Simulating Rutherford's Gold Foil Experiment

Purpose: To simulate Ernest Rutherford's Gold foil experiment and to **indirectly** measure the radius of a nuclei.

Background: You come up with the background

Materials:
Paper with circles
marble
carbon paper
ruler

Procedure:
- Measure the dimensions of the square and record
- Place carbon sheet of paper on top of paper with circles and tape it down
- Drop a marble onto the paper from a height of at least 2 feet 100 times
- Record the # of hits and non-hits

Data Table:
Number in or on the circle:
Number outside the circle:
Length of Rectangle (cm)=
Width of Rectangle (cm)=
Use the following to calculate the radius of the circles

$$\frac{10 \times (area\ of\ circle)}{Area\ of\ square} = \frac{\#\ hits\ (in\ the\ circle)}{total\ number\ of\ drops}$$

Conclusion:
Restate the problem
Answer the problem
Errors-

Questions:
1. What does the marble represent in this simulation?
2. What two things did Rutherford conclude from the results of his experiment?
3. If Rutherford shot 5.00×10^7 alpha particles and only recorded 100. Hits, how many gold atoms are present if the radius of a gold atom is 1.44×10^{-14} meters and the gold foil has an area of $1.00\ m^2$.