



The Scientific Method

Scientists need **testable** ways to prove ideas. The scientific method is a consistent way to solve **problems**.

You start with a prediction, or **hypothesis**. This is what you think will happen. "Fertilizer makes plants grow taller" is an example.

You need at least two groups of plants for the **experiment**. The **control group** does not receive fertilizer. The fertilizer is the **independent variable**. It is the only difference between the control group and the **experimental group**.

Then you make **observations**. In this case, you measure the height of the plants. You **evaluate** the **results** to form a **conclusion**. This tells you whether your hypothesis was correct or not.

Get ready!

1 Before you read the passage, talk about these questions.

- 1 What kind of test is done to try to prove theories?
- 2 What is one group used in an experiment?

Reading

2 Read the textbook chapter. Then, choose the correct answers.

- 1 What is the purpose of the textbook chapter?
 - A to stress the importance of accurate observation
 - B to illustrate a method of testing a hypothesis
 - C to analyze the results of an experiment
 - D to compare methods for solving problems
- 2 Which of the following is NOT part of the scientific method?
 - A creating a hypothesis
 - B performing an experiment
 - C predicting an observation
 - D forming a conclusion
- 3 In the example, what is true about plants in the experimental group?
 - A They are expected to grow taller than the control group.
 - B They are smaller than the control group at the start of the experiment.
 - C They receive less fertilizer than the control group.
 - D They are different from the control group in several ways.

Vocabulary

3 Write a word that is similar in meaning to the underlined part.

- 1 The determination after the experiment was that a chemical is killing the fish.
_ _ n c _ _ _ i o _
- 2 One patch of grass is the part of the experiment that receives treatment.
e _ _ e r _ _ _ t _ _ r _ u _
- 3 The scientist made some new discoveries by watching something closely.
_ b _ _ r v _ _ _ _ n
- 4 The scientific journal published results from a new process designed to reveal the effect of something. _ _ p _ _ i m _ _ _
- 5 The scientist solved the question that needed an answer with the scientific method.
p _ _ b _ e _

- 4 Fill in the blanks with the correct words and phrases from the word bank.

Word BANK

independent variable control group
testable result evaluate hypothesis

- The scientist's _____ is "Pesticides are making birds sick."
 - The scientific method is a way to prove _____ ideas.
 - The _____ is the only difference between groups in an experiment.
 - A scientist must _____ data carefully to avoid inaccurate conclusions.
 - The fish did not receive the treatment, so they were the _____.
 - The _____ of the experiment proved that the scientist was right.
- 5 Listen and read the textbook chapter again. When do scientists come to a conclusion?

Listening

- 6 Listen to a conversation between two scientists. Mark the following statements as true (T) or false (F).
- The experiment proved that the factory is killing the fish.
 - The woman needs another stream as her control group.
 - The woman predicts that the experimental group will have the most deaths.
- 7 Listen again and complete the conversation.

Scientist 1: How's your new experiment going?

Scientist 2: I haven't made any 1 _____ yet.

Scientist 1: What's your 2 _____?

Scientist 2: I think the 3 _____ a species of fish. They are releasing a chemical into the water.

Scientist 1: Are there more dead fish 4 _____?

Scientist 2: That's what I want to find out. I need 5 _____ with the same species of fish.

Scientist 1: I see. You want to compare fish deaths in the two streams.

Scientist 2: Exactly. I predict that fewer fish will die in the 6 _____.

Scientist 1: That will mean that the chemicals are killing the experimental group.

Speaking

- 8 With a partner, act out the roles below based on Task 7. Then switch roles.

USE LANGUAGE SUCH AS:

How's ... going?

That's what I want to ...

I predict that ...

Student A: You are a scientist. Talk to Student B about:

- an experiment
- his or her hypothesis
- the significance of the results

Student B: You are a scientist. Talk to Student A about your experiment.

Writing

- 9 Use the textbook chapter and the conversation from Task 8 to fill out the experiment summary.



Summary of Findings

Hypothesis: _____ is causing _____

Control group: _____

Experimental group: _____

Observation: _____

Conclusion: _____ is / is not (choose one) causing _____