

Nature of Science

Lesson 2: Scientific Method

Today's focus

I will:

- Recognize that science doesn't always follow a "scientific method"
- Understand that science is the study of the natural world
- Understand how to be safe during lab activities
- Understand that scientific explanations are based on observations and evidence
- Identify appropriate forms of record keeping
- Make and record measurements as data

Bellringer:

Jane is investigating whether bean plants grow taller in ordinary topsoil or special potting soil over a three-week period. She sets up her investigation with 10 bean plants of equal size in each type of soil.

What should Jane do each day to make sure she gets valid results?

- a. Water only the plants in special potting soil.
- b. Calculate the average plant height for each soil type.
- c. Move the plants in ordinary topsoil to different locations.
- d. Estimate the height of each plant's stem and record the estimate.



Science Notes:

Scientific investigation:

A scientific investigation begins when scientists make _____ and ask _____ about the natural world.

ALL types of scientific investigation include making _____ and collecting _____ to draw conclusions.

To begin an experiment scientists write a testable question.

A testable question is _____

An answer to a testable question is determined by what is **observed** and **measured** during the experiment.

Nature of Science

LAB TIME

To begin today's experiment, you will read a scenario and create a testable question.

Javier loves to play with bubbles! He normally uses a recipe that calls for 1 tablespoon of dish soap mixed with 50 mL of water to make his bubbles. Javier decides he wants to make larger bubbles and wonders if increasing the amount of dish soap in the recipe will make a difference in the size of the bubbles.

Find the testable question:

DIRECTIONS: Circle the testable question(s).

#1. Which type of dish soap is best to make a big bubble?	#2. Does increasing the amount of dish soap cause the bubbles to be larger?	#3. Will adding more dish soap increase the size of the bubbles?	#4. What amount of dish soap is best for bubble making?
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A hypothesis is when scientists use what they already know to state what they think will occur during their investigation. Scientists never change their hypothesis. It is absolutely okay for a hypothesis to be wrong!

(If... Then.... because.....) - Correct Hypothesis Format

Make a hypothesis for this experiment...

If I add more dish soap to the recipe, then the diameter of the bubbles will _____ because _____.

Bubble Formula LAB!!

Materials:

- ❖ 100 mL tap water
- ❖ 6 Tablespoons dish soap
- ❖ centimeter rulers
- ❖ spoon
- ❖ 2 cups labeled A and B
- ❖ Two 50 mL graduated cylinders
- ❖ pipettes
- ❖ straws
- ❖ plates

Procedure:

1. Pour 50 mL of water in each of the cups A and B.
2. Place 1 Tablespoon of dish soap into cup A and stir. Place 5 Tablespoons of dish soap into cup B and stir.
3. Fill the pipette completely with mixture from cup A and squeeze it on the table.
4. Using the straw, blow into the mixture on the table to create a bubble.
5. Continue blowing until the bubble pops.
6. Measure the diameter of the bubble outline left on the table in centimeters.
7. Record the measurement in the data table.
8. Repeat steps 4-7 two more times.
9. Fill the second pipette with the mixture from cup B and squeeze it on the table.
10. Repeat steps 5-9 two more times for cup B.

Nature of Science

	Cup A (1 Tbs)	Cup B (5 Tbs)
Trial 1		
Trail 2		
Trail 3		
Avg.		

Exit ticket

1. Jordan wants to find out if a hamster can learn a maze as quickly as a mouse can. She has researched mice and hamsters and predicts which rodent she thinks will learn more quickly.
 - a. What should her next step be?

- b. Show how she can organize her data.
