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Atomic Model Lab

Purpose: The purpose of this lab is to give you an opportunity to build a 3D model of a Lithium atom.

Materials:

7 Large Marshmallows 3 Small Marshmallows 15 Flat Toothpicks 1 Highlighter

Pre-lab Questions: Use your notes and the diagram to the right to answer the following questions.

1. What is the atomic number of Lithium?

2. How many protons are in the nucleus of a Lithium atom?

3. How many electrons orbit the nucleus of a Lithium atom?

4. What is the atomic mass of a Lithium atom (rounded to the nearest whole number)?

5. How many neutrons are in the nucleus of a Lithium atom?

Procedure:

1. Using the highlighter draw a plus sign (+) on an appropriate number of the large marshmallows to represent protons. Leave the remaining large marshmallows blank to represent neutrons. The small marshmallows will represent the electrons.

2. Using some of the toothpicks, stick the large marshmallows together to form the nucleus of your atomic model. Be sure that the plus signs (+) on the protons are visible!

3. Use some of the remaining toothpicks to attach the small marshmallows to your model. Remember that the electrons are not located in the nucleus (the small marshmallows should NOT be touching the large marshmallows)!

4. Raise your hand and wait for Mr. McCaffrey to come grade your model. Your model will be graded according to the following criteria:

 Correct # of protons = 5 points Correct # of neutrons = 5 points Correct number of electrons = 5 points Total Points Earned \_\_\_\_\_\_\_\_\_\_\_\_ / 25 Structural accuracy = 5 points Neatness = 5 points

Work together to answer the Analysis Questions on the back while you are waiting.

5. Clean up your lab area and dispose of your lab materials (in a tasty and delicious manner if you so desire) appropriately. Answer the Analysis Questions on the back of this lab sheet.

Analysis Questions

1. What are the three subatomic particles that make up an atom?

2. Which two subatomic particles are located in the nucleus of an atom?

3. Why do atoms always have an overall neutral charge?

4. If an atom has 42 protons and 36 neutrons, how many electrons will it have?

5. What is the atomic number of an atom that has 18 protons, 15 neutrons, and 18 electrons?

6. What is the atomic number of an atom that has 33 neutrons and 29 electrons?

7. What is the mass number of an atom that has 12 protons and 13 neutrons?

8. What is the atomic mass of an atom that has 3 protons, 4 neutrons, and 3 electrons?

9. How many neutrons does an atom have if it has a mass number of 20 and an atomic number of 11?

10. How many neutrons does an atom have if it has 7 protons and has an atomic mass of 16 amu?