

Skills Worksheet

Directed Reading A

Section: Scientific Methods and Inquiry

WHAT ARE SCIENTIFIC METHODS?

1. The ways in which scientists follow steps to answer questions and solve problems are called _____.

2. Do scientists use the same steps in the same order during all scientific investigations? Explain.

3. What can you learn by studying scientific methods?

ASK A QUESTION

- _____ 4. What do observations in science lead to?
- a. questions and more observations
 - b. answers and methods
 - c. answers and records
 - d. records and confusion

MAKE OBSERVATIONS

- _____ 5. Observation is information gathered
- a. by reading the encyclopedia.
 - b. by asking teachers.
 - c. through the senses.
 - d. on the Internet.
- _____ 6. Observations are useful only if they are
- a. accurate.
 - b. important.
 - c. complicated.
 - d. understood.

Directed Reading A *continued*

7. What were three types of observations the students in Minnesota made after they found deformed frogs?

8. What does accurate record keeping help maintain?

FORM A HYPOTHESIS

_____ **9.** What term do scientists use for a possible explanation or answer to a question?

- a.** hypothesis
- b.** suggestion
- c.** query
- d.** observation

10. If a hypothesis is not testable, is it always wrong? Explain.

11. A statement of cause and effect that can be used to set up a test for a hypothesis is called a(n) _____.

TEST THE HYPOTHESIS

_____ **12.** When do scientists test a hypothesis?

- a.** after they answer questions
- b.** after they research the answers
- c.** after they make a prediction
- d.** before they make a prediction

Directed Reading A *continued*

- _____ **13.** Anything in an experiment that can influence the experiment's outcome is a(n)
a. prediction.
b. hypothesis.
c. variable.
d. factor.
- _____ **14.** An experiment that tests one factor at a time, using a control group and one or more experimental groups is called a(n)
a. controlled experiment.
b. control factor.
c. group experiment.
d. hypothetical situation.
- _____ **15.** In a controlled experiment, all of the factors for the control group and the experimental groups are the same except for one, called the
a. prediction.
b. hypothesis.
c. variable.
d. factor.

16. What is required to design a good experiment?

17. Why do scientists try to test large groups of individuals in control and experimental groups?

18. How do scientists test the results of their experiments?

ANALYZE THE RESULTS

- _____ **19.** What does analyzing results help scientists to do?
a. reject the hypothesis
b. prove the answers they were looking for
c. keep busy and stay out of trouble
d. explain and focus on the effect of the variable

Directed Reading A *continued*

20. What are two things scientists use to organize data?

DRAW CONCLUSIONS

21. What does it mean for scientists to draw conclusions?

22. What must a scientist do if the hypothesis is not supported by experimental results?

23. Why is proving a hypothesis wrong just as helpful as supporting it?

24. Will similar investigations or experiments always have the same results? Explain.

COMMUNICATE RESULTS

_____ **25.** After an investigation, what do scientists do with their results?

- a. hide them from other scientists
- b. share them only with their family
- c. put them away for several years to see if they hold up
- d. communicate their results to other scientists

26. What are three reasons that scientists share their experimental results with other scientists?
