

# Investigation and Experimentation

Name: \_\_\_\_\_

## Scientific Methods

Period: \_\_\_\_\_

Use Chapter 1, Section 2 of your textbook to answer the questions below. The word banks can be used to fill out the sentences below them.

accurate    counting    measurements    observation    problems    questions    vary

### Section 2: Scientific Methods (p.12)

#### What Are Scientific Methods?

1. Scientists answer \_\_\_\_\_ and solve \_\_\_\_\_ using scientific methods.
2. The order that scientists use steps for investigations isn't always the same; it may \_\_\_\_\_.
3. Look at Figure 1. Is the order of the steps of the scientific method always the same? \_\_\_\_\_

#### Ask a Question (p.13)

- \_\_\_\_\_ 4. What usually happens when someone observes something that is hard to explain?
- a. they ask questions.    b. they do experiments    c. they forget about it.    d. they do nothing.

#### Make Observations (p.13)

5. The students made observations when they \_\_\_\_\_ numbers of deformed frogs and normal frogs.
6. The students photographed the frogs and took \_\_\_\_\_ of them, as well as writing descriptions.
7. Observations are useful only if they are made \_\_\_\_\_.



#### Types of Observations (p.13)

8. Information that you gather through your senses is called an \_\_\_\_\_.
- \_\_\_\_\_ 9. Look in Figure 2. Which of these tools is this scientist using to make their observations?  
a. a hammer    b. a calculator    c. a microscope    d. a spoon

hypothesis    observations    prediction    results    tested

#### Form a Hypothesis (p.14)

10. A possible explanation or answer to a question is called a \_\_\_\_\_.
11. A good hypothesis should be based on \_\_\_\_\_, and can be \_\_\_\_\_.
- \_\_\_\_\_ 12. Which of the following was a possible explanation for the deformed frogs?  
a. UV light    b. chemical pollutants    c. parasites    d. all of these

#### Predictions (p.15)

13. A statement of cause and effect that can help test a hypothesis is a \_\_\_\_\_.
- \_\_\_\_\_ 14. How are predictions usually stated?  
a. as a question    b. in an if-then format    c. in code    d. as a hypothesis
15. Scientists do experiments to see if \_\_\_\_\_ match their predictions.

turn this page over for more questions

# Investigation and Experimentation

## Scientific Methods

Name:

Period:

controlled data factor variable

### Test the Hypothesis (p.16)

16. Anything in an experiment that can influence an experiment's outcome is considered a \_\_\_\_\_.
17. An experiment that tests only one factor at a time is a \_\_\_\_\_ experiment.
18. The one factor that differs between groups in an experiment is the \_\_\_\_\_.

### Designing an Experiment (p.16)

- \_\_\_\_\_ 19. What must be considered when you design an experiment?  
a. every factor      b. temperature      c. many variables      d. light
- \_\_\_\_\_ 20. Look at Table 1. Which of the following is true about the control group for the experiment?  
a. it has a different number of eggs than the other groups  
b. its frogs are not the same as the frogs in the experimental groups  
c. its temperature is the highest of all the groups  
d. it is not exposed to UV light, unlike the experimental groups



### Collecting Data (p.17)

- \_\_\_\_\_ 21. Why do scientists try to test many individuals?  
a. to be more certain of their data      c. to study many variables  
b. to make a new hypothesis      d. to have a big experiment
- \_\_\_\_\_ 22. What is one way that scientists can support their conclusions?  
a. by stopping their investigation      c. by repeating experiments  
b. by telling other scientists      d. by asking different questions

23. Look at Figure 6. Which group had the greatest number of deformed frogs? \_\_\_\_\_

### Analyze the Results (p.17)

24. Scientists must organize their \_\_\_\_\_ before they can analyze the results of an experiment.

### Draw Conclusions (p.18)

- \_\_\_\_\_ 25. What are scientists deciding when they draw conclusions?  
a. whether to put the data in a graph      c. whether the results support their hypothesis  
b. which factor is the variable      d. which group should be the control group
- \_\_\_\_\_ 26. What must a scientist do when a hypothesis is proved wrong?  
a. organize the data again      b. find another explanation      c. tell people it was right      d. retire from science

### What Is the Answer? (p.18)

- \_\_\_\_\_ 27. What is true about finding an answer to a science question?  
a. It may lead to another investigation.      c. The original question was not good.  
b. No more questions can come up.      d. The experiment was done wrong.

### Communicate Results (p.18)

- \_\_\_\_\_ 28. Why do scientists share their results?  
a. so other scientists can make money from them      c. to practice their writing  
b. so other scientists can repeat the experiments      d. to hide their mistakes