SECTION 1-1 REVIEW

WHAT IS SCIENCE?

VOCABULARY REVIEW  Define the following terms.

1. science  ____________________________________________________________
   ____________________________________________________________

2. data  ____________________________________________________________
   ____________________________________________________________

3. hypothesis  ______________________________________________________
   ____________________________________________________________

4. inference  ________________________________________________________
   ____________________________________________________________

MULTIPLE CHOICE  Write the correct letter in the blank.

_____ 1. Which of the following is not a goal of science?
   a. to investigate and understand the natural world
   b. to explain events in the natural world
   c. to use data to support your own beliefs
   d. to use scientific explanations to make useful predictions

_____ 2. Information gathered from observing a plant that grows 3 cm over a two week period may be recorded as
   a. quantitative data.  b. qualitative data.  c. nonsense data.  d. All of the above.

_____ 3. A controlled experiment allows the scientist to isolate and test
   a. a conclusion.  c. a mass of information.
   b. several variables at once.  d. a single variable.

_____ 4. A(n) _____________ is a logical interpretation based on prior knowledge or experience.
   a. inference  c. hypothesis
   c. observation  d. theory

_____ 5. Which of the following is not a way that scientists generate hypotheses?
   a. using informed, creative imagination  c. using logical inferences
   c. using prior knowledge  d. using a feeling about what should occur
SHORT ANSWER  Answer the questions in the space provided.

1. What is the goal of science?  (p.3)
   ____________________________________________________________
   ___________________________________________________________________

2. What is an observation?  (p.4)
   ____________________________________________________________
   ___________________________________________________________________

3. What is an inference?  (p.4)
   ____________________________________________________________
   ___________________________________________________________________

4. What do scientists assume about the universe?  (p.6)
   ____________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

5. Is the following statement true or false?  A community must use its shared values to make decisions about scientific
   issues.  Explain your answer.  (p.7)
   ____________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

6. Complete the table below. It will help you to better understand the difference between **qualitative** and **quantitative**
   data.

<table>
<thead>
<tr>
<th>Type of Data</th>
<th>Data Involves</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Characteristics that cannot be easily counted or measured in some way</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Is a scientific hypothesis accepted if there is no way to test it?  Explain your answer.  (p.5)
   ____________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
VOCABULARY REVIEW  Define the following terms.

1. spontaneous generation

2. controlled experiment

3. manipulated variable

4. responding variable

5. theory

MULTIPLE CHOICE  Write the correct letter in the blank.

_____ 1. Ideally, how many variables should an experiment test at a time?
   a. one  b. two  c. three  d. None of the above.

_____ 2. In a(n) ______________ experiment, only one variable is changed at a time, while other variables are kept the same.
   a. virtual  b. unrealistic  c. controlled  d. hypothetical

_____ 3. Of the following steps in a scientific investigation, the first to be done is usually
   a. experimenting.  b. forming a theory.  c. producing a model.  d. hypothesizing.

_____ 4. A theory
   a. is always true.  c. is the opening statement of an experiment.
   b. may be revised or replaced.  d. is a problem to be solved.

_____ 5. The term spontaneous generation means that
   a. living things can arise from nonliving things.  c. living things arise from other living things.
   b. a maggot is part of a life cycle of a fly.  d. living things evolve over time.
SHORT ANSWER  Answer the questions in the space provided.

1. Describe a historical experiment performed to test the theory of spontaneous generation. Use either Redi’s (p.9) or Pasteur’s experiment. (p.12)

____________________________________________________________________________________________
____________________________________________________________________________________________
____________________________________________________________________________________________

2. Use the numbers 1 - 5 to place the following steps of an experimental investigation in the correct order. One is the first step and five is the last step. (pp.8-10)

______ a. draw a conclusion _______ b. set up a controlled experiment
______ e. ask a question _______ d. form a hypothesis _______ e. record data

3. How are a hypothesis and a theory related? (p.13)

____________________________________________________________________________________________
____________________________________________________________________________________________
____________________________________________________________________________________________

4. A scientist wanted to study the effect of a medicine on the blood pressure of rats. She set up an experiment in which the experimental group consisted of rats that were injected with a salt solution containing the medicine. What should the control group consist of? (p.9)

____________________________________________________________________________________________
____________________________________________________________________________________________

What were the manipulated and responding variables in her experiment? (p.9)

____________________________________________________________________________________________
____________________________________________________________________________________________

5. Examine the drawing of the owl. In each space below, provide an observation that would support the inference given or provide an inference that could be derived from the observation given.

<table>
<thead>
<tr>
<th>Observations</th>
<th>Inferences</th>
</tr>
</thead>
<tbody>
<tr>
<td>_______________________________________________</td>
<td>Owls live in trees.</td>
</tr>
<tr>
<td>_______________________________________________</td>
<td>Owls feed on mice.</td>
</tr>
<tr>
<td>_______________________________________________</td>
<td>Owls kill prey with their claws.</td>
</tr>
<tr>
<td>The owl has wings.</td>
<td></td>
</tr>
<tr>
<td>Both of the owl's eyes face forward.</td>
<td></td>
</tr>
<tr>
<td>It is night.</td>
<td></td>
</tr>
</tbody>
</table>
SECTION 1-3 REVIEW

STUDYING LIFE

VOCABULARY REVIEW  Circle the term that does not belong in each of the following groups, and briefly explain why it does not belong.

1. rocks, cells, metabolism, growth

2. metabolism, photosynthesis, respiration, diversity of life

3. cell division, cell specialization, internal environment, development

4. water content, insulation, reproduction, homeostasis

5. eggs, fertilization, unicellular organisms, offspring

MULTIPLE CHOICE  Write the correct letter in the blank.

_____ 1. Which of the following is not a characteristic of all living things?
   a. growth and development  
   b. response to the environment  
   c. ability to move  
   d. ability to reproduce

_____ 2. The sum of all of the chemical processes that occur in an organism is called
   a. growth.  
   b. metabolism.  
   c. development.  
   d. homeostasis.

_____ 3. Which of the following terms includes all of the others?
   a. biologist  
   b. botanist  
   c. zoologist  
   d. microbiologist

_____ 4. The process by which an adult body form arises is called
   a. fertilization.  
   b. metabolism.  
   c. development.  
   d. respiration.

_____ 5. Many of the organisms living today have not been identified because they are
   a. very large.  
   b. extinct.  
   c. not composed of cells.  
   d. residents of deep ocean waters.
SHORT ANSWER  Answer the questions in the space provided.

1. List at least six characteristics of living things. (p.15)
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

2. Why do organisms require energy? (p.19)
   __________________________________________________________________________
   __________________________________________________________________________

3. What are the eight levels of organization that biologist study? (p.21)
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

4. What is the difference between sexual and asexual reproduction? (p.17)
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

5. Is reproduction essential to the survival of an individual organism? Explain your answer.
   __________________________________________________________________________
   __________________________________________________________________________

6. Critical Thinking  A female frog has a genetic trait that prevents it from producing eggs. How likely is it that this trait will spread through the frog population? Explain your answer.
   __________________________________________________________________________
   __________________________________________________________________________

   STRUCTURES AND FUNCTIONS  Explain how the drawing below illustrates the characteristics of life.
SECTION 1-4 REVIEW

TOOLS AND PROCEDURES

VOCABULARY REVIEW  Circle the term that does not belong in each of the following groups, and briefly explain why it does not belong.

1. compound light microscope, TEM, centrifuge, SEM

2. Celsius thermometer, stage, nosepiece, objective lens

3. magnification, power of magnification, resolution, mass

4. second, micrometer, meter, kilometer

5. goggles, safety glasses, food, science lab

MULTIPLE CHOICE  Write the correct letter in the blank.

_____ 1. To observe a small living organism, a scientist might use a(n)
   a. electronic balance. b. TEM. c. SEM. d. light microscope.

_____ 2. One limitation of the scanning electron microscope is that it cannot be used to
   a. examine specimens smaller than cells.
   b. view living specimens.
   c. produce an enlarged image of a specimen.
   d. produce an image of the surface of a specimen.

_____ 3. A microscope with a 10x ocular lens and a 25x objective lens has a total power of magnification equal to
   a. 2.5x. b. 35x. c. 250x. d. 2,500x.

_____ 4. The SI base unit for mass in the metric system is
   a. meter. b. ounce. c. liter. d. gram.

_____ 5. The SI prefix that represents 1,000 times the base unit is
   a. deci. b. centi. c. kilo. d. milli.
SHORT ANSWER  Answer the questions in the space provided.

1. Arrange the following parts in the order that matches the light path through a light microscope: (p.1070)
   specimen, eyepiece, objective lens, body tube, illuminator. _____________________________________________
   ___________________________________________________________________________________________

2. What is the single most important rule for your safety while working in a laboratory? (p.28)______________
   ___________________________________________________________________________________________

3. Write the abbreviation for each of the following units: (p.1069) kilometer, centimeter, millimeter, milliliter, gram.
   ___________________________________________________________________________________________
   What is the mathematical relationship between all units in the metric system? _________________________
   ___________________________________________________________________________________________

4. Critical Thinking    A group of scientists want to determine whether the bacteria they are studying have viruses inside them. Which type of microscope should they use? Explain your answer. (p.26)_______________________
   ___________________________________________________________________________________________
   ___________________________________________________________________________________________

STRUCTURES AND FUNCTIONS  Label each part of the figure in the spaces provided. Use the following terms: objective lenses, body tube, illuminator, stage, eyepiece, nosepiece. (p.1070)

[Diagram of microscope with labels]
The crossword puzzle is a simple way to master some of the more important vocabulary terms in this chapter.

Across
1. eats existing food; not an autotroph
3. maintaining an internal balance to a changing environment
4. how clearly objects may be seen when magnified
5. the enlargement of an object
10. process where cells become specialized
12. the abbreviation for deoxyribonucleic acid
13. using a small group to represent the whole group

Down
1. a possible explanation about a problem
2. numerical data; not qualitative
4. creating offspring by sexual or asexual _____
6. produces its own food; not a heterotroph
7. using one's senses
8. the science that studies living things
9. all of the chemical activities within a cell
11. another name for the eyepiece of a microscope

Here are some words in this puzzle that are not found in Chapter 1: autotroph, ocular, heterotroph, differentiation, sampling, and resolution. To complete this puzzle correctly, use a reference source to find their definition.