**History of the Structure of the Atom**

**Atomic Models – Inferring Structure from Evidence**

Look at the 5 pictures of atoms that have been used by scientists at different stages of their understanding of the structure of an atom. Match each model (A-E) to the scientist below. Explain your reasoning.

1. In 1806, the English chemist John Dalton’s experiments showed that matter was made up of lumpy particles (atoms). These atoms were thought of simply as solid spheres.

The model that best represents Dalton’s model is \_\_\_\_\_\_\_\_\_, because

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. In 1897, English physicist J. J. Thompson discovered that there were negatively charged particles (electrons) in the atom. He proposed that the atom was a positive mass with electrons spread evenly through it, like raisins in a bowl of oatmeal.

The model that best represents Thompson’s model is \_\_\_\_\_\_, because

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. In 1911, another English scientist, Ernest Rutherford found that if a tiny particle is shot into the middle of an atom, it hits something dense in the center and bounces back in the direction from which it came. If a tiny particle is shot into other parts of the atom, it goes through. Most tiny particles shot through the atom will go through. From this evidence, he developed a model of the atom that had a small, positively charged mass in the center. This center was orbited by negatively charged particles which moved in different pathways, but were all about the same distance from the center.

The model that best represents Rutherford’s model is \_\_\_\_\_\_, because

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. In 1913, in order to explain some of the discrepancies between the Rutherford model and some excepted theories of physics, the Danish physicist Niels Bohr proposed that the negatively charged particles orbited in a specific distances from the nucleus. It followed that the further away from the center of an atom the negatively charged particle are, the easier they are to remove.

The model that best represents Bohr’s model is \_\_\_\_\_\_\_\_\_\_, because

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. In 1927, the German physicist Werner Heisenberg presented theories that the negatively charged particles didn’t move around the nucleus in orbits, but rather occupied a specifically shapes cloud. The concept of protons was accepted, but in 1932, the English physicist James Chadwick discovered the neutron.

The model that best represents this model is \_\_\_\_\_\_\_\_\_\_\_, because

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

When you are finished, compare your answers to the information on the History of the Structure of the Atom Reference page.