AIMS Multimedia is a leading producer and distributor of educational programs serving schools and libraries for nearly 40 years. AIMS draws upon the most up-to-date knowledge, existing and emerging technologies, and all of the instructional and pedagogical resources available to develop and distribute educational programs in film, videocassette, laserdisc, CD-ROM and CD-i formats.

Persons or schools interested in obtaining additional copies of this AIMS Teaching Module, please contact:

AIMS Multimedia

1-800-FOR-AIMS
1-800-367-2467
Congratulations!

You have chosen a learning program that will actively motivate your students AND provide you with easily accessible and easily manageable instructional guidelines designed to make your teaching role efficient and rewarding.

The AIMS Teaching Module provides you with a video program keyed to your classroom curriculum, instructions and guidelines for use, plus a comprehensive teaching program containing a wide range of activities and ideas for interaction between all content areas. Our authors, educators, and consultants have written and reviewed the AIMS Teaching Modules to align with the Educate America Act: Goals 2000.

This ATM, with its clear definition of manageability, both in the classroom and beyond, allows you to tailor specific activities to meet all of your classroom needs.
RATIONALE

In today's classrooms, educational pedagogy is often founded on Benjamin S. Bloom's “Six Levels of Cognitive Complexity.” The practical application of Bloom's Taxonomy is to evaluate students' thinking skills on these levels, from the simple to the complex: Knowledge (rote memory skills), Comprehension (the ability to relate or retell), Application (the ability to apply knowledge outside its origin), Analysis (relating and differentiating parts of a whole), Synthesis (relating parts to a whole), and Evaluation (making a judgment or formulating an opinion).

The AIMS Teaching Module is designed to facilitate these intellectual capabilities, AND to integrate classroom experiences and assimilation of learning with the students' life experiences, realities, and expectations. AIMS' learner verification studies prove that our AIMS Teaching Modules help students to absorb, retain, and to demonstrate ability to use new knowledge in their world. Our educational materials are written and designed for today's classroom, which incorporates a wide range of intellectual, cultural, physical, and emotional diversities.
ORGANIZATION AND MANAGEMENT

To facilitate ease in classroom manageability, the AIMS Teaching Module is organized in four sections. You are reading Section 1, Introduction to the Aims Teaching Module (ATM).

SECTION 2, INTRODUCING THIS ATM will give you the specific information you need to integrate the program into your classroom curriculum.

SECTION 3, PREPARATION FOR VIEWING provides suggestions and strategies for motivation, language preparedness, readiness, and focus prior to viewing the program with your students.

SECTION 4, AFTER VIEWING THE PROGRAM provides suggestions for additional activities plus an assortment of consumable assessment and extended activities, designed to broaden comprehension of the topic and to make connections to other curriculum content areas.
FEATURES

INTRODUCING EACH ATM

SECTION 2

Your AIMS Teaching Module is designed to accompany a video program written and produced by some of the world’s most credible and creative writers and producers of educational programming. To facilitate diversity and flexibility in your classroom, your AIMS Teaching Module features these components:

Themes

The Major Theme tells how this AIMS Teaching Module is keyed into the curriculum. Related Themes offer suggestions for interaction with other curriculum content areas, enabling teachers to use the teaching module to incorporate the topic into a variety of learning areas.

Overview

The Overview provides a synopsis of content covered in the video program. Its purpose is to give you a summary of the subject matter and to enhance your introductory preparation.

Objectives

The ATM learning objectives provide guidelines for teachers to assess what learners can be expected to gain from each program. After completion of the AIMS Teaching Module, your students will be able to demonstrate dynamic and applied comprehension of the topic.
PREPARATION FOR VIEWING

SECTION 3
In preparation for viewing the video program, the AIMS Teaching Module offers activity and/or discussion ideas that you may use in any order or combination.

Introduction To The Program
Introduction to the Program is designed to enable students to recall or relate prior knowledge about the topic and to prepare them for what they are about to learn.

Introduction To Vocabulary
Introduction to Vocabulary is a review of language used in the program: words, phrases, usage. This vocabulary introduction is designed to ensure that all learners, including limited English proficiency learners, will have full understanding of the language usage in the content of the program.

Discussion Ideas
Discussion Ideas are designed to help you assess students’ prior knowledge about the topic and to give students a preview of what they will learn. Active discussion stimulates interest in a subject and can motivate even the most reluctant learner. Listening, as well as speaking, is active participation. Encourage your students to participate at the rate they feel comfortable. Model sharing personal experiences when applicable, and model listening to students’ ideas and opinions.

Focus
Help learners set a purpose for watching the program with Focus, designed to give students a focal point for comprehension continuity.

Jump Right In
Jump Right In provides abbreviated instructions for quick management of the program.

AFTER VIEWING THE PROGRAM

SECTION 4
After your students have viewed the program, you may introduce any or all of these activities to interact with other curriculum content areas, provide reinforcement, assess comprehension skills, or provide hands-on and in-depth extended study of the topic.
The Suggested Activities offer ideas for activities you can direct in the classroom or have your students complete independently, in pairs, or in small work groups after they have viewed the program. To accommodate your range of classroom needs, the activities are organized into skills categories. Their labels will tell you how to identify each activity and help you correlate it into your classroom curriculum. To help you schedule your classroom lesson time, the AIMS hourglass gives you an estimate of the time each activity should require. Some of the activities fall into these categories:

**Meeting Individual Needs**

These activities are designed to aid in classroom continuity. Reluctant learners and learners acquiring English will benefit from these activities geared to enhance comprehension of language in order to fully grasp content meaning.

**Curriculum Connections**

Many of the suggested activities are intended to integrate the content of the ATM program into other content areas of the classroom curriculum. These cross-connections turn the classroom teaching experience into a whole learning experience.

**Critical Thinking**

Critical Thinking activities are designed to stimulate learners’ own opinions and ideas. These activities require students to use the thinking process to discern fact from opinion, consider their own problems and formulate possible solutions, draw conclusions, discuss cause and effect, or combine what they already know with what they have learned to make inferences.

**Cultural Diversity**

Each AIMS Teaching Module has an activity called Cultural Awareness, Cultural Diversity, or Cultural Exchange that encourages students to share their backgrounds, cultures, heritage, or knowledge of other countries, customs, and language.

**Hands On**

These are experimental or tactile activities that relate directly to the material taught in the program. Your students will have opportunities to make discoveries and formulate ideas on their own, based on what they learn in this unit.

**Writing**

Every AIMS Teaching Module will contain an activity designed for students to use the writing process to express their ideas about what they have learned. The writing activity may also help them to make the connection between what they are learning in this unit and how it applies to other content areas.

**In The Newsroom**

Each AIMS Teaching Module contains a newsroom activity designed to help students make the relationship between what they learn in the classroom and how it applies in their world. The purpose of In The Newsroom is to actively involve each class member in a whole learning experience. Each student will have an opportunity to perform all of the tasks involved in production: writing, researching, producing, directing, and interviewing as they create their own classroom news program.

**Extended Activities**

These activities provide opportunities for students to work separately or together to conduct further research, explore answers to their own questions, or apply what they have learned to other media or content areas.

**Link to the World**

These activities offer ideas for connecting learners’ classroom activities to their community and the rest of the world.

**Culminating Activity**

To wrap up the unit, AIMS Teaching Modules offer suggestions for ways to reinforce what students have learned and how they can use their new knowledge to enhance their world view.
VOCAULARY

Every ATM contains an activity that reinforces the meaning and usage of the vocabulary words introduced in the program content. Students will either read or find the definition of each vocabulary word, then use the word in a written sentence.

CHECKING COMPREHENSION

Checking Comprehension is designed to help you evaluate how well your students understand, retain, and recall the information presented in the AIMS Teaching Module. Depending on your students' needs, you may direct this activity to the whole group yourself, or you may want to have students work on the activity page independently, in pairs, or in small groups. Students can verify their written answers through discussion or by viewing the video a second time. If you choose, you can reproduce the answers from your Answer Key or write the answer choices in a Word Bank for students to use. Students can use this completed activity as a study guide to prepare for the test.

CONSUMABLE ACTIVITIES

The AIMS Teaching Module provides a selection of consumable activities, designed to specifically reinforce the content of this learning unit. Whenever applicable, they are arranged in order from low to high difficulty level, to allow a seamless facilitation of the learning process. You may choose to have students take these activities home or to work on them in the classroom independently, in pairs or in small groups.

CHECKING VOCABULARY

The Checking Vocabulary activity provides the opportunity for students to assess their knowledge of new vocabulary with this word game or puzzle. The format of this vocabulary activity allows students to use the related words and phrases in a different context.

TEST

The AIMS Teaching Module Test permits you to assess students' understanding of what they have learned. The test is formatted in one of several standard test formats to give your students a range of experiences in test-taking techniques. Be sure to read, or remind students to read, the directions carefully and to read each answer choice before making a selection. Use the Answer Key to check their answers.
ADDITIONAL AIMS MULTIMEDIA PROGRAMS

After you have completed this AIMS Teaching Module you may be interested in more of the programs that AIMS offers. This list includes several related AIMS programs.

ADDITIONAL READING SUGGESTIONS

AIMS offers a carefully researched list of other resources that you and your students may find rewarding.

ANSWER KEY

Reproduces tests and work pages with answers marked.
THEMES

*Cells: The Building Blocks of Life* describes the different types of cells and their major components. In addition, the program discusses the importance of the cell membrane in the processes of diffusion, osmosis and active transport. Other processes, including respiration, photosynthesis and reproduction are also examined.

OVERVIEW

*Cells: The Building Blocks of Life* is part two of the Biology Essentials series which examines modern day biology. The program begins by introducing cells as the building blocks of life. It also describes the two basic types of cells—eukaryotic and prokaryotic. The major components of prokaryotic cells are discussed, including the nucleus, nuclear membrane, Golgi bodies, microtubules, microfilaments and cytoplasm. Cellular processes such as respiration, photosynthesis, diffusion, osmosis and active transport are also explored.

OBJECTIVES

- To identify the characteristics that differentiate living matter from non-living matter.
- To explain the difference between eukaryotic and prokaryotic cells.
- To describe the function of the various major organelles found in plant and animal cells.
- To differentiate between the active transport of materials and the diffusion of materials across the cell membrane.
- To illustrate and explain the basic differences between plant and animal cells.
- To describe why the cell membrane is critical to homeostasis.
- To explain the processes of photosynthesis and cellular respiration.
Our AIMS Multimedia Educational Department welcomes your observations and comments. Please feel free to address your correspondence to:

AIMS Multimedia
Editorial Department
9710 DeSoto Avenue
Chatsworth, California 91311-4409
INTRODUCTION TO THE PROGRAM

Ask the class to think of a cell as a small society. It must receive food and water in order to survive. This food must be converted into energy and other valuable nutrients. The nutrients have to be processed, packaged and sent to the right part of the cell. Certain balances must be maintained inside the cell in order for it to survive. Defense mechanisms must be installed to protect the cell from invaders. The cell must have a way to move, grow, and eventually, reproduce. How can all of these things take place in a space so small it can’t be seen with the naked eye? The answer lies within the amazing world of cellular organelles.

INTRODUCTION TO VOCABULARY

The word “cell” originates from the Latin word for “room.” The cell wall transforms the cell into a kind of room, making it difficult for most things to enter or leave. “Nucleus” is a word that originally meant “kernel” or “essential part.” The nucleus is the heart of the cell, holding the genetic material that will ensure its future generations.

DISCUSSION IDEAS

If every living thing is made of cells, why can snakes move around while trees cannot? Why can our skin, when pinched, return to its normal shape while a daisy stem cannot? The answer lies in specialization. There are many different types of cells, each with specific functions. These types can be broken down into four basic categories. free-living plant cells, like diatoms that float in the ocean; free-living animal cells, like bacteria that float in the air; communal plant cells, like those in a tree; and communal animal cells, like those in your liver.

FOCUS

Before viewing the program, ask students to think of all the things that go inside their bodies. How do these things take place so smoothly? What would happen if a single type of cell stopped working inside them? Tell them they are going to learn more about the cell and its amazing contributions to their daily lives.
JUMP RIGHT IN

HOW TO USE THE CELLS: THE BUILDING BLOCKS OF LIFE AIMS TEACHING MODULE

Preparation

▷ Read Cells: The Building Blocks of Life Themes, Overview, and Objectives to become familiar with program content and expectations.

▷ Use Preparation for Viewing suggestions to introduce the topic to students.

Viewing CELLS: THE BUILDING BLOCKS OF LIFE

▷ Set up viewing monitor so that all students have a clear view.

▷ Depending on your classroom size and learning range, you may choose to have students view Cells: The Building Blocks of Life together or in small groups.

▷ Some students may benefit from viewing the video more than one time.

After Viewing CELLS: THE BUILDING BLOCKS OF LIFE

▷ Select Suggested Activities that integrate into your classroom curriculum. If applicable, gather materials or resources.

▷ Choose the best way for students to work on each activity. Some activities work best for the whole group. Other activities are designed for students to work independently, in pairs, or in small groups. Whenever possible, encourage students to share their work with the rest of the group.

▷ Duplicate the appropriate number of Vocabulary, Checking Comprehension, and consumable activity pages for your students.

▷ You may choose to have students take consumable activities home, or complete them in the classroom, independently, or in groups.

▷ Administer the Test to assess students’ comprehension of what they have learned, and to provide them with practice in test-taking procedures.

▷ Use the Culminating Activity as a forum for students to display, summarize, extend, or share what they have learned with each other, the rest of the school, or a local community organization.
SUGGESTED ACTIVITIES

Connection to History

Before scientists understood microorganisms, like single-celled bacteria, they didn’t understand how diseases spread from person to person. Over the years, many things took the blame for illnesses, including demons and lost spirits of the dead. Treatments for these diseases were even more unbelievable. Ask students to do some historical research to uncover ancient methods of dealing with disease. Have them share their findings with the class, and encourage them to explain why the “cure” failed or succeeded.

Connection to Art

Ask students to illustrate a cell using a library or reference book as their guide. Have them color each part of the cell according to the list below.

- mitochondria = red
- nuclear membrane = blue
- endoplasmic reticulum = pink
- chloroplast = green
- nucleus = light blue
- lysosomes = purple
- ribosomes = orange
- vacuoles = white
- Golgi bodies = brown
- cytoplasm = yellow

Hands On

Have students observe their own cheek cells under a microscope. Ask them to write a paragraph describing what they see. Is the nucleus clearly visible? How defined is the cell wall? What other structures, if any, can be seen? Ask students to sketch what they see and label the parts of the cheek cell that they recognize.
**Link to the World**

Although cellular diffusion is something we cannot see without a microscope, there are times when we can see diffusion on a large scale in the non-living world. Ask students to think of examples of diffusion and osmosis that occur in the objects around them. Remind them that both processes can occur when materials in one area are more concentrated or less concentrated than in another area. (There are many examples. As you breathe into a scarf, the molecules you exhale make the air between your mouth and the scarf more concentrated. Therefore, air molecules are diffused through the scarf. As steam from the shower fills the bathroom, making the air in the room more concentrated, the air is forced out through the space beneath the door.)

**Critical Thinking**

Human beings are living organisms made of atoms and molecules just like the ones found in inanimate objects such as rock and ice. What gives humans and other living creatures the ability to perform so many different functions? (Specialization of cells and cell organelles allow living creatures to perform functions such as digestion, respiration, movement and reproduction.)

Ask students to list as many specialized human cells as they can. What unique qualities must these cells have in order to function properly? (Muscles cells need high levels of energy, liver cells must contain ducts for bile secretion, blood cells must be able to transport oxygen, and so forth.)

**Writing**

Tell students to imagine they are a nucleus overseeing the functions of a human cell. Ask them to use their creative writing skills to describe what goes on inside their cell. Where do they place their orders for more cellular energy? Who is in charge of bringing food into the cell? How will the food be digested and distributed? How is the cell protected from intruders? What plans need to be made for the reproduction of the cell? Encourage them to include as many details as they can. After all, the job of a nucleus is very demanding.
Meeting Individual Needs

Ask students to look up the words “cell,” “organelle,” “tissue” and “organ” in the dictionary. What does each word mean? How are the words interrelated? (A cell is the basic fundamental unit of living matter, capable of functioning independently or in groups. An organelle is a specialized structure within a cell, capable of performing a specific task. Tissue is a group of similar cells that together form one of the structural materials of a plant or animal. An organ is a structure made of cells and tissues that performs a specific function in an organism. Each element is a vital part of the construction of a living creature.)

Extended Activity

Cryobiology may sound like something from a bizarre novel, but the study of freezing cells for future use is a very real science. Ask students to use their library research skills to learn more about cryobiology. What are some of the possible uses of cryobiology? What might the implications of these uses be? What obstacles do cryobiologists still have to overcome? Ask students to summarize their findings in a one-page paper.

In the Newsroom

Ask students to pretend they are newspaper reporters covering the process of photosynthesis. Have them write articles describing photosynthesis in a particular plant. Encourage them to include as many “journalistic” details as they can. Their article should also include a drawing of the plant being described.

Collect the articles in a notebook and allow the class to see the final results of this collaborative “Photosynthesis Newspaper.”

Culminating Activity

Serve as the host of a Cellular Talk Show. Assign a cell organelle to each student and ask them to study up on their part before the show. Include the mitochondria, nuclear membrane, endoplasmic reticulum, chloroplast, nucleus, lysosomes, flagella, microtubules, ribosomes, vacuoles, cilia, cell and nuclear membranes, cytoplasm, Golgi bodies, microfilaments and more. Interview each “guest” by asking them questions that will reinforce what the class has learned about the cell anatomy.
**VOCABULARY**

The following vocabulary words are from *Cells: The Building Blocks of Life*. Fill in the number of each word next to its closest definition.

1. active transport
2. cell
3. chloroplast
4. cilia
5. cytoplasm
6. endoplasmic reticulum
7. eukaryote
8. Golgi bodies
9. lysosomes
10. mitochondria
11. nucleus
12. organelle
13. prokaryote
14. vacuoles

___ cells that contain no distinct nucleus or other structures within the cell membrane
___ control center that directs the life activities of a cell
___ fluid within the cell membrane and outside the nuclear membrane
___ fundamental unit of all living matter
___ cells that have well-defined nuclei and organelles
___ organelle that provides cells with energy by oxidizing food
___ cellular structures that carry out specific tasks
___ system of tube-like structures that produce and transport materials such as proteins and lipids within cells
___ system within the cell that processes and packages proteins and
___ cellular structure containing digestive enzymes that break down large molecules
___ fluid-filled spaces in the cell where trapped food and water are stored
___ hair-like structures that move materials along the outer surface of the cell
___ structure found in plant cells that contains chlorophyll and is the site for photosynthesis
___ process of moving materials through the cell membrane using energy from the cell
CHECKING COMPREHENSION

Read the following sentences and circle the letters of the words that best fill each blank.

A major characteristic of all living organisms is that they respond to various _____1_____. Living things also must maintain a state of balance through the process known as _____2_____. Cells are the fundamental unit of all living matter and come in two forms, _____3_____. The nucleus of a cell acts as its control center and houses _____4_____ molecules that are vital in cell reproduction. The endoplasmic reticulum is a system of tube-like structures that produce and transport _____5_____. Small spheres on the endoplasmic reticulum called _____6_____ manufacture various proteins for the cell. The cells of plants have structures called chloroplasts, which contain chlorophyll, a chemical needed during _____7_____. _____8_____ is the process of elements moving in and out of the cell through the cell membrane. When the material being transported is water, this process is known as _____9_____. Some materials cannot diffuse through the cell wall. In this case, the cell must use energy to transport the materials in a process known as _____10_____.

1. A. stimuli
   B. chloroplasts
   C. cilia
   D. lipids

2. A. photosynthesis
   B. respiration
   C. homeostasis
   D. digestion

3. A. animal and plant
   B. genotype and phenotype
   C. enzymes and coenzymes
   D. eukaryotes and prokaryotes

4. A. water
   B. DNA
   C. carbon dioxide
   D. fat

5. A. proteins and lipids
   B. digestive enzymes
   C. DNA
   D. water and air
CELL ANATOMY

Each sentence describes a cellular structure. Using the words below, write the correct name of each structure in the blanks.

mitochondria
nuclear membrane
endoplasmic reticulum
chloroplast
nucleus
lysosomes
flagella
microtubules
ribosomes
vacuoles

1. ______________________ contain digestive enzymes
2. ______________________ thin, hollow rods that are used to move organelles through the cytoplasm
3. ______________________ transports proteins throughout the cell
4. ______________________ controls life activities of cell
5. ______________________ produce proteins for the cell
6. ______________________ squeezes excess waste and water from the cell
7. ______________________ tail-like structures that help some cells move through their environment
8. ______________________ controls movement of materials in and out of nucleus
9. ______________________ site of photosynthesis in plant cells
10. ______________________ provide energy for the cell by oxidizing food
TRUE OR FALSE

Place a T next to statements that are true and an F next to statements that are false.

1. _____ Some plants and animals contain prokaryotic cells.
2. _____ The cell membrane separates the nucleus from the cytoplasm.
3. _____ The cytoplasm is the site of many cellular chemical reactions.
4. _____ Ribosomes fuse with food vacuoles and release digestive enzymes.
5. _____ Microfilaments are thread-like structures that provide support and shape for cells.
6. _____ Some primitive organisms contain chlorophyll that is not contained in chloroplasts.
7. _____ Some plant cells have rigid cell walls while others have walls that are flexible.
8. _____ Diffusion can occur when materials are in greater concentration inside a cell than outside.
9. _____ One form of active transport involves vacuoles contracting to discharge waste and water from the cell.
10. _____ During cellular respiration, glucose is broken down into oxygen and water.
## CELLULAR MATCH-UP

Match each term on the left with the most appropriate group of words on the right.

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. diffusion</td>
<td>sugar that releases stored energy</td>
</tr>
<tr>
<td>2. active transport</td>
<td>study of freezing cells</td>
</tr>
<tr>
<td>3. photosynthesis</td>
<td>balance necessary to maintain life</td>
</tr>
<tr>
<td>4. glucose</td>
<td>cells with well-defined nuclei</td>
</tr>
<tr>
<td>5. chloroplast</td>
<td>light converted into chemical energy</td>
</tr>
<tr>
<td>6. enzyme</td>
<td>plant organelle where ATP is made</td>
</tr>
<tr>
<td>7. cryobiology</td>
<td>requires no energy from cell</td>
</tr>
<tr>
<td>8. homeostasis</td>
<td>allows chemical reactions to take place</td>
</tr>
<tr>
<td>9. eukaryotes</td>
<td>requires energy from cell</td>
</tr>
<tr>
<td>10. prokaryotes</td>
<td>cells with no nuclei</td>
</tr>
</tbody>
</table>
PARTS OF A CELL

Label the diagram below using the following list of words.

- cell membrane
- mitochondria
- cytoplasm
- lysosomes
- vacuoles

1. Which organelle releases enzymes that reabsorb worn-out and defective cell parts?

2. Other than floating in the cytoplasm, where are ribosomes commonly found?

3. Which organelle is responsible for processing and packaging vital cellular materials?

4. In which cellular structure can DNA be found?

5. Which structure helps the cell maintain homeostasis by way of osmosis and diffusion?
WORD SEARCH

The following words can be found below. The letters may be arranged horizontally, vertically, diagonally or backward.

- cell
- cilia
- cytoplasm
- eukaryote
- lysosome
- nucleus
- organelle
- prokaryote
- ribosome
- vacuole

L A R N U C L E U S D O
L T E I E Y I M I Z F R
E D L L B T B G W M P G
C I L I A O E J C K R A
F J Y A Z P S K M N O N
P L S R V L N O T T K E
U B O A G A G T M I A L
R H S J R S C D S E R L
W J O C B M Q U T J Y E
Z S M H K Q C K O M O Z
S E E O P D N J H L T Q
J L E U K A R Y O T E R
Circle the phrase which best answers the question.

1. Cells that have no well-defined nuclei or other structures are known as:
   - eukaryotes.
   - prokaryotes.
   - organelles.
   - microtubules.

2. The system of tube-like structures that transport proteins and lipids to the cell are called:
   - lysosomes.
   - ribosomes.
   - endoplasmic reticulum.
   - microfilaments.

3. To break down food, lysosomes release digestive enzymes into:
   - vacuoles.
   - Golgi bodies.
   - the nucleus.
   - ribosomes.

4. Thread-like structures that provide shape and support for cells are called:
   - cilia.
   - flagella.
   - vacuoles.
   - microfilaments.

5. All plants have cell walls that are:
   - rigid.
   - flexible.
   - opaque.
   - nonpermeable.
6. When waste products are more concentrated inside a cell than outside:
   • active transport must take place.
   • the waste will diffuse out of the cell membrane.
   • the waste will diffuse into the cell membrane.
   • diffusion cannot take place.

7. Water diffusing in or out of a cell is a process known as:
   • osmosis.
   • mitosis.
   • nucleous.
   • homeosis.

8. Glucose is a simple sugar that cells break down in order to obtain stored:
   • water.
   • carbon dioxide.
   • chemical energy.
   • chlorophyll.

9. During cellular respiration, oxygen is used to break down glucose into:
   • oxygen and water.
   • carbon dioxide and chlorophyll.
   • oxygen and carbon.
   • carbon dioxide and water.

10. Enzymes are large coiled protein molecules made up of smaller organic molecules called:
    • coenzymes.
    • amino acids.
    • lipids.
    • glycogen.
ADDITIONAL AIMS MULTIMEDIA PROGRAMS

You and your students might also enjoy these other AIMS Multimedia programs:

Living Cells
The Life of a Red Blood Cell
Human Blood Circulation
Circulation of the Blood
Meiosis and Mitosis: Fertilization
### VOCABULARY

The following vocabulary words are from *Cells: The Building Blocks of Life*. Fill in the number of each word next to its closest definition.

<table>
<thead>
<tr>
<th>Number</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>process of moving materials through the cell membrane using energy from the cell</td>
</tr>
<tr>
<td>2</td>
<td>fundamental unit of all living matter</td>
</tr>
<tr>
<td>3</td>
<td>structure found in plant cells that contains chlorophyll and is the site for photosynthesis</td>
</tr>
<tr>
<td>4</td>
<td>hair-like structures that move materials along the outer surface of the cell</td>
</tr>
<tr>
<td>5</td>
<td>fluid within the cell membrane and outside the nuclear membrane</td>
</tr>
<tr>
<td>6</td>
<td>system of tube-like structures that produce and transport materials such as proteins and lipids within cells</td>
</tr>
<tr>
<td>7</td>
<td>cells that have well-defined nuclei and organelles</td>
</tr>
<tr>
<td>8</td>
<td>system within the cell that processes and packages proteins and</td>
</tr>
<tr>
<td>9</td>
<td>cellular structure containing digestive enzymes that break down large molecules</td>
</tr>
<tr>
<td>10</td>
<td>organelle that provides cells with energy by oxidizing food</td>
</tr>
<tr>
<td>11</td>
<td>control center that directs the life activities of a cell</td>
</tr>
<tr>
<td>12</td>
<td>cellular structures that carry out specific tasks</td>
</tr>
<tr>
<td>13</td>
<td>cells that contain no distinct nucleus or other structures within the cell membrane</td>
</tr>
<tr>
<td>14</td>
<td>vacuoles</td>
</tr>
<tr>
<td>15</td>
<td>fluid-filled spaces in the cell where trapped food and water are stored</td>
</tr>
<tr>
<td>16</td>
<td>Golgi bodies</td>
</tr>
<tr>
<td>17</td>
<td>lysosomes</td>
</tr>
<tr>
<td>18</td>
<td>mitochondria</td>
</tr>
<tr>
<td>19</td>
<td>nucleus</td>
</tr>
<tr>
<td>20</td>
<td>organelle</td>
</tr>
<tr>
<td>21</td>
<td>prokaryote</td>
</tr>
</tbody>
</table>
CHECKING COMPREHENSION

Read the following sentences and circle the letters of the words that best fill each blank.

A major characteristic of all living organisms is that they respond to various _____1_____. Living things also must maintain a state of balance through the process known as _____2_____. Cells are the fundamental unit of all living matter and come in two forms, _____3_____. The nucleus of a cell acts as its control center and houses _____4_____ molecules that are vital in cell reproduction. The endoplasmic reticulum is a system of tube-like structures that produce and transport _____5_____. Small spheres on the endoplasmic reticulum called _____6_____ manufacture various proteins for the cell. The cells of plants have structures called chloroplasts, which contain chlorophyll, a chemical needed during _____7_____. _____8_____ is the process of elements moving in and out of the cell through the cell membrane. When the material being transported is water, this process is known as _____9_____. Some materials cannot diffuse through the cell wall. In this case, the cell must use energy to transport the materials in a process known as _____10_____.

<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A. stimuli</td>
<td></td>
<td>B. chloroplasts</td>
<td></td>
<td>C. cilia</td>
<td></td>
<td>D. lipids</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>A. photosynthesis</td>
<td></td>
<td>B. respiration</td>
<td></td>
<td>C. homeostasis</td>
<td></td>
<td>D. digestion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>A. animal and plant</td>
<td></td>
<td>B. genotype and phenotype</td>
<td></td>
<td>C. enzymes and coenzymes</td>
<td></td>
<td>D. eukaryotes and prokaryotes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>A. water</td>
<td></td>
<td>B. DNA</td>
<td></td>
<td>C. carbon dioxide</td>
<td></td>
<td>D. fat</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>A. proteins and lipids</td>
<td></td>
<td>B. digestive enzymes</td>
<td></td>
<td>C. DNA</td>
<td></td>
<td>D. water and air</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>A. Golgi bodies</td>
<td></td>
<td>B. ribosomes</td>
<td></td>
<td>C. lysosomes</td>
<td></td>
<td>D. vacuoles</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>A. active transport</td>
<td></td>
<td>B. enzyme reaction</td>
<td></td>
<td>C. photosynthesis</td>
<td></td>
<td>D. osmosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>A. diffusion</td>
<td></td>
<td>B. molecular transport</td>
<td></td>
<td>C. mitosis</td>
<td></td>
<td>D. cryogenesis</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>A. cellular digestion</td>
<td></td>
<td>B. meiosis</td>
<td></td>
<td>C. osmosis</td>
<td></td>
<td>D. hydro transport</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>A. osmosis</td>
<td></td>
<td>B. diffusion</td>
<td></td>
<td>C. photosynthesis</td>
<td></td>
<td>D. active transport</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© Copyright 1998  AIMS Multimedia  Cells: The Building Blocks of Life
CELL ANATOMY

Each sentence describes a cellular structure. Using the words below, write the correct name of each structure in the blanks.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>lysosomes</td>
<td>contain digestive enzymes</td>
</tr>
<tr>
<td>microtubules</td>
<td>thin, hollow rods that are used to move organelles through the cytoplasm</td>
</tr>
<tr>
<td>endoplasmic reticulum</td>
<td>transports proteins throughout the cell</td>
</tr>
<tr>
<td>nucleus</td>
<td>controls life activities of cell</td>
</tr>
<tr>
<td>ribosomes</td>
<td>produce proteins for the cell</td>
</tr>
<tr>
<td>vacuoles</td>
<td>squeezes excess waste and water from the cell</td>
</tr>
<tr>
<td>flagella</td>
<td>tail-like structures that help some cells move through their environment</td>
</tr>
<tr>
<td>nuclear membrane</td>
<td>controls movement of materials in and out of nucleus</td>
</tr>
<tr>
<td>chloroplast</td>
<td>site of photosynthesis in plant cells</td>
</tr>
<tr>
<td>mitochondria</td>
<td>provide energy for the cell by oxidizing food</td>
</tr>
</tbody>
</table>

© Copyright 1998  AIMS Multimedia  Cells: The Building Blocks of Life
TRUE OR FALSE

Place a T next to statements that are true and an F next to statements that are false.

1. F Some plants and animals contain prokaryotic cells.
2. F The cell membrane separates the nucleus from the cytoplasm.
3. T The cytoplasm is the site of many cellular chemical reactions.
4. F Ribosomes fuse with food vacuoles and release digestive enzymes.
5. T Microfilaments are thread-like structures that provide support and shape for cells.
6. T Some primitive organisms contain chlorophyll that is not contained in chloroplasts.
7. F Some plant cells have rigid cell walls while others have walls that are flexible.
8. T Diffusion can occur when materials are in greater concentration inside a cell than outside.
9. T One form of active transport involves vacuoles contracting to discharge waste and water from the cell.
10. F During cellular respiration, glucose is broken down into oxygen and water.
CELLULAR MATCH-UP

Match each term on the left with the most appropriate group of words on the right.

1. diffusion — sugar that releases stored energy
2. active transport — study of freezing cells
3. photosynthesis — balance necessary to maintain life
4. glucose — cells with well-defined nuclei
5. chloroplast — light converted into chemical energy
6. enzyme — plant organelle where ATP is made
7. cryobiology — requires no energy from cell
8. homeostasis — allows chemical reactions to take place
9. eukaryotes — requires energy from cell
10. prokaryotes — cells with no nuclei
1. Which organelle releases enzymes that reabsorb worn-out and defective cell parts?

   lysosome

2. Other than floating in the cytoplasm, where are ribosomes commonly found?

   on endoplasmic reticulum

3. Which organelle is responsible for processing and packaging vital cellular materials?

   Golgi Bodies

4. In which cellular structure can DNA be found?

   the nucleus

5. Which structure helps the cell maintain homeostasis by way of osmosis and diffusion?

   cell membrane
WORD SEARCH

The following words can be found below. The letters may be arranged horizontally, vertically, diagonally or backward.

- cell
- cilia
- cytoplasm
- eukaryote
- lysosome
- nucleus
- organelle
- prokaryote
- ribosome
- vacuole
Circle the phrase which best answers the question.

1. Cells that have no well-defined nuclei or other structures are known as:
   - eukaryotes.
   - prokaryotes.
   - organelles.
   - microtubules.
   - **prokaryotes**

2. The system of tube-like structures that transport proteins and lipids to the cell are called:
   - lysosomes.
   - ribosomes.
   - endoplasmic reticulum.
   - microfilaments.
   - **endoplasmic reticulum**

3. To break down food, lysosomes release digestive enzymes into:
   - vacuoles.
   - Golgi bodies.
   - the nucleus.
   - ribosomes.
   - **vacuoles**

4. Thread-like structures that provide shape and support for cells are called:
   - cilia.
   - flagella.
   - vacuoles.
   - **microfilaments**
   - microfilaments

5. All plants have cell walls that are:
   - rigid.
   - flexible.
   - opaque.
   - nonpermeable.
   - **rigid**
6. When waste products are more concentrated inside a cell than outside:

• active transport must take place.
• the waste will diffuse out of the cell membrane.
• the waste will diffuse into the cell membrane.
• diffusion cannot take place.

7. Water diffusing in or out of a cell is a process known as:

• osmosis.
• mitosis.
• nucleous.
• homeosis.

8. Glucose is a simple sugar that cells break down in order to obtain stored:

• water.
• carbon dioxide.
• chemical energy.
• chlorophyll.

9. During cellular respiration, oxygen is used to break down glucose into:

• oxygen and water.
• carbon dioxide and chlorophyll.
• oxygen and carbon.
• carbon dioxide and water.

10. Enzymes are large coiled protein molecules made up of smaller organic molecules called:

• coenzymes.
• amino acids.
• lipids.
• glycogen.