The Smallest Matter-Teacher Answer Key

1. Observe the experiment setup and hypothesize what will happen when you roll alpha particles at the gold foil and why.

Answers will vary.

2. Roll the round object representing alpha particles toward the gold foil. Observe and record your observations for each roll.

Answers will vary. Students should observe the alpha particles (marbles, ping pong balls, etc.) passing straight through at times and striking the protons and deflecting in different directions at times.

3. Share your conclusions.

What conclusions did you form about the structure of an atom based on the experiment and your observations?

Answers will vary.

From the gold foil experiment, Rutherford and Bohr concluded that each atom was mostly empty space, but also contained a central mass that the alpha particles could not pass through. Rutherford concluded that the central mass must have a positive charge. Why did he think that?

Because the positively charged alpha particles were deflected by the positively charged nucleus. This is based on the principles of electromagnetic force and the repulsion of like charges.