Name_____ Class_____ Date _____

Section 1–2 How Scientists Work (pages 8–14)

Key Concepts

- How do scientists test hypotheses?
- How does a scientific theory develop?

Designing an Experiment (pages 8–10)

1. The idea that life can arise from nonliving matter is called _____.

2. What was Francesco Redi's hypothesis about the appearance of maggots?

_____

3. What are variables in an experiment? _____

4. Ideally, how many variables should an experiment test at a time? _____

_____

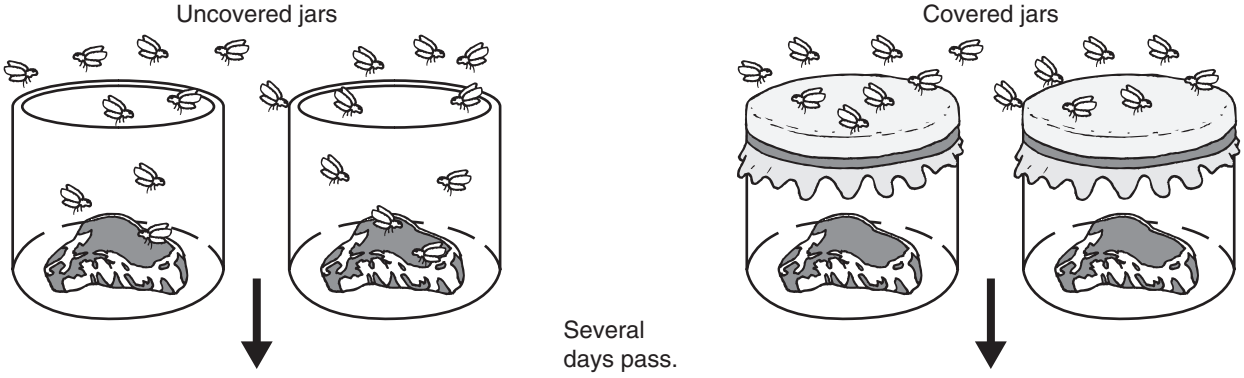
5. What is a controlled experiment? _____

_____

_____

6. The illustration below shows the beginning of Redi's experiment. Complete the illustration by showing the outcome.

Redi's Experiment on Spontaneous Generation



Name_____ Class_____ Date _____

7. Complete the table about variables.

VARIABLES

Type of Variable	Definition
Manipulated variable	
Responding variable	

8. In Redi's experiment, what were the manipulated variable and the responding variable?

_____

_____

_____

9. For what do scientists use the data from a controlled experiment? _____

_____

10. When scientists look for explanations for specific observations, what do they assume about nature? _____

_____

Repeating Investigations (pages 10–12)

11. Why do scientists assume that experimental results can be reproduced?

_____

_____

12. What did Anton van Leeuwenhoek discover? _____

_____

_____

13. What did John Needham conclude from his test of Redi's findings? _____

_____

_____

14. What did Spallanzani do to improve upon Redi's and Needham's work? _____

_____

_____

15. How did Pasteur settle the spontaneous generation argument? _____

_____

_____

Name_____ Class_____ Date _____

When Experiments Are Not Possible (page 13)

16. In animal field studies, why do scientists usually try to work without making the animals aware that humans are present? _____

_____

_____

17. When a controlled experiment is not possible, why do scientists try to identify as many relevant variables as possible? _____

_____

How a Theory Develops (pages 13–14)

18. In science, what is a theory? _____

_____

19. Is the following sentence true or false? A theory may be revised or replaced by a more useful explanation. _____

Reading Skill Practice

A flowchart can help you remember the order in which a set of events has occurred or should occur. On a separate sheet of paper, create a flowchart that represents the process that Redi carried out in his investigation of spontaneous generation. This process is explained under the heading Designing an Experiment on pages 8–10. For more information about flowcharts, see Organizing Information in Appendix A of your textbook.