

Assess Your Understanding

Photosynthesis

How Do Living Things Get Energy From the Sun?

1a. **IDENTIFY** An organism that makes its own food is a(n) (autotroph/heterotroph).

b. **EXPLAIN** Why do living things need energy?

c. **APPLY CONCEPTS** Give an example of how energy from the sun gets into your cells.

got it?.....

I get it! Now I know that living things get energy by _____ or indirectly by _____

I need extra help with _____

What Happens During Photosynthesis?

2a. **NAME** Circle two products of photosynthesis. glucose/carbon dioxide/oxygen/chlorophyll

b. **INTERPRET DIAGRAMS** Refer to Figure 3 on page 48 of your textbook. Where does the hydrogen that is used in Stage 2 of photosynthesis come from?

c. **CHALLENGE** Would you expect a plant to produce more oxygen on a sunny day or cloudy day? Explain.

got it?.....

I get it! Now I know that during photosynthesis _____

I need extra help with _____

Place the outside corner, the corner away from the dotted line, in the corner of your copy machine to copy onto letter-size paper.

Lesson Quiz

Photosynthesis

Write the letter of the correct answer on the line at the left.

1. ____ Another name for a heterotroph is a
 A producer
 B raw material
 C consumer
 D plant
2. ____ Which of the following is not true about the products of photosynthesis?
 A Some of the sugar is made into other compounds, such as cellulose.
 B Some of the sugar is stored in the plant's cells for later use.
 C The waste product carbon dioxide is given off through tiny openings on the underside of the leaves.
 D The products are used by both plants and animals for energy.
3. ____ Which of the following represents the raw materials of photosynthesis?
 A carbon dioxide and oxygen
 B carbon dioxide and water
 C glucose and oxygen
 D water and glucose
4. ____ The main characteristic of the first stage of photosynthesis is
 A the production of hydrogen and energy
 B the production of hydrogen and glucose
 C the release of oxygen and carbon dioxide
 D the storage of glucose in the plant's cells

If the statement is true, write *true*. If the statement is false, change the underlined word or words to make the statement true.

5. _____ Autotrophs are also known as producers.
6. _____ The ultimate source of energy for all living things is the leaf.
7. _____ Plants are able to carry out photosynthesis because they contain the organelle known as a(n) mitochondrion.
8. _____ One important sugar that results from photosynthesis is cellulose.
9. _____ Light energy is changed to cell energy in Stage 1 of photosynthesis.
10. _____ The green pigment that absorbs light energy is chlorophyll.

Assess Your Understanding

Cellular Respiration

What Happens During Cellular Respiration?

1a. INTERPRET DIAGRAMS Look at Figure 2 on page 52 of your textbook.
How does Stage 2 of cellular respiration benefit a cell?

b. RELATE CAUSE AND EFFECT Why does cellular respiration add carbon dioxide to the atmosphere, but photosynthesis does not?


got it?.....

I get it! Now I know that during cellular respiration, cells _____

I need extra help with _____

What Happens During Fermentation?

2a. DEVELOP HYPOTHESES When a race ends, why do you think runners continue to breathe fast and deeply for a few minutes?

b. ANSWER  How do living things get energy?

got it?.....

I get it! Now I know fermentation is a way for cells to _____

I need extra help with _____

Place the outside corner, the corner away from the dotted line, in the corner of your copy machine to copy onto letter-size paper.

Key Concept Summaries

Cellular Respiration

What Happens During Cellular Respiration?

<p>Cellular respiration is the process by which cells obtain energy from glucose, which is the most common sugar in foods and the result of the breakdown of foods. During cellular respiration, cells break down glucose and other molecules from food in the presence of oxygen, releasing energy.</p>	<p>broken down into smaller molecules. Only a small amount of energy is released. In the second stage, which takes place in the mitochondria, the small molecules react, producing a great deal of energy. The balanced equation for cellular respiration is:</p> $C_6H_{12}O_6 + 6 O_2 \rightarrow 6 H_2O + 6 CO_2 + \text{energy}$
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<p>Living things continuously carry out cellular respiration in order to have a constant supply of energy. In the first stage of cellular respiration, which takes place in the cytoplasm of a cell, molecules of glucose are</p>	<p>Photosynthesis and cellular respiration can be thought of as opposite processes.</p>
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What Happens During Fermentation

<p>Fermentation is an energy-releasing process that does not require oxygen. During fermentation, cells release energy from food without using oxygen. Fermentation releases much less energy than cellular respiration does. One type of fermentation, called alcoholic fermentation, produces alcohol, carbon</p>	<p>dioxide, and a small amount of energy. It takes place in yeast and other single-celled organisms. Lactic acid fermentation produces lactic acid and occurs in the cells of muscles that must produce lots of energy with only a little available oxygen.</p>
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On a separate sheet of paper, compare and contrast the processes of cellular respiration and fermentation.

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Lesson Quiz

Cellular Respiration

If the statement is true, write *true*. If the statement is false, change the underlined word or words to make the statement true.

1. _____ Fermentation is the opposite process of cellular respiration.
2. _____ Fermentation in yeast produces lactic acid.
3. _____ In the first stage of respiration, very little energy is released.
4. _____ Oxygen is a product of cellular respiration.
5. _____ Glucose is a product of photosynthesis.

Fill in the blank to complete each statement.

6. Pain and weakness in human muscles cells are often the result of the buildup of _____.
7. Plant and animal cells release energy from food as a result of the process of _____.
8. The energy-releasing process that does not require oxygen is _____.
9. _____ are the powerhouses of the cell because they are the organelles in which the second stage of cellular respiration takes place.
10. The products of photosynthesis are the _____ of cellular respiration.

Assess Your Understanding

Cell Division

What Are the Functions of Cell Division?

got it?.....

I get it! Now I know the functions of cell division are _____

I need extra help with _____

What Happens During the Cell Cycle?

1a. LIST What are the three stages of the cell cycle?

b. SEQUENCE Put the following terms in correct order: anaphase, telophase, metaphase, prophase.

c. PREDICT What do you think would happen if a cell's DNA did not replicate correctly?

got it?.....

I get it! Now I know that during the cell cycle _____

I need extra help with _____

Place the outside corner, the corner away from the dotted line, in the corner of your copy machine to copy onto letter-size paper.

Key Concept Summaries

Cell Division

What Are the Functions of Cell Division?

Cell division allows organisms to grow, repair damaged structures, and reproduce. Many single-celled organisms reproduce simply through cell division. Other organisms reproduce when cell	division leads to the growth of new structures. Most organisms reproduce when specialized cells from two different parents combine, forming a new cell.
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What Happens During the Cell Cycle?

The regular sequence of growth and division that cells undergo is known as the cell cycle . During the cell cycle, a cell grows, prepares for division, and divides into two new cells, which are called "daughter cells." The cell cycle consists of three main stages: interphase, mitosis, and cytokinesis.	distributed to each nucleus of each daughter cell. There are four parts to mitosis: prophase, metaphase, anaphase, and telophase. The final stage of the cell cycle is cytokinesis , in which the cytoplasm divides. When cytokinesis is complete, two new cells have formed, each having the same number of chromosomes as the original parent cell. During cytokinesis in animal cells, the cell membrane squeezes together around the middle of the cell, and the cell pinches into two cells. In plant cells, the rigid cell wall cannot squeeze together. Instead, a structure called a cell plate forms across the middle of the cell and begins to form new cell membranes between the two daughter cells. New cell walls then form around the cell membranes.
During interphase , the cell grows, makes a copy of its DNA, and prepares to divide into two new cells. The process by which a cell makes an exact copy of the DNA in its nucleus is called replication . At the end of replication, the cell contains two identical sets of chromosomes , which are the threadlike structures made up of proteins and DNA found in the nucleus.	
Mitosis is the stage during which the cell's nucleus divides into two nuclei and one set of DNA is	

On a separate sheet of paper, describe the stages of the cell cycle. In your description of mitosis, list the four parts in the correct order.

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Lesson Quiz

Cell Division

Write the letter of the correct answer on the line at the left.

1. ____ The total number of cells in an organism increases as a result of which process?
 - A respiration
 - B photosynthesis
 - C cell division
 - D fermentation
2. ____ The formation of a cell plate is a characteristic of
 - A cytokinesis in plant cells
 - B cytokinesis in animal cells
 - C both A and B
 - D neither A nor B
3. ____ Chromatids are held together by a
 - A spindle fiber
 - B centromere
 - C cell plate
 - D centriole
4. ____ The correct order for the parts of mitosis are
 - A prophase, interphase, metaphase, anaphase
 - B telophase, anaphase, metaphase, prophase
 - C interphase, prophase, metaphase, telophase
 - D prophase, metaphase, anaphase, telophase

If the statement is true, write *true*. If the statement is false, change the underlined word or words to make the statement true.

5. _____ Cell division allows organisms to grow, repair damaged structures, and produce energy.
6. _____ Mitosis results in the formation of two daughter cells.
7. _____ The process in which the cell makes an exact copy of the DNA in its nucleus is replication.
8. _____ Cell growth and production of new organelles and enzymes are characteristics of prophase.
9. _____ It would take five cell divisions for one original cell to produce 128 new cells.
10. _____ The two rod-like parts that make up a chromosome are called chromatids.