



## RUTHERFORD'S EXPERIMENT

### LAB AIDS #100 OB-SCERTAINER KIT

All science is an attempt to understand and explain the world we live in. Investigators, scientists, and researchers have sought to explain the incredible amount of phenomena that makes up our world. Despite the incredible amount of and variety of research, these specialists use a universal approach to scientific problems. Often this process is referred to as the *Scientific Method*.

The *Scientific Method* involves recognizing the existence of a problem, accumulating data, forming tentative hypotheses, and controlled experimentation. Results and conclusions should be consistent and verifiable by other scientists and investigators. Once an explanation is assumed, a model representing a theory can be created. This model may change over time as a result of additional experimentation and research. For example, the model of the universe espoused by the Greeks and Arabs showed earth as the center. Later in the seventeenth century, Copernicus and Galileo proposed a model that showed the sun as the center with earth and the other planets revolving around it. This process took about 2,000 years. However in recent times we are constantly revising this model to include more information involving actual shape and numbers of moons and planets as a result of technological advances that allow us to more "directly" observe our universe.

In this LAB-AIDS® kit you will be observing and experimenting with an object that has a specific design inside. You will not be able to see this design or configuration, so your observations will be *indirect*. These indirect observations will involve your other senses.

In order to solve the following problem, you will need to be patient, use all of your concentration, be alert to detail, and show ingenuity.

**PROBLEM:** What is the configuration or design inside the closed container known as an OB-SCERTAINER™ ?

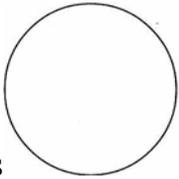
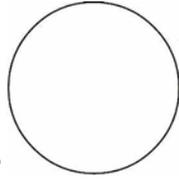
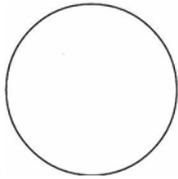
**KNOWN DATA:** The closed OB-SCERTAINERS™ have a steel ball inside that moves within the partitions and walls. You are unable to see or touch the inside of the OB-SCERTAINER™ ,

### EXPERIMENTATION OR PROCEDURE:

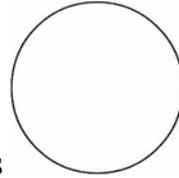
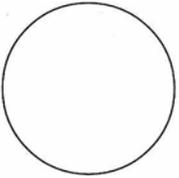
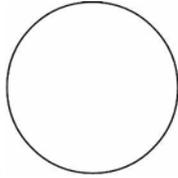
1. Carefully shake and tilt your OB-SCERTAINER™ .
2. From the sound and path of the steel ball, determine the shape and location of the partition or partitions.
3. Record the OB-SCERTAINER™ number in the blank below and draw your hypothesis or best guess in the first circle,

4. Test this hypothesis by moving the ball along the partitions according to your hypothesis. If you wish to make changes to your hypothesis or create a new one, do so in the second circle. This will reflect your final hypothesis.
5. As you complete this, you are creating a model to explain the phenomenon you are observing. Save the third circle to fill in after your teacher has revealed the actual configurations.
6. Continue testing at least four OB-SCERTAINERS™ . Some of them may be more difficult than others, but do not spend more than 5 minutes on each. DO NOT OPEN THE OB-SCERTAINERS™ .

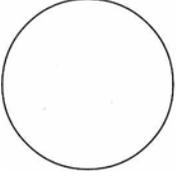
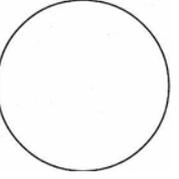
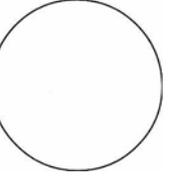
OB-SCERTAINER # \_\_\_\_\_

|            |   |        |   |              |   |
|------------|---|--------|---|--------------|---|
| HYPOTHESIS |  | RETEST |  | ACTUAL MODEL |  |
|------------|---|--------|---|--------------|---|

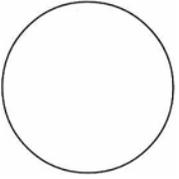
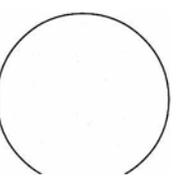
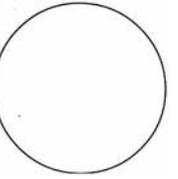
OB-SCERTAINER # \_\_\_\_\_

|            |  |        |  |              |  |
|------------|--|--------|--|--------------|--|
| HYPOTHESIS |  | RETEST |  | ACTUAL MODEL |  |
|------------|--|--------|--|--------------|--|

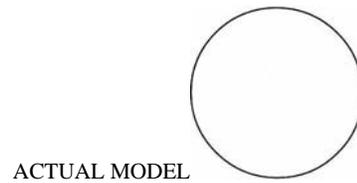
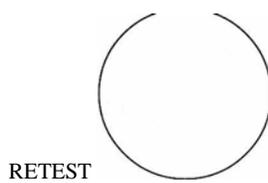
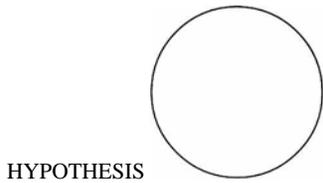
OB-SCERTAINER # \_\_\_\_\_

|            |   |        |   |              |   |
|------------|---|--------|---|--------------|---|
| HYPOTHESIS |  | RETEST |  | ACTUAL MODEL |  |
|------------|---|--------|---|--------------|---|

OB-SCERTAINER # \_\_\_\_\_

|            |   |        |   |              |   |
|------------|---|--------|---|--------------|---|
| HYPOTHESIS |  | RETEST |  | ACTUAL MODEL |  |
|------------|---|--------|---|--------------|---|

OB-SCERTAINER # \_\_\_\_\_



SUMMARY QUESTIONS:

1. When making a guess, you are forming a \_\_\_\_\_
2. When making a guess and retesting this information, a theory or \_\_\_\_\_ may be formed which explains why something has occurred or what it may look like.
3. When you can not see what is taking place, but other senses indicate occurrences. This is called \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. Choose one of your OB-SCERTAINERS™ and write a summary of the actual OB-SCERTAINER™ configuration and your hypothesis (conception) of it. List those things that you were able to determine and those that you were unable to determine.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. Is there any reason why you were successful for certain characteristics and not for others? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_