Cells: The Building Blocks of Life

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

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1-800-367-2467

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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

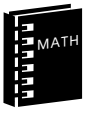
After your students have viewed the program, you may introduce any or all of these activities to interact with other curriculum content areas, provide reinforcement, assess comprehension skills, or provide hands-on and in-depth extended study of the topic.

SUGGESTED ACTIVITIES

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.

VOCABULARY

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.

Cells: The Building Blocks of Life

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.

Use this page for your individual notes about planning and/or effective ways to manage this AIMS Teaching Module in your classroom.

Our AIMS Multimedia Educational Department welcomes your observations and comments. Please feel free to address your correspondence to:

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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

60 Minutes

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

30 Minutes

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

40 Minutes

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

20 Minutes

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

30 Minutes

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

30 Minutes

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

30 Minutes

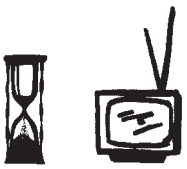
Ask students to look up the words "cell," "organelle," "tissue" and "organ" in the dictionary. What does each word mean? How are the words interrelated? (A cell is the basic fundamental unit of living matter, capable of functioning independently or in groups. An organelle is a specialized structure within 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

30 Minutes

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



60 Minutes

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

40 Minutes

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.

Name

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

Name

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

6. A. Golgi bodies
   B. ribosomes
   C. lysosomes
   D. vacuoles

7. A. active transport
   B. enzyme reaction
   C. photosynthesis
   D. osmosis

8. A. diffusion
   B. molecular transport
   C. mitosis
   D. cryogenesis

9. A. cellular digestion
   B. meiosis
   C. osmosis
   D. hydro transport

10. A. osmosis
    B. diffusion
    C. photosynthesis
    D. active transport

Name

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

Name

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.

Name

CELLULAR MATCH-UP

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

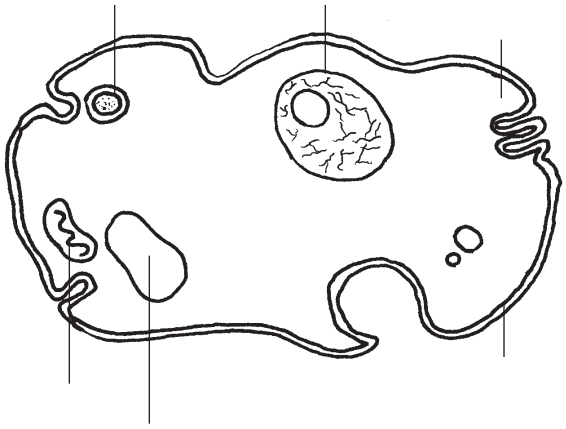
1.	diffusion	sugar that releases stored energy
2.	active transport	study of freezing cells
3.	photosynthesis	balance necessary to maintain life
4.	glucose	cells with well-defined nuclei
5.	chloroplast	light converted into chemical energy
6.	enzyme	plant organelle where ATP is made)
7.	cryobiology	requires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

Name _____

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?

_____

Name

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

Name

TEST

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.

Name

TEST (CONTINUED)

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

ANSWER KEY for page 18

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

13 cells that contain no distinct nucleus or other structures within the cell membrane

11 control center that directs the life activities of a cell

5 fluid within the cell membrane and outside the nuclear membrane

2 fundamental unit of all living matter

7 cells that have well-defined nuclei and organelles

10 organelle that provides cells with energy by oxidizing food

12 cellular structures that carry out specific tasks

6 system of tube-like structures that produce and transport materials such as proteins and lipids within cells

8 system within the cell that processes and packages proteins and

9 cellular structure containing digestive enzymes that break down large molecules

15 fluid-filled spaces in the cell where trapped food and water are stored

4 hair-like structures that move materials along the outer surface of the cell

3 structure found in plant cells that contains chlorophyll and is the site for photosynthesis

1 process of moving materials through the cell membrane using energy from the cell

ANSWER KEY for page 19

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

6. A. Golgi bodies
   (B) ribosomes
   C. lysosomes
   D. vacuoles

7. A. active transport
   B. enzyme reaction
   (C) photosynthesis
   D. osmosis

8. (A) diffusion
   B. molecular transport
   C. mitosis
   D. cryogenesis

9. A. cellular digestion
   B. meiosis
   (C) osmosis
   D. hydro transport

10. A. osmosis
    B. diffusion
    C. photosynthesis
    (D) active transport

ANSWER KEY for page 20

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. **lysosomes** contain digestive enzymes
2. **microtubules** thin, hollow rods that are used to move organelles through the cytoplasm
3. **endoplasmic reticulum** transports proteins throughout the cell
4. **nucleus** controls life activities of cell
5. **ribosomes** produce proteins for the cell
6. **vacuoles** squeezes excess waste and water from the cell
7. **flagella** tail-like structures that help some cells move through their environment
8. **nuclear membrane** controls movement of materials in and out of nucleus
9. **chloroplast** site of photosynthesis in plant cells
10. **mitochondria** provide energy for the cell by oxidizing food

ANSWER KEY for page 21

TRUE OR FALSE

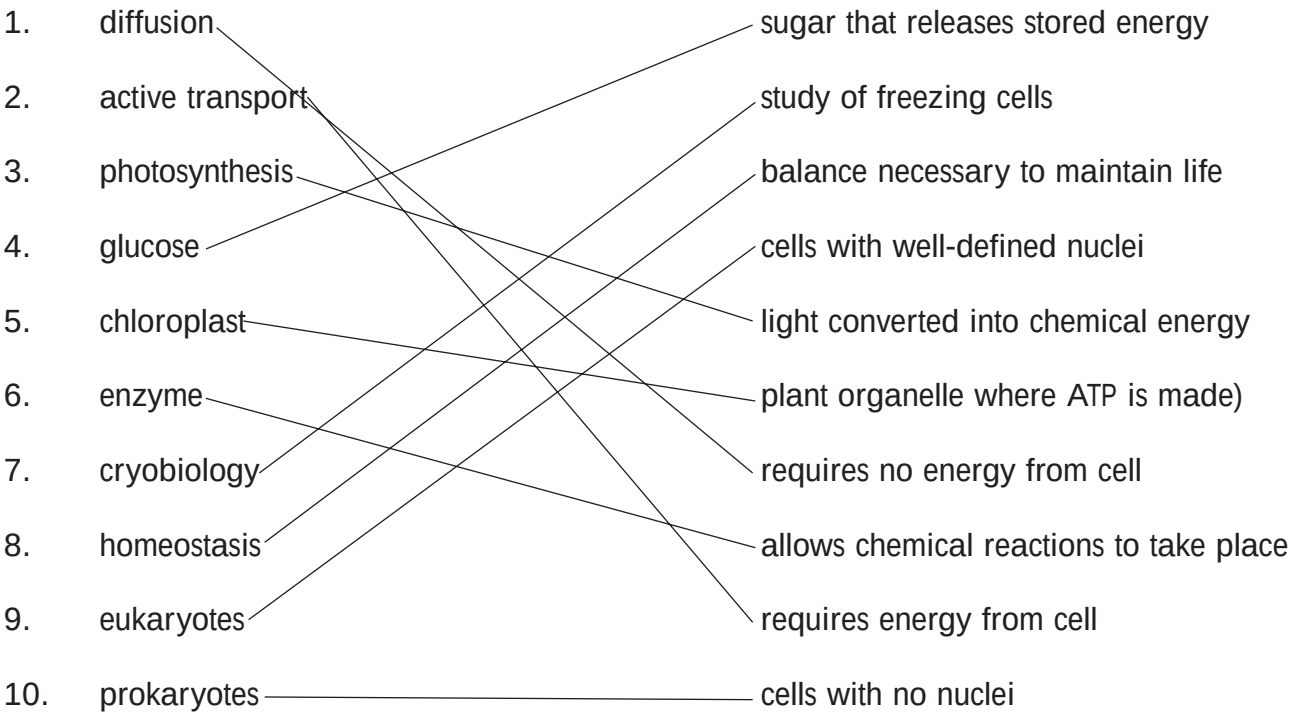
Place a T next to statements that are true and an F next to statements that are false.

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.

ANSWER KEY for page 22

CELLULAR MATCH-UP

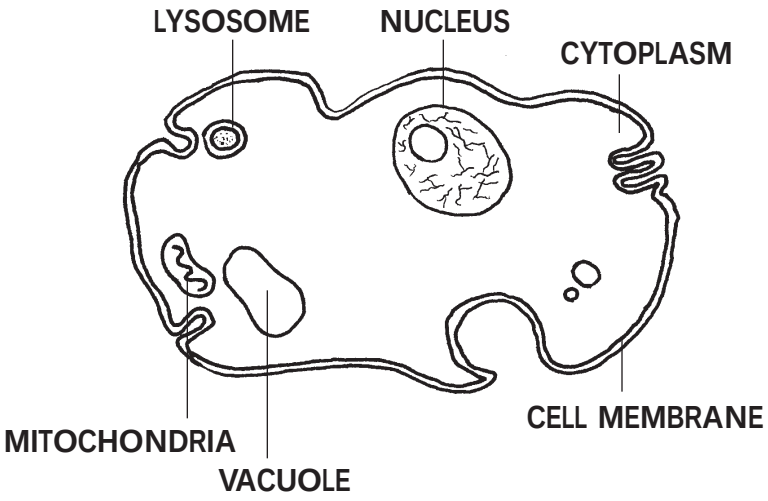
Match each term on the left with the most appropriate group of words on the right.



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?

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?

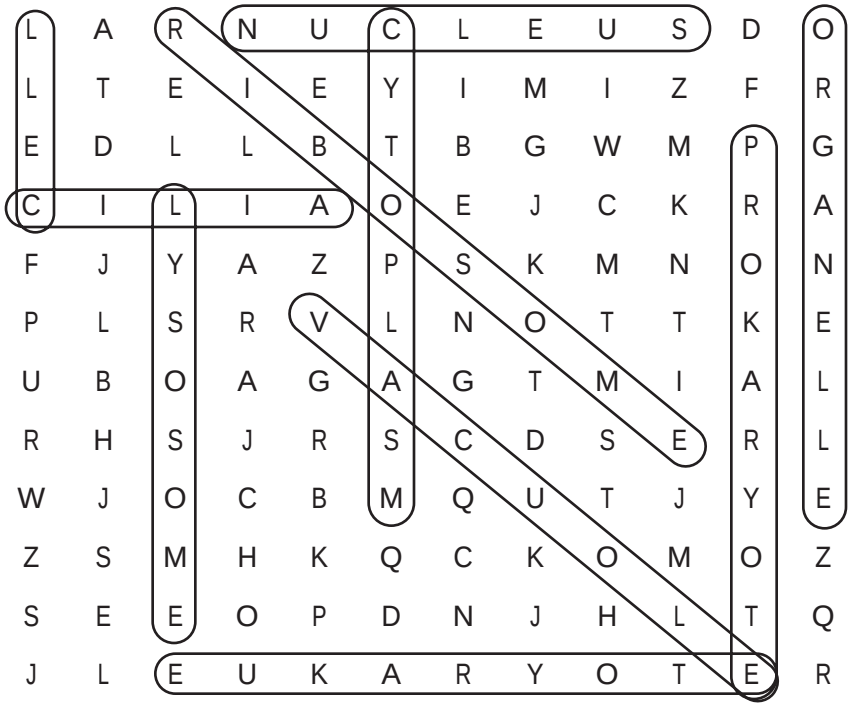
cell membrane

ANSWER KEY for page 24

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



ANSWER KEY for page 25

TEST

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.

TEST (CONTINUED)

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.

The Web of Life: Producer to Predator

INTRODUCTION TO THE AIMS TEACHING MODULE (ATM) → SECTION 1

INTRODUCING THE WEB OF LIFE: PRODUCER TO PREDATOR → SECTION 2

PREPARATION FOR VIEWING → SECTION 3

AFTER VIEWING THE PROGRAM → SECTION 4

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

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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

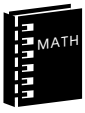
After your students have viewed the program, you may introduce any or all of these activities to interact with other curriculum content areas, provide reinforcement, assess comprehension skills, or provide hands-on and in-depth extended study of the topic.

SUGGESTED ACTIVITIES

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.

VOCABULARY

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.

The Web of Life: Producer to Predator

THEMES

The *Web of Life: Producer to Predator* explores the energy pyramids, food chains and nutrient cycles that support all forms of life. Students learn more about the ecosystems that make up our world and the roles of different organisms within their own niches.

OVERVIEW

Ecosystems serve as examples for discovering how organisms adapt to unique environments. Abiotic factors such as temperature, precipitation, nutrients and geography play a critical role in the survival and evolution of populations. Water, carbon, nitrogen and phosphorous cycle between the biotic and abiotic worlds, and in doing so, transfer energy from the sun to fuel life.

OBJECTIVES

- To define community, predator, prey, decomposer, mimicry, mutualism and symbiosis.
- To identify a biome and its unique characteristics.
- To better understand the four basic requirements of life.
- To discuss the carbon cycle and the nitrogen cycle, and to explain their influence on humans.
- To explain the contrast between producers and consumers.
- To explore the relationship of plants, solar energy and the earth.

Use this page for your individual notes about planning and/or effective ways to manage this AIMS Teaching Module in your classroom.

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

Life has many forms on the earth, and each form has a specific niche to fill. The variation found in organisms and the relationships between them can be incredibly complex and amazing.

Ask students to make a list of organisms they see frequently. The list should include humans, plants, trees, small animals, insects and possibly large animals such as cows and horses. What do their lists say about the ecosystem they live in? How do these organisms relate to one another? Collect the lists and return them when the unit of study is complete. What have students learned about the workings of their own ecosystem?

INTRODUCTION TO VOCABULARY

Write the words *parasite, decomposer* and *omnivore* on the board. What do students think each word means? Can they give some examples of each? What do these organisms contribute to the earth? (Parasites, such as ticks and fleas, are organisms that live on or in another organism for protection or sustenance, usually doing harm to their host and providing no benefits. Decomposers extract energy from waste, creating nutrient-rich soils for another generation of plants. Decomposers also prevent overpopulation and keep garbage and dead organisms from piling up on the earth. Omnivores are animals that digest both plant and animal food. Omnivores help keep animal populations down. They also exhale carbon dioxide, which is used by plants during photosynthesis.)

DISCUSSION IDEAS

The intelligence of human beings has eliminated or controlled many natural forces that limit human population size, such as starvation, disease and predators. How have humans controlled these threats? What are the advantages and disadvantages of these controls? (Humans have devised better farming methods and pest controls to produce more food, vaccination and medical advances to deal with disease, and weapons to protect themselves from predators. Such controls have clear advantages for humans, who can live longer and in greater numbers. Disadvantages to other ecosystems include extinction of certain animal species and pollution from harmful chemicals in pesticides and fertilizers.)

FOCUS

Ask students to spend a few days thinking about their own ecosystem. What kind of climate does it have? What does it contribute to their lives and well-being? Do students enjoy the ecosystem they live in? Encourage them to explain their answers.

JUMP RIGHT IN

HOW TO USE THE THE WEB OF LIFE: PRODUCER TO PREDATOR AIMS TEACHING MODULE

Preparation

- Read *The Web of Life: Producer to Predator* **Themes, Overview,** and **Objectives** to become familiar with program content and expectations.
- Use **Preparation for Viewing** suggestions to introduce the topic to students.

Viewing THE WEB OF LIFE: PRODUCER TO PREDATOR

- 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 *The Web of Life: Producer to Predator* together or in small groups.
- Some students may benefit from viewing the video more than one time.

After Viewing THE WEB OF LIFE: PRODUCER TO PREDATOR

- 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 Geography

1 Hour

The earth is filled with a variety of biomes, each with its own blend of climate, plants and animals. Ask students to use an atlas to find an example of a biome in each of the following categories: ocean, swamp, forest, desert and mountain. Tell them to investigate one specific biome more closely. What kind of weather does it have? Who lives in the biome? What sort of vegetation grows there? Have people been able to develop a society there, or is the climate too harsh for humankind?

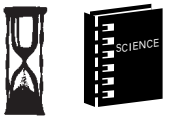
Link to the World

30 Minutes

Carbon dioxide, a greenhouse gas, is responsible for much of the earth's warming. Carbon dioxide levels have increased greatly in the last few hundred years because humans have been burning greater amounts of fossil fuels. When fossil fuels are burned, they give off large amounts of carbon dioxide, adding to the greenhouse effect.

Ask students to make a list of ways to reduce the greenhouse effect by conserving fossil fuels. Remind them that fuels are consumed whenever we use electricity or gas-driven vehicles like cars. (Ways to reduce include carpooling, bike riding, using less heat and air conditioning, and turning off lights and appliances when we're finished with them.)

Connection to Science



30 Minutes

Imagine being trapped on a spaceship far from earth. What basic requirements will you need to stay alive? What will you need to get rid of? Which requirement for life do you think will run out the most quickly? How can you conserve your resources? (Air, food, water and an appropriate temperature will be needed. Solid waste and carbon dioxide from respiration will need to be eliminated from the spaceship. Depending on reserve supplies, air will probably run out the most quickly. Resources can be conserved by breathing shallow, eating less food and drinking less water, and not moving around much since movement causes the body to need more oxygen and energy from food.)

How is the earth similar to the spaceship you're trapped on? (The earth has a limited supply of water, food and breathable air. These resources must be conserved, just as they would be on a stranded spaceship.)

In the Newsroom

1 Hour

Every day, we can read about current issues affecting our environment. Ask students to search newspapers and magazines for ecology-related stories. Have them present their articles to the class, giving their own personal reflections on the event described. If possible, have students use audio or video equipment to create a news show focusing on their stories.

Hands On

1-2 Hours

What kind of biome do students live in? To find out, have them collect both abiotic and biotic samples from their outdoor environment. Tell them to place their samples in glass jars. Leaves, insects, rocks, flowers and grass can be important clues in labeling an ecosystem. Students should also write a short description of any animals they see. Along with the information collected, have students use encyclopedias or science books to narrow down their ecosystem. Do they see evidence of more than one kind of climate? How has the weather of their region affected the type of ecosystem that exists?

Meeting Individual Needs

35 Minutes

Ask students to look up the words *habitat, biome and community*. What does each word mean? What is an example of each? (Habitat is a certain type of environment where an organism lives and seeks shelter, such as a pine tree. Biome is an area of characteristic climate and vegetation, such as a Louisiana swamp. Community is the living part of a biome, including a particular group of animals or plants living together, such as a group of capuchin monkeys living in a South American rain forest.)

Critical Thinking

25 Minutes

Most organisms have little or no control over their environment. However, humans can easily move from one environment to another. You may be at your home in the morning, at school during the day, and at a friend's house in the evening. In addition to changing environments, humans can also adapt to the environment they are in. Ask students if they can think of ways that they adapt to their environment. (Some ways include turning on the heat in winter and the air conditioning in summer, changing clothes or footwear to fit the climate, and using devices such as snow skis to maneuver in the elements.)

Do other animals have any built-in adaptations like the ones mentioned above? If so, what are they? (Yes, some animals have fur, feathers or skin that adjusts according to the season. Others have large, insulated feet that make it easier to walk in snow or through water.)

Cultural Exchange

20 Minutes

A biome is an area with a characteristic climate that determines the types of plants and animals that can live there. There are five basic types of climate: tundra, forest, grassland, desert and mountain. Write these climate types on the board and ask each student to choose one. Have them locate an example of their chosen climate on a map. Pretending they live in the area, each student should write a a one-page diary entry describing daily life. What kind of clothes do people wear? What foods do they eat? What types of animals, plants and insects do they see?

Connection to Art

30 Minutes

Using the diary entry they created, ask students to draw a scene that was described. Remind them to include themselves and their home in the drawing. Their clothing and surroundings should reflect the climate they imagined living in. What kind of shoes will they wear? Do they have a warm coat? What kind of material is used to make their home? Do they have any pets? Encourage them to be rich with details.

Culminating Activity

40 Minutes

Tell the class they are going to work together to become a rain forest. Ask each student to choose an organism listed below. After choosing, they must use what they have learned to explain their role within the ecosystem. Ask them to write a short description of what they contribute to their community. What are they taking from the environment? What are they giving back? How are they related to the other organisms listed? Are they involved in a parasitic or symbiotic relationship? What are their defense mechanisms?

Encourage students to draw a picture of their chosen organism along with their description. Display these "biographies" on a wall labeled "THE LIVING RAIN FOREST."

boa constrictor (consumer)
mushroom (decomposer)
jaguar (consumer)
banana tree (producer)
spider monkey (consumer)
tree frog (consumer)
hibiscus plant (producer)
bacteria on root of hibiscus plant (decomposer)
tarantula (consumer)
fungus growing on banana tree (decomposer)
ant (consumer)

Name

VOCABULARY

The following vocabulary words are from *The Web of Life: Producer to Predator*. Fill in the number of each word next to its closest definition.

1. biome
2. camouflage
3. community
4. decomposer
5. geography
6. habitat
7. mimicry
8. mutualism
9. niche
10. nitrate
11. nitrogen
12. omnivore
13. parasite
14. phosphorous

___ group of animals or plants living together as part of an ecosystem or biome

___ phenomenon in which an organism manipulates the coloration warning system falsely

___ compound of salt and nitric acid created for plant nutriment

___ element necessary for the formation of nerves, bones and other parts of the body

___ fungi or bacteria which extract energy from waste to create nutrient-rich soils for future plants

___ certain type of environment where an organism lives and seeks shelter

___ occurs when two organisms interact in a way that's beneficial to both

___ an area of characteristic climate and vegetation

___ organism that digests both animals and plants

___ plant or animal that lives on or in an organism of another species from which it derives sustenance and protection

___ gas that comprises 79% of the earth's atmosphere; critical to the development of life

___ ability to disguise or conceal by means of shape and color

___ role of an individual species or organism in its environment, including behavior and position in food cycle

___ physical or surface features of a region such as temperature and available water

Name

CHECKING COMPREHENSION

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

Life on earth is made up of countless _____(1) _____ , each filling its own _____(2) _____ in remarkable ways. The requirements for all life are _____(3) _____ . The organisms living in an ecosystem are called a _____(4) _____ . Plants and other living things capable of _____(5) _____ are called producers. Plants absorb _____(6) _____ from the atmosphere and release oxygen. _____(7) _____ consumers are creatures who eat plants, while _____(8) _____ consumers eat other animals. Organisms known as _____(9) _____ break down the waste of consumers, creating nutrient-rich soils for a new generation of plants. The actions of humankind have disrupted this cycle of life and increased the amount of carbon dioxide in the atmosphere, leading to an environmental problem called _____(10) _____ .

1. A. nitrates
   B. gases
   C. organisms
   D. elements

2. A. decomposer
   B. phosphorus cycle
   C. greenhouse effect
   D. niche

3. A. soil, solvent, sunlight and water
   B. carbon, nitrogen and phosphorus
   C. nutrients, energy, water and a range of temperature
   D. sunlight, water and a variety of plants

4. A. family
   B. community
   C. species
   D. habitat

5. A. photosynthesis
   B. digestion
   C. camouflage
   D. mimicry

6. A. phosphorus
   B. pure carbon
   C. carbon dioxide
   D. bacteria

7. A. symbiotic
   B. primary
   C. mutual
   D. secondary

8. A. secondary
   B. tertiary
   C. communal
   D. primary

9. A. parasites
   B. omnivores
   C. producers
   D. decomposers

10. A. the symbiotic effect
    B. the carbon cycle
    C. the greenhouse effect
    D. the nitrogen cycle

Name

PLACES IN THE FOOD CHAIN

Next to each organism below write a D if the organism is a decomposer, a C if it's a consumer, a PA if it's a parasite and a PR if it's a producer.

1. _____ Flea
2. _____ Bear
3. _____ Rose
4. _____ Fungus
5. _____ You
6. _____ Strawberry
7. _____ Grasshopper
8. _____ Tapeworm
9. _____ Bacteria
10. _____ Oak tree

_____

Name

WHERE DID IT COME FROM?

Many of the items we use every day started with a plant or an animal. Record the history of each item below, going backward until you reach the item's origin. The first one has been done for you.

1. **LEATHER BELT:** store - belt factory - leather tannery - cow farm - cow
2. **ORANGE JUICE:** _____
3. **COTTON SHIRT:** _____
4. **CHEESE:** _____
5. **CORN FLAKES:** _____
6. **WOODEN DESK:** _____
7. **OMELET:** _____
8. **NOTEBOOK PAPER:** _____
9. **SILK RIBBON:** _____
10. **HONEY:** _____

BONUS: Many of the things we use are made of plastic. Where does plastic come from? What natural resource does it use?

_____

_____

_____

_____

_____

_____

_____

_____

Name

ECOLOGY MATCH-UP

Match each word below to the example that best describes it.

1. camouflage	6. symbiotic relationship
2. parasitism	7. competition
3. mimicry	8. mutualism
4. commensalism	9. predator-prey relationship
5. warning coloration	10. decomposition

_____ An oxtail bird eats flies off the back of a rhinoceros.

_____ A lion kills a zebra.

_____ The viceroy butterfly is not eaten by birds because it looks like the untasty monarch.

_____ The feathers of a pheasant are the same colors as its habitat.

_____ A harmless snake has colors similar to the poisonous coral snake.

_____ The epiphyte plant grows on a tree branch, receiving only structure from its host.

_____ A bee feeds on the nectar of a flower, collecting pollen on its back.

_____ Bacteria turn dead organic matter into nutrient-rich soil.

_____ A crow and a bluejay fight over the remains of a dead rabbit.

_____ A flea sucks blood from a cat's leg.

Name

REVERSE ALPHABET

An important word in each sentence below is written in reverse alphabet. Reverse alphabet works like this:

A=Z, B=Y, C=X, D=W, E=V, F=U, G=T, H=S, I=R, J=Q, K=P, L=O, M=N, N=M, O=L, P=K, Q=J, R=I, S=H, T=G, U=F, V=E, W=D, X=C, Y=B, Z=A

Use reverse alphabet to uncover the code word in each sentence. Write your answer below each word.

1. The physical and surface features of an area make up the area's **TVLTIZKSB**.

2. **UFMTR** and **YZXGVIRZ** are two types of decomposers.

3. Compounds of salt and nitric acid created for plant nutriment are called **MRGIZGVH**.

4. Animals that digest both plant and animal food are called **LNMRELIVH**.

5. Organisms that mutually depend on one another have a **HBNYRLGRX** relationship.

6. **XZIYLM** forms the framework for all organic molecules.

7. Organisms capable of photosynthesis are called **KILWFXVIH.**

8. **NRNRXIB** is a form of defense for non-poisonous organisms.

9. Animals that eat plants are known as **KIRNZIB** consumers.

10. **MRGILTVM** comprises 79% of the earth's atmosphere.

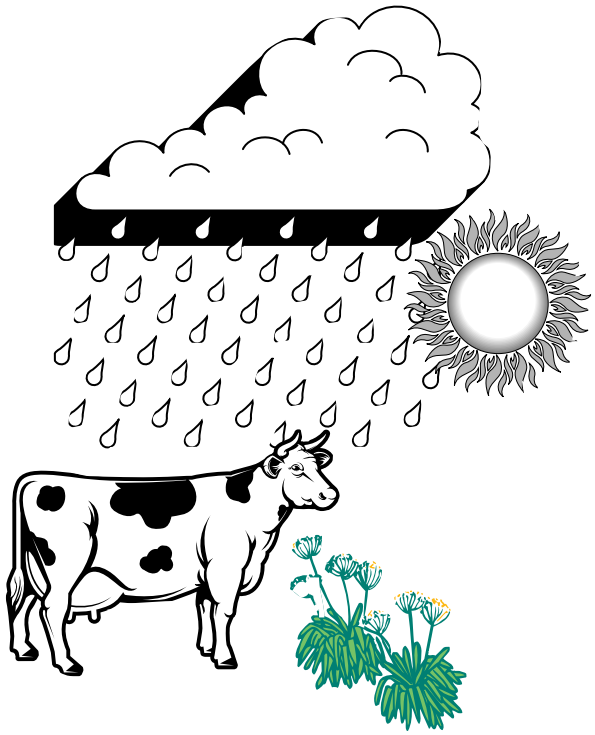
_____

Name

PICTURE QUESTIONS

Use the drawing below to answer the following questions.

1. What important gas is the plant releasing into the atmosphere? _____
2. What type of consumer is the cow? _____
3. How does the plant obtain nitrogen? _____
4. Based on what is pictured, what might nitrate-producing bacteria feed on? _____
5. What important gas is the cow releasing in respiration? _____
6. In what two ways does the plant benefit the cow? _____
7. What important gas does the plant absorb during photosynthesis? _____
8. What else does the plant need to survive? _____
9. If another cow appears, but the food supply stays the same, what kind of relationship might develop between the cows? _____
10. As a living part of their ecosystem, the cow and the plant are part of what? _____



Name

VOCABULARY SEARCH

Look up, down, diagonally and backwards to find the words below.

biome	mimicry
carbon	niche
decomposer	omnivore
greenhouse	parasite
habitat	water

E H C I N H Y N K R L
M M U K H M G L D F E
E H I V A C U Q E T S
Q P O M B Z P C C S U
L A N B I O M E O B O
W R Y G T C W A M Q H
S A D N A R R N P I N
J S T J T G R Y O L E
Z I M E P A D H S W E
E T C A R B O N E B R
V E L M O P C K R I G
P O M N I V O R E X H

Name

TEST

Circle the letter which best answers the question.

1. The living part of an ecosystem or biome is called a:

    a. habitat.
    b. environment.
    c. family.
    d. community.

2. Which of the following is a good example of an ecosystem?

    a. a pond
    b. the earth
    c. a drop of water
    d. all of the above

3. The greenhouse effect is thought to be caused by the excessive release of:

    a. nitrogen.
    b. carbon dioxide.
    c. phosphorus.
    d. none of the above.

4. A relationship that takes place between populations and communities is called a:

    a. competitive relationship.
    b. predator-prey relationship.
    c. symbiotic relationship.
    d. all of the above.

5. The element that forms the framework for all organic molecules is:

    a. oxygen.
    b. phosphorus.
    c. carbon.
    d. fossil fuels.

Name

TEST (CONTINUED)

6. Where can phosphates be found?

    a. in rocks like limestone
    b. in the atmosphere
    c. in oceans and mountain streams
    d. in all of the above

7. Organisms capable of photosynthesis are called:

    a. detritus feeders.
    b. decomposers.
    c. producers.
    d. consumers.

8. Ticks, fleas and leeches are common examples of:

    a. hosts.
    b. detritus feeders.
    c. parasites.
    d. secondary consumers.

9. Which group of animals is an example of omnivores?

    a. humans, seals and cows
    b. rats, bears and raccoons
    c. deer, cows and seals
    d. wolves, snakes and frogs

10. Living environment is determined by:

    a. latitude.
    b. elevation.
    c. proximity to oceans and mountains.
    d. all of the above.

ADDITIONAL AIMS MULTIMEDIA PROGRAMS

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

Ecosystems: Nature in Balance
The World's Biomes: Desert to Rainforest
Classification: Bringing Order to Diversity

ANSWER KEY for page 18

Name

VOCABULARY

The following vocabulary words are from *The Web of Life: Producer to Predator*. Fill in the number of each word next to its closest definition.

1. biome
2. camouflage
3. community
4. decomposer
5. geography
6. habitat
7. mimicry
8. mutualism
9. niche
10. nitrate
11. nitrogen
12. omnivore
13. parasite
14. phosphorous

3 group of animals or plants living together as part of an ecosystem or biome

7 phenomenon in which an organism manipulates the coloration warning system falsely

10 compound of salt and nitric acid created for plant nutriment

14 element necessary for the formation of nerves, bones and other parts of the body

4 fungi or bacteria which extract energy from waste to create nutrient-rich soils for future plants

6 certain type of environment where an organism lives and seeks shelter

8 occurs when two organisms interact in a way that's beneficial to both

1 an area of characteristic climate and vegetation

12 organism that digests both animals and plants

13 plant or animal that lives on or in an organism of another species from which it derives sustenance and protection

11 gas that comprises 79% of the earth's atmosphere; critical to the development of life

2 ability to disguise or conceal by means of shape and color

9 role of an individual species or organism in its environment, including behavior and position in food cycle

5 physical or surface features of a region such as temperature and available water

ANSWER KEY for page 19

Name

CHECKING COMPREHENSION

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

Life on earth is made up of countless _____(1) _____ , each filling its own _____(2) _____ in remarkable ways. The requirements for all life are _____(3) _____ . The organisms living in an ecosystem are called a _____(4) _____ . Plants and other living things capable of _____(5) _____ are called producers. Plants absorb _____(6) _____ from the atmosphere and release oxygen. _____(7) _____ consumers are creatures who eat plants, while _____(8) _____ consumers eat other animals. Organisms known as _____(9) _____ break down the waste of consumers, creating nutrient-rich soils for a new generation of plants. The actions of humankind have disrupted this cycle of life and increased the amount of carbon dioxide in the atmosphere, leading to an environmental problem called _____(10) _____ .

1. A. nitrates
   B. gases
   C. organisms
   D. elements

2. A. decomposer
   B. phosphorus cycle
   C. greenhouse effect
   D. niche

3. A. soil, solvent, sunlight and water
   B. carbon, nitrogen and phosphorus
   C. nutrients, energy, water and a range of temperature
   D. sunlight, water and a variety of plants

4. A. family
   B. community
   C. species
   D. habitat

5. **A. photosynthesis**
   B. digestion
   C. camouflage
   D. mimicry

6. A. phosphorus
   B. pure carbon
   C. carbon dioxide
   D. bacteria

7. A. symbiotic
   B. primary
   C. mutual
   D. secondary

8. **A. secondary**
   B. tertiary
   C. communal
   D. primary

9. A. parasites
   B. omnivores
   C. producers
   D. decomposers

10. A. the symbiotic effect
    B. the carbon cycle
    C. the greenhouse effect
    D. the nitrogen cycle

ANSWER KEY for page 20

Name

PLACES IN THE FOOD CHAIN

Next to each organism below write a D if the organism is a decomposer, a C if it's a consumer, a PA if it's a parasite and a PR if it's a producer.

1. PA Flea
2. C Bear
3. PA Rose
4. PR Fungus
5. C You
6. PR Strawberry
7. C Grasshopper
8. PA Tapeworm
9. D Bacteria
10. PR Oak tree

ANSWER KEY for page 21

Name

WHERE DID IT COME FROM?

Many of the items we use every day started with a plant or an animal. Record the history of each item below, going backward until you reach the item's origin. The first one has been done for you.

1. **LEATHER BELT:** store - belt factory - leather tannery - cow farm - cow
2. **ORANGE JUICE:** grocery store - juice plant - orange orchard - orange
3. **COTTON SHIRT:** store - clothing factory - fabric factory - cotton mill - cotton plant
4. **CHEESE:** grocery store - cheese factory - dairy farm - cow
5. **CORN FLAKES:** grocery store - cereal factory - farm - corn stalk
6. **WOODEN DESK:** store - furniture factory - lumber yard - tree
7. **OMELET:** egg - grocery store - dairy farm - chicken
8. **NOTEBOOK PAPER:** store - paper company - paper mill - lumber - tree
9. **SILK RIBBON:** store - silk factory - silk farm - silkworm
10. **HONEY:** store - honey factory - bee farm - bee

BONUS: Many of the things we use are made of plastic. Where does plastic come from? What natural resource does it use?

Plastic is made from fossil fuels that have been underground for millions of years. These fuels are the earth's most valuable form of stored energy. Once they are used up, they can never be replaced.

ANSWERS WILL VARY

ANSWER KEY for page 22

Name

ECOLOGY MATCH-UP

Match each word below to the example that best describes it.

1. camouflage	6. symbiotic relationship
2. parasitism	7. competition
3. mimicry	8. mutualism
4. commensalism	9. predator-prey relationship
5. warning coloration	10. decomposition

8 An oxtail bird eats flies off the back of a rhinoceros.

9 A lion kills a zebra.

3 The viceroy butterfly is not eaten by birds because it looks like the untasty monarch.

1 The feathers of a pheasant are the same colors as its habitat.

5 A harmless snake has colors similar to the poisonous coral snake.

4 The epiphyte plant grows on a tree branch, receiving only structure from its host.

6 A bee feeds on the nectar of a flower, collecting pollen on its back.

10 Bacteria turn dead organic matter into nutrient-rich soil.

7 A crow and a bluejay fight over the remains of a dead rabbit.

2 A flea sucks blood from a cat's leg.

ANSWER KEY for page 23

Name

REVERSE ALPHABET

An important word in each sentence below is written in reverse alphabet. Reverse alphabet works like this:
A=Z, B=Y, C=X, D=W, E=V, F=U, G=T, H=S, I=R, J=Q, K= P, L =O, M=N, N=M, O=L, P=K, Q=J, R=I, S=H, T=G, U=F, V=E, W=D, X=C, Y=B, Z=A

Use reverse alphabet to uncover the code word in each sentence. Write your answer below each word.

1. The physical and surface features of an area make up the area's **TVLTIZKSB**.
   GEOGRAPHY

2. **UFMTR** and **YZXGVIRZ** are two types of decomposers.
   FUNGI, BACTERIA

3. Compounds of salt and nitric acid created for plant nutriment are called **MRGIZGVH**.
   NITRATES

4. Animals that digest both plant and animal food are called **LNMRELIVH**.
   OMNIVORES

5. Organisms that mutually depend on one another have a **HBNYRLGRX** relationship.
   SYMBIOTIC

6. **XZIYLM** forms the framework for all organic molecules.
   CARBON

7. Organisms capable of photosynthesis are called **KILWFXVIH.**
   PRODUCERS

8. **NRNRXIB** is a form of defense for non-poisonous organisms.
   MIMICRY

9. Animals that eat plants are known as **KIRNZIB** consumers.
   PRIMARY

10. **MRGILTVM** comprises 79% of the earth's atmosphere.
    NITROGEN

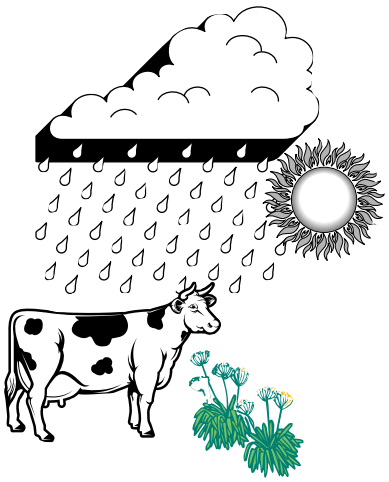
ANSWER KEY for page 24

Name

PICTURE QUESTIONS

Use the drawing below to answer the following questions.

1. What important gas is the plant releasing into the atmosphere? **OXYGEN**
2. What type of consumer is the cow? **PRIMARY CONSUMER**
3. How does the plant obtain nitrogen? **FROM NITRATES FOUND IN THE SOIL & FROM RAIN**
4. Based on what is pictured, what might nitrate-producing bacteria feed on? **MANURE, DEAD PLANT**
5. What important gas is the cow releasing in respiration? **CARBON DIOXIDE**
6. In what two ways does the plant benefit the cow? **GIVES COW NOURISHMENT & OXYGEN**
7. What important gas does the plant absorb during photosynthesis? **CARBON DIOXIDE**
8. What else does the plant need to survive? **SUN, WATER & SOIL**
9. If another cow appears, but the food supply stays the same, what kind of relationship might develop between the cows? **COMPETITIVE RELATIONSHIP**
10. As a living part of their ecosystem, the cow and the plant are part of what? **COMMUNITY**



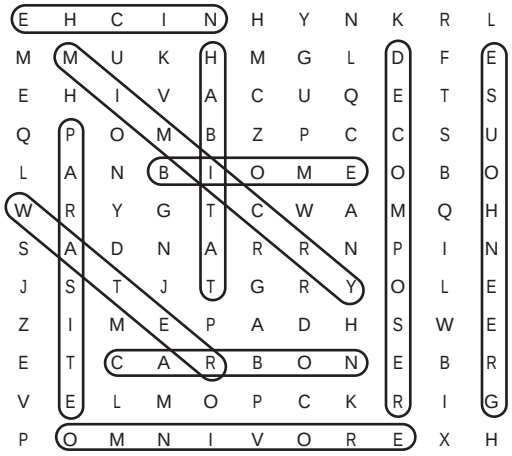
ANSWER KEY for page 25

Name

VOCABULARY SEARCH

Look up, down, diagonally and backwards to find the words below.

biome	mimicry
carbon	niche
decomposer	omnivore
greenhouse	parasite
habitat	water



ANSWER KEY for page 26

Name

TEST

Circle the letter which best answers the question.

1. The living part of an ecosystem or biome is called a:
   a habitat.
   b environment.
   c family.
   (d) community.

2. Which of the following is a good example of an ecosystem?
   a a pond
   b the earth
   c a drop of water
   (d) all of the above

3. The greenhouse effect is thought to be caused by the excessive release of:
   a nitrogen.
   (b) carbon dioxide.
   c phosphorus.
   d none of the above.

4. A relationship that takes place between populations and communities is called a:
   a competitive relationship.
   b predator-prey relationship.
   c symbiotic relationship.
   (d) all of the above.

5. The element that forms the framework for all organic molecules is:
   a oxygen.
   b phosphorus.
   (c) carbon.
   d fossil fuels.

ANSWER KEY for page 27

Name

TEST (CONTINUED)

6. Where can phosphates be found?
   - (a) in rocks like limestone
   - b in the atmosphere
   - c in oceans and mountain streams
   - d in all of the above

7. Organisms capable of photosynthesis are called:
   - a detritus feeders.
   - b decomposers.
   - (c) producers.
   - d consumers.

8. Ticks, fleas and leeches are common examples of:
   - a hosts.
   - b detritus feeders.
   - (c) parasites.
   - d secondary consumers.

9. Which group of animals is an example of omnivores?
   - a humans, seals and cows
   - (b) rats, bears and raccoons
   - c deer, cows and seals
   - d wolves, snakes and frogs

10. Living environment is determined by:
    - a latitude.
    - b elevation.
    - c proximity to oceans and mountains.
    - (d) all of the above.

The Human Body: The Ultimate Machine

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

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1-800-367-2467

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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

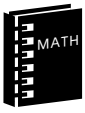
After your students have viewed the program, you may introduce any or all of these activities to interact with other curriculum content areas, provide reinforcement, assess comprehension skills, or provide hands-on and in-depth extended study of the topic.

SUGGESTED ACTIVITIES

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.

VOCABULARY

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.

The Human Body: The Ultimate Machine

THEMES

In *The Human Body: The Ultimate Machine*, students will study each major system of the human body. Vital organs and functions of the systems will be discussed, as well as the interrelation of the systems. Important health aspects concerning each system will also be explored.

OVERVIEW

The Human Body: The Ultimate Machine details the functioning of each of the human body's major systems including the muscular, circulatory, respiratory, digestive, skeletal, urinary, endocrine, lymphatic and nervous systems. The primary organs comprising each system are discussed, as well as the relationship between systems working together. Students are also introduced to the methods used by physicians to examine each major system.

OBJECTIVES

- To identify the ten major systems of the human body.
- To explain how the skin regulates body temperature and why this is important.
- To list the three types of muscles and discuss their differences.
- To understand the function of ligaments, cartilage and bones.
- To discuss the components of blood.
- To explain the role of lymph and lymph nodes in fighting infection.
- To understand how the kidneys maintain a constant blood PH.
- To list the three major parts of the brain and explain their functions.
- To discuss the function of the endocrine system and hormones.
- To understand the process of digestion.

Use this page for your individual notes about planning and/or effective ways to manage this AIMS Teaching Module in your classroom.

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 name as many human body systems as they can. Encourage them to think about body processes they may normally overlook. How does the human body fight infection? How does it maintain a constant body temperature? What controls its growth? Is there more than one system responsible for removing wastes from the body? (The major body systems are the muscular, circulatory, respiratory, digestive, skeletal, urinary, endocrine, lymphatic, nervous and reproductive systems. The skin is also considered a body system. The body fights infection with the skin and the lymphatic system. The skin also maintains body temperature. Growth is controlled by the endocrine system. Both the digestive and urinary systems rid the body of wastes.)

INTRODUCTION TO VOCABULARY

Write the words "endocrine," "lymphatic" and "urinary" on the board. What do students know about the meaning of each word? Which body processes do they think each word relates to? How important are these processes in relation to digestive, circulatory and respiratory processes? (The endocrine system regulates body activities by producing hormones. The lymphatic system produces antibodies that are used to fight infection. The urinary system filters harmful waste products from the blood. Each system is just as vital to our survival as the digestive, circulatory and respiratory systems.)

DISCUSSION IDEAS

Our bodies are a bit like fancy machines that must be carefully maintained. Ask students to think for a moment about their daily health habits. How can each body system benefit from proper maintenance? What about the quality of the fuel used to provide them with energy? How flexible and "lubricated" are their joints? Are their frameworks structurally sound? Are their bodies able to stay clean and free from pollutants? Encourage students to continue the machine metaphor by discussing other aspects of their health. (The quality of the fuel or food we eat is important to many of our body systems. Our joints can become more flexible with regular exercise, reducing our risk of injury. Calcium and certain vitamins can make our bones more structurally sound. Abstaining from junk food, smoking and too much alcohol can help to keep our bodies free of pollution.)

FOCUS

Ask students to spend a few minutes thinking about all the activities that are going on inside their bodies. What would happen if even one of these activities stopped? How long would their bodies be able to survive? Tell the class they are about to learn more about the amazing systems of the human body and how they hold the key to our very survival.

JUMP RIGHT IN

HOW TO USE THE THE HUMAN BODY: THE ULTIMATE MACHINE AIMS TEACHING MODULE

Preparation

- Read *The Human Body: The Ultimate Machine* **Themes, Overview,** and **Objectives** to become familiar with program content and expectations.
- Use **Preparation for Viewing** suggestions to introduce the topic to students.

Viewing THE HUMAN BODY: THE ULTIMATE MACHINE

- 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 *The Human Body: The Ultimate Machine* together or in small groups.
- Some students may benefit from viewing the video more than one time.

After Viewing THE HUMAN BODY: THE ULTIMATE MACHINE

- 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 Language Arts

20 Minutes

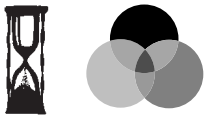
Ask students to think about the expressions, "hair standing on end," stomach butterflies," and "a broken heart." Each phrase is related to a real biological event caused by a strong emotion. What might be the biological reason for each of these events? (Fear causes the erector pili muscles, which are attached to hair roots, to contract. Nervousness makes the stomach and intestinal muscles contract, causing a shaky feeling in the belly. Sadness and other strong emotions can cause the heart to have an irregular beat, leading to a heavy or painful feeling in the chest.)

Critical Thinking

20 Minutes

A person's skin accounts for about 1/12 of his or her total body weight. Ask students to calculate how much this would be for their bodies. Generate a list of items with a similar weight. What would it be like to carry this weight around all day? Why does skin have to be so heavy? (Skin protects us from wear and tear, and it keeps us insulated from the environment.)

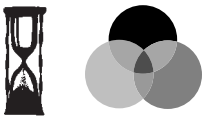
Cultural Diversity



30 Minutes

Human bodies come in all shapes and sizes. Many of these differences are based on a person's environment. Why might someone from a very cold region have a round body shape with plenty of excess fat? Why would someone from a poor region have a height that is less than normal? Why might someone in a sunny region have darker skin? (People in cold regions need more body fat for warmth and insulation. Those with little food don't get the nutrition they need to grow properly. People in sunny climates are outdoors more often, with more skin exposed. Therefore, their skin produces more protective melanin.)

Connection to Art



40 Minutes

Have students choose one of the body systems discussed. Ask them to draw each major organ of the system, labeling the organs with proper names and vital functions. Group the drawings by systems and display them on the classroom wall.

Extended Activity

30 Minutes

Ask students to do some investigative work to find out which bone is the largest in the body. Which bone is the smallest? Which muscles are the largest and smallest? (The femur, or thigh bone, is the largest bone. The stirrup, attached to the eardrum, is the smallest bone. The largest muscle is the gluteus maximus, or buttock and upper thigh muscle. The smallest muscle is the stapedial muscle, a tiny muscle attached to the stirrup bone.)

Hands On

20 Minutes

Bring a small hand mirror to class. Allow each student to exhale while holding the mirror close to his or her mouth. Clean the mirror with a paper towel in between each student's turn. Why does the mirror fog up? How do the circulatory and respiratory systems make this happen? (The mirror fogs because water is being exhaled. Respiration uses oxygen and sugar to produce energy and two waste products: carbon dioxide and water vapor. The oxygen passes from the lungs to the blood, where this exchange process takes place. Waste products pass from the blood back to the lungs and are exhaled.)

Link to the World

20 Minutes

Usually, we don't notice respiration, but sometimes the world around us changes our breathing into special processes. Ask students to identify each of the following special types of breathing. If dirt irritates the lining of our noses, we take a deep breath and blow this dirt out at a speed of up to 100 miles per hour. (a sneeze) If we breathe too slowly, such as when we're tired, we don't get enough oxygen or we may not get rid of enough carbon dioxide. To fix this problem, our brains tell us to take an extra deep breath. (a yawn) If we eat or drink too much, our full stomach rubs against our diaphragm, causing it to contract. As a result, we take a quick, jerky breath. (a hiccup)

Meeting Individual Needs

30 Minutes

Ask students to choose one of the following systems: circulatory, respiratory, digestive, urinary, endocrine, nervous or reproductive. Have them write a list of the organs comprising the system they choose. Next to each organ, ask them to write a description of what the organ does and how it contributes to the system.

Culminating Activity

30 Minutes

Host a Human Body Quiz Show. Divide students into several groups, assigning each group to a system of the human body. Before the quiz, ask each group to write a list of questions for the other groups. Collect these questions and read them to the appropriate groups. For instance, a question about the heart would be read to the circulatory group. Keep each group's score until the questions have all been asked and a winner is declared.

Name

VOCABULARY

The following vocabulary words are from The Human Body: The Ultimate Machine. Fill in the number of each word next to its closest definition.

1. alveoli
2. bone marrow
3. capillaries
4. cartilage
5. cerebellum
6. cerebrum
7. hemoglobin
8. hormone
9. insulin
10. kidneys
11. lymph
12. lysomes
13. melanin
14. pancreas
15. pituitary
16. plasma
17. spleen
18. tendon
19. thyroid
20. villi

___ gland which produces the hormone insulin
___ very small blood vessels
___ compound of iron and protein found in red blood cells
___ cellular structures containing powerful digestive enzymes
___ part of the brain involved in unconscious processes like muscle contractions
___ substance formed from plasma; contains a large number of white blood cells
___ lymphatic organ that filters blood and gets rid of worn out red blood cells
___ organs in the urinary system which filter blood
___ elastic saclike structures in the lungs that are lined with capillaries
___ part of the brain involved in conscious process like thinking
___ master gland which controls the output of hormones by other glands
___ hormone that is critical in controlling the level of sugars in the blood
___ finger-like projections lining the small intestine which increase surface area
___ band of tissue that connects muscle to bone
___ smooth, lubricated tissue on bones that helps joints move easily
___ dark pigment that causes skin to have color
___ spongy tissue where blood cells and platelets are produced
___ substance that speeds up or slows down chemical reactions in the body
___ liquid portion of the blood
___ gland that controls the metabolism of the body

Name

CHECKING COMPREHENSION

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

As one of the most overlooked systems, the skin protects the body from ____1____. Skin also regulates body ____2____ by increasing or decreasing the flow of blood in the ____3____. Skin color is the result of a dark pigment called ____4____. There are three basic types of muscle in the body: smooth, skeletal and ____5____. Skeletal muscles are attached to bones by ____6____ . The components of blood are produced in bone ____7____. These components include ____8____, whose primary job is to fight infection by killing microorganisms. Blood is filtered by two organs in the urinary system called the ____9____. The endocrine system controls body activities by secreting ____10____ The ____11____ gland effects the output of other glands and largely controls the body's growth. Most of the body systems are controlled by the ____12____, a portion of the brain involved with unconscious processes.

1. A. microorganisms
B. ultraviolet radiation
C. phosphates
D. both A and B

2. A. metabolism
B. hormone levels
C. temperature
D. fat

3. A. kidneys
B. brain
C. muscles
D. capillaries

4. A. melanin
B. nephron
C. hemoglobin
D. dermis

Name

Checking Comprehension - Page 2

5. A. cardiac
B. neural
C. digestive
D. circulatory

6. A. lymph nodes
B. tendons
C. blood vessels
D. neurons

7. A. ligaments
B. tendons
C. marrow
D. cartilage

8. A. white blood cells
B. red blood cells
C. platelets
D. plasmas

9. A. lymph nodes
B. spleens
C. alveoli
D. kidneys

10. A. lysomes
B. hormones
C. lymph
D. blood cells

11. A. pituitary
B. thyroid
C. adrenal
D. pancreatic

12. A. cerebrum
B. spinal base
C. cerebellum
D. brainstem

Name

HUMAN BODY FILL-IN-THE-BLANKS

Use the following words to fill in the blanks below.

cerebrum, cerebellum, kidneys, lymphatic, pancreas, spleen, stomach, liver, lungs, thyroid

1. The _____ is responsible for balance and posture.
2. The _____ gland is responsible for the body's overall metabolism.
3. Worn out blood cells are filtered in the _____.
4. The _____ is responsible for thinking, writing and speaking.
5. Bile breaks down fat and is produced in the _____ .
6. The _____ are part of the urinary system. (kidneys)
7. Hydrochloric acid is released in the _____ .
8. Insulin regulates blood sugar and is produced in the _____ .
9. The _____ system produces antibodies and filters the blood.
10. Cellular respiration takes place in the _____ .

Name

SYSTEM MATCH-UP

Match each body system on the left with the best group of words on the right.

- skin
- muscular
- skeletal
- circulatory
- lymphatic
- urinary
- nervous
- endocrine
- digestive

- supplied with sweat and sebaceous glands
- responsible for voluntary and involuntary movements
- supports soft tissues and protects organs
- carries oxygen-rich blood to cells
- produces antibodies and filters the blood
- removes liquid wastes from the blood
- controls activities through electrical impulses
- controls chemical reactions in the body
- absorbs and breaks down nutrients

Name

PICTURE ALPHABET

Using the picture alphabet, write the correct words over the coded words in each sentence.
(use funny pictures instead of the symbols below)

A = *
B = @
C = >
D = ?
E = !
G = ?
H = ?
I = ˜
K =
L = ^
M = ?
N = %
O = <
P = Ï
R = ?
S = $
T = #
U = +

1. Sunlight striking the skin is important in the formation of vitamin D, which helps the body absorb >*^>˜+? and Ï?<$Ï?*#!

2. >*??˜*> muscles are smooth like the muscles of other organs, but they resemble $!^!#*^ muscles.

3. Red blood cells contain a compound of iron and protein called ?!?<?^<@˜%.

4. The kidneys filter blood in structures called %! Ï??<%$.

5. Body temperature and reflexes are a function of the @?*˜%$#!?.

6. *??!%*^ glands produce a hormone that is released during times of fear or stress.

Name

TRUE OR FALSE

Place a T beside each true statement and an F beside each false statement.

1. Skin helps the body form vitamin D, which is used by the body in the absorption of calcium. _____

2. Skeletal muscles are connected to bones by long bands of tissue called cartilage. _____

3. Smooth muscles are controlled by hormones and the autonomic nervous system. _____

4. Cardiac muscle is involuntary and has a structure similar to smooth muscle. _____

5. Lymph contains a large number of specialized white blood cells called lysomes. _____

6. Many components of blood plasma are forced into the kidneys where wastes are filtered out. _____

7. Deoxygenated blood is pumped to the alveoli, which are lined with capillaries. _____

8. High blood pressure increases the chance of plaque causing a heart attack or stroke.)_____

9. The cerebrum is involved in unconscious processes like balance and coordination. _____

10. The adrenal glands are responsible for maintaining overall body metabolism. _____

Name

NAME THAT SYSTEM

Next to each sentence below, write the first letter of the system that is being discussed. Systems can be used more than once.

C for Circulatory

D for Digestive

U for Urinary

E for Endocrine

L for Lymphatic

N for Nervous

1. ___ Oxygenated blood is carried to the cells by arteries, which become subdivided into capillaries.
2. ___ The pancreas produces insulin, which controls the level of sugar in the blood.
3. ___ Proteins, fats, vitamins, water and electrolytes are absorbed into the blood stream through the villi.
4. ___ Photo-receptor cells in the retina send impulses to a chain of neurons.
5. ___ The spleen filters blood and rids the body of worn out blood cells.
6. ___ Glucose and amino acids are filtered in the nephrons and returned to the bloodstream.
7. ___ People with an underactive thyroid may feel tired or put on weight.

Name

VOCAB SEARCH

The following words can be found in the maze below. The letters may be arranged horizontally, vertically, diagonally or backwards.

bile	muscle
brain	neurons
cerebrum	pancreas
kidney	plasma
lymph	skeleton
marrow	villi

B K A R C W R B L E U V
S I M C P A N C R E A S
J D L Y M P H F B I B M
M N J E A U L P Q D F S
U E T A R G S A B L K N
R Y D G R I E C S H Y O
B W I D O L P E L M X R
E C A L W H B H P E A U
R M S K E L E T O N K E
E G T S M Z N B R A I N
C E I L L I V Z K O P Q

Name

TEST

Fill in the bubble for the phrase which best answers the question.

1. Bone marrow is responsible for forming:

   platelets and hemoglobin.
   minerals and vitamins.
   red blood cells, white blood cells and platelets.
   red blood cells and lymph.

2. The nervous system controls billions of cells:

   by releasing hormones.
   by regulating blood flow.
   through muscular movement.
   through electrical impulses.

3. Where are the main groups of lymph nodes found?

   neck and groin
   spinal cord and brain
   small and large intestines
   muscles and bone marrow

4. What are the three types of muscles in the human body?

   peripheral, neural and cardiac
   smooth, autonomic and skeletal
   skeletal, smooth and cardiac
   lymphatic, smooth and skeletal

5. Kidneys are part of which human body system?

   urinary
   circulatory
   digestive
   reproductive

Name

TEST - page 2

6. Glands of the endocrine system control body functions by releasing:

   white blood cells.
   melanin.
   electrical impulses.
   hormones.

7. Sunlight striking the skin is important in forming:

   Vitamin C.
   Vitamin D.
   phosphate.
   calcium.

8. What is the basis of the digestive system?

   the large intestine
   the stomach
   the gastrointestinal tract
   the liver

9. The average adult has _____ of blood flowing through the body.

   12 litres
   1 to 3 litres
   8 to 10 litres
   4 to 6 litres

10. How many major body systems are at work in the human body?

    8
    5
    12
    10

Name

VOCABULARY

The following vocabulary words are from The Human Body: The Ultimate Machine. Fill in the number of each word next to its closest definition.

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3. capillaries
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11. lymph
12. lysomes
13. melanin
14. pancreas
15. pituitary
16. plasma
17. spleen
18. tendon
19. thyroid
20. villi

14 gland which produces the hormone insulin

3 very small blood vessels

7 compound of iron and protein found in red blood cells

12 cellular structures containing powerful digestive enzymes

5 part of the brain involved in unconscious processes like muscle contractions

11 substance formed from plasma; contains a large number of white blood cells

17 lymphatic organ that filters blood and gets rid of worn out red blood cells

10 organs in the urinary system which filter blood

1 elastic saclike structures in the lungs that are lined with capillaries

6 part of the brain involved in conscious process like thinking

15 master gland which controls the output of hormones by other glands

9 hormone that is critical in controlling the level of sugars in the blood

20 finger-like projections lining the small intestine which increase surface area

18 band of tissue that connects muscle to bone

4 smooth, lubricated tissue on bones that helps joints move easily

13 dark pigment that causes skin to have color

2 spongy tissue where blood cells and platelets are produced

8 substance that speeds up or slows down chemical reactions in the body

16 liquid portion of the blood

19 gland that controls the metabolism of the body

Name

CHECKING COMPREHENSION

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

As one of the most overlooked systems, the skin protects the body from ___1___. Skin also regulates body ___2___ by increasing or decreasing the flow of blood in the ___3___. Skin color is the result of a dark pigment called ___4___. There are three basic types of muscle in the body: smooth, skeletal and ___5___. Skeletal muscles are attached to bones by ___6___ . The components of blood are produced in bone ___7___. These components include ___8___, whose primary job is to fight infection by killing microorganisms. Blood is filtered by two organs in the urinary system called the ___9___. The endocrine system controls body activities by secreting ___10___ The ___11___ gland effects the output of other glands and largely controls the body's growth. Most of the body systems are controlled by the ___12___, a portion of the brain involved with unconscious processes.

1. A. microorganisms
B. ultraviolet radiation
C. phosphates
D. both A and B **(X)**

2. A. metabolism
B. hormone levels
C. temperature **(X)**
D. fat

3. A. kidneys
B. brain
C. muscles
D. capillaries **(X)**

4. A. melanin **(X)**
B. nephron
C. hemoglobin
D. dermis

Name _____

Checking Comprehension - Page 2

5. A. cardiac **(X)**
B. neural
C. digestive
D. circulatory

6. A. lymph nodes
B. tendons **(X)**
C. blood vessels
D. neurons

7. A. ligaments
B. tendons
C. marrow **(X)**
D. cartilage

8. A. white blood cells **(X)**
B. red blood cells
C. platelets
D. plasmas

9. A. lymph nodes
B. spleens
C. alveoli
D. kidneys **(X)**

10. A. lysomes
B. hormones **(X)**
C. lymph
D. blood cells

11. A. pituitary **(X)**
B. thyroid
C. adrenal
D. pancreatic

12. A. cerebrum
B. spinal base
C. cerebellum **(X)**
D. brainstem

Name

HUMAN BODY FILL-IN-THE-BLANKS

Use the following words to fill in the blanks below.

cerebrum, cerebellum, kidneys, lymphatic, pancreas, spleen, stomach, liver, lungs, thyroid

1. The _____ is responsible for balance and posture. (cerebellum)
2. The _____ gland is responsible for the body's overall metabolism. (thyroid)
3. Worn out blood cells are filtered in the _____ . (spleen)
4. The _____ is responsible for thinking, writing and speaking. (cerebrum)
5. Bile breaks down fat and is produced in the _____ . (liver)
6. The _____ are part of the urinary system. (kidneys)
7. Hydrochloric acid is released in the _____ . (stomach)
8. Insulin regulates blood sugar and is produced in the _____ . (pancreas)
9. The _____ system produces antibodies and filters the blood. (lymphatic)
10. Cellular respiration takes place in the _____ . (lungs)

Name _____

SYSTEM MATCH-UP

Match each body system on the left with the best group of words on the right.

- skin
- muscular
- skeletal
- circulatory
- lymphatic
- urinary
- nervous
- endocrine
- digestive

- supplied with sweat and sebaceous glands
- responsible for voluntary and involuntary movements
- supports soft tissues and protects organs
- carries oxygen-rich blood to cells
- produces antibodies and filters the blood
- removes liquid wastes from the blood
- controls activities through electrical impulses
- controls chemical reactions in the body
- absorbs and breaks down nutrients

- supplied with sweat and sebaceous glands **(skin)**
- responsible for voluntary and involuntary movements **(muscular)**
- supports soft tissues and protects organs **(skeletal)**
- carries oxygen-rich blood to cells **(circulatory)**
- produces antibodies and filters the blood **(lymph)**
- removes liquid wastes from the blood **(urinary)**
- controls activities through electrical impulses **(nervous)**
- controls chemical reactions in the body **(endocrine)**
- absorbs and breaks down nutrients **(digestion)**

ANSWER KEY for page 23

Name

PICTURE ALPHABET

Using the picture alphabet, write the correct words over the coded words in each sentence.
(use funny pictures instead of the symbols below)

A = *
B = @
C = >
D = ?
E = !
G = ?
H = ?
I = ˜
K =
L = ^
M = ?
N = %
O = <
P = Ï
R = ?
S = $
T = #
U = +

1. Sunlight striking the skin is important in the formation of vitamin D, which helps the body absorb >*^>˜+? and Ï?<$Ï?*#! **(calcium and phosphate)**

2. >*??˜*> muscles are smooth like the muscles of other organs, but they resemble $!^!#*^ muscles. **(Cardiac, skeletal)**

3. Red blood cells contain a compound of iron and protein called ?!?<?^<@˜%. **(hemoglobin)**

4. The kidneys filter blood in structures called %! Ï??<%$. **(nephrons)**

5. Body temperature and reflexes are a function of the @?*˜%$#!?. **(brainstem)**

6. *??!%*^ glands produce a hormone that is released during times of fear or stress. **(Adrenal)**

ANSWER KEY for page 24

Name

TRUE OR FALSE

Place a T beside each true statement and an F beside each false statement.

1. Skin helps the body form vitamin D, which is used by the body in the absorption of calcium. **T**
2. Skeletal muscles are connected to bones by long bands of tissue called cartilage. **F**
3. Smooth muscles are controlled by hormones and the autonomic nervous system. **T**
4. Cardiac muscle is involuntary and has a structure similar to smooth muscle. **F**
5. Lymph contains a large number of specialized white blood cells called lysomes. **F**
6. Many components of blood plasma are forced into the kidneys where wastes are filtered out. **T**
7. Deoxygenated blood is pumped to the alveoli, which are lined with capillaries. **T**
8. High blood pressure increases the chance of plaque causing a heart attack or stroke.) **T**
9. The cerebrum is involved in unconscious processes like balance and coordination. **F**
10. The adrenal glands are responsible for maintaining overall body metabolism. **F**

Name _____

NAME THAT SYSTEM

Next to each sentence below, write the first letter of the system that is being discussed. Systems can be used more than once.

C for Circulatory

D for Digestive

U for Urinary

E for Endocrine

L for Lymphatic

N for Nervous

1. **C** Oxygenated blood is carried to the cells by arteries, which become subdivided into capillaries.
2. **E** The pancreas produces insulin, which controls the level of sugar in the blood.
3. **D** Proteins, fats, vitamins, water and electrolytes are absorbed into the blood stream through the villi.
4. **N** Photo-receptor cells in the retina send impulses to a chain of neurons.
5. **L** The spleen filters blood and rids the body of worn out blood cells.
6. **U** Glucose and amino acids are filtered in the nephrons and returned to the bloodstream.
7. **E** People with an underactive thyroid may feel tired or put on weight.

Name _____

VOCAB SEARCH

The following words can be found in the maze below. The letters may be arranged horizontally, vertically, diagonally or backwards.

bile	muscle
brain	neurons
cerebrum	pancreas
kidney	plasma
lymph	skeleton
marrow	villi

B	**K**	A	R	C	W	R	B	L	E	U	V
S	**I**	M	C	**P**	**A**	**N**	**C**	**R**	**E**	**A**	**S**
J	**D**	**L**	**Y**	**M**	**P**	**H**	F	B	I	B	M
M	**N**	J	**E**	**A**	**U**	**L**	P	Q	D	F	**S**
U	**E**	T	A	**R**	G	**S**	**A**	B	L	K	**N**
R	**Y**	D	G	**R**	I	E	**C**	**S**	H	Y	**O**
B	W	I	D	**O**	L	P	E	**L**	**M**	X	**R**
E	C	A	L	**W**	H	B	H	P	**E**	**A**	**U**
R	M	**S**	**K**	**E**	**L**	**E**	**T**	**O**	**N**	K	**E**
E	G	T	S	M	Z	N	**B**	**R**	**A**	**I**	**N**
C	E	**I**	**L**	**L**	**I**	**V**	Z	K	O	P	Q

Name _____

TEST

Fill in the bubble for the phrase which best answers the question.

1. Bone marrow is responsible for forming:

   platelets and hemoglobin.
   minerals and vitamins.
   red blood cells, white blood cells and platelets. **(X)**
   red blood cells and lymph.

2. The nervous system controls billions of cells:

   by releasing hormones.
   by regulating blood flow.
   through muscular movement.
   through electrical impulses. **(X)**

3. Where are the main groups of lymph nodes found?

   neck and groin **(X)**
   spinal cord and brain
   small and large intestines
   muscles and bone marrow

4. What are the three types of muscles in the human body?

   peripheral, neural and cardiac
   smooth, autonomic and skeletal
   skeletal, smooth and cardiac **(X)**
   lymphatic, smooth and skeletal

5. Kidneys are part of which human body system?

   urinary **(X)**
   circulatory
   digestive
   reproductive

Name

TEST - page 2

6. Glands of the endocrine system control body functions by releasing:

   white blood cells.
   melanin.
   electrical impulses.
   hormones. **(X)**

7. Sunlight striking the skin is important in forming:

   Vitamin C.
   Vitamin D.
   phosphate. **(X)**
   calcium.

8. What is the basis of the digestive system?

   the large intestine
   the stomach
   the gastrointestinal tract **(X)**
   the liver

9. The average adult has _____ of blood flowing through the body.

   12 litres
   1 to 3 litres
   8 to 10 litres
   4 to 6 litres **(X)**

10. How many major body systems are at work in the human body?

    8
    5
    12
    10 **(X)**

Genetics and Heredity: The Blueprint of Life

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

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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

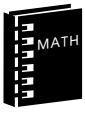
After your students have viewed the program, you may introduce any or all of these activities to interact with other curriculum content areas, provide reinforcement, assess comprehension skills, or provide hands-on and in-depth extended study of the topic.

SUGGESTED ACTIVITIES

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.

VOCABULARY

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.

Title

THEMES

Genetics and Heredity: The Blueprint of Life explores the role of DNA in reproduction. The processes of mitosis and meiosis are also discussed, with emphasis on the division and infinite variety of genetic material. Dominant and recessive traits are described, as well as mutations and genetic disorders.

OVERVIEW

Genetics and Heredity: The Blueprint of Life is part four of the Biology Essentials series which examines modern-day biology. The program illustrates the structure of DNA and the processes of mitosis and meiosis. It explains how traits are passed between generations, how pure and hybrid traits differ, and how Punnett squares can be used to predict the probability of inheriting a given trait. The program also looks at common genetic disorders and the importance of genetics in medicine and biotechnology.

OBJECTIVES

- To outline the importance of the work of Gregor Mendel.
- To illustrate the shape and composition of DNA molecules.
- To describe genes and chromosomes.
- To explain the difference between dominant and recessive traits.
- To describe the difference between a pure and hybrid trait.
- To use a Punnett square to predict the likelihood of a single gene trait being passed to an offspring.
- To list a number of genetic illnesses.

Use this page for your individual notes about planning and/or effective ways to manage this AIMS Teaching Module in your classroom.

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 name as many human traits as they can. Include general traits such as hair color, height, intelligence, musical talent, and so on. List the responses on the board and ask students to think about their own specific characteristics. Where did these traits come from? Can they recognize a strong family trait, such as large noses or red hair? Do they have traits that can't be attributed to either parent? How did they become such a complicated mix of their family and their own unique self?

INTRODUCTION TO VOCABULARY

Taking a close look at the history of a word can give us a better understanding of the word's meaning. "Genetic" is related to the word "genesis." Ask students to explain the meaning of genesis. (Genesis means the origin or coming into being of something; To be born.)

"Heredity" can be traced back to an ancient form of the word "heir." What is the meaning of heir? (An heir is one who receives the property, rank, title or qualities of a parent.)

DISCUSSION IDEAS

Early scientists could plainly see inherited traits in the faces of their subjects. Yet, they had no concrete ideas about how this information was passed on. Some scientists, including Aristotle, thought that genetic traits were passed on through blood. Ask students to consider the expressions "it's in the blood," "blood line," blue blood," and "blood relative." What does each phrase mean? Are they accurate descriptions of how heredity works? (Not really, since genetic material is found in all cells, not just blood cells.)

FOCUS

Discuss with students the importance of learning more about heredity and genetics. How might our developing knowledge of these subjects contribute to the prevention of disease, the evolution of a smarter and healthier population, and an increased life span? Tell students they are going to learn more about the fascinating world of genetics, and the many useful possibilities that it holds.

JUMP RIGHT IN

HOW TO USE THE GENETICS AND HEREDITY: THE BLUPRINT OF LIFE AIMS TEACHING MODULE

Preparation

- Read *Genetics and Heredity: The Blueprint 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 GENETICS AND HEREDITY: THE BLUEPRINT OF LIFE

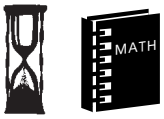
- Set up viewing monitor so that all students have a clear view.
- Depending on your classroom size and learning range, you may choose to have students view *Genetics and Heredity: The Blueprint of Life*together or in small groups.
- Some students may benefit from viewing the video more than one time.

After Viewing GENETICS AND HEREDITY: THE BLUEPRINT 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

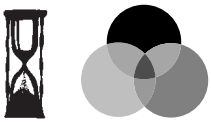


60 Minutes

Many great thinkers have contributed to the study of genetics over the last two-hundred years. Some of the leading pioneers included Casper Friedrich Wolff, Jean Baptiste Lamarck, Gregor Mendel, Thomas Hunt Morgan, Alfred H. Sturtevant, George W. Beadle and Edward L. Tatum, James Watson and Francis H.C. Crick.

Ask students to choose one of these men and investigate their specific contributions. Have them summarize their findings in a one-page paper. What kind of science did each man practice? What did they use in their genetic experiments? What did they add to the expanding world of genetic knowledge?

Cultural Diversity



30 Minutes

Eugenics is a social movement that aims to improve the human race by encouraging healthy, intelligent people to reproduce, and discouraging the reproduction of people who are mentally and physically inferior. At the beginning of the 20th century, laws were passed in several countries, including the U.S., to prevent the mentally and physically ill from having children. The most appalling example of eugenics occurred in Nazi Germany, when people labeled inferior were driven from society and killed in death camps. Most of these laws were done away with when people complained that eugenics was a violation of basic human rights.

What might be a fatal flaw with the eugenics theory? What factors, other than genetics, are crucial to the success of a race? Although Hitler convinced many Germans that their superiority was genetic and unchangeable, he used social influences to greatly change their behavior. How was he contradicting himself?

Connection to Art

60 Minutes

Ask students to draw each phase of mitosis using colored pencils. In each phase, have them label the cell wall, nucleus, chromosomes or chromatids, centromere, cytoplasm and microtubules. Perhaps students will choose to illustrate the mitosis of a specific cell, such as a red blood cell or a liver cell. Display the finished drawings on a wall labeled, "The Mitosis Gallery."

Writing

30 Minutes

What possibilities might genetic engineering hold for the world? What would our society be like if everyone was "perfect"? Encourage students to share their ideas in a short class discussion. Then, ask each student to pretend they are living five-hundred years in the future. Have them write a one-page diary entry describing what they encounter in a typical day. Do they enjoy their lives? What kind of friends do they have? What type of activities are they involved in? What kind of problems, if any, do they experience?

Meeting Individual Needs

20 Minutes

Ask students to look up the words "genotype" and "phenotype" in the dictionary. What does each word mean? Can you name some examples of your phenotype? How are the words related?

Phenotype is the collection of an organism's physical characteristics. Genotype is the collection of an organism's genetic material. Examples of phenotype can include curly hair, blue eyes and small hands. A person's genotype guides the person's resulting phenotype.

Extended Activity

60 Minutes

Hereditary diseases are passed from generation to generation. Hemophilia, muscular dystrophy, cystic fibrosis, Huntington's disease and sickle-cell anemia are some of the most serious of these diseases. Many of these inherited illnesses can be detected soon after birth. In fact, modern medicine even allows some diseases to be spotted before birth.

Ask students to choose a hereditary disease and study it more closely. What causes the disease? Which parts of the body are affected and how? What treatments are available for the disease? How common is the disease, and what type of person is most likely to get it? Have students present their findings in a short presentation to the class.

In the Newsroom

120 Minutes

Magazines and newspapers are filled with stories about genetic engineering and cloning. Instruct students to gather articles and books with information on these subjects. Encourage them to compare their findings to uncover any misleading or controversial information. Have them put together a news show based on their "investigative reporting." News reports, interviews and editorials can all be included. If audio or video equipment is available, have the class record their presentations. Get everyone involved in the project by letting students choose to write, research, produce, direct or interview.

Hands On

120 Minutes

A pedigree chart is something that usually makes us think of dog or horse breeding. In fact, pedigree charts can be drawn for any species, including humans. Locate some examples of pedigree charts from resource or library books. After going over the basic structure with students, ask them to draw their own pedigree chart. The chart should center around one of their inherited traits, such as blond hair or freckles. Encourage them to check with their parents and other family members to discover the prevalence of this family trait. What seems to be the pattern of the trait? Do they think the trait is recessive or dominant?

Culminating Activity

60 Minutes

Divide students into two interactive groups. Assign one group to be mitosis and the other meiosis. Instruct each group to prepare a skit illustrating each phase of their assigned process. Some students will be microtubules, others chromatids and centromeres. The cell wall and nucleus should also be represented. In addition, one student from each group should serve as the narrator, describing each phase as it occurs.

Name

VOCABULARY

The following vocabulary words are from *Genetics and Heredity: The Blueprint of Life*. Fill in the number of each word next to its closest definition.

1. anaphase
2. centromere
3. chromosomes
4. DNA
5. genes
6. hybrid
7. interphase
8. meiosis
9. metaphase
10. mitosis
11. mutations
12. prophase
13. Punnett square
14. pure
15. telophase

___ cellular materials that pass traits from parent to offspring
___ type of cell division that produces an exact copy of the parent cell
___ time in a cell's life when mitosis is not occurring
___ special region that joins matching chromosomes during cell division
___ phase of cell division in which microtubules attach to chromatids and pull them to the center of the cell
___ trait that occurs when two genes in a gene pair are the same
___ molecular substance that carries information used by cells to synthesize proteins and control other life processes
___ diagram used to predict the probability that an offspring will inherit a given trait
___ phase of cell division in which chromosomes condense tightly into matched pairs
___ final phase of cell division in which chromosomes extend back into their relaxed state and the cytoplasm splits in two
___ coiled strands in the cell nuclei that contain genetic information
___ trait that occurs when two genes in a gene pair are different
___ type of cell division that produces cells used in sexual reproduction
___ spontaneous changes that occur in genetic material
___ phase of cell division in which the centromere divides and the chromatids are pulled to opposite sides of the cell

Name

CHECKING COMPREHENSION

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

DNA, or deoxyribonucleic acid, is molecular material found in the cells of _____1_____ . DNA molecules contain information that is used by cells to synthesize _____2_____ . Long threads of DNA are coiled and folded into strands called _____3_____ . Mitosis is a type of cell division which produces _____4_____ of the parent cell. Meiosis is a type of cell division that produces cells used in _____5_____. _____6_____ is the phase in a cell's life when mitosis is not occurring. During prophase , matching pairs of chromosomes are joined together by a _____7_____ . During metaphase, _____8_____ pull the chromosomes to the center of the cell. The centromere divides during _____9_____ , and the individual chromosomes move to opposite sides of the cell. During telophase, the nuclear material forms around the chromosomes, and the _____10_____ splits into two equal parts.

1. A. humans and animals
   B. higher organisms
   C. some plants and animals
   D. all organisms

2. A. proteins
   B. energy
   C. nerve impulses
   D. water

3. A. nuclei
   B. chromosomes
   C. centrioles
   D. microtubules

4. A. a mutation
   B. a close replica
   C. an exact copy
   D. one half

5. A. digestion
   B. circulation
   C. sensory organs
   D. reproduction

6. A. Interphase
   B. Telophase
   C. Chromophase
   D. Anaphase

7. A. chromatid
   B. centromere
   C. spiral tubule
   D. cytoplasmere

8. A. microtubules
   B. genomes
   C. chromatids
   D. nuclei

9. A. telophase
   B. interphase
   C. anaphase
   D. metaphase

10. A. hemoglobin
    B. cytoplasm
    C. microtubule
    D. centromere

Name

PHASES OF MITOSIS

Each sentence below describes a process that takes place during mitosis. Label each process according to which phase it occurs in. Use a P for prophase, M for metaphase, A for anaphase and T for telophase.

1. ___ Microtubules at either end of the cell attach to the chromatids.
2. ___ Individual chromosomes extend back into their relaxed state.
3. ___ Microtubules pull at the chromatids, placing them in the middle of the cell
4. ___ The chromosomes condense tightly into matching pairs.
5. ___ Nuclear material forms around the chromosomes while the cytoplasm splits.
6. ___ Matched pairs of chromosomes are joined by a region called the centromere.
7. ___ The centromere divides and the chromatids are pulled to opposite sides of the cell.
8. ___ Small fibers called microtubules begin to form at each end of the cell.)

Name

TRUE OR FALSE

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

1. ___ Genetic counselors can tell couples the exact genes that they will pass on to their offspring.

2. ___ Gregor Mendel developed his genetic theories by studying peas in a garden.

3. ___ Meiosis produces sex cells that have the same number of chromosomes as other cells in the organism.

4. ___ During prophase, chromatids are pulled to opposite sides of the cell.

5. ___ If a child inherited one freckle gene and one non-freckle gene, the trait would be hybrid.

6. ___ The result of meiosis is four sex cells, all with different genetic combinations than the parent cell.

7. ___ Punnett squares reflect all of the possible combinations of genes that an offspring can inherit.

8. ___ All mutations enhance an organism's ability to survive.

9. ___ Genetic engineering allows scientists to create their own mutations in organisms.

10. ___ Genes are arranged in coiled strands called centromeres.

Name

GENETIC MATCH-UP

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

1.	meiosis	phase between mitosis
2.	microtubules	part of meiosis in which genes are cut and snipped
3.	prophase one	produces sperm and eggs
4.	hybrid	genetically inherited disease
5.	hemophilia	spontaneous genetic changes
6.	proteins	pull on chromosomes in a cellular tug-of-war
7.	mutations	DNA tells cells how to synthesize these
8.	interphase	trait that results from two different genes

Name

VOCABULARY SEARCH

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

ANAPHASE
CHROMOSOME
DNA
GENES
HYBRID
INTERPHASE
MEIOSIS
MITOSIS
PURE
TRAIT

E F A M C Q S C V I Y H
M I N T E R P H A S E W
I C A G T I J R G N D S
T F P L E W R O A L H T
O R H B K N M M B O P L
S K A Q S J E O P U R E
I O S I A K I S J T P H
S R E U T L O O N B R Y
X B M D C G S M D H T B
C E O J K Q I E X E Q R
Y Z V Y A M S U P B L I
A N D I G R X P Y W T D

Name

TEST

Circle the correct answer

1. What is the basic molecule that makes up genes?

   - chromosomes
   - deoxyribonucleic acid
   - nucleotides
   - paramecium

2. The first person to develop genetic theory in the late 1800s was:

   - Charles Darwin.
   - Paul Punnett.
   - Gregor Mendel.
   - Francis Crick.

3. Which of the following shows the stages of mitosis in the correct order?

   - periphase, anaphase, metaphase, telophase
   - metaphase, prophase, anaphase, interphase
   - telophase, prophase, metaphase, anaphase
   - prophase, metaphase, anaphase, telophase

4. Mitosis does not occur during:

   - interphase.
   - metaphase.
   - telophase.
   - prophase.

5. If two genes in a gene pair are for the same trait, the trait will be:

   - inherited from the father.
   - pure.
   - inherited from the mother.
   - hybrid.

Name

TEST (CONTINUED)

6. Which of the following statements is false?

- The genes which make up chromosomes are responsible for defining traits. .
- Individuals have at least one pair of genes for each trait they have.
- Only the recessive gene is expressed in hybrid traits.
- If two genes in a gene pair are for different traits, the resulting trait will be hybrid.

7. The _____ is used to visualize the likelihood that offspring will inherit a given trait.

- genetic circle
- Mendel model
- Punnett square
- periodical table

8. Which of the following is not a genetic disorder?

- hemophilia
- Huntington's disease
- malaria
- sickle-cell anemia

9. The process of genetic engineering:

- works to change outcomes of traits by altering genetic material.
- is the manipulation of the genetic code in an attempt to improve a species.
- allows scientists to create their own mutations in organisms.
- all of the above.

10. Chromosomes inherited from the father are called:

- maternal chromosomes.
- primary chromosomes.
- paternal chromosomes.
- secondary chromosomes.

ADDITIONAL AIMS MULTIMEDIA PROGRAMS

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

The Human Body: The Ultimate Machine
Cells: The Building Blocks of Life
The Web of Life: Producer to Predator
The World's Biomes: Desert to Rainforest
Classification: Bringing Order to Diversity

ANSWER KEY for page 18

VOCABULARY

The following vocabulary words are from *Genetics and Heredity: The Blueprint of Life*. Fill in the number of each word next to its closest definition.

1. anaphase
2. centromere
3. chromosomes
4. DNA
5. genes
6. hybrid
7. interphase
8. meiosis
9. metaphase
10. mitosis
11. mutations
12. prophase
13. Punnett square
14. pure
15. telophase

5 cellular materials that pass traits from parent to offspring

10 type of cell division that produces an exact copy of the parent cell

7 time in a cell's life when mitosis is not occurring

2 special region that joins matching chromosomes during cell division

9 phase of cell division in which microtubules attach to chromatids and pull them to the center of the cell

14 trait that occurs when two genes in a gene pair are the same

4 molecular substance that carries information used by cells to synthesize proteins and control other life processes

13 diagram used to predict the probability that an offspring will inherit a given trait

12 phase of cell division in which chromosomes condense tightly into matched pairs

15 final phase of cell division in which chromosomes extend back into their relaxed state and the cytoplasm splits in two

3 coiled strands in the cell nuclei that contain genetic information

6 trait that occurs when two genes in a gene pair are different

8 type of cell division that produces cells used in sexual reproduction

11 spontaneous changes that occur in genetic material

1 phase of cell division in which the centromere divides and the chromatids are pulled to opposite sides of the cell

ANSWER KEY for page 19

CHECKING COMPREHENSION

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

DNA, or deoxyribonucleic acid, is molecular material found in the cells of _____1_____ . DNA molecules contain information that is used by cells to synthesize _____2_____ . Long threads of DNA are coiled and folded into strands called _____3_____ . Mitosis is a type of cell division which produces _____4_____ of the parent cell. Meiosis is a type of cell division that produces cells used in _____5_____. _____6_____ is the phase in a cell's life when mitosis is not occurring. During prophase , matching pairs of chromosomes are joined together by a _____7_____ . During metaphase, _____8_____ pull the chromosomes to the center of the cell. The centromere divides during _____9_____ , and the individual chromosomes move to opposite sides of the cell. During telophase, the nuclear material forms around the chromosomes, and the _____10_____ splits into two equal parts.

1. A. humans and animals
   B. higher organisms
   C. some plants and animals
   (D.) all organisms

2. (A.) proteins
   B. energy
   C. nerve impulses
   D. water

3. A. nuclei
   (B.) chromosomes
   C. centrioles
   D. microtubules

4. A. a mutation
   B. a close replica
   (C.) an exact copy
   D. one half

5. A. digestion
   B. circulation
   C. sensory organs
   (D.) reproduction

6. (A.) Interphase
   B. Telophase
   C. Chromophase
   D. Anaphase

7. A. chromatid
   (B.) centromere
   C. spiral tubule
   D. cytoplasmere

8. (A.) microtubules
   B. genomes
   C. chromatids
   D. nuclei

9. A. telophase
   B. interphase
   (C.) anaphase
   D. metaphase

10. A. hemoglobin
    (B.) cytoplasm
    C. microtubule
    D. centromere

ANSWER KEY for page 20

PHASES OF MITOSIS

Each sentence below describes a process that takes place during mitosis. Label each process according to which phase it occurs in. Use a P for prophase, M for metaphase, A for anaphase and T for telophase.

1. **M** Microtubules at either end of the cell attach to the chromatids.
2. **T** Individual chromosomes extend back into their relaxed state.
3. **M** Microtubules pull at the chromatids, placing them in the middle of the cell
4. **P** The chromosomes condense tightly into matching pairs.
5. **T** Nuclear material forms around the chromosomes while the cytoplasm splits.
6. **P** Matched pairs of chromosomes are joined by a region called the centromere.
7. **A** The centromere divides and the chromatids are pulled to opposite sides of the cell.
8. **P** Small fibers called microtubules begin to form at each end of the cell.

ANSWER KEY for page 21

TRUE OR FALSE

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

1. __F__ Genetic counselors can tell couples the exact genes that they will pass on to their offspring.

2. __T__ Gregor Mendel developed his genetic theories by studying peas in a garden.

3. __F__ Meiosis produces sex cells that have the same number of chromosomes as other cells in the organism.

4. __F__ During prophase, chromatids are pulled to opposite sides of the cell.

5. __T__ If a child inherited one freckle gene and one non-freckle gene, the trait would be hybrid.

6. __T__ The result of meiosis is four sex cells, all with different genetic combinations than the parent cell.

7. __T__ Punnett squares reflect all of the possible combinations of genes that an offspring can inherit.

8. __F__ All mutations enhance an organism's ability to survive.

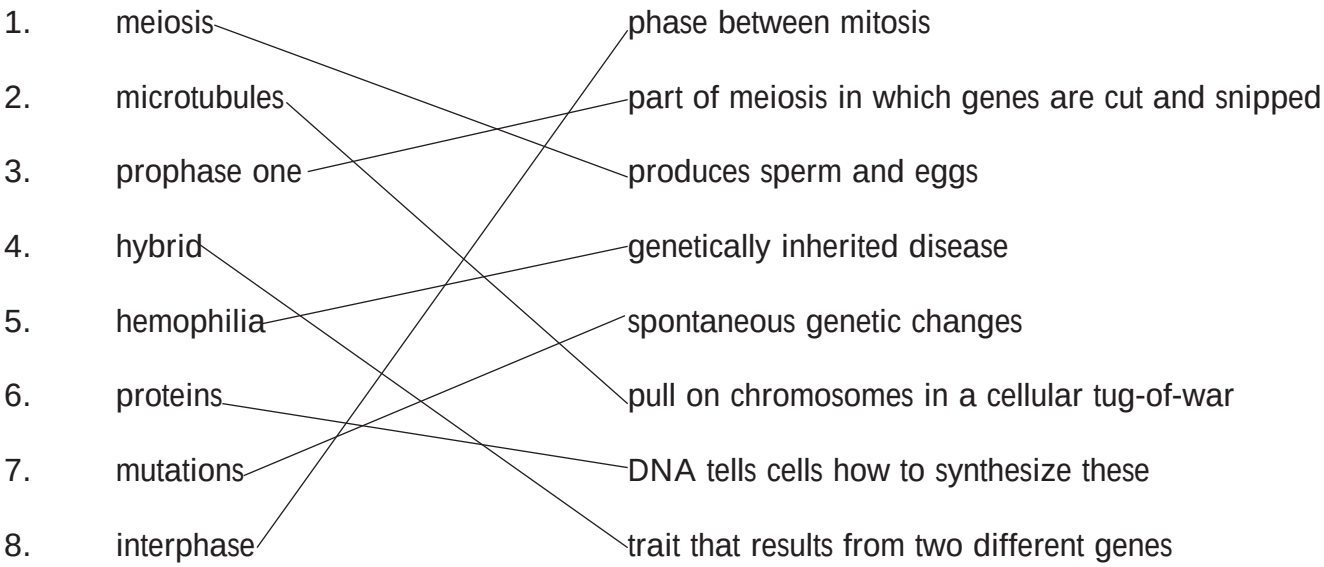
9. __T__ Genetic engineering allows scientists to create their own mutations in organisms.

10. __F__ Genes are arranged in coiled strands called centromeres.

ANSWER KEY for page 22

GENETIC MATCH-UP

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

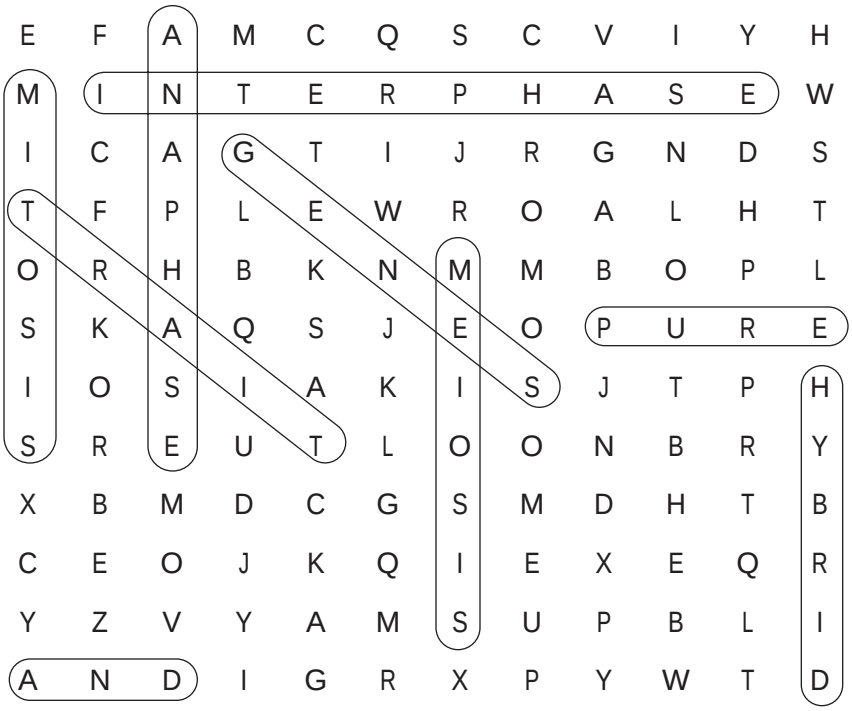


ANSWER KEY for page 23

VOCABULARY SEARCH

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

ANAPHASE
CHROMOSOME
DNA
GENES
HYBRID
INTERPHASE
MEIOSIS
MITOSIS
PURE
TRAIT



ANSWER KEY for page 24

TEST

Circle the correct answer

1. What is the basic molecule that makes up genes?

   - chromosomes
   - deoxyribonucleic acid
   - nucleotides
   - paramecium

2. The first person to develop genetic theory in the late 1800s was:

   - Charles Darwin.
   - Paul Punnett.
   - Gregor Mendel.
   - Francis Crick.

3. Which of the following shows the stages of mitosis in the correct order?

   - periphase, anaphase, metaphase, telophase
   - metaphase, prophase, anaphase, interphase
   - telophase, prophase, metaphase, anaphase
   - prophase, metaphase, anaphase, telophase

4. Mitosis does not occur during:

   - interphase.
   - metaphase.
   - telophase.
   - prophase.

5. If two genes in a gene pair are for the same trait, the trait will be:

   - inherited from the father.
   - pure.
   - inherited from the mother.
   - hybrid.

ANSWER KEY for page 25

TEST (CONTINUED)

6. Which of the following statements is false?

- The genes which make up chromosomes are responsible for defining traits. .
- Individuals have at least one pair of genes for each trait they have.
- Only the recessive gene is expressed in hybrid traits.
- If two genes in a gene pair are for different traits, the resulting trait will be hybrid.

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10. Chromosomes inherited from the father are called:

- maternal chromosomes.
- primary chromosomes.
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Classification: Bringing Order to Diversity

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

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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

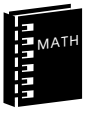
After your students have viewed the program, you may introduce any or all of these activities to interact with other curriculum content areas, provide reinforcement, assess comprehension skills, or provide hands-on and in-depth extended study of the topic.

SUGGESTED ACTIVITIES

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.

VOCABULARY

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.

Classification: Bringing Order to Diversity

THEMES

In *Classification: Bringing Order to Diversity,* students will study each of the **major kingdoms** which classify organisms: Monera, Protista, Fungi, Plantae and Animalia. **Characteristics** of each kingdom will be discussed, as well as factors which determine the **subdivision** of each kingdom. The **interrelation** of certain groups will also be explored.

OVERVIEW

There are currently two to four and one-half million species of organisms on the earth, a high percentage of which live in or around tropical rain forests. Through fossil records, scientists have also discovered thousands of forms of life that lived long ago but no longer exist. The millions of species of living organisms are broken down into seven major categories: kingdom, phylum, class, order, family, genus and species.

OBJECTIVES

- To learn the five major kingdoms of organisms and how they are classified.
- To explore the characteristics of each kingdom and its primary phylums.
- To discuss the factors that determine how plants are classified.
- To learn the difference between vertebrates, such as amphibians and reptiles.
- To better understand how each kingdom relates to members of other kingdoms.
-

Use this page for your individual notes about planning and/or effective ways to manage this AIMS Teaching Module in your classroom.

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

Organisms are classified according to many different factors. They may share a body part, color, size or shape. They may have a specific feature in common, such as sharp teeth, busy tails or the ability to climb trees. Kingdom is the broadest category of classification. Phylum is the second largest category, dividing animals into more than 20 groups and plants into 10. Class, the next level of organization, contains members with more characteristics in common than the members of a phylum. Order, family, genus and species further divide the members of a class.

INTRODUCTION TO VOCABULARY

Many names used for classification provide clues about the organisms they describe. For instance, Class Osteichthyes refers to bony fish. The prefix Ost- is often used in words referring to bones or the skeleton. Ask students to search through encyclopedias and library books to find other examples of classification names that have common prefixes, suffixes and root words. Encourage them to share the examples they find.

DISCUSSION IDEAS

Ask the class to name as many groups of organisms as they can. Encourage discussion and accept all answers. Write the groups on the board, along with some common examples that students can name. How do these groups relate? Do any of the organisms mentioned seem like they are in the wrong group? Classifying organisms can be a confusing business. To organize such a large variety of living things, scientists often look at the structure of an organism, how it gets food and how it moves around. Review the answers given after covering the unit. How has the students' understanding of classification changed?

FOCUS

Ask students to spend a few minutes thinking about the huge variety of organisms that fill the earth. How would scientists ever study the millions of living things around us if they could not organize them in some way? Tell the class they are about to learn more about the process of classification and its importance in many fields of scientific study.

JUMP RIGHT IN

HOW TO USE THE CLASSIFICATION: BRINGING ORDER TO DIVERSITY AIMS TEACHING MODULE

Preparation

- Read *Classification: Bringing Order to Diversity* **Themes, Overview,** and **Objectives** to become familiar with program content and expectations.
- Use **Preparation for Viewing** suggestions to introduce the topic to students.

Viewing CLASSIFICATION: BRINGING ORDER TO DIVERSITY

- 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 *Classification: Bringing Order to Diversity* together or in small groups.
- Some students may benefit from viewing the video more than one time.

After Viewing CLASSIFICATION: BRINGING ORDER TO DIVERSITY

- 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

Extended Activity

120 Minutes

Ask students to choose one of the following classes of vertebrates: amphibians, reptiles, birds or mammals. Have them research their chosen topic using the internet. Encourage them to find websites with pictures and interesting facts.

What were the best websites they found? What new information did they learn about the topic? If they designed their own websites dealing with these topics, what information or images would they include?

Critical Thinking

30 Minutes

Mammals are an incredibly diverse class with thousands of different species. Many of these species have made special adaptations to their environment over the years. Ask students to think carefully about the following mammalian adaptations and their functions: giraffe's neck (allows giraffe to reach tall leaves), camel's hump (helps camel store water in a dry environment), squirrel monkey's tail (helps monkey balance as he walks on tree branches searching for food), porcupine's quills (punctures predators who attack the porcupine), and tiger's stripes (help tiger blend in with tall grass so prey can't see him approaching). Then discuss why they think the adaptations occurred.

Hands On

60 Minutes

Ask students to collect small branches from several different trees near their homes. Have them bring these branches to class in plastic bags. Which of the branches are angiosperms and which are gymnosperms? Do any of the branches have cones or wing-like seeds? Do they have buds or flowers? Ask students to use a library book or other reference source to name the tree that each branch came from.

Connection to Art

30 Minutes

Have students select one of their branches from the previous experiment. Ask them to draw the branch in detail using colored pencils. If the branch is a gymnosperm, ask them to label any cones or seeds that are present. If the branch is an angiosperm, ask them to label any flower parts that can be seen, such as the stamen, ovule or pistol. Display the branch drawings on a wall labeled, "Vascular Seed Plants."

Link to the World

120 Minutes

How many examples of the major kingdoms can students find in their community? Ask them to make a chart listing the following kingdoms: Monera, Protista, Fungi, Plantae and Animalia. Beneath each kingdom, tell them to list the organisms they have seen in and around their hometown. Encourage them to spend a weekend afternoon exploring a natural outdoor region. Assigning cooperative partners to work together is a good way to generate interest in the "outdoor expeditions."

Connection to Language Arts

30 Minutes

More than one million species of insects have been identified, making Class Insecta the largest known. As a result, insects are broken into many orders, some of which have interesting names providing clues about the members of that order. Ask students to use their vocabulary skills, along with prefix and suffix clues, to find the meanings of the following orders: Diptera (two wings), Hemiptera (half wings), Phasmatodea ("like a ghost," insects that use disguise for protection), Odonata (toothed flies), and Dermaptera (leathery or skin-like wings).

Meeting Individual Needs

30 Minutes

Ask students to look up "amphibian" and "reptile" in an encyclopedia. What do these classes of animal have in common? How are they different? (Amphibians, such as frogs and toads, have no scales like reptiles. They breathe through their skin, while reptiles breathe through their nostrils. Most amphibians must live near water, where they usually lay their eggs. Reptiles on the other hand, have scaly skin that holds moisture, allowing reptiles to live in very dry environments.)

Cultural Diversity

60 Minutes

The environment we live in greatly determines the organisms living close to us. Allow each student to spin a globe with their eyes closed. Have them stop the globe and place their finger on a specific location, without opening their eyes. (If they land on water or an extreme polar region, have them try again.) Ask them to learn more about the climate of the area they have pointed to. What kinds of plants, animals and fungi live there? Have them summarize their findings in a one-page report.

In the Newsroom

Every day, we can read about current issues affecting the earth's organisms. Coral reefs are endangered by warming oceans. Trees are destroyed by ice storms or hurricanes. Bacteria are discovered to have amazing medical uses. Animals are threatened by humankind's careless behavior.

Ask students to search newspapers and magazines for stories that relate to non-human organisms. Have them present their articles to the class, explaining the kingdom, phylum and class of the organism discussed. If possible, have students use audio or video equipment to create a news show focusing on their stories.

60 Minutes (If video not used)

Culminating Activity

Ask students to choose an organism from any of the five major kingdoms. Ask them to explain the organism to their classmates using actions and sounds, but no words. As the students guess each organism, ask them to name the organism's kingdom, phylum and class. Encourage students to choose diverse organisms, from single-celled bacteria to growing trees to monkeys.

30 Mimutes

Name

VOCABULARY

The following vocabulary words are from Classification: Bringing Order to Diversity. Fill in the number of each word next to its closest definition.

1. Animalia
2. bacteria
3. dicot
4. eukaryotes
5. Fungi
6. invertebrates
7. kingdom
8. Monera
9. monocot
10. nonvascular
11. Plantae
12. Porifera
13. Protista
14. vascular
15. vertebrates

_____ the broadest division of organisms

_____ cells that have a well-defined nucleus and other structures

_____ single-celled organisms that depend on matter or other living things for food

_____ kingdom containing a large diversity of species, from sponges to human beings

_____ plant with two seed leaves and oval or complex symmetrical leaves

_____ plant with one seed leaf and long, narrow strap-like leaves

_____ kingdom containing plant-like organisms that cannot make their own food

_____ fairly primitive animals with no backbone or interior skeleton

_____ fairly complex animals with backbones and interior skeletons

_____ kingdom consisting mostly of blue-green algae and bacteria

_____ plants without food-and-water-conducting tissues

_____ plants that have roots, stems and leaves which transport food and water

_____ kingdom of organisms that produce food through photosynthesis

_____ phylum of primitive animals whose bodies are perforated with many holes

kingdom of complex single-celled organisms such as diatoms and Euglena

Name

CHECKING COMPREHENSION

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

The earth's millions of species are broken down into categories, the broadest of which is the ____1____. Monera and Protista are comprised entirely of ____2____ organisms such as the amoeba. The most prevalent Monerans are blue-green algae and ____3____. Protists, such as the ____4____, are more complex and usually move around on their own. Members of the Kingdom ____5____ are plant-like organisms that contain no chlorophyll. Plants are organisms that produce food through ____6____ . Their cells are eukaryotic and have ____7____. Plants which flower are known as ____8____. Invertebrates include the phylum ____9____, which are organisms with hard exoskeletons, jointed legs and segmented bodies. Vertebrates include ____10____, animals that can live both in and out of water.

1. A. phylum
B. kingdom
C. family
D. class

2. A. harmful
B. prokaryotic
C. single-celled
D. photosynthetic

3. A. bacteria
B. diatoms
C. fungi
D. euglenoids

4. A. flagella
B. paramecium
C. penicillium
D. flea

5. A. Plantae
B. Algae
C. Fungi
D. Lichen

Name

CHECKING COMPREHENSION - part 2

6. A. phagocytosis
B. pollenation
C. photosynthesis
D. symbiosis

7. A. gametophytes
B. cilia
C. cones
D. chloroplasts

8. A. angiosperms
B. non-vascular
C. gymnosperms
D. lichens

9. A. Hemichordata
B. Arthropoda
C. Coelenterata
D. Mollusca

10. A. bony fish
B. octopi
C. amphibians
D. reptiles

Name

CLASSIFICATION CHART

Fill in the chart below by listing an organism in each class.

Monera	Protista	Fungi	Plantae	Animalia
			Non-Vascular and Vascular	*Coelenterata, Arthropoda, Amphibia, Reptilia, Aves and Mammalia*

Name

CLASS MATCH-UP

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

1.	arthropods	• plant with no food-conducting tissues
2.	Coelenterata	• cells with a nucleus
3.	eukaryotes	• complex single-celled organisms
4.	fungus	• penicillium is one type
5.	mammals	• plant with roots, stems and leaves
6.	non-vascular	• coral, sea anemones and jelly fish
7.	protists	• insects and spiders
8.	vascular	• warm-blooded organisms with hair or fur

Name

TRUE OR FALSE

Place a T beside each true statement and an F beside each false statement.

1. The cell of a moneran has no distinct nucleus, but does contain DNA._____
2. Some protists make food using chlorophyll, while others must capture their food._____
3. Lichen is formed by a symbiotic relationship between fungi and animals._____
4. Plants with fungi on their roots cannot get enough nutrients and will usually die._____
5. Vascular plants have roots, stems and leaves for transporting food and water._____
6. Dicots have long, strap-like leaves and broad, fibrous root systems._____
7. Arthropoda is the most diverse phylum, totaling three-fourths of all animal species._____
8. Amphibians have a three-chambered heart and gills that develop into lungs._____
9. Birds and insects are the only animals that can fly efficiently._____
10. Birds have hollow skeletal bones to reduce their weight._____

Name

NAME THAT KINGDOM

Next to each phrase below, write the name of the kingdom that is being described.

1. _____ includes Porifera and Mollusca
2. _____ blue-green algae is one division
3. _____ some species are used to make cheese and bread
4. _____ paramecium and amoebas are two species
5. _____ has more species than any other kingdom
6. _____ includes monocots and dicots
7. _____ includes both helpful and harmful bacteria
8. _____ mosses are one of the most primitive species
9. _____ mushrooms are one tasty species
10. _____ many species have flagella or cilia

Name

VOCAB SEARCH

The following words can be found in the maze below. The letters may be arranged horizontally, vertically, diagonally or backwards.

bacteria	monocot
dicot	Plantae
Fungi	Porifera
kingdom	protist
mammal	reptile
Monera	vascular

D M M H D M T L L D R
K I N G D O M V B F Q
B A C T E R I A C A B
S B F O G E S S C T E
P K C M T P F C L O P
Q L R A B T I U M O R
L H A Q G I D L N E O
A L L N K L J A N G T
M G C D T E P R J P I
M O N E R A E M Q K S
A P O R I F E R A Z T
M V A W T O C O N O M

Name

TEST

Fill in the bubble for the phrase which best answers the question.

1. Most methods of classification divide organisms into _____ kingdoms.

   ten
   five
   eight
   seven

2. Which kingdoms consist of single-celled organisms?

   Fungi, Monera and Protista
   Protista and Fungi
   Monera and Protista
   Fungi, Plantae and Protista

3. The first organism on earth was probably:

   . a euglenoid.
   penicillium.
   blue-green algae.
   an angiosperm.

4. Most protists are classified according to their:

   cell composition.
   reproductive structures.
   means of locomotion.
   surrounding environment.

5. Plant-like organisms that contain no chlorophyll are members of the:

   Kingdom Fungi.
   Kingdom Plantae.
   Kingdom Monera.
   Kingdom Protista.

Name

TEST - page 2

6. Gymnosperms and angiosperms are two basic types of:

   non-vascular plants.
   fungi.
   seed plants.
   bacteria.

7. Which kingdom has more species than any other?

   Monera
   Protista
   Animalia
   Plantae

8. Which of the following is NOT an invertebrate?

   sponge
   coral
   snake
   lobster

9. Which of the following is NOT a vertebrate?

   Class Reptilia
   Phylum Arthropoda
   Class Aves
   Class Amphibia

10. What are the five major kingdoms of organisms?

    Reptilia, Aves, Mammalia, Amphibia, Coelenterata
    Monocotyledon, Dicotyledon, Vertebrate, Nonvertebrate, Protista
    Monera, Protista, Fungi, Plantae, Animalia
    Plantae, Animalia, Fungi, Coelenterata, Porifera

Name

VOCABULARY

The following vocabulary words are from Classification: Bringing Order to Diversity. Fill in the number of each word next to its closest definition.

1. Animalia
2. bacteria
3. dicot
4. eukaryotes
5. Fungi
6. invertebrates
7. kingdom
8. Monera
9. monocot
10. nonvascular
11. Plantae
12. Porifera
13. Protista
14. vascular
15. vertebrates

(7) the broadest division of organisms

(4) cells that have a well-defined nucleus and other structures

(2) single-celled organisms that depend on matter or other living things for food

(1) kingdom containing a large diversity of species, from sponges to human beings

(3) plant with two seed leaves and oval or complex symmetrical leaves

(9) plant with one seed leaf and long, narrow strap-like leaves

(5) kingdom containing plant-like organisms that cannot make their own food

(6) fairly primitive animals with no backbone or interior skeleton

(15) fairly complex animals with backbones and interior skeletons

(8) kingdom consisting mostly of blue-green algae and bacteria

(10) plants without food-and-water-conducting tissues

(14) plants that have roots, stems and leaves which transport food and water

(11) kingdom of organisms that produce food through photosynthesis

(12) phylum of primitive animals whose bodies are perforated with many holes

(13) kingdom of complex single-celled organisms such as diatoms and Euglena

Name

CHECKING COMPREHENSION

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

The earth's millions of species are broken down into categories, the broadest of which is the __1__. Monera and Protista are comprised entirely of __2__ organisms such as the amoeba. The most prevalent Monerans are blue-green algae and __3__. Protists, such as the __4__, are more complex and usually move around on their own. Members of the Kingdom __5__ are plant-like organisms that contain no chlorophyll. Plants are organisms that produce food through __6__ . Their cells are eukaryotic and have __7__. Plants which flower are known as __8__. Invertebrates include the phylum __9__, which are organisms with hard exoskeletons, jointed legs and segmented bodies. Vertebrates include __10__, animals that can live both in and out of water.

1. A. phylum
B. kingdom **(X)**
C. family
D. class

2. A. harmful
B. prokaryotic
C. single-celled **(X)**
D. photosynthetic

3. A. bacteria **(X)**
B. diatoms
C. fungi
D. euglenoids

4. A. flagella
B. paramecium **(X)**
C. penicillium
D. flea

5. A. Plantae
B. Algae
C. Fungi **(X)**
D. Lichen

Name _____

CHECKING COMPREHENSION - part 2

6. A. phagocytosis
B. pollenation
C. photosynthesis **(X)**
D. symbiosis

7. A. gametophytes
B. cilia
C. cones
D. chloroplasts **(X)**

8. A. angiosperms **(X)**
B. non-vascular
C. gymnosperms
D. lichens

9. A. Hemichordata
B. Arthropoda **(X)**
C. Coelenterata
D. Mollusca

10. A. bony fish
B. octopi
C. amphibians **(X)**
D. reptiles

Name

CLASSIFICATION CHART

Fill in the chart below by listing an organism in each class.

Monera	Protista	Fungi	Plantae	Animalia
			Non-Vascular and Vascular	*Coelenterata, Arthropoda, Amphibia, Reptilia, Aves and Mammalia*

Name

CLASS MATCH-UP

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

1.	arthropods	• plant with no food-conducting tissues
2.	Coelenterata	• cells with a nucleus
3.	eukaryotes	• complex single-celled organisms
4.	fungus	• penicillium is one type
5.	mammals	• plant with roots, stems and leaves
6.	non-vascular	• coral, sea anemones and jelly fish
7.	protists	• insects and spiders
8.	vascular	• warm-blooded organisms with hair or fur

- plant with no food-conducting tissues **(non-vascular)**
- cells with a nucleus **(eukaryotes)**
- complex single-celled organisms **(protists)**
- penicillium is one type **(fungus)**
- plant with roots, stems and leaves **(vascular)**
- coral, sea anemones and jelly fish **(Coelenterata)**
- insects and spiders **(arthropods)**
- warm-blooded organisms with hair or fur **(mammals)**

ANSWER KEY for page 23

Name

TRUE OR FALSE

Place a T beside each true statement and an F beside each false statement.

1. The cell of a moneran has no distinct nucleus, but does contain DNA.___**(T)**___
2. Some protists make food using chlorophyll, while others must capture their food.___**(T)**___
3. Lichen is formed by a symbiotic relationship between fungi and animals.___**(F)**___
4. Plants with fungi on their roots cannot get enough nutrients and will usually die.___**(F)**___
5. Vascular plants have roots, stems and leaves for transporting food and water.___**(T)**___
6. Dicots have long, strap-like leaves and broad, fibrous root systems.___**(F)**___
7. Arthropoda is the most diverse phylum, totaling three-fourths of all animal species.___**(T)**___
8. Amphibians have a three-chambered heart and gills that develop into lungs.___**(T)**___
9. Birds and insects are the only animals that can fly efficiently.___**(F)**___
10. Birds have hollow skeletal bones to reduce their weight.___**(T)**___

Name

NAME THAT KINGDOM

Next to each phrase below, write the name of the kingdom that is being described.

1. **(Animalia)** includes Porifera and Mollusca
2. **(Monera)** blue-green algae is one division
3. **(Fungi)** some species are used to make cheese and bread
4. **(Protista** paramecium and amoebas are two species
5. **(Animalia)** has more species than any other kingdom
6. **(Plantae)** includes monocots and dicots
7. **(Monera)** includes both helpful and harmful bacteria
8. **(Plantae)** mosses are one of the most primitive species
9. **(Fungi)** mushrooms are one tasty species
10. **(Protista)** many species have flagella or cilia

Name _____

VOCAB SEARCH

The following words can be found in the maze below. The letters may be arranged horizontally, vertically, diagonally or backwards.

bacteria	monocot
dicot	Plantae
Fungi	Porifera
kingdom	protist
mammal	reptile
Monera	vascular

D	M	M	H	D	M	T	L	L	D	R
K	**I**	**N**	**G**	**D**	**O**	**M**	**V**	B	F	Q
B	**A**	**C**	**T**	**E**	**R**	**I**	**A**	C	A	B
S	B	F	**O**	G	**E**	S	**S**	C	T	E
P	K	C	M	**T**	**P**	**F**	**C**	L	O	**P**
Q	**L**	R	A	B	**T**	I	**U**	M	O	**R**
L	H	**A**	Q	G	**I**	D	**L**	**N**	E	**O**
A	L	L	**N**	K	**L**	J	**A**	N	**G**	**T**
M	G	C	D	**T**	**E**	P	**R**	J	P	**I**
M	**O**	**N**	**E**	**R**	**A**	E	M	Q	K	**S**
A	**P**	**O**	**R**	**I**	**F**	**E**	**R**	**A**	Z	**T**
M	V	A	W	**T**	**O**	**C**	**O**	**N**	**O**	**M**

_____
Name

TEST

Fill in the bubble for the phrase which best answers the question.

1. Most methods of classification divide organisms into _____ kingdoms.

   ten
   five **(X)**
   eight
   seven

2. Which kingdoms consist of single-celled organisms?

   Fungi, Monera and Protista
   Protista and Fungi
   Monera and Protista **(X)**
   Fungi, Plantae and Protista

3. The first organism on earth was probably:

   . a euglenoid.
   penicillium.
   blue-green algae. **(X)**
   an angiosperm.

4. Most protists are classified according to their:

   cell composition.
   reproductive structures.
   means of locomotion. **(X)**
   surrounding environment.

5. Plant-like organisms that contain no chlorophyll are members of the:

   Kingdom Fungi. **(X)**
   Kingdom Plantae.
   Kingdom Monera.
   Kingdom Protista.

Name

TEST - page 2

6. Gymnosperms and angiosperms are two basic types of:

   non-vascular plants.
   fungi.
   seed plants. **(X)**
   bacteria.

7. Which kingdom has more species than any other?

   Monera
   Protista
   Animalia **(X)**
   Plantae

8. Which of the following is NOT an invertebrate?

   sponge
   coral
   snake **(X)**
   lobster

9. Which of the following is NOT a vertebrate?

   Class Reptilia
   Phylum Arthropoda **(X)**
   Class Aves
   Class Amphibia

10. What are the five major kingdoms of organisms?

    Reptilia, Aves, Mammalia, Amphibia, Coelenterata
    Monocotyledon, Dicotyledon, Vertebrate, Nonvertebrate, Protista
    Monera, Protista, Fungi, Plantae, Animalia **(X)**
    Plantae, Animalia, Fungi, Coelenterata, Porifera

The World's Biomes: Desert to Rainforest

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

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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

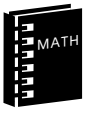
After your students have viewed the program, you may introduce any or all of these activities to interact with other curriculum content areas, provide reinforcement, assess comprehension skills, or provide hands-on and in-depth extended study of the topic.

SUGGESTED ACTIVITIES

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.

VOCABULARY

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.

The World's Biomes: Desert to Rainforest

THEMES

In *The World's Biomes: Desert to Rainforest,* students will study each **major biome** of the Earth. The factors that determine the **climate** of each biome will be discussed, as well as the **relationship of climate to organisms in the surrounding region**. The **plant life** and **animal life** of each biome will be explored, in addition to typical **geographical features**.

OVERVIEW

The majority of the earth's surface is populated with plant and animal life. However, there are many variations in the types of organisms that populate different regions of the globe. Large areas that are populated by characteristic plant and animal life are called biomes. *The World's Biomes: Desert to Rainforest* explores the environmental factors that govern these regions.

OBJECTIVES

- To study each of the major biomes of the Earth.
- To explore the factors that determine climate, including latitude, elevation and proximity to oceans and mountains.
- To discuss the relationship between climate and organisms in the biomes.
- To study the typical animal and plant life of each biome.

  To discuss the geographical features of each biome, and how they affect the region.

Use this page for your individual notes about planning and/or effective ways to manage this AIMS Teaching Module in your classroom.

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

Why does the elephant not roam North America? Do apple trees grow in a tropical rainforest? Would you be able to find a fiddler crab in the deserts of Mexico? Over long periods of time, small changes have taken place in animals and plants. These changes have helped them to survive in a particular region. The ones that could not survive, died out long ago. As a result, each area of the Earth is populated with its own unique variety of plants and animals. Some areas, like the tropical rainforest with its abundance of food and water, are home to millions of different organisms. Others, like the harsh desert, contain only the toughest creatures, able to withstand tremendous heat and an ongoing lack of water. This link between climate and life is what gives the Earth its wonderful versatility.

INTRODUCTION TO VOCABULARY

Write the word "biome" on the board. Ask students to give suggestions about the meaning of the word. What clue within the word hints at its meaning? What is the meaning of this clue and in what other common words is it used? (Biome is a large area populated by characteristic plant and animal life. A clue to its meaning is found in the prefix "bio-" which means "life or living." The prefix can also be found in the words biology, which means "study of life," biography, which is "the written history of a person's life," and biopsy, which is "the examination of living tissue."

DISCUSSION IDEAS

Ask the class to name as many climates as they can. Accept answers such as desert, forest, mountain and coastal. What factors contribute to the climates of these regions? Are these factors natural or can they also be caused by man? (Elevation, temperature, humidity, wind patterns, latitude and proximity to mountains or bodies of water can all affect climate. Although these factors are natural, man can also change the climate of a region. For example, large forests once covered much of the eastern U.S. Most of the forests were cleared and turned into grassland for grazing, or into large towns and cities. In other parts of the world, such as Egypt, dry land has been irrigated with water and turned into fertile farmland.)

FOCUS

Ask students to spend a few minutes thinking about their surroundings. Do they enjoy the environment they live in? How would they change it if they could? What other nearby environments would they like to move to someday? Tell them they are about to learn more about the Earth's biomes, and what makes each of them unique, diverse and interesting.

JUMP RIGHT IN

HOW TO USE THE THE WORLD'S BIOMES: DESERT TO RAINFALL AIMS TEACHING MODULE

Preparation

- Read *The World's Biomes: Desert To Rainforest* **Themes, Overview,** and **Objectives** to become familiar with program content and expectations.
- Use **Preparation for Viewing** suggestions to introduce the topic to students.

Viewing THE WORLD'S BIOMES: DESERT TO RAINFOREST

- 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 *The World's Biomes: Desert To Rainforest* together or in small groups.
- Some students may benefit from viewing the video more than one time.

After Viewing THE WORLD'S BIOMES: DESERT TO RAINFOREST

- 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 Geography

30 Minutes

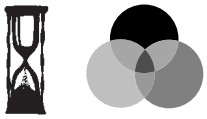
The factors of elevation, temperature, latitude, and proximity to mountains and oceans combine to create a climate. With the help of a globe and several good atlases, ask students to learn more about the climate of their city or town. What is the elevation? The average temperature? What is the latitude? How close are mountains, the ocean or other large bodies of water? How do all these factors contribute to the area's climate? After the information is collected, ask students to decide what kind of biome they live in.

Critical Thinking

30 Minutes

The biome we live in affects many things in our lives. How do our surroundings and weather conditions affect what we wear? How might our food supply differ from people in other biomes? Would the hobbies and outdoor activities we enjoy be possible in other biomes? How might our homes, schools and roads be different? (Answers will vary, but should include discussion of temperature, precipitation, plant and animal life and other factors that greatly influence lifestyle.)

Cultural Diversity

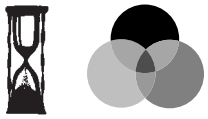


40 Minutes

What would it be like to live in a scorching hot desert? On a coastal island? In a temperate rainforest? Ask students to research one of the locations listed below, learning more about its climate, people and lifestyles. Pretending they are a student living in their chosen location, tell them to write a one-page diary entry about a typical day in the region.

Fairbanks, Alaska (tundra)
African Savanna (grassland)
Cairo, Egypt (desert)
Brazilian Rainforest (tropical rainforest)
Jamaica (marine)
Canadian Pacific coast (temperate rainforest)

Connection to Art



30 Minutes

Using information from the previous "Cultural Diversity" activity, ask students to draw an outdoor scene mentioned in their diary. Encourage them to include themselves. What are they wearing? What buildings are nearby? What kinds of plants and animals might be included in the picture? What are nearby people doing?

Group the drawings by locations and display them on a wall labeled "Biomes of the World."

Extended Activity

90 Minutes

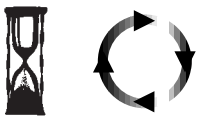
Arrange for students to have access to the internet and ask them to do research by starting with the words “climate” or “biome.” They also may choose to use a specific biome such as “desert” or “tropical rainforest.” Have them print out information from the best websites they find, and allow each student to spend a few minutes presenting their information to the class

Hands On

Extended Time

Many biomes can exist, even in one country. After deciding what biome they are living in, encourage students to spend a few days exploring their unique outdoor environment. Ask them to buy a small notebook to keep notes in. They should record any animal life they see or weather patterns they notice. They might also collect small specimens of plant life. Drawings of animals, larger plants and geographical features such as mountains should also be encouraged. When the assignment is over, display the notebooks so that students can enjoy the work of their classmates.

Link to the World



30 Minutes

Many changes are occurring in biomes across the planet. Some of these changes have been blamed on human actions, such as the burning of coal for energy. Acid rain from the burning coal has already damaged much of the earth’s forests, coral reefs and coastal communities. In addition, rainforests are being destroyed to make room for grazing cattle.

Ask students to think about these problems for a minute. What are some ways that everyone can help protect the Earth’s biomes? Who is responsible for doing these things? (Answers can include: using less electrical power, carpooling, recycling paper, contributing time or money to conservation groups, cleaning up pollution and supporting laws that protect the Earth. It is everyone’s responsibility to do these things.)

Meeting Individual Needs

20-30 Minutes

Ask students to look up the words “climate,” “weather” and “environment” in the dictionary. What does each word mean? What do the words have in common? (Climate is the average weather of a region. Weather is a region’s current state of temperature, precipitation, wind speed, humidity and other factors. Environment consists of surrounding objects and conditions, including weather.)

In the Newsroom

30 Minutes

Ask students to write an imaginary newspaper article with the headline, “The Greatest Biome On Earth.” When writing their article, ask them to consider the questions below.

Which biome do they think would be the greatest to live in, and why? What would they enjoy most about the biome? What kinds of activities can people in the biome enjoy? What do most people wear? What do they eat? What is the weather usually like? Is the biome a scenic place to live? Encourage students to be persuasive in their articles.

Culminating Activity

120 Minutes

Divide students into cooperative groups, assigning each group a different biome. Ask each group to prepare skits about their biomes. Students can portray animals, plants, geographical features, even weather phenomena. Encourage them to be both creative and informative.

Name

VOCABULARY

The following vocabulary words are from *The World's Biomes: Desert to Rainforest*. Fill in the number of each word next to its closest definition.

1. biome
2. climate
3. coniferous forest
4. deciduous forest
5. desert
6. freshwater
7. grassland
8. latitude
9. marine
10. temperate rainforest
11. tropical rainforest
12. tundra

____ warm areas with wet weather and abundant animal life

____ distance north or south of the equator, measured in degrees

____ area characterized by broadleaf trees and fairly mild winters

____ average temperature, precipitation and other factors in an area

____ hot, arid region with little plant life

____ salt-water regions such as coastal waters, coral reefs and open oceans

____ area characterized by evergreen trees and fairly cold winters

____ region with abundant plant life but few trees

____ areas with heavy rainfall and primarily coniferous trees

____ large area populated by characteristic plant and animal life

____ aquatic regions such as ponds, lakes and rivers

____ vast, treeless arctic plain

Name

CHECKING COMPREHENSION

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

Four basic requirements must be met in order for life to exist. Nutrients, such as ____1____, must be available for the construction of living tissue. Energy must also be available, either from the sun or from stored ____2____ energy obtained by consuming other organisms. The third critical factor is ____3____, the solvent in which all chemical reactions occur. The final requirement for life is a range of ____4____ that allow chemical reactions to take place. Different areas of the earth have different amounts of these requirements, resulting in a variety of ____5____, or regions with characteristic plants and animals. An area's average weather, or ____6____, is affected by many environmental factors. Elevation and proximity to ____7____ can help determine the temperature and rainfall of a particular region. ____8____, or location north and south of the equator, is another factor that contributes to climate. Places close to the ____9____, which has a latitude of zero degrees, are very hot and dry. These environmental and geographical factors determine a biome's ____10____.

1. A. ice and fire
B. water and air
C. calcium and nitrogen
D. salt and sand

2. A. chemical
B. electrical
C. solar
D. ocean

3. A. salt
B. water
C. oxygen
D. oil

4. A. animals
B. plants
C. temperatures
D. weather patterns

Name

Checking Comprehension - Page 2

4. A. animals
B. plants
C. temperatures
D. weather patterns

5. A. countries
B. precipitation
C. hemispheres
D. biomes

6. A. climate
B. latitude
C. elevation
D. forecast

7. A. mountains and oceans
B. towns and cities
C. plants and animals
D. none of the above

8. A. Temperance
B. Longitude
C. Latitude
D. Elevation

9. A. equator
B. sun
C. desert
D. grassland

10. A. plant life
B. animal life
C. weather
D. all of the above

Name

WHERE ON EARTH?

Complete the chart below by writing the name of a location, plant and animal that fits each biome listed. A physical map or encyclopedia may help. The first one has been done for you.

	Location	Plant	Animal
Tundra	Greenland	spruce tree	caribou
Coniferous Forest			
Deciduous Forest			
Temperate Rainforest			
Tropical Rainforest			
Desert			
Grassland			
Marine			
Freshwater			

Name

BIOME MATCH-UP

Match each biome on the left with the best group of words on the right.

- tundra
- coniferous forest
- deciduous forest
- temperate rainforest
- tropical rainforest
- desert
- grassland
- marine
- freshwater

- either oligotrophic or eutrophic
- broad leaves are shed in winter
- dry, bare ground and some vegetation
- wet, coastal area with coniferous trees
- can be either alpine or arctic
- enough rain for plants but not trees
- trees stay green year round
- includes coral reefs and vent communities
- warm, wet and multi-layered

Name

BIOME CLUES

Use each clue below to fill in the blanks.

1. W _____
2. O _____
3. R _____
4. L _____
5. D _____
6. B _____
7. I _____
8. O _____
9. M _____
10. E _____
11. S _____

1. Solvent in which all chemical reactions of life occur
2. Poorly fed body of fresh water
3. Biome that receives great amounts of precipitation
4. Degrees north and south of the equator
5. Trees that shed their leaves in winter
6. Area with characteristic plant and animal life
7. Common standard of measurement for snow and rainfall
8. Most common form of marine biome
9. Proximity to a range of these can change an area's climate
10. Latitude of zero degrees
11. Form of energy used by plants during photosynthesis

Name

TRUE OR FALSE

Place a T beside each true statement and an F beside each false statement.

1. Latitude is the average temperature and precipitation of a region._____
2. The British Isles are warmer than would be expected because they receive heated air from the Gulf Stream._____
3. Higher elevations have lower temperatures because the air is more dense._____
4. The equator has a latitude of 90 degrees, the highest latitude possible._____
5. Tundras can occur because of a high elevation or a far northern latitude_____
6. The waxy coating and needle-like leaves of pine trees help evergreens minimize water loss._____
7. Deciduous trees have broad leaves that help them conduct photosynthesis all year long._____
8. Rain forests only cover 6% of the Earth's surface, but are believed to contain almost two-thirds of the planet's species._____
9. Some desert mammals are so adept at storing the moisture in their vegetable diets, they can go their entire lives without drinking water._____
10. The Earth's marine biomes cover nearly one-third of the planet._____

Name

NAME THAT BIOME

Next to each phrase below, write the name of the biome that is being described.

1. _____ - trees enter a dormant state during the winter

2. _____ - because sunlight is scarce, primary food sources are single-celledphotosynthetic phytoplankton

3. _____ - large inputs of sediment and nutrients make these areas murky and low in oxygen

4. _____ - much of the animal life is arboreal due to the scarcity of food on the ground

5. _____ - plants grow close to the ground to protect themselves from the harsh winter winds

6. _____ - in the U.S., most of these areas have been used for agricultural purposes

7. _____ - reptiles are abundant since their thick skin resists the evaporation of water

8. _____ - trees have an antifreeze resin and flexible branches that help them survive heavy snowfalls

Name

VOCAB SEARCH

The following words can be found in the maze below. The letters may be arranged horizontally, vertically, diagonally or backwards.

biome	grassland
climate	latitude
forest	marine
desert	tropical
freshwater	tundra

S B P M R E I M T U Z L
C L I M A T E X R N G Y
M F L O C G D A O P R T
C R A B M K M I P Q A B
I E T E J E A K I C S V
N S I U G H C P C K S G
E H T L N H B G A P L T
N W U E W D V D L B A O
I A D I F O R E S T N Q
R T E N H A L A T L D B
A E R D B R N T R S O F
M R G H W S T R E S E D

Name

TEST

Fill in the bubble the phrase which best answers the question.

1. The four basic requirements of life are:

   carbon, nitrogen, phosphorus and calcium.
   sun, water, plants and nutrients.
   nutrients, energy, water and a range of temperature.
   soil, energy, water and solvents.

2. Climate is the measure of a region's:

   humidity.
   wind speed.
   temperature and precipitation.
   all of the above

3. The distance north or south of the equator, measured in degrees is known as:

   elevation.
   longitude.
   latitude.
   none of the above

4. There are _____biomes on the Earth.

   seven
   ten
   four
   twelve

5. Much of the animal life in a tropical rainforest is arboreal, referring to animals that:

   hunt at night.
   live in trees.
   live near water.
   live underground.

Name

Test - Page 2

6. Since most desert animals are nocturnal, they spend the daytime hours:

in underground burrows.
hunting.
laying in the sun.
looking for trees to climb.

7. Which of the following is a food source in open ocean biomes?

diatomes
dinoflagellates
zooplankton
all of the above

8. What are the major types of ocean biomes?

aquatic, marine, coastal and temperate
coral reef, marine and freshwater
open ocean, coastal waters and rainforests
coastal waters, coral reefs, open ocean and vent communities

9. Freshwater that is poorly fed based on nutrient content is:

oligotrophic.
murky.
eutrophic.
oxygen-poor.

10. Grasslands can't support the growth of trees because:

too much rainfall causes them to flood.
constant snowfall freezes growing plants.
the climate is too warm.
there is not enough precipitation.

Name

VOCABULARY

The following vocabulary words are from *The World's Biomes: Desert to Rainforest.* **Fill in the number of each word next to its closest definition.**

1. biome
2. climate
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6. freshwater
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9. marine
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12. tundra

11 warm areas with wet weather and abundant animal life

8 distance north or south of the equator, measured in degrees

4 area characterized by broadleaf trees and fairly mild winters

2 average temperature, precipitation and other factors in an area

5 hot, arid region with little plant life

9 salt-water regions such as coastal waters, coral reefs and open oceans

3 area characterized by evergreen trees and fairly cold winters

7 region with abundant plant life but few trees

10 areas with heavy rainfall and primarily coniferous trees

1 large area populated by characteristic plant and animal life

1 aquatic regions such as ponds, lakes and rivers

12 vast, treeless arctic plain

Name

CHECKING COMPREHENSION

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

Four basic requirements must be met in order for life to exist. Nutrients, such as ___1___, must be available for the construction of living tissue. Energy must also be available, either from the sun or from stored ___2___ energy obtained by consuming other organisms. The third critical factor is ___3___, the solvent in which all chemical reactions occur. The final requirement for life is a range of ___4___ that allow chemical reactions to take place. Different areas of the earth have different amounts of these requirements, resulting in a variety of ___5___, or regions with characteristic plants and animals. An area's average weather, or ___6___, is affected by many environmental factors. Elevation and proximity to ___7___ can help determine the temperature and rainfall of a particular region. ___8___, or location north and south of the equator, is another factor that contributes to climate. Places close to the ___9___, which has a latitude of zero degrees, are very hot and dry. These environmental and geographical factors determine a biome's ___10___.

1. A. ice and fire
B. water and air
C. calcium and nitrogen **(X)**
D. salt and sand

2. A. chemical **(X)**
B. electrical
C. solar
D. ocean

3. A. salt
B. water **(X)**
C. oxygen
D. oil

4. A. animals
B. plants
C. temperatures **(X)**
D. weather patterns

Name _____

Checking Comprehension - Page 2

4. A. animals
B. plants
C. temperatures **(X)**
D. weather patterns

5. A. countries
B. precipitation
C. hemispheres
D. biomes **(X)**

6. A. climate **(X)**
B. latitude
C. elevation
D. forecast

7. A. mountains and oceans **(X)**
B. towns and cities
C. plants and animals
D. none of the above

8. A. Temperance
B. Longitude
C. Latitude **(X)**
D. Elevation

9. A. equator **(X)**
B. sun
C. desert
D. grassland

10. A. plant life
B. animal life
C. weather
D. all of the above **(X)**

Name

WHERE ON EARTH?

Complete the chart below by writing the name of a location, plant and animal that fits each biome listed. A physical map will help.

Answers will vary but could include the following.

Tundra: Greenland, spruce tree, caribou

Coniferous Forest: northern Europe, pine tree, deer

Deciduous Forest: northeastern U.S., oak tree, squirrel

Temperate Rainforest: northwestern U.S., fungi, snails

Tropical Rainforest: northern South America, teak tree, toucan

Desert: southwestern U.S., cactus, rattlesnake

Grassland: African savanna, boabab tree, zebra

Marine: Pacific Ocean, kelp, sea urchin

Freshwater: pond, water lily, frog

Name

BIOME MATCH-UP

Match each biome on the left with the best group of words on the right.

- tundra
- coniferous forest
- deciduous forest
- temperate rainforest
- tropical rainforest
- desert
- grassland
- marine
- freshwater

- either oligotrophic or eutrophic
- broad leaves are shed in winter
- dry, bare ground and some vegetation
- wet, coastal area with coniferous trees
- can be either alpine or arctic
- enough rain for plants but not trees
- trees stay green year round
- includes coral reefs and vent communities
- warm, wet and multi-layered

- either oligotrophic or eutrophic **(freshwater)**
- broad leaves are shed in winter **(deciduous forest)**
- dry, bare ground and some vegetation **(desert)**
- wet, coastal area with coniferous trees **(temperate rainforest)**
- can be either alpine or arctic **(tundra)**
- enough rain for plants but not trees **(grassland)**
- trees stay green year round **(coniferous forest)**
- includes coral reefs and vent communities **(marine)**
- warm, wet and multi-layered **(tropical rainforest)**

Name

BIOME CLUES

Use each clue below to fill in the blanks.

1. W **(water)**
2. O **(oligotrophic)**
3. R **(rainforest)**
4. L **(latitude)**
5. D **(deciduous)**
6. B **(biome)**
7. I **(inches)**
8. O **(ocean)**
9. M **(mountains)**
10. E **(equator)**
11. S **(solar)**

1. Solvent in which all chemical reactions of life occur
2. Poorly fed body of fresh water
3. Biome that receives great amounts of precipitation
4. Degrees north and south of the equator
5. Trees that shed their leaves in winter
6. Area with characteristic plant and animal life
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9. Proximity to a range of these can change an area's climate
10. Latitude of zero degrees
11. Form of energy used by plants during photosynthesis

Name

TRUE OR FALSE

Place a T beside each true statement and an F beside each false statement.

1. Latitude is the average temperature and precipitation of a region. **(F)**
2. The British Isles are warmer than would be expected because they receive heated air from the Gulf Stream. **(T)**
3. Higher elevations have lower temperatures because the air is more dense. **(F)**
4. The equator has a latitude of 90 degrees, the highest latitude possible. **(F)**
5. Tundras can occur because of a high elevation or a far northern latitude **(T)**
6. The waxy coating and needle-like leaves of pine trees help evergreens minimize water loss. **(T)**
7. Deciduous trees have broad leaves that help them conduct photosynthesis all year long. **(F)**
8. Rain forests only cover 6% of the Earth's surface, but are believed to contain almost two-thirds of the planet's species. **(T)**
9. Some desert mammals are so adept at storing the moisture in their vegetable diets, they can go their entire lives without drinking water. **(T)**
10. The Earth's marine biomes cover nearly one-third of the planet. **(F)**

Name

NAME THAT BIOME

Next to each phrase below, write the name of the biome that is being described.

1. **(deciduous forest)** - trees enter a dormant state during the winter
2. **(marine)** - because sunlight is scarce, primary food sources are single-celledphotosynthetic phytoplankton
3. **(freshwater)** - large inputs of sediment and nutrients make these areas murky and low in oxygen
4. **(rainforest)** - much of the animal life is arboreal due to the scarcity of food on the ground
5. **(tundra)** - plants grow close to the ground to protect themselves from the harsh winter winds
6. **(grasslands)** - in the U.S., most of these areas have been used for agricultural purposes
7. **(desert)** - reptiles are abundant since their thick skin resists the evaporation of water
8. **(coniferous forest)** - trees have an antifreeze resin and flexible branches that help them survive heavy snowfalls

Name _____

VOCAB SEARCH

The following words can be found in the maze below. The letters may be arranged horizontally, vertically, diagonally or backwards.

biome	grassland
climate	latitude
forest	marine
desert	tropical
freshwater	tundra

S **B** P M R E I M **T** U Z L

C **L** **I** **M** **A** **T** **E** X **R** N **G** Y

M **F** **L** **O** C G D A **O** P **R** T

C **R** **A** B **M** K M I **P** Q **A** B

I **E** **T** E J **E** A K **I** C **S** V

N **S** **I** **U** G H C P **C** K **S** G

E **H** **T** L **N** H B G **A** P **L** T

N **W** **U** E W D V D **L** B **A** O

I **A** **D** I **F** **O** **R** **E** **S** **T** **N** Q

R **T** **E** N H A L **A** T L **D** B

A **E** R D B R N T R S O F

M **R** G H W S **T** **R** **E** **S** **E** **D**

Name

TEST

Fill in the bubble for the phrase which best answers the question.

1. The four basic requirements of life are:

   carbon, nitrogen, phosphorus and calcium.
   sun, water, plants and nutrients.
   nutrients, energy, water and a range of temperature. **(X)**
   soil, energy, water and solvents.

2. Climate is the measure of a region's:

   humidity.
   wind speed.
   temperature and precipitation.
   all of the above **(X)**

3. The distance north or south of the equator, measured in degrees is known as:

   elevation.
   longitude.
   latitude. **(X)**
   none of the above

4. There are _____biomes on the Earth.

   seven **(X)**
   ten
   four
   twelve

5. Much of the animal life in a tropical rainforest is arboreal, referring to animals that:

   hunt at night.
   live in trees. **(X)**
   live near water.
   live underground.

Name

Test - Page 2

6. Since most desert animals are nocturnal, they spend the daytime hours:

in underground burrows. **(X)**
hunting.
laying in the sun.
looking for trees to climb.

7. Which of the following is a food source in open ocean biomes?

diatomes
dinoflagellates
zooplankton
vall of the above **(X)**

8. What are the major types of ocean biomes?

aquatic, marine, coastal and temperate
coral reef, marine and freshwater
open ocean, coastal waters and rainforests
coastal waters, coral reefs, open ocean and vent communities **(X)**

9. Freshwater that is poorly fed based on nutrient content is:

oligotrophic. **(X)**
murky.
eutrophic.
oxygen-poor.

10. Grasslands can't support the growth of trees because:

too much rainfall causes them to flood.
constant snowfall freezes growing plants.
the climate is too warm.
there is not enough precipitation. **(X)**