USING VOCABULARY
To complete the following sentences, choose the correct term from each pair of terms listed, and write the term in the blank.

1. In the cell membrane, _______________ molecules form two layers. (protein or phospholipid)

2. When a planarian worm is cut in half, each half develops into a whole worm. This is an example of _______________ reproduction. (asexual or sexual)

3. _______________ are sometimes called the blueprints of life. (Proteins or Nucleic acids)

4. _______________ is the passing of traits from one generation to the next. (Homeostasis or Heredity)

5. _______________ refers to all of the chemical activities that an organism’s cells perform. (Metabolism or Homeostasis)

UNDERSTANDING CONCEPTS
Multiple Choice
Circle the correct answer.

6. _______ is a complex carbohydrate manufactured by plants.
   a. Oil  c. Starch
   b. Protein d. Hemoglobin

7. When a duck dives under water, its inner eyelids automatically raise to cover the duck’s eyes. In this case, water acts as
   a. homeostasis.  c. a reaction.
   b. a stimulus.  d. an enzyme.

8. The molecule that provides energy for cellular processes is
   a. ATP.  c. RNA.
   b. DNA.  d. protein.

9. The subunits of proteins are
   a. enzymes.  c. nucleotides.
   b. amino acids. d. sugar molecules.

10. Cells do not use _______ for energy storage.
    a. fats  c. carbohydrates
    b. oils  d. nucleic acids
11. Which of the following is NOT true of proteins?
   a. They are a component of spider webs.
   b. They protect cells from foreign material.
   c. They are the primary source of energy for cells.
   d. They speed up chemical reactions.

**Short Answer**

12. What six characteristics do all living things have in common?

13. a. Explain the difference between the structures of simple and complex carbohydrates.

b. Give an example of a food source that contains simple carbohydrates and an example of one that contains complex carbohydrates.
CONCEPT MAPPING
14. Use the following terms to complete the concept map below: oxygen, water, carbon dioxide, sugar, sunlight.

MATH IN SCIENCE
15. After all the water is removed from its body, a certain insect weighs 3 g. Find the insect’s original body weight. (Hint: The water content of an organism’s cells is about 70 percent.) Show your work.
CRITICAL THINKING AND PROBLEM SOLVING

16. An organism’s ability to maintain homeostasis is important to its survival. Explain why an organism that lives on land has more complex mechanisms to maintain a stable internal environment than do aquatic organisms.

INTERPRETING Graphics

Examine the diagram of a cell membrane below and answer the questions that follow.

17. What does A represent in the diagram above?

18. What can you conclude about the content of the fluid surrounding the cell? Explain.
Chapter 2 Test

 USING VOCABULARY  (Recommended 3 pts. each)
To complete the following sentences, choose the correct term from each pair of terms listed, and write the term in the blank.

1. In the cell membrane, __________ molecules form two layers. (protein or phospholipid)
2. When a planarian worm is cut in half, each half develops into a whole worm. This is an example of __________ reproduction. (asexual or sexual)
3. __________ are sometimes called the blueprints of life. (Proteins or Nucleic acids)
4. __________ is the passing of traits from one generation to the next. (Homeostasis or Heredity)
5. __________ refers to all of the chemical activities that an organism’s cells perform. (Metabolism or Homeostasis)

UNDERSTANDING CONCEPTS

Multiple Choice  (Recommended 4 pts. each)
Circle the correct answer.

6. __________ is a complex carbohydrate manufactured by plants.
   a. Oil                  c. Starch
   b. Protein             d. Hemoglobin

7. When a duck dives under water, its inner eyelids automatically raise to cover the duck’s eyes. In this case, water acts as
   a. a homeostasis.      c. a reaction.
   b. a stimulus.         d. an enzyme.

8. The molecule that provides energy for cellular processes is
   a. ATP.                 c. RNA.
   b. DNA.                d. protein.

9. The subunits of proteins are
   a. enzymes.             c. nucleotides.
   b. amino acids.        d. sugar molecules.

10. Cells do not use __________ for energy storage.
    a. fats                  c. carbohydrates
    b. oils                d. nucleic acids
11. Which of the following is NOT true of proteins?
   a. They are a component of spider webs.
   b. They protect cells from foreign material.
   c. They are the primary source of energy for cells.
   d. They speed up chemical reactions.

**Short Answer (Recommended 7 pts. each)**

12. What six characteristics do all living things have in common?

   All living things are composed of one or more cells. They all sense change in their environment
   and have the ability to respond to change. All living things reproduce organisms like themselves.
   They all use energy. They all grow and develop during periods of their lives. All living things have
   DNA.

13. a. Explain the difference between the structures of simple and complex carbohydrates.

   Simple carbohydrates are made of one or a few sugar molecules linked together. Complex
   carbohydrates are linkages of many simple sugar molecules.

   b. Give an example of a food source that contains simple carbohydrates and an example of one that contains complex carbohydrates.

   Sample answer: The sugar found in fruit is a simple carbohydrate. The starch found in potatoes
   is a complex carbohydrate.
CONCEPT MAPPING  (Recommended 2 pts. each)
14. Use the following terms to complete the concept map below: oxygen, water, carbon dioxide, sugar, sunlight.

MATH IN SCIENCE  (Recommended 9 pts.)
15. After all the water is removed from its body, a certain insect weighs 3 g. Find the insect’s original body weight. (Hint: The water content of an organism’s cells is about 70 percent.) Show your work.

If water makes up 70 percent of the organism’s weight, then 3 g is 30 percent of the weight.

If \( x = \) original weight and \( 0.3x = 3 \) g, then \( x = 10 \) g. The original body weight was 10 g.
CRITICAL THINKING AND PROBLEM SOLVING (Recommended 12 pts.)

16. An organism’s ability to maintain homeostasis is important to its survival. Explain why an organism that lives on land has more complex mechanisms to maintain a stable internal environment than do aquatic organisms.

The conditions of a land environment can change from hot to cold or wet to dry in a short amount of time. An organism that lives on land must have homeostatic mechanisms to regulate its water balance and body temperature. In this way, the organism can keep its internal environment stable. Water changes temperature more slowly than air does and always provides a moist environment. Therefore, organisms living in water do not need as many homeostatic mechanisms as land-dwelling organisms do.

INTERPRETING GRAPHICS (Recommended 8 pts. each)

Examine the diagram of a cell membrane below and answer the questions that follow.

17. What does A represent in the diagram above?

A represents the heads of phospholipid molecules.

18. What can you conclude about the content of the fluid surrounding the cell? Explain.

The fluid surrounding the cell must contain water. The heads of phospholipid molecules are attracted to water, but the tails are not.