

72 The Scientific Method



Did you ever wonder why the water level in a glass doesn't change when the ice in the glass melts? To find out why, you can use the scientific method. Used by scientists in various situations, the scientific method is also a clear and logical way to solve many real-world problems, as the procedure below indicates.

Steps in the Scientific Method	Example
State the problem or question.	"Why doesn't the water level in a glass rise when ice melts?"
Using your own observations and research, <u>compile</u> information about the problem.	You already know that ice is frozen water. From your research, you learn that water and ice are made of water molecules.
Form a hypothesis, or a best guess based on the information.	"The molecules in water appear to be closer together than they are in ice."
Test the hypothesis by doing an experiment.	Fill four glasses with ice. Then pour water over the ice and fill each glass to the rim. As the ice melts, you observe that the water does not spill over the top of the glasses. Each time you repeat the experiment, you get the same results.
Draw a conclusion based on your results.	Molecules are closer together in water than they are in ice.

Main Idea

1

Mark the *main idea*

Mark the statement that is *too broad*

Mark the statement that is *too narrow*

- a. Scientists like to figure out problems.
- b. One step in the scientific method is to test the hypothesis.
- c. The steps in the scientific method help people solve problems.

Answer

Score

M

15

B

5

N

5

B

M

N



Score 15 points for each correct answer.

Score

- Subject Matter** 2 Another good title for this passage would be
- a. Are You Curious?
 - b. Water and Ice Don't Mix.
 - c. Follow the Steps to Find Out Why.
 - d. Hypothesis and Conclusion.

- Supporting Details** 3 A hypothesis is
- a. a guess about the cause of something.
 - b. a conclusion about water molecules.
 - c. the first step in the scientific method.
 - d. an experiment.

- Conclusion** 4 This passage suggests that
- a. doing an experiment will always prove that your hypothesis is correct.
 - b. the scientific method is a logical way to solve problems.
 - c. research should be done only in books.
 - d. few scientists use the scientific method anymore.

- Clarifying Devices** 5 The chart structure in the passage is useful because it
- a. compares and contrasts water and ice.
 - b. shows a diagram of how ice melts.
 - c. explains cause and effect.
 - d. clearly shows steps and examples.

- Vocabulary in Context** 6 In this passage compile means
- a. collect.
 - b. lose.
 - c. finish.
 - d. buy.

Add your scores for questions 1–6. Enter the total here and on the graph on page 216.

Total Score

When the ice in
Used by scientific way to

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15

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5

Science
Vocabulary Words

Unit One: The Scientific Method

Experiment: An activity that is planned and designed to test a hypothesis

Controlled Experiment: An experiment with controlled variables to make results fair and valid.

Hypothesis: An educated guess about a problem that can be tested

Prediction: Statement about what might happen before it does

Inference: A logical explanation of an observation

Observations: A record of information using senses or tools

Qualitative Observations: Observations using senses and descriptions

Quantitative Observations: Observations containing measurements

Variables: Factors that can affect the outcome of the experiment

Independent Variable: Variable that is intentionally changed in an experiment to affect the outcome

Controlled Variables: Variables that are kept the same during an experiment

Dependent Variables: Factor that is affected by the independent variable.
It is the outcome

