2-4 Cells and Energy

True/False
Indicate whether the statement is true or false.

____ 1. The shape of a cell may tell you something about the job the cell does.

____ 2. Diffusion is a type of active transport.

____ 3. Only animals undergo respiration.

____ 4. Passive transport takes place without the use of energy.

____ 5. Animals use chlorophyll to produce glucose.

____ 6. Photosynthesis results in the release of oxygen.

____ 7. In respiration, glucose is broken down.

____ 8. Photosynthesis releases energy.

____ 9. Glucose and oxygen are the result of respiration.

____ 10. Energy is stored during photosynthesis.

____ 11. Carbon dioxide, water, and energy are the result of aerobic respiration.

____ 12. Light energy, water, and carbon dioxide are at the start of photosynthesis.

____ 13. Respiration takes place in the cells of Eukaryotic organisms.

____ 14. Glucose and oxygen are at the start of photosynthesis.

____ 15. Photosynthesis takes place in cells with chloroplasts.

Multiple Choice
Identify the choice that best completes the statement or answers the question. Write the letter on the blank line to the left of the question.

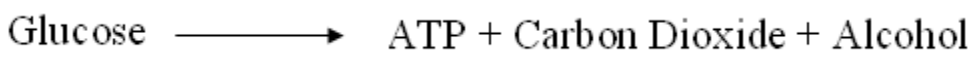
____ 1. Photosynthesis occurs at the cell level. Which organelle is necessary for photosynthesis?
a. Golgi apparatus
b. chloroplasts
c. mitochondrion
d. rough endoplasmic reticulum

____ 2. What is the main difference between a prokaryotic cell and an eukaryotic cell?
a. Only prokaryotic cells have vacuoles.
b. Eukaryotic cells are smaller than prokaryotic cells.
c. Prokaryotic cells have many organelles, each with their own specialized functions.
d. Only eukaryotic cells have its genetic material surrounded by a membrane.

____ 3. Which substance is broken down during glycolysis?
a. glucose
b. carbon dioxide
c. cytoplasm
d. water

____ 4. Which substance is released as a waste product during photosynthesis?
a. glucose
b. carbon dioxide
c. cytoplasm
d. oxygen

____ 5. Which type of fermentation is illustrated below?



a. Lactic-Acid Fermentation
b. Alcohol Fermentation
c. Prokaryotic Fermentation
d. None of the above

____ 6. Which form of energy is necessary in photosynthesis?
a. ATP
b. lactic acid
c. glycolysis
d. light

____ 7. During periods of strenuous activity, muscle cells run low on ____.
a. oxygen
b. glucose
c. carbon dioxide
d. lactic acid

____ 8. The process that releases energy without using oxygen is ____.
a. photosynthesis
b. respiration
c. osmosis
d. fermentation

____ 9. Photosynthesis is the process in which plants use energy from light to produce ____.
a. new cells
b. organelles
c. food
d. none of the above

____ 10. Which of the following is NOT involved in photosynthesis or respiration?
a. water
b. carbon dioxide
c. chlorophyll
d. ribosomes

____ 11. Respiration is the process in which organisms break down food to release ____.
a. energy
b. nutrients
c. sugar
d. oxygen

____ 12. The green color of tree leaves is due to green light energy reflected from ____.
a. glucose
b. carbon dioxide
c. chlorophyll
d. water

Completion
Complete each statement.

1. The energy used in photosynthesis comes from _____.

2. _____ is important because it changes food energy into a form all cells can use.

Short Answer. Answer <u>ONE</u> of the following three questions.

1. Why is respiration almost the opposite of photosynthesis? (2 points)

2. Photosynthesis requires carbon dioxide, water, and light energy to make glucose. Explain why photosynthesis slows down as fall approaches. (2 points)

3. Why are photosynthesis and cellular respiration important to Homo Sapiens? (3 points)

2-4 Cells and Energy
Answer Section

TRUE/FALSE

1. ANS: T PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
   REF: To review this topic refer to Cell Structure and Function: Lesson 1
   OBJ: 2-1 STA: 5.3.6.A.2 | 5.3.8.A.1 | 5.3.8.A.2
2. ANS: F
   Diffusion is the movement of substances from an area of higher concentration to an area of lower concentration.

   PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
   REF: To review this topic refer to Cell Structure and Function: Lesson 3
   OBJ: 2-6
3. ANS: F
   All living things, from one-celled organisms to humans, need energy to survive. Cellular respiration is a series of chemical reactions that convert the energy in food molecules into a usable form of energy called ATP.

   PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
   REF: To review this topic refer to Cell Structure and Function: Lesson 4
   OBJ: 2-8 STA: 5.3.8.A.1
4. ANS: T PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
   REF: To review this topic refer to Cell Structure and Function: Lesson 4
   OBJ: 2-7
5. ANS: F
   Humans and other animals convert food energy into ATP through cellular respiration.

   PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
   REF: To review this topic refer to Cell Structure and Function: Lesson 4
   OBJ: 2-7 STA: 5.2.8.B.2
6. ANS: T PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
   REF: To review this topic refer to Cell Structure and Function: Lesson 4
   OBJ: 2-8 STA: 5.2.8.B.2
7. ANS: T PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
   REF: To review this topic refer to Cell Structure and Function: Lesson 4
   OBJ: 2-8 STA: 5.2.8.B.2
8. ANS: F
   Photosynthesis is a series of chemical reactions that convert light energy, water, and CO_2 into the food-energy molecule glucose and give off oxygen.

   PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
   REF: To review this topic refer to Cell Structure and Function: Lesson 4
   OBJ: 2-7 STA: 5.2.8.B.2
9. ANS: F
   Cellular respiration is a series of chemical reactions that convert the energy in food molecules into a usable form of energy called ATP.

PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-7 STA: 5.2.8.B.2

10. ANS: T PTS: 1 DIF: Bloom's Level 1 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-7 STA: 5.2.8.B.2
11. ANS: T PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-8 STA: 5.2.8.B.2
12. ANS: T PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-7 STA: 5.2.8.B.2
13. ANS: T PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-7 STA: 5.2.8.B.2 | 5.3.6.A.2 | 5.3.8.A.2
14. ANS: F
Photosynthesis is a series of chemical reactions that convert light energy, water, and CO_2 into the food-energy molecule glucose and give off oxygen.

PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-8 STA: 5.2.8.B.2 | 5.3.6.A.2 | 5.3.8.A.2
15. ANS: T PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-8 STA: 5.2.8.B.2 | 5.3.6.A.2 | 5.3.8.A.2

MULTIPLE CHOICE

1. ANS: B
Chloroplasts are membrane-bound organelles that use light energy and make food from water and carbon dioxide in a process known as photosynthesis.

PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 2
OBJ: 2-4 STA: 5.3.6.A.2
2. ANS: D PTS: 1 DIF: Bloom's Level 4 | DOK 3-MOD
REF: To review this topic refer to Cell Structure and Function: Lesson 2
OBJ: 2-4 STA: 5.3.8.A.2 | 5.3.8.D.1
3. ANS: A
Glycolysis is a process by which glucose, a sugar, is broken down into smaller molecules.

PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-7 STA: 5.2.8.B.2
4. ANS: D
Photosynthesis is a series of chemical reactions that convert light energy, water, and CO_2 into the food-energy molecule glucose and give off oxygen.

PTS: 1 DIF: Bloom's Level 1 | DOK 1-LOW

REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-8 STA: 5.2.8.B.2

5. ANS: B
Alcohol fermentation produces an alcohol called ethanol and CO_2.

PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-8 STA: 5.2.8.B.2

6. ANS: D
Photosynthesis requires light energy.

PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-8 STA: 5.2.8.B.2

7. ANS: A
Sometimes when you exercise, your cells don't have enough oxygen to make ATP through cellular respiration.

PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-8 STA: 5.3.8.A.1 | 5.3.8.A.2

8. ANS: D
Fermentation is a reaction that eukaryotic and prokaryotic cells use to obtain energy from food when oxygen levels are low.

PTS: 1 DIF: Bloom's Level 1 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-8 STA: 5.3.8.A.1 | 5.3.8.A.2

9. ANS: C
Photosynthesis is a series of chemical reactions that convert light energy, water, and CO_2 into the food-energy molecule glucose and give off oxygen.

PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-8 STA: 5.2.8.B.2 | 5.3.6.A.2

10. ANS: D
Cellular respiration is a series of chemical reactions that convert the energy in food molecules into a usable form of energy called ATP. Photosynthesis is a series of chemical reactions that convert light energy, water, and CO_2 into the food-energy molecule glucose and give off oxygen.

PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-8 STA: 5.2.8.B.2 | 5.3.6.A.2

11. ANS: A
Cellular respiration is a series of chemical reactions that convert the energy in food molecules into a usable form of energy called ATP.

PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
REF: To review this topic refer to Cell Structure and Function: Lesson 4
OBJ: 2-7 STA: 5.2.8.B.2

12. ANS: C
    When chlorophyll absorbs light, it absorbs all colors except green.

    PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
    REF: To review this topic refer to Cell Structure and Function: Lesson 4
    OBJ: 2-8 STA: 5.2.8.B.2

COMPLETION

1. ANS: the Sun

    PTS: 1 DIF: Bloom's Level 2 | DOK 1-LOW
    REF: To review this topic refer to Cell Structure and Function: Lesson 4
    OBJ: 2-7 STA: 5.2.8.B.2 | 5.3.6.A.2 | 5.3.8.A.2
2. ANS: Respiration

    PTS: 1 DIF: Bloom's Level 3 | DOK 1-LOW
    REF: To review this topic refer to Cell Structure and Function: Lesson 4
    OBJ: 2-8 STA: 5.2.8.B.2 | 5.3.6.B.2

SHORT ANSWER

1. ANS:
    Photosynthesis uses carbon dioxide and water to produce sugars and oxygen. Respiration uses sugars and oxygen to produce carbon dioxide and water.

    PTS: 1 DIF: Bloom's Level 4 | DOK 2-MOD
    REF: To review this topic refer to Cell Structure and Function: Lesson 4
    OBJ: 2-8 STA: 5.2.8.B.2
2. ANS:
    In the fall, there are fewer hours of daylight, so plants receive less light energy from the Sun for photosynthesis.

    PTS: 1 DIF: Bloom's Level 3 | DOK 1-LOW
    REF: To review this topic refer to Cell Structure and Function: Lesson 4
    OBJ: 2-8 STA: 5.2.8.B.2
3. ANS:
    Photosynthesis produces the oxygen needed to breathe and produces the food eaten in one form or another. Respiration breaks done the glucose into ATP, a usable form of energy.

    PTS: 1 DIF: Bloom's Level 3 | DOK 1-LOW
    REF: To review this topic refer to Cell Structure and Function: Lesson 4
    OBJ: 2-8 STA: 5.2.8.B.2