Cells and Energy

A. Cellular Respiration

1. All ________________ things need energy to survive.
2. ________________ is a series of chemical reactions that convert the energy in food molecules into a usable form of energy called ATP.
3. The first step of cellular respiration, called glycolysis, occurs in the ________________ of all cells.
4. During glycolysis ________________, a sugar, is broken into smaller molecules.
5. The second step of cellular respiration occurs in the ________________ of eukaryotic cells. This step requires ________________.
6. During the second step of cellular respiration, the smaller molecules made during ________________ are broken down. Large amounts of usable energy, called ________________, are produced.
7. ________________ and carbon dioxide (CO₂) are two waste products that are given off during the second step of cellular respiration.

B. Fermentation

1. Eukaryotic and prokaryotic cells use fermentation to obtain energy from food when ________________ levels are low.
2. Fermentation occurs in a cell’s ________________.
3. Lactic-acid fermentation converts ________________ into ATP and a waste product called lactic acid.
4. Some types of bacteria and yeasts make ATP during ________________ fermentation. This process produces ________________ and CO₂.

C. Photosynthesis

1. Plants and some unicellular organisms obtain energy from ________________.
2. Photosynthesis is a series of chemical reactions that convert light energy, water, and CO₂ into ________________ and ________________.
3. In plants, light energy is absorbed by ________________ such as chlorophyll.
Lesson Outline continued

4. The chemical reactions of photosynthesis occur in ________________, the organelles in plant cells that convert light energy into food.

5. Photosynthesis uses CO₂ that is released during ________________ to make food energy and release oxygen.

6. When an organism eats plant material, it takes in ________________ energy. An organism’s cells use ________________ released during photosynthesis.
<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
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Cells and Energy

Directions: In this word search puzzle, find and circle the four terms listed below. Then write each term on the line before its definition.

1. ___________
2. ___________
3. ___________
4. ___________

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1. Cells use oxygen in this process to convert food energy into ATP.
2. This is a reaction used by cells to obtain energy from food when oxygen levels are low.
3. This process breaks apart glucose.
4. This process converts light energy into glucose and releases oxygen.
Lesson 4  Cells and Energy


Skim or scan the heading, boldfaced words, and pictures in the lesson. Identify or predict three facts you will learn from the lesson. Discuss your thoughts with a classmate.

Main Idea

Cellular Respiration

I found this on page ________.

Organize information about cellular respiration.

What it is: a series of

What it does: converts

into ________________

Where it occurs:

1. ________________

2. ________________

Summarize the first step in the process of cellular respiration.  
Then label the steps in the diagram on the left.

First Step of Cellular Respiration

occurs in ________________

is called ________________, a process that

breaks ________________ into ________________

produces some ________________ molecules
Lesson 4 | Cells and Energy (continued)

Main Idea

I found this on page ________.

Details

Describe the second step of cellular respiration.

Define fermentation by completing the sentences.

When cells do not have enough _____________ to make ___________ through ________________________, they use a process called _______________________. Because no _________________ is used, less _____________ is produced than in _________________________________.

Compare fermentation to cellular respiration.

<table>
<thead>
<tr>
<th></th>
<th>Fermentation</th>
<th>Cellular Respiration</th>
</tr>
</thead>
<tbody>
<tr>
<td>What gets broken down?</td>
<td></td>
<td></td>
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<td>Where does the breakdown occur?</td>
<td></td>
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<td>Is energy released?</td>
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</tbody>
</table>

Sequence the 2 types of fermentation.

muscle cells use ___________ to produce ___________ + 

yeast cells use ___________ to produce ___________ + 

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Main Idea

**Photosynthesis**

I found this on page ________.

Diagram the reactions that occur in chloroplasts during photosynthesis in the space below. Show what goes into and comes out of this process. Use these terms:

- sugar
- oxygen
- light energy
- water
- carbon dioxide

Create a cycle diagram that shows the relationship between photosynthesis and cellular respiration. Use the terms chloroplast, glucose, oxygen, water, carbon dioxide, light energy, and mitochondrion in your model.

Analyze It

Why is photosynthesis important to living things other than plants?
Use Vocabulary

Use the vocabulary from the chapter to complete the sentences below.

1. Substances formed by joining smaller molecules together are called ________________.

2. The ____________________ consists of proteins joined together to create fiberlike structures inside cells.

3. The movement of substances from an area of high concentration to an area of low concentration is called ________________.

4. A process that uses oxygen to convert energy from food into ATP is ________________ ________________.

Link Vocabulary and Key Concepts

Use vocabulary terms from the chapter to complete the concept map below.

- cell membrane
- shape
- movement of materials by diffusion
- active transport
- carbohydrates
- macromolecules
- energy obtained by fermentation

5. ____________________

6. ____________________

7. ____________________

8. ____________________

9. ____________________

10. ____________________

11. ____________________

12. ____________________

13. ____________________
Understand Key Concepts

Circle the correct answer below.

1. Cholesterol is which type of macromolecule? **SC.6.L.14.2**
   A. carbohydrate
   B. lipid
   C. nucleic acid
   D. protein

2. Genetic information is stored in which macromolecule? **SC.6.L.14.2**
   A. DNA
   B. glucose
   C. lipid
   D. starch

3. The arrow below is pointing to which cell part? **SC.6.L.14.4**

A. chloroplast
B. mitochondrion
C. cell membrane
D. cell wall

   A. lipids
   B. proteins
   C. contained in mitochondria
   D. storage compartments

5. Which is true of fermentation? **SC.6.L.14.3**
   A. does not generate energy
   B. does not require oxygen
   C. occurs in mitochondria
   D. produces lots of ATP

   A. endocytosis
   B. exocytosis
   C. osmosis
   D. photosynthesis

7. Which cell shown below can send signals over long distances? **SC.6.L.14.4**

A. 
B. 
C. 
D. 

8. The figure below shows a cell. What is the arrow pointing to? **SC.6.L.14.3**

A. chloroplast
B. cytoplasm
C. mitochondrion
D. nucleus
Chapter 10 Review continued

Critical Thinking
Use the lines below to respond to the following questions.

9. Evaluate the importance of the microscope to biology. SC.6.L.14.2

10. Summarize the role of water in cells. LA.6.2.2.3

11. Hypothesize how new cells form from existing cells. SC.6.L.14.2

12. Distinguish between channel proteins and carrier proteins. LA.6.2.2.3


Chapter 10 Review continued

Critical Thinking
Use the lines below to respond to the following questions.

15. **Compare** the amounts of ATP generated in cellular respiration and fermentation.  **LA.6.2.2.3**

16. **Assess** the role of fermentation in baking bread.  **SC.6.L.14.3**

17. **Hypothesize** how air pollution like smog affects photosynthesis.  **SC.6.L.14.3**

18. **Compare** prokaryotes and eukaryotes by copying and filling in the table below.  **SC.6.L.14.3**

<table>
<thead>
<tr>
<th>Structure</th>
<th>Prokaryote (yes or no)</th>
<th>Eukaryote (yes or no)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell membrane</td>
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<tr>
<td>DNA</td>
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<tr>
<td>Nucleus</td>
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<tr>
<td>Endoplasmic reticulum</td>
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<tr>
<td>Golgi apparatus</td>
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<tr>
<td>Cell wall</td>
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