

Active Reading

Section 1: Scientific Methods

Read the passage below and answer the questions that follow.

Experiments should be designed to pinpoint cause-and-effect relationships. For this reason, good experiments have two essential characteristics: a single variable is tested, and a control is used. The **variable** (VER ee uh buhl) is the factor of interest, which, in the example in which Keene High School students hypothesized that phosphate in the river was killing dwarf wedge mussels, would be the level of phosphate in the water. To test for one variable, scientists usually study two groups or situations at a time. The variable being studied is the only difference between the groups. The group that receives the experimental treatment is called the **experimental group**. In our example, the experimental group would be those mussels that receive phosphate in their water. The group that does not receive the experimental treatment is called the control group. In our example, the **control group** would be those mussels that do not have phosphate added to their water. If the mussels in the control group thrive while most of those in the experimental group die, the experiment's results support the hypothesis that phosphates from fertilizer are killing the mussels.

IDENTIFYING MAIN IDEAS

One reading skill is the ability to identify the main idea of a passage. The main idea is the main focus or key idea. Frequently a main idea is accompanied by supporting information that offers detailed facts about the main idea.

Read each question and write the answer in the space provided.

1. What are two essential characteristics of a good experiment?

2. How do scientists usually test for one variable?

3. How should experiments be designed?

Active Reading *continued*

VOCABULARY DEVELOPMENT

Read each question and write the answer in the space provided.

4. The group that does *not* receive an experimental treatment is called the _____.
5. The group that receives the experimental treatment is called the _____.

RECOGNIZING SIMILARITIES AND DIFFERENCES

One reading skill is the ability to recognize similarities and differences between two phrases, ideas, or things. This is sometimes known as comparing and contrasting.

Read each question and write the answer in the space provided.

6. What do a control group and an experimental group have in common?
- _____
- _____
7. In the experiment discussed in the passage, what is the variable?
- _____

RECOGNIZING CAUSE AND EFFECT

One reading skill is the ability to recognize cause and effect.

In the space provided, write the letter of the term or phrase that best completes the statement.

- _____ 8. The differences observed between control groups and experimental groups can help identify _____ relationships.
- | | |
|-------------------------|-------------------|
| a. cause-and-effect | c. conditional |
| b. inverse-and-converse | d. unconventional |

Read each question and write the answer in the space provided.

9. What is the effect of using both a variable and a control in an experiment?
- _____
- _____
10. In the example used in this passage, what would the students know if the mussels in the experimental group died?
- _____
- _____