

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

## Modeling Rutherford Lab

**Background Information:** Since the atom cannot be seen with standard lab equipment, many early scientists had to use indirect observations to determine the structure of an atom.



In 1911, Rutherford bombarded a thin gold foil with positive alpha particles and noticed that although almost all of them went through the foil, one in a great many would “bounce” back. Rutherford concluded that . . .

### Hypothesis – as a picture: **No Peaking!**

1. In the box, **draw** a picture of what you think your “unique” atom may look like (i.e. what shapes “particles” you think are under the board, how many there are . . . )



### Experiment – **No Peaking under the board!!!**

2. You will roll the marble from under one side of the board to another – make barriers so it doesn't drop to the floor.
3. While you do this you will record your observations on the board with the dry erase marker.
4. Use a  to show how you rolled the marble in
5. Use a  to show the path you think it took as it came out
6. **Repeat** steps 2-5 **MANY** times, *from different areas of the board*, until you believe you know the locations and shapes of **ALL** the objects under the board.
7. Use the dry erase marker, on your white-board, and draw in the locations and shapes of **ALL** the objects you believe are under the board. Remember, **NO PEAKING!**
8. In the box below, draw in the locations and shapes of **ALL** the objects under the board.



9. Raise your hand for your teacher to check off the lab. \_\_\_\_\_ *Teacher Signature*

10. You may now look under the board to verify your answer. Using a different colored pen/pencil, **make corrections to your drawing in Step 8** to indicate the actual “particles.”

**Analysis and Conclusions: Answer in detail**

11. How is this activity a good model of Rutherford’s gold foil experiment?

12. When Rutherford did this experiment not much was known about the structure of the atom. What did the gold foil experiment help scientists learn about the structure of an atom?

13. What type of error(s) could happen in this experiment, and what would their impacts be?

14. **How** has the use of technology allowed us to learn more about the atom?

15. Respond to the following statement with detail. “With our current technology we know everything there is to know about the atom.”