

Chemical Compounds in Cells (pages 74–78)

Elements and Compounds (pages 74–75)

Key Concept: An element is any substance that cannot be broken down into simpler substances. When two or more elements combine chemically, they form a compound.

- Elements are the basic substances that everything is made of. An **element** cannot be broken down into simpler substances. Oxygen and hydrogen are two elements.
- A **compound** is made of two or more elements that are joined together in a chemical reaction. Water is a compound made of the elements hydrogen and oxygen.
- Most chemical reactions in cells take place in water. Some chemical reactions use water in the reaction itself.
- Many of the compounds that make up living things contain the element carbon. Compounds that contain carbon are called organic compounds.

Answer the following questions. Use your textbook and the ideas above.

1. Any substance that cannot be broken down into simpler substances is a(an) _____.
2. Two or more elements that are joined together chemically are called a(an) _____.
3. Is the following sentence true or false? Many of the chemical reactions in cells take place in carbon. _____

Cell Processes and Energy ▪ *Adapted Reading and Study***Carbohydrates** (page 76)

Key Concept: One important group of organic compounds found in living things is carbohydrates.

- A **carbohydrate** (kahr boh HY drayt) is a compound made of the elements carbon, hydrogen, and oxygen. Carbohydrates give energy.
- Sugars and starches are carbohydrates. When plants make food, they make sugar. Plants store extra sugar as starch.
- All cells use carbohydrates for energy. Carbohydrates also make up the cell wall and the cell membrane.

Answer the following questions. Use your textbook and the ideas above.

4. Circle the letter of each sentence that is true about carbohydrates.
 - a. Carbohydrates have the element nitrogen.
 - b. Cells use carbohydrates for energy.
 - c. Carbohydrates make up some cell parts.
5. Two carbohydrates are sugar and _____.

Lipids (page 76)

Key Concept: Lipids are one important group of organic compounds found in living things.

- **Lipids** are energy-rich compounds made of carbon, hydrogen, and oxygen. Fats, oils, and waxes are examples of lipids.
- Lipids have more energy than carbohydrates.
- Cells store energy as lipids for later use.
- Cell membranes are made mostly of lipids.

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Answer the following questions. Use your textbook and the ideas on page 36.

6. Is the following sentence true or false? Carbohydrates have more energy than lipids. _____
7. Cell membranes are made mostly of _____.

Proteins (page 77)

Key Concept: Proteins are one important group of organic compounds found in living things.

- **Proteins** are large organic compounds. Meat, eggs, fish, and nuts are foods that are high in protein.
- Proteins are made up of many smaller compounds called **amino acids**. There are 20 different amino acids. Cells combine the amino acids in different ways to form thousands of different proteins.
- Most cell structures are made of proteins.
- Proteins called **enzymes** speed up the chemical reactions that take place in cells. Without enzymes, many chemical reactions would not happen.

Answer the following question. Use your textbook and the ideas above.

8. Draw a line from each term to its meaning.

Term	Meaning
amino acid	a. speeds up chemical reactions
enzyme	b. found in foods such as meat, eggs, and fish
protein	c. makes up proteins

Cell Processes and Energy ▪ *Adapted Reading and Study***Nucleic Acids** (page 78)

Key Concept: Nucleic acids are one important group of organic compounds found in living things.

- **Nucleic acids** are long organic compounds that instruct cells in carrying out all their functions.
- One kind of nucleic acid is deoxyribonucleic (dee ahk see ry boh noo KLEE ik) acid, or **DNA**. **DNA** is the genetic material that carries information about an organism. DNA is passed from parents to offspring. DNA is in the nucleus of the cell.
- The information in DNA directs the cell's activities.
- Ribonucleic (ry boh noo KLEE ik) acid, or **RNA**, helps make the proteins that a cell needs. RNA is in the cytoplasm and in the nucleus.

Answer the following questions. Use your textbook and the ideas above.

9. Circle the letter of a function of nucleic acids.
- a. carry information about the cell
 - b. provide energy
 - c. make up cell structures

10. Fill in the table about nucleic acids.

Nucleic Acids		
Type	Role in the Cell	Location in the Cell
DNA	carries information about living things	a. _____
RNA	b. _____ _____	cytoplasm and nucleus