s formulated a hypothesis and theories to explain his observations known as Dalton’s Atomic Theory.

**Dalton’s Atomic Theory**

1. All elements are composed of tiny indivisible particles called\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Atoms of the same element are\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Atoms of any one element will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_from those of any other element.

3. Atoms of different elements can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_or can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_in simple whole-number ratios to form compounds (2H to 1O make water)

4. Chemical reactions occur when atoms \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_from each other, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_in a different combination. Atoms of one element, however, are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_changed into atoms of another element as a result of a chemical reaction

**Subatomic particles**

Much of Dalton’s atomic theory is accepted today. One major change to the theory is the fact that atoms \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_: positively charged particle (found in nucleus)

\_\_\_\_\_\_\_\_\_\_\_\_\_: neutral charged particle (found in nucleus)

\_\_\_\_\_\_\_\_\_: negatively charged particle (found around the nucleus)

**Electron**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_discovered the electron.

He used a\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, where electrons travel from cathode to anode.

**Mass of Electron**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ performed the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ to determine the mass of an electron

**The electron wasn’t the ONLY sub particle discovered…**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ discovered the proton using the SAME cathode ray tube experiment as\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Each proton is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ times more massive than the electron

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ discovered the neutron 46 years later having the same mass of the proton.

It was \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ who concluded these sub particles were together in a nucleus of the atom using a\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Gold Foil Experiment**

Used \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(which was helium that lost both of its electrons)

In theory, the alpha particles should have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Although most of the experiment is true, there was a small fraction that deflected in great angles

**What does the atomic model look like, according to Dalton, Thomson and Rutherford?**