Grade 10

CONCEPTS OF LIFE SCIENCE

C-1 • UNITS 1-3

Based on the Alaska Science Standards
SC 1.1, SC 2.1, SC 3.1

FOR THE

Juneau-Douglas High School

Sealaska Heritage Institute

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Integrating Culturally Responsive, Place-Based Content with Language Skills Development for Curriculum Enrichment

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INTRODUCTION

Over the years, much has been written about the successes and failures of students in schools. There is no end to the solutions offered, particularly for those students who are struggling with academics. There have been efforts to bring local cultures into the classroom, thus providing the students with familiar points of departure for learning. However, most often such instruction has been limited to segregated activities such as arts and crafts or Native dancing rather than integrating Native culture into the overall learning process. Two core cultural values, *Haa Aaní,* the reference for and usage of the land, and *Haa Shagóon,* the tying of the present with the past and future, are known by both students and parents, and can be included in a curriculum that simultaneously provides a basis for self-identity and cultural pride, within the educational setting. This will provide a valuable foundation for improved academic achievement.

While the inclusion of Native concepts, values, and traditions into a curriculum provides a valuable foundation for self-identity and cultural pride, it may not, on its own, fully address improved *academic* achievement.

This program is designed to meet the academic realities, faced by high school students every day, using a developmental process that integrates *culture* with *skills* development. The values of *Haa Aaní* and *Haa Shagóon* are reinforced through the various activities in the program.

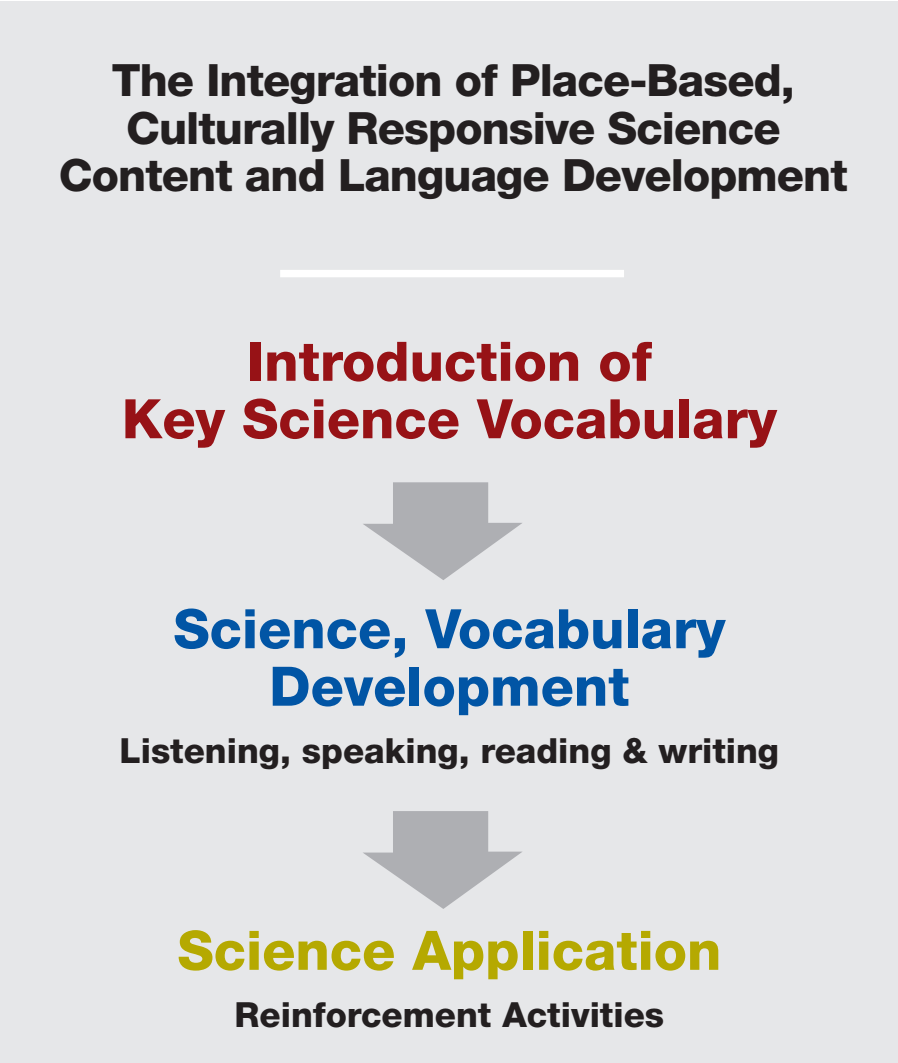
During science lessons, the students are exposed to new information and to key vocabulary that represent that information. While the students may acquire, through various processes, the scientific information, the vocabulary is often left at an exposure level and not internalized by them. Over time, this leads to *language-delay* that impacts negatively on a student's on-going academic achievement.

Due to *language delay*, many Native Alaskan high school students struggle with texts that are beyond their comprehension levels and writing assignments that call for language they do not have.

To this end, in this resource program, each key vocabulary word in science is viewed as a *concept*. The words are introduced concretely, using place-based information and contexts. Whenever possible, the concepts are viewed through the Native heritage cultural perspectives, thus reinforcing the value of *Haa Shagóon* and *Haa Aaní.* Using this approach, the students have the opportunity to acquire new information in manageable chunks; the sum total of which, represent the body of information to be learned in the science program.

When the key vocabulary/concepts have been introduced, the students are then taken through a sequence of listening, speaking, reading, and writing activities, designed to instill the vocabulary into their long term memories.

Finally, at the end of each unit, the students will participate in enrichment activities based on recognized and research-based *best practices*. By this time, the science information and vocabulary will be familiar, adding to the students' feelings of confidence and success. These activities will include *place-based* and *heritage culture* perspectives of the information learned.



The Developmental Language Process

The Developmental Language Process is designed to instill language into long term memory. The origin of the Process is rooted in the struggles faced by language-delayed students, particularly when they first enter school.

The Process takes the students/children through developmental steps that reflect the natural acquisition of language in the home and community. Initially, once key language items have been introduced concretely to the students, the vocabulary are used in the first of the language skills, Basic Listening. This stage in the process represents *input* and is a critical venue for language acquisition and retention. A baby hears many different things in the home, gradually the baby begins to *listen* to what he/she hears. As a result of the *input* provided through Basic Listening, the baby tries to repeat some of the language heard – this is represented by the second phase of the Process, Basic Speaking - the oral *output* stage of language acquisition.

As more language goes into a child's long-term memory, he/she begins to understand simple commands and phrases. This is a higher level of listening represented by the stage, Listening Comprehension. With the increase in vocabulary and sentence development, the child begins to explore the use of language through the next stage in the Process, Creative Speaking. All of these steps in the Process reflect the natural sequence of language development.

The listening and speaking skill areas represent *true* language skills; most cultures, including Alaska Native cultures, never went beyond them to develop written forms. Oral traditions are inherent in the listening and speaking skills.

However, English does have abstract forms of language in reading and writing. Many Native children entering kindergarten come from homes where language is used differently than in classic Western homes. This is not a value judgment of child rearing practices but a definite cross-cultural reality. Therefore, it is critical that the Native child be introduced to the concepts of reading and writing before ever dealing with them as skills areas. It is vital for the children to understand that reading and writing are *talk in print*.

The Developmental Language Process integrates the *real* language skills of listening and speaking with the related skills of reading and writing. At this stage in the Process, the students are introduced to the printed words for the first time. These abstract representations are now familiar, through the listening and speaking activities, and the relationship is formed between the words and language, beginning with Basic Reading.

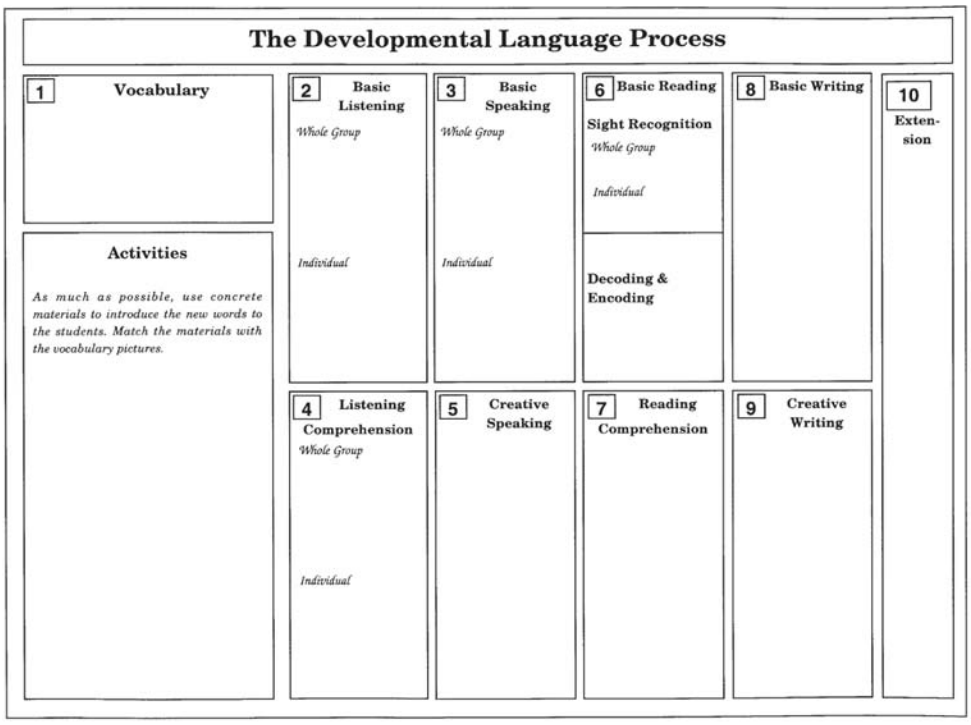
As more language goes into the children's long-term memories, they begin to comprehend more of what they read, in Reading Comprehension.

Many Alaskan school attics are filled with reading programs that didn't work – in reality, any of the programs would have worked had they been implemented through a language development process. For many Native children, the printed word creates angst, particularly if they are struggling with the reading process. Often, children are asked to read language they have never heard.

Next in the Process is Basic Writing, where the students are asked to write the key words. Finally, the most difficult of all the language skills, Creative Writing, asks the students to write sentences of their own, using the key words and language from their long-term memories. This high level skill area calls upon the students to not only retrieve language, but to put the words in their correct order within the sentences, to spell the words correctly and to sequence their thoughts in the narrative.

A student's ability to comprehend well in listening and reading, and to be creatively expressive in speaking and writing, is dependent upon how much language he/she has in long-term memory.

The Developmental Language Process is represented in this chart:



It should be understood that these materials are not a *curriculum* - rather, they are resource materials designed to encourage academic achievement through intensive language development in the content areas.

These resource materials are *culturally responsive* in that they utilize teaching and learning styles effective with Native students. As the students progress through the steps of the Process, they move from a concrete introduction of the key vocabulary, to a symbolic representation of the vocabulary, and finally, to their abstract forms - reading and writing. This provides a format for the students to develop language and skills that ultimately lead to improved academic performance.

Alaska Content Standards for Science

A. Science as Inquiry and Process

A student should understand and be able to apply the processes and applications of scientific inquiry. A student who meets the content standard should:

1. develop an understanding of the processes of science used to investigate problems, design and conduct repeatable scientific investigations, and defend scientific arguments;
2. develop an understanding that the processes of science require integrity, logical reasoning, skepticism, openness, communication, and peer review; and
3. develop an understanding that culture, local knowledge, history, and interaction with the environment contribute to the development of scientific knowledge, and local applications provide opportunity for understanding scientific concepts and global issues.

B. Concepts of Physical Science

A student should understand and be able to apply the concepts, models, theories, universal principals, and facts that explain the physical world. A student who meets the content standard should:

1. develop an understanding of the characteristic properties of matter and the relationship of these properties to their structure and behavior;
2. develop an understanding that energy appears in different forms, can be transformed from one form to another, can be transferred or moved from one place or system to another, may be unavailable for use, and is ultimately conserved;
3. develop an understanding of the interactions between matter and energy, including physical, chemical, and nuclear changes, and the effects of these interactions on physical systems; and
4. develop an understanding of motions, forces, their characteristics and relationships, and natural forces and their effects.

C. Concepts of Life Science

A student should understand and be able to apply the concepts, models, theories, facts, evidence, systems, and processes of life science. A student who meets the content standard should:

1. develop an understanding of how science explains changes in life forms over time, including genetics, heredity, the process of natural selection, and biological evolution;
2. develop an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms; and
3. develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.

D. Concepts of Earth Science
A student should understand and be able to apply the concepts, processes, theories, models, evidence, and systems of earth and space sciences. A student who meets the content standard should:

1. develop an understanding of Earth's geochemical cycles;
2. develop an understanding of the origins, ongoing processes, and forces that shape the structure, composition, and physical history of the Earth;
3. develop an understanding of the cyclical changes controlled by energy from the sun and by Earth's position and motion in our solar system; and
4. develop an understanding of the theories regarding the origin and evolution of the universe.

E. Science and Technology
A student should understand the relationships among science, technology, and society. A student who meets the content standard should:

1. develop an understanding of how scientific knowledge and technology are used in making decisions about issues, innovations, and responses to problems and everyday events;
2. develop an understanding that solving problems involves different ways of thinking, perspectives, and curiosity that lead to the exploration of multiple paths that are analyzed using scientific, technological, and social merits; and
3. develop an understanding of how scientific discoveries and technological innovations affect and are affected by our lives and cultures.

F. Cultural, Social, Personal Perspectives and Sciences
A student should understand the dynamic relationships among scientific, cultural, social, and personal perspectives. A student who meets the content standard should:

1. develop an understanding of the interrelationships among individuals, cultures, societies, science, and technology;
2. develop an understanding that some individuals, cultures, and societies use other beliefs and methods in addition to scientific methods to describe and understand the world; and
3. develop an understanding of the importance of recording and validating cultural knowledge.

G. History and Nature of Science
A student should understand the history and nature of science. A student who meets the content standard should:

1. develop an understanding that historical perspectives of scientific explanations demonstrate that scientific knowledge changes over time, building on prior knowledge;
2. develop an understanding that the advancement of scientific knowledge embraces innovation and requires empirical evidence, repeatable investigations, logical arguments, and critical review in striving for the best possible explanations of the natural world;
3. develop an understanding that scientific knowledge is ongoing and subject to change as new evidence becomes available through experimental and/or observational confirmation(s); and
4. develop an understanding that advancements in science depend on curiosity, creativity, imagination, and a broad knowledge base.

http://www.educ.state.ak.us/ContentStandards/Science.html


UNIT 1
Sealaska Heritage Institute

INTRODUCTION OF

Key Vocabulary

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Natural Selection

PLACE-BASED PERSPECTIVE

If a giraffe "stretched" its neck to get leaves, it would not have offspring with longer necks. *Natural selection* requires mutation. Mutants that are able to survive by finding food or not becoming food live to pass on their genes. So the mutant giraffes born with slightly longer necks were able to get to leaves that other shorter neck giraffes could not get to and pass on their genes as the shorter neck giraffes went extinct.
Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Mountain goats grow more wool during the winter months to survive in cold temperatures. For this reason, Native peoples would hunt mountain goats during the winter as the thicker hides would provide more wool per goat. Over time, the mountain goats adapted to their environment through *natural selection*.

Speciation

PLACE-BASED PERSPECTIVE

Show a picture of all five species of salmon, have the students specify what type they are.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Southeast animals such as bears and otters are examples of different species.

Extinction

PLACE-BASED PERSPECTIVE

Show a picture of a Wooly Mammoth and discuss how the this animal has become *extinct*.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Some southeast wildlife have faced *extinction*. This includes lynx, sea otter, bald headed eagles, and puffins.

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Issues

PLACE-BASED PERSPECTIVE

Show a newspaper. Discuss how newspapers report on *issues* that people want to understand better.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Southeast Alaska residents have historically faced a variety of socioeconomic and environmental *issues*. These included the Alaska Native Claims Settlement Act, civil rights, and resource management. The effects of early commercial fisheries nearly wiped-out all of the salmon resources by use of fish traps. All of these issues are sovereignty issues.

Describe

PLACE-BASED PERSPECTIVE

Ask the students to write down how to open their email on a computer. Have them *describe* how it is done from the point of turning it on to being able to check their email.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Raven Stories were used to *describe* environment, resources and desired behaviors.

Structure

PLACE-BASED PERSPECTIVE

Bring in pictures of buildings being built where the frame is exposed and steel bridges with visible girders. Explain that a *structure* is a whole that is made up of cohesive parts.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

The clan house is an excellent example of a Southeastern *structure*.

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Function

PLACE-BASED PERSPECTIVE

Show a picture of a jellyfish and discuss the *function* of the tentacles.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

The fish wheel is a good example of a simple machine with a specific *function.*

Relationships

PLACE-BASED PERSPECTIVE

Discuss the *relationship* between the amount of sleep that we get and performance in the class.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

There is a *relationship* between how hard a person works to gather food and the quality of life. There is also a relationship between the amount available for harvesting and the actual harvest.

Cells

PLACE-BASED PERSPECTIVE

Show a picture of a cross section of an onion and discuss what *cells* are.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Specialized

PLACE-BASED PERSPECTIVE

Show a picture of a red blood cell and discuss how the shape of the cell is *specialized* to be able to transport oxygen to other cells.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Native peoples were well aware of the *specialized* purposes of the different body parts. Much of their knowledge about the internal function of a body would have come from the butchering of harvested animals.

Major Organ System

PLACE-BASED PERSPECTIVE

Explain to students about how it is important that the space shuttle has a life support system, an ignition system, an electrical system, and a computer system that all work together to make the shuttle work properly. Use this to introduce the concept that *organ systems* in living organisms are dependent on working together for life.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Native peoples knew about the *major organ systems* of humans and animals.

Respiratory

PLACE-BASED PERSPECTIVE

Show a picture of a bottle of nasal spray to represent the importance of breathing with the *respiratory* system.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Traditional knowledge of the Native peoples recognized that all living things, including the land and water, breathe.

Language Skills

Language & Skills Development

LISTENING

Use the activity pages from the Student Support Materials.

Major League

Group the students into two teams. Have the first player from team one stand in the center of the classroom. Give the student a ruler or other item which can be used as a "baseball bat." You may wish to have another player stand at a safe distance behind the "batter" to retrieve the ball. Say a vocabulary word or a sentence which contains a key vocabulary word. Then, toss a nerf ball towards the batter, saying a vocabulary or sentence at the same time. If the vocabulary word/sentence is the same as the one you said before pitching, the student should swing at the nerf ball. However, if the vocabulary word/sentence is not the same, the student should not swing. Play the game along the lines of a regular baseball game - i.e., three strikes and the batter is out. After three outs, the other team is "in."

SPEAKING

Your Number is Up!

Provide each student with ten blank flashcards. Each student should then write one number on each of his/her cards, using the numbers zero to nine - one number per card. When the students' number cards are ready, they should turn their cards over on their desks (face down). Then, each student should turn one card face up. Call a number between zero and nine. Any student or students who have that number face up on their desks must identify a vocabulary illustration you point to. Then, those number cards should be placed to the side and other number cards turned over. The winner or winners of this activity are those students who have no number cards left on their desks.

READING

Use the activity pages from the Student Support Materials.

Half Time

Before the activity begins, cut each of the sight words in half. Keep one half of each sight word and give the remaining halves to the students. Hold up one of your halves and the student who has the other half of that word must show his half an say the sight word. Repeat in this way until all students have responded. An alternative to this approach is to give all of the word halves to the students. Say one of the sight words and the two students who have the halves that make up the sight word must show their halves. Depending upon the number of students in your class, you may wish to prepare extra sight word cards for this activity.

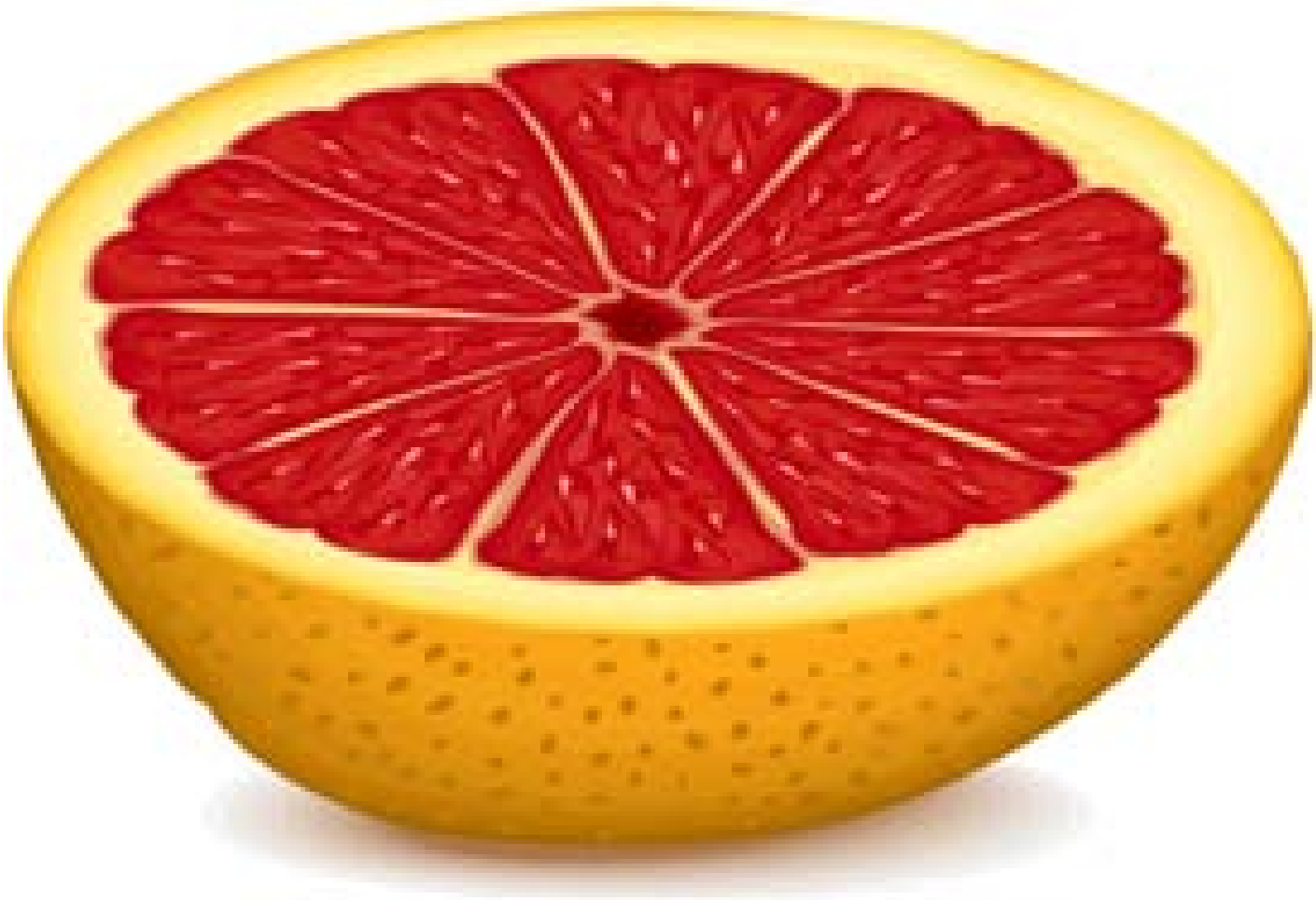
WRITING

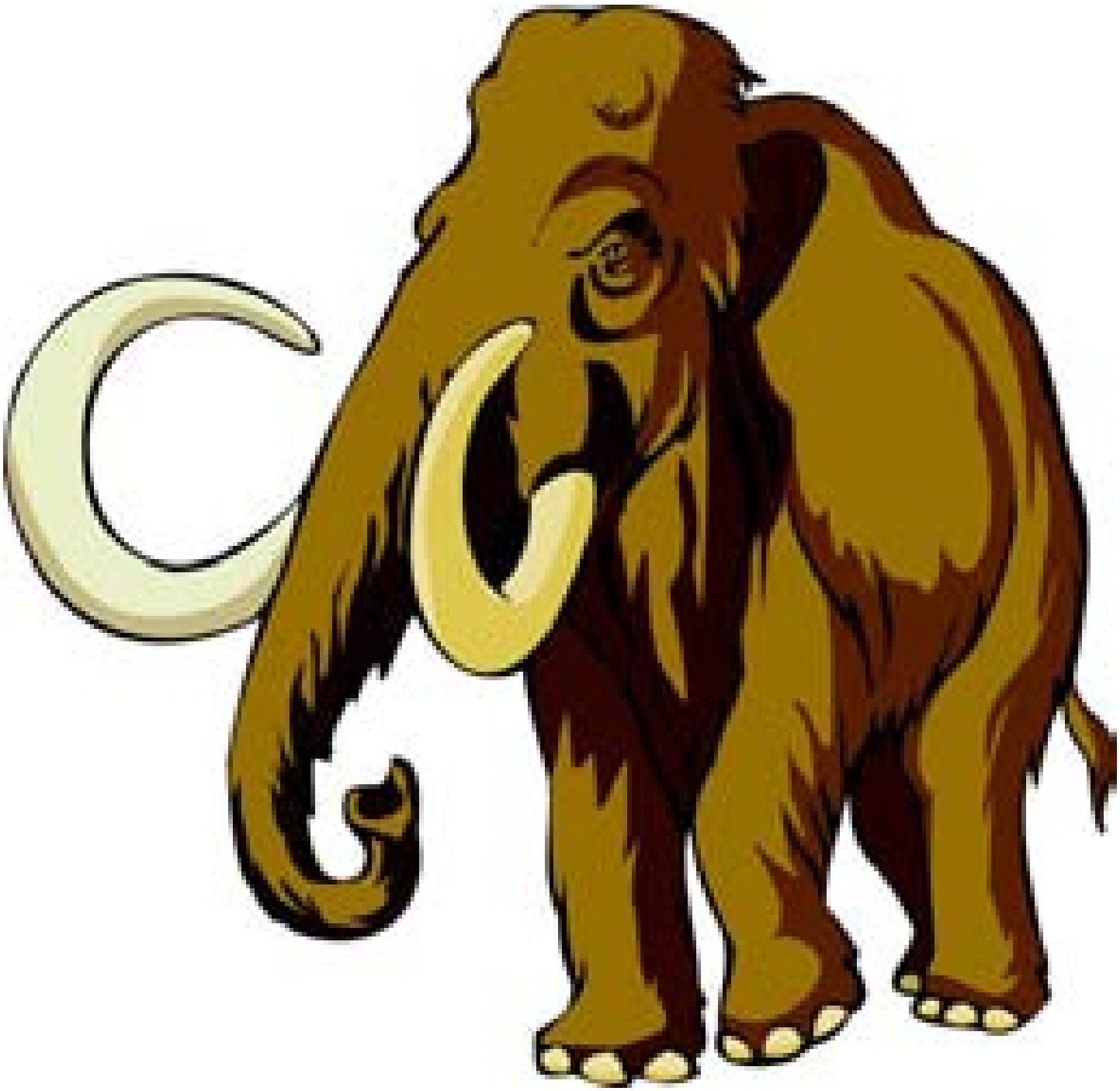
Use the activity pages from the Student Support Materials.

Mirror Writing

Group the students into two teams. Have the first player from each team stand in front of the chalkboard. Give each of the two players a small, unbreakable mirror. Stand some distance behind the two players with illustrations for the sight words. Hold up one of the illustrations. When you say "Go," the players with the mirrors must look over their shoulders to see the illustration you are holding. When a player sees the illustration, he/she must write the sight word for that illustration on the chalkboard. The first player to do this correctly wins the round. Repeat this process until all players in each team have had an opportunity to respond.

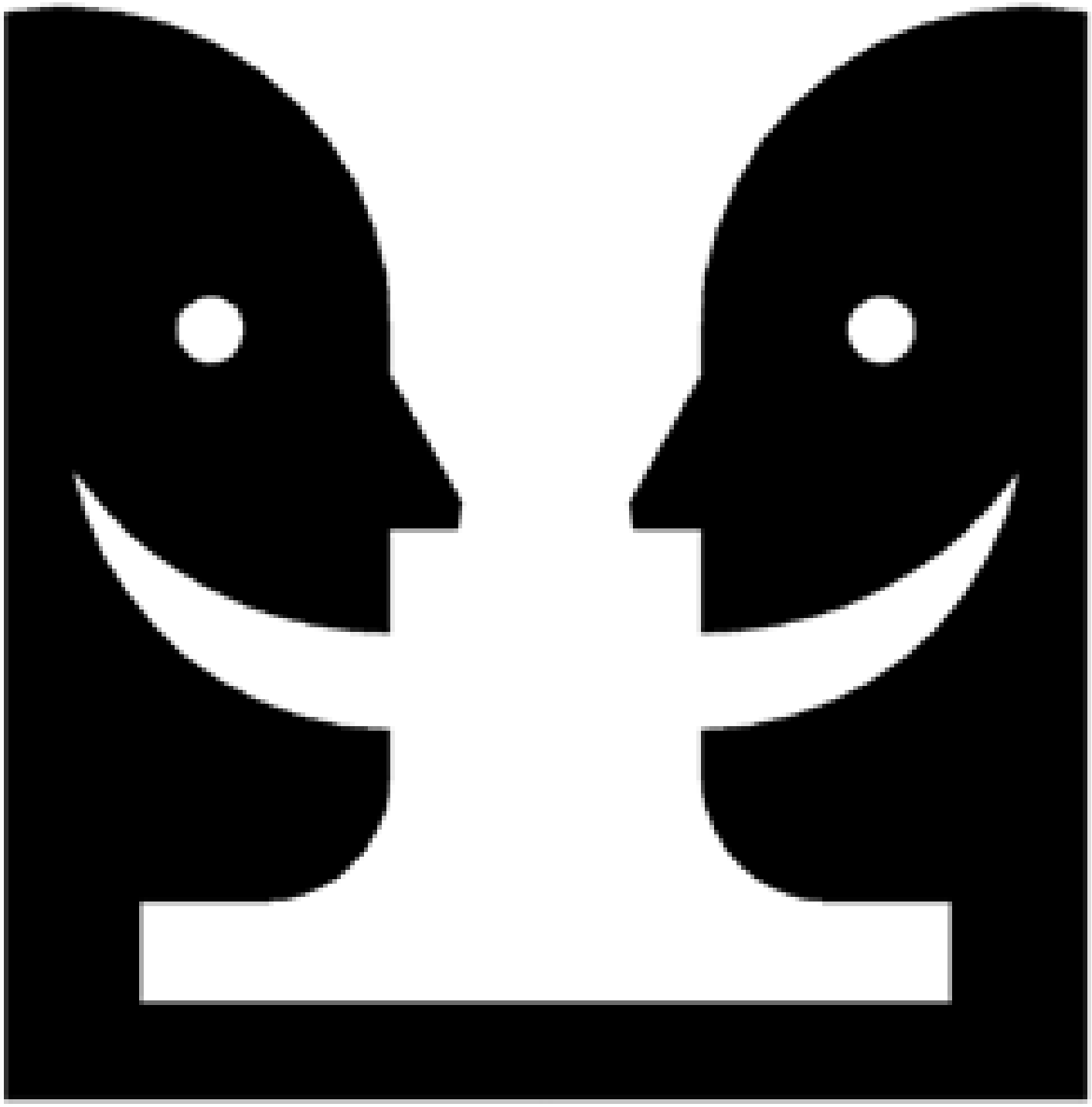
Vocabulary Images



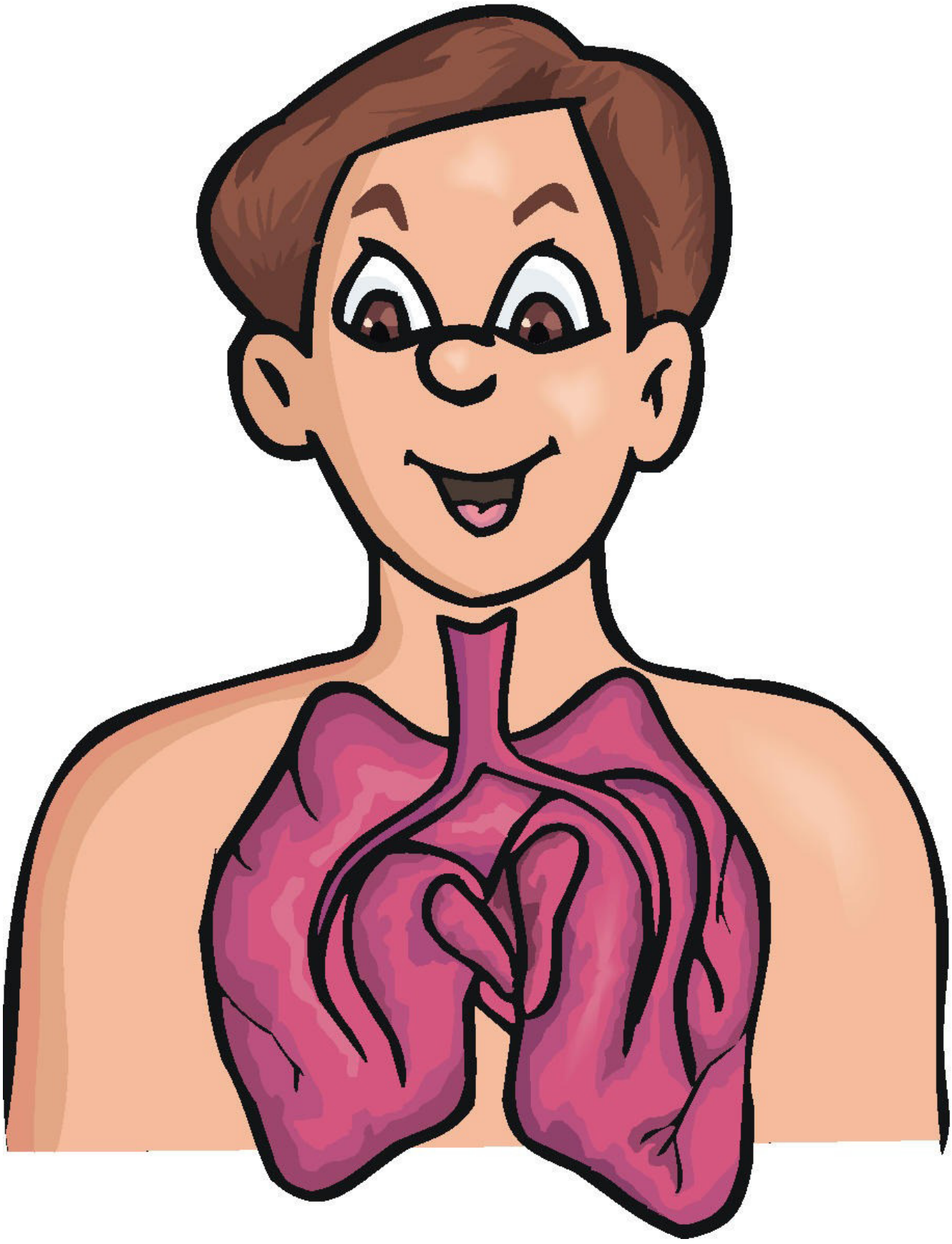


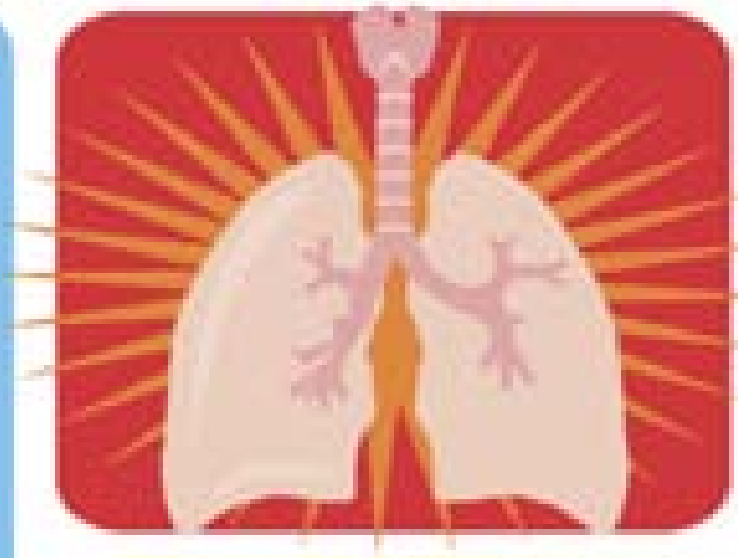
describe

function



specialized





STUDENT SUPPORT MATERIALS

Listening

Say these words to the students - they write the numbers of the words under the pictures.
1. natural selection, 2. speciation, 3. extinction, 4. issues, 5. describe, 6. structure, 7. function
8. relationships, 9. cells, 10. specialized, 11. major organ system, 12. respiratory

Fill-in The Blanks, Paragraph

Read the sentences to the students. The students should name the "missing words."

Biology is the study of life, its evolution, and the_____1_____between organisms on our planet. Biology encompasses a number of more specialized fields. For example, it includes physiology – concerned with tracing the pathways within an organism and the ____2____ inside _____3_____ that afford life. Cells of multicellular organisms are often ____4____, performing specific tasks. These cells are then grouped together into tissues that themselves comprise organs. Organs are grouped into _____5_____ (e.g. the _____6_____ system that includes the lungs where gas is exchanged), that perform complicated processes necessary for the functioning of multicellular animals. Another major organ system in the human body is that of the internal skeleton, which provides _____7_____for the body.

Fundamental to the study of Biology is evolution. The primary (but not the only) mechanism of evolution is _____8_____, often described as survival of the fittest. Essentially, conditions are not equally favorable to all individuals, and those that are most adapted survive. This leads to _____9_____, as individuals in isolated populations adapt to local conditions. In some cases, parallel evolution occurs – where completely different species, subjected to the same evolutionary processes, arrive at similar adaptations. An example of this are the wings of birds and bats. Divergent evolution refers to the branching of species away from each other. For example, one branch of reptiles led to the dinosaurs and subsequently birds (and other reptiles) whereas one lineage diverged – and mammals evolved. In some cases, the evolution of species converges, for example, as the red wolf populations in the southeastern U.S. became very small, they began breeding with coyotes and the evolution of these species converged in local regions. There is now a debate as to whether the red wolf underwent complete _____10_____, or whether it did not, as the population now consists of hybrids.

The field of biology also includes genetics, itself a field that encompasses a wide variety of seemingly unrelated fields. For example, a farmer who is selectively breeding sheep is practicing artificial selection. The farmer is selecting specific combinations of genes, the genotype, by focusing on visible characteristics – the phenotype, of the animals. Thus, the farmer is practicing genetics! The field of genetics seeks to _____11_____ the relationship between what is seen, and the DNA that codes for what is seen. Many _____12_____ associated with genetics, such as the creation of clones, are controversial. Regardless, our understanding of genetics is greatly enhancing our understanding of biological processes and the evolutionary history of life on this planet.

ANSWERS
1. relationships, 2. functions, 3. cells, 4. specialized, 5. major organ systems, 6. respiratory
7. structure, 8. natural selection, 9. speciation, 10. extinction, 11. describe, 12. issues

True Or False?

Read the following sentences to the students. The students should write "true" or "false" for each of the sentences.

1) Corn hybrids have been developed in agriculture by natural selection.
2) Change does not happen during evolution.
3) Although extinctions on Earth occur constantly - mass extinctions have occurred from time to time that account for the majority of lost species.
4) That evolution has, and is occurring, is not really an issue among scientists.
5) An important part of a geologist's job is to describe the structure of insect exoskeletons.
6) One means of structure in a plant is a mineralized endoskeleton.
7) The function of a cell wall is to provide a rigid structure for the cell.
8) There are complex relationships between rocks and trees.
9) The cell is semi-permeable to some substances, and not permeable to others.
10) Cells are never specialized, but tissues can be.
11) A sponge, being multi-cellular, has several major organ systems.
12) Some fish have lungs that they use to obtain oxygen in shallow warm water.

ANSWERS

1. T, 2.F, 3. F, 4. F, 5. T, 6. T, 7. F, 8. T, 9. F, 10. T, 11. T, 12. F

STUDENT SUPPORT MATERIALS

Sight Words

natural selection

speciation

extinction issues describe

structure

function

relationship

cells

specialized

respiratory

major organ system

STUDENT SUPPORT MATERIALS

Reading

Word Find

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

cells
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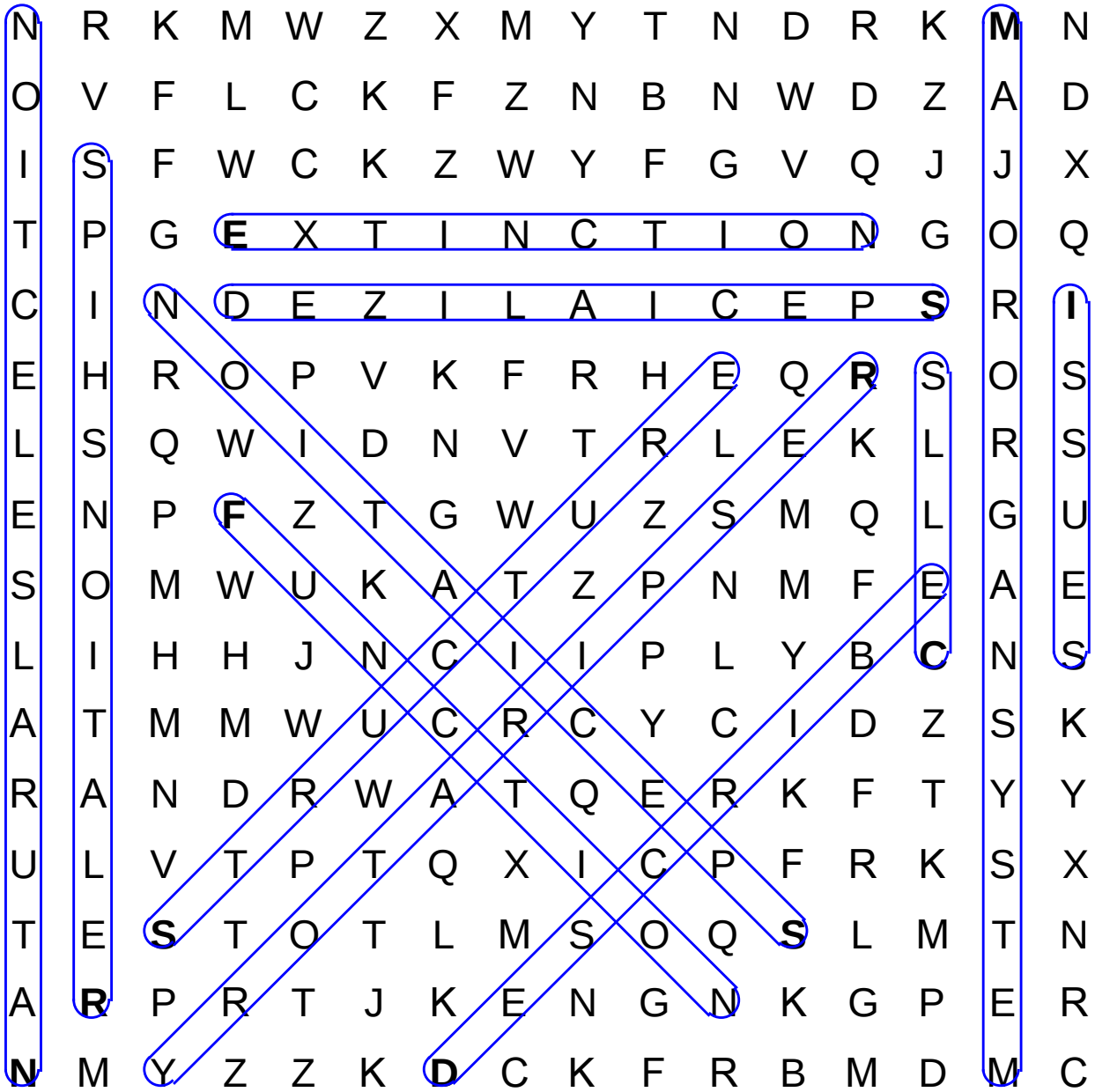
Word Find Solution



Sight Words Activity Page

Have the students highlight or circle the words for the pictures.

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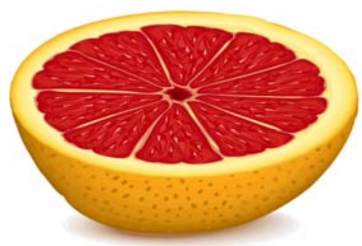

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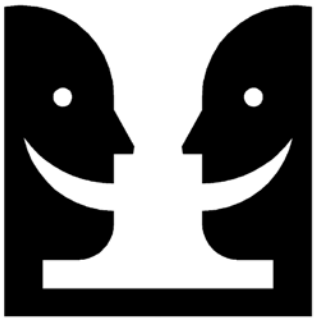

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natural selection
speciation
extinction
issues
describe
structure
function
relationships
cells
specialized
major organ system
respiratory

natural selection
speciation
extinction
issues
describe
structure
function
relationships
cells
specialized
major organ system
respiratory

Sentence Halves

Have the students write the numbers/letters for sentence halves that match.

1) Speciation typically has occurred in short
2) The current rate of extinction
3) While many may think that the issue of evolution is settled,
4) The better an organism is described,
5) The structure of a plant is such that
6) An important function of the chloroplast
7) There are many relationships among animals,
8) Some argue that a virus is not alive
9) All organisms alive may be considered
10) Injury to one of the major organ systems in a human
11) The respiratory system of both the larval amphibian and the adult

A. Some are beneficial to one another, but others are not.
B. It remains propped up towards the light.
C. Usually results in death.
D. The phylogeny of many organisms remains undetermined and an issue argued by taxonomists.
E. Amphibian consists of gills.
F. Intense periods on the planet – often following cataclysmic events such as collisions with asteroids.
G. Because it does not seem to consist of cells.
H. Is to absorb light energy during photosynthesis.
I. Specialized for the environment of the time.
J. Is much greater than in the past – as a result of human activity/hunting.
K. The more easily it may be identified.

ANSWERS
1/F 2/J 3/D 4/K 5/B 6/H 7/A 8/G 9/I 10/C 11/E

Word & Definition Match

Have the students write the word numbers on their matching definitions.

a matter that is in dispute	*the role or purpose of something*	*anything composed of parts arranged together*	*the formation of new species*	*breathing*
to be adapted to a special function	*heritable traits become more common*	*a connection existing between two things*	*the nervous, musculoskeletal, respiratory, etc*	*the basic structural unit of all organisms*
the cessation of a species or group of organisms	*to tell or depict in written or spoken words*			

1. natural selection	2. speciation	3. extinction	4. issues	5. describe
6. structure	7. function	8. relationships	9. cells	10. specialized
11. major organ system	12. respiratory			

Which Belongs?

Have the students circle/identify the word that is correct for each sentence.

1. Three legged dogs didn't survive in the wild as a result of natural selection/artificial selection

2. Speciation/extinction is occurring today in bacteria as a result of the misuse of antibiotics.

3. Extinction/speciation of humans may occur as a result of our tinkering with the planet's biosphere.

4. There are a multitude of issues/parallels surrounding stem cell research.

5. Describing/tracing the cell became easier with better microscopes.

6. The cells/structure of wood, compared to grass stems, is different in that it contains more lignin.

7. A person's liver performs many vital functions/pathways.

8. There is a relationship/parallel between stress and general health.

9. The basic building block of the body is the cell/tissue.

10. Specialized/functional groups of cells make up tissues.

11. Several major organ systems/tissues are not found in starfish.

12. The respiratory system/major organ system in frogs consists of the skin and lungs.

ANSWERS
1. natural selection, 2. speciation, 3. extinction, 4. issues, 5. describing, 6. structure,
7. function, 8. relationships, 9. cells, 10. specialized, 11. major organ systems, 12. respiratory

What's The Answer?

Have the students read the questions and then select the correct answer for them. They should fill-in the appropriate circles, beside the answers of their choice.

1) Which of the following is not an example of natural selection?
   - (a) When prey become extinct, a wolf pack that learns to eat fish survives while a pack that does not, will perish.
   - (b) The male bird with the brightest display is selected by the female as a mate;
   - (c) A volcano erupts wiping out all the tigers in the area.

2) The development of hybrid corn that grows in conditions corn could not be grown in initially, best describes:
   - (a) Natural selection;
   - (b) artificial selection;
   - (c) natural breeding.

3) Speciation:
   - (a) Results when organisms in an area breed together;
   - (b) Results when organisms isolated from others of their species adapt to local conditions;
   - (c) Results when conditions remain stable and there is no variation among organisms.

4) Collisions between the Earth and large comets have resulted in several:
   - (a) Alien sightings;
   - (b) Mass extinctions
   - (c) Periods of massive species radiation.

5) There are multiple issues regarding:
   - (a) The development of radio technologies;
   - (b) The development of refrigeration technology;
   - (c) The development of cloning techniques;

6) The structure of plants is based on:
   - (a) the incorporation of minerals into their tissues;
   - (b) the generation of carbon compounds from photosynthesis;
   - (c) the infusion of rock into their cell walls.

7) Cells carry out functions:
   - (a) With different enzymes;
   - (b) By osmosis only;
   - (c) In the absence of any energy;

What's The Answer?

Have the students read the questions and then select the correct answer for them. They should fill-in the appropriate circles, beside the answers of their choice.

8) Which of the following is considered a mutualistic symbiotic relationship:
   - (a) One animal is benefited, the other is not harmed;
   - (b) One animal is harmed, the other benefits;
   - (c) Both animals benefit.

9) Cells, at a minimum,
   - (a) Consist of a membrane and cytoplasm;
   - (b) Consist of a cell wall, a membrane, and cytoplasm;
   - (c) Consist of cytoplasm.

10) Specialized cells
   - (a) Carry on the same business as all other cells in the body;
   - (b) Perform specific functions in the body;
   - (c) Are not found in multi-cellular organisms.

11) Major organ systems consist of:
   - (a) Specialized cells
   - (b) A collection of organs;
   - (c) Specialized systems

12) Which of the following systems is involved in the exchange of gases:
   - (a) Circulatory;
   - (b) Respiratory;
   - (c) Digestive.

ANSWERS

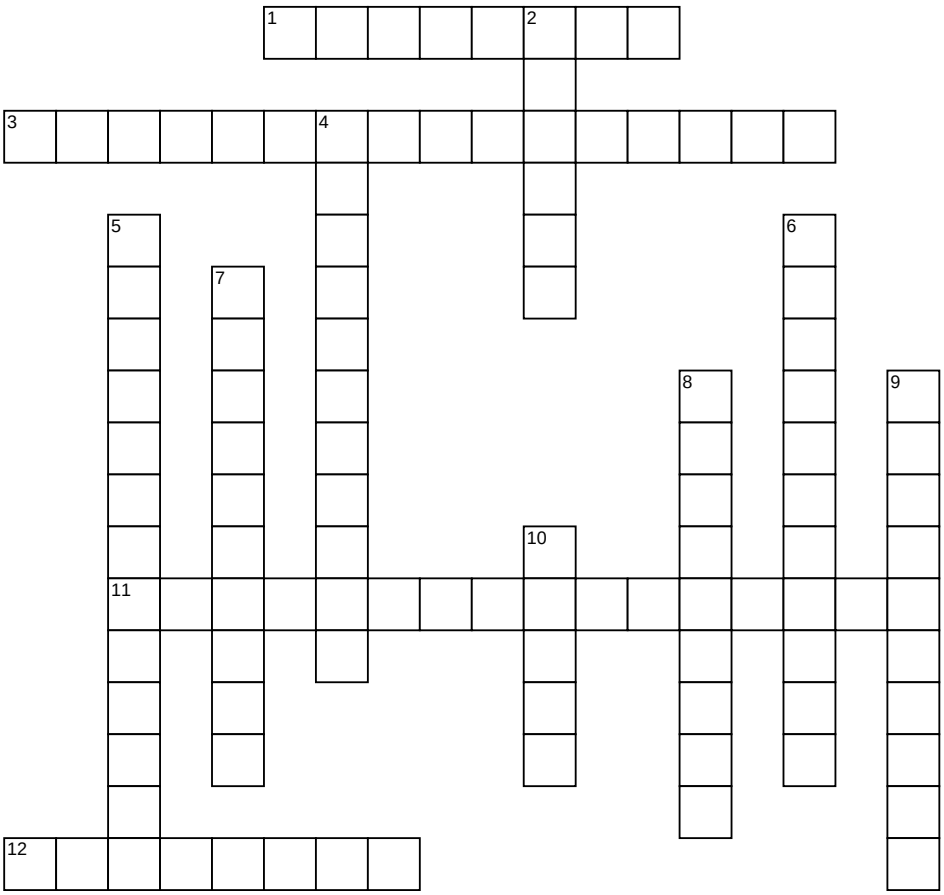
1. c, 2. b, 3. b, 4. b, 5. c, 6. b, 7. a, 8. c, 9. a, 10. b, 11. b, 12. b

STUDENT SUPPORT MATERIALS

Writing

10th C-1 Concepts of Life Science

Unit 1



www.CrosswordWeaver.com

ACROSS

1 the role or purpose of something.
3 any of the various organ systems in the body.
11 the process by which favorable heritable traits become more common in successive generations of population due to different reproduction of genotypes.
12 to tell or depict in written or spoken words.

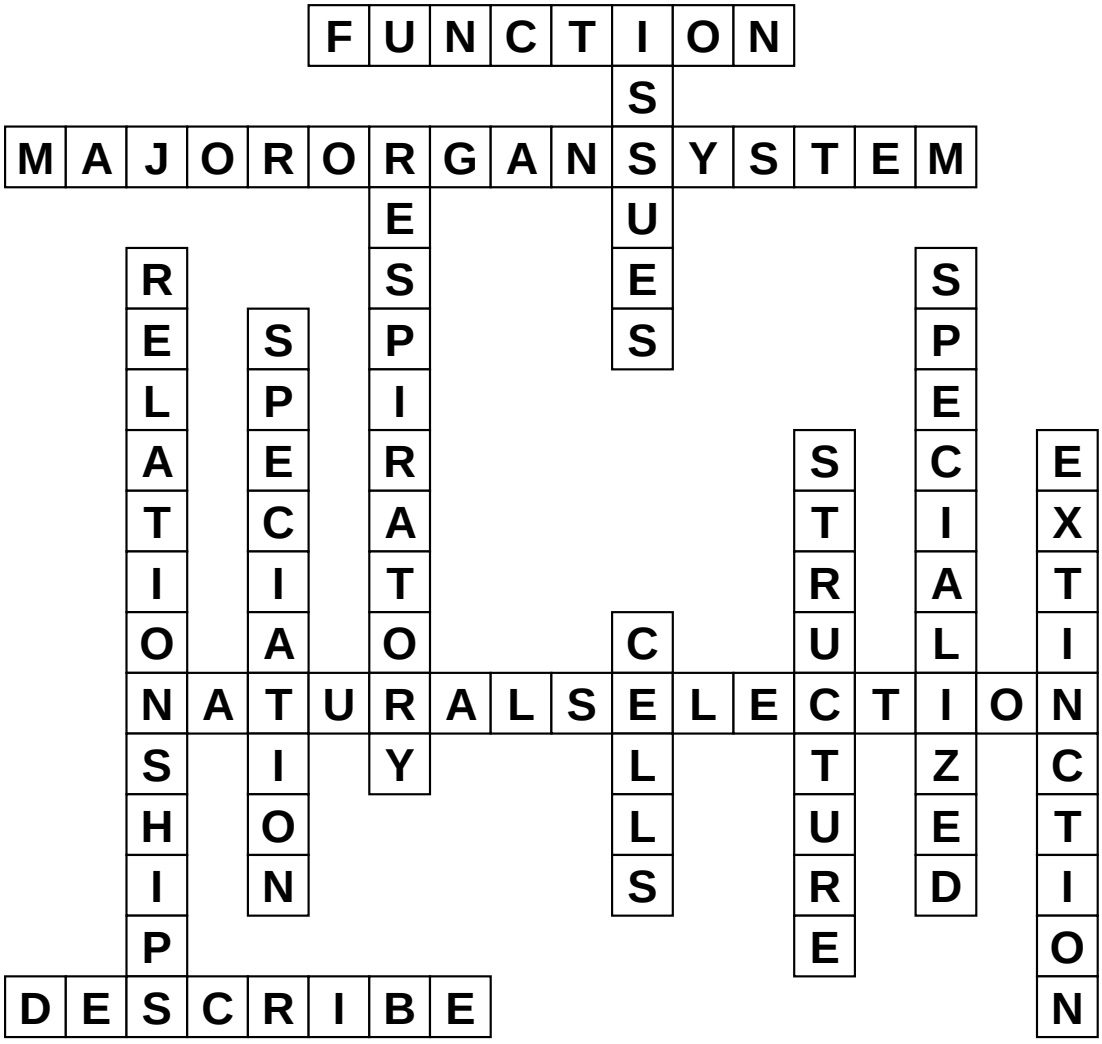
DOWN

2 a point in question or a matter that is in dispute.
4 pertaining to or serving for respiration, breathing.
5 a particular kind of connection existing between two things.
6 to be adapted to a special function or environment.
7 the formation of a new species.
8 anything composed of parts arranged together in some way.
9 the cessation of a species or group of organisms.
10 the basic structural unit of all organisms.

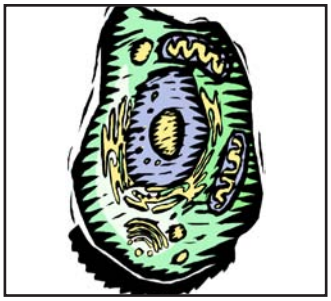
10th C-1 Concepts of Life Science

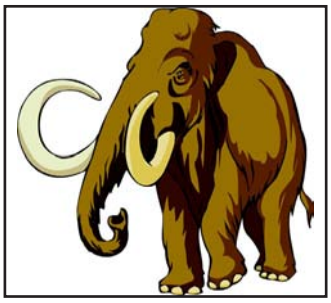
Unit 1

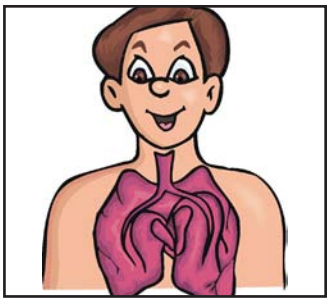
Solution:

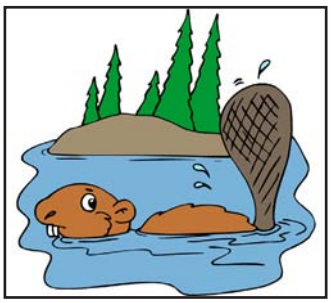


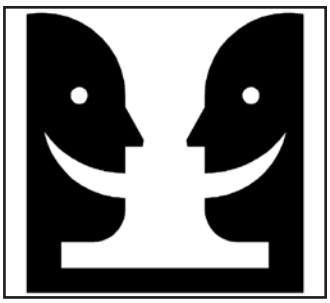
Write The Words!

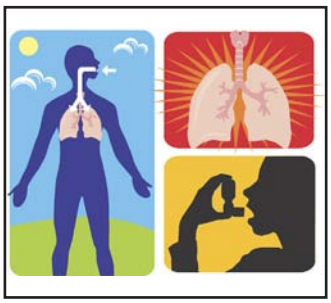


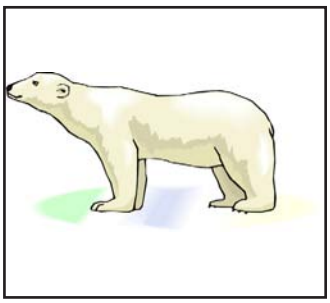




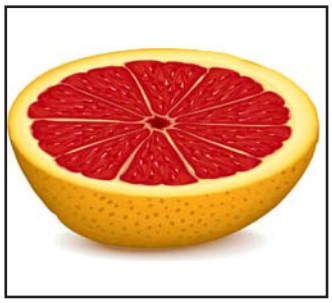








Write the Words!



Complete The Sentence

Have the students write the key words in the blanks.

1. Darwin proposed _____- as the mechanism for Evolution.

2. One way in that _____ occurs, is by geographical isolation.

3. _____ results when changes.

4. There are many _____ surrounding genetic modification of foods.

5. Taxonomists seek to _____ new species.

6. The _____ of DNA is a double helix.

7. Whereas DNA codes for enzymes, it is the enzymes that carry out the _____ of the body.

8. _____ between ancient evolutionary lineages is not always clear.

9. One basic truth of life as we know it is that every organism consists of _____

10. In a multi-cellular organism, some cells are _____ for particular functions.

11. There are several _____ in the human body – such as the digestive system.

12. The _____ in a fish usually consists of gills.

ANSWERS
1. periodic table, 2. base, 3. components, 4. thermal energy, 5. transfer, 6. transformation, 7. efficient, 8. useful energy, 9. total energy, 10. energy loss, 11. energy conversion, 12. kinetic energy, 13. potential energy

Creative Writing Activity Page

Have the students write sentences of their own, using the key words from this unit. When the students' sentences are finished, have them take turns reading their sentences orally. The students should say "Blank," for the key words; the other students must name the "missing" words. You may wish to have the students write the "definitions" for the key words.

natural selection

speciation

extinction

issues

describe

structure

function

relationships

cells

Creative Writing Activity Page

Have the students write sentences of their own, using the key words from this unit. When the students' sentences are finished, have them take turns reading their sentences orally. The students should say "Blank," for the key words; the other students must name the "missing" words. You may wish to have the students write the "definitions" for the key words.

specialized

---

major organ systems

---

respiratory

Creative Writing Activity Page

Have the students write sentences of their own, based on the picture below. When finished, have each student read his/her sentences to the others.

STUDENT SUPPORT MATERIALS

Reinforcement Activities

Flying Fish

The remarkable feature of this fish is its ability to “fly”! Actually, the fish don’t “fly” ... they glide through the air up to distances of 30-40 metres. Just before takeoff, the fish swims quickly towards the surface, bursting into the air at speeds of 35 mph!

Once it is airborne, the fish spreads its large pectoral fins (seen spread in the picture) and appears to be “flying”.

Explain how this adaptation could have come about from natural selection.
Make sure to use the following words (or concepts) in your description:

1. time
2. DNA (genetic change)
3. reproduction
4. offspring better able to compete

Unit Assessment

Unit 1 Quiz

G10, C1, Unit 1, Concepts of Life Science Quiz

Name: _____
Date: _____

Fill in the Blank: Fill in the blanks of each sentence with the best word. Choose your word from the list provided below.

natural selection function speciation structure extinction specialized

1) Anything composed of parts that are arranged together in some way is _____.

2) The finch as a bird has adapted to its environment. The large ground finch has a beak for grinding fruit. The small ground finch has a beak for eating small seeds. When organisms adapt to a special function or environment they become _____.

3) A species is a group of organism that can mate and produce offspring and they, in turn, can mate and produce more offspring. The formation of new species is _____.

4) Organisms change over time. Some are better suited to survive in their environment and to pass on their traits to the next generation than are others. The process by which favorable heritable traits become more common in successive generations of a population due to different reproduction of genotypes is called _____.

5) When the finches beak adapts for grinding fruit or eating seeds, it changes due to its role or purpose for eating. It changes due to its _____.

6) When a species or group of organism have ceased to exist the _____ of that species has occurred.

Multiple Choice: Read each statement carefully. Select the best answer from the choices provided.

7) Which word below best matches the following definition?
"***positive, pleasing, affording advantage, opportunity or convenience; advantageous"***

a) function

b) structure

c) favorable

d) relationships

Matching: Match the key vocabulary on the left with the definition on the right. Place the letter from the correct definition in front of the word it matches.

8) _____ issues

9) _____ relationships

10) _____ describe

a. a point in question or matter that is in dispute

b. to tell or depict in written or spoken word

c. a particular kind of connection existing between two things

True/False: Select the answer that is most likely to be correct.

11) When a matter has been resolved and there is no longer a dispute it is said to be an issue.

a) True

b) False

Illustrations of Key Vocabulary: The following questions will use illustrations to define key science vocabulary.

12) Illustrate or define the key vocabulary **MAJOR ORGAN SYSTEM** in the space provided below.

G10, C1, Unit 1, Concepts of Life Science Quiz

Name: _____
Date: _____

Fill in the Blank: Fill in the blanks of each sentence with the best word. Choose your word from the list provided below.

natural selection function speciation structure extinction specialized

1) Anything composed of parts that are arranged together in some way is **structure**.

2) The finch as a bird has adapted to its environment. The large ground finch has a beak for grinding fruit. The small ground finch has a beak for eating small seeds. When organisms adapt to a special function or environment they become **specialized**.

3) A species is a group of organism that can mate and produce offspring and they, in turn, can mate and produce more offspring. The formation of new species is **speciation**.

4) Organisms change over time. Some are better suited to survive in their environment and to pass on their traits to the next generation than are others. The process by which favorable heritable traits become more common in successive generations of a population due to different reproduction of genotypes is called **natural selection**.

5) When the finches beak adapts for grinding fruit or eating seeds, it changes due to its role or purpose for eating. It changes due to its **function**.

6) When a species or group of organism have ceased to exist the **extinction** of that species has occurred.

Multiple Choice: Read each statement carefully. Select the best answer from the choices provided.

7) Which word below best matches the following definition?
"***positive, pleasing, affording advantage, opportunity or convenience; advantageous"***

a) function

b) structure

c) favorable

d) relationships

Matching: Match the key vocabulary on the left with the definition on the right. Place the letter from the correct definition in front of the word it matches.

8) **a** issues

9) **c** relationships

10) **b** describe

a. a point in question or matter that is in dispute

b. to tell or depict in written or spoken word

c. a particular kind of connection existing between two things

True/False: Select the answer that is most likely to be correct.

11) When a matter has been resolved and there is no longer a dispute it is said to be an issue.

a) True

b) False

Illustrations of Key Vocabulary: The following questions will use illustrations to define key science vocabulary.

12) Illustrate or define the key vocabulary **MAJOR ORGAN SYSTEM** in the space provided below.

student will draw the illustration for major organ system or will write the definition.the various organ systems in the body...nervous, musculoskeletal, respiratory, etc.


UNIT 2
Sealaska Heritage Institute

INTRODUCTION OF

Key Vocabulary

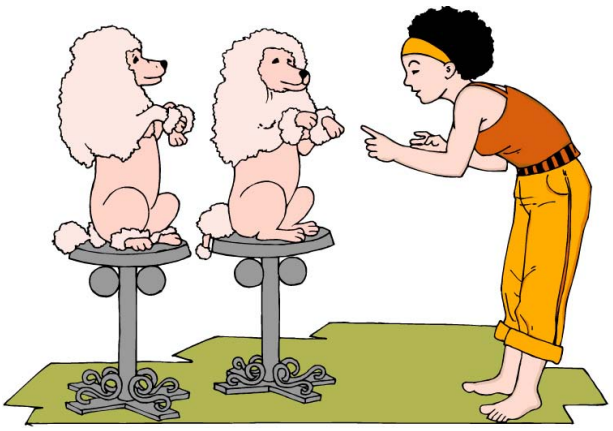
Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Clone

PLACE-BASED PERSPECTIVE

Show a picture of an alder tree and discuss how some trees may reproduce through asexual reproduction as *clones*.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.



Convergent

PLACE-BASED PERSPECTIVE

Show cars crashing into each other and discuss how they are *convergent*.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

In Southeast Alaska, Chatham Strait, Icy Strait and Lynn Canal *converge*, thus producing good fishing grounds and rough waters.

Divergent

PLACE-BASED PERSPECTIVE

Discuss with the students how some students will choose to go to college and some students will decide to stay home. These are *divergent* pathways.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Historically, for a variety of reasons, clans *diverged* and moved to different locations and took on new names.

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Favorable

PLACE-BASED PERSPECTIVE

Discuss how candy is a *favorable* food to most children over vegetables.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

In Southeast Alaska, *favorable* weather conditions and natural resources impacted on daily life. Also, some species of salmon were considered more favorable than others - many feel that the white king salmon is the most favorable salmon.

Form

PLACE-BASED PERSPECTIVE

Show the students a picture of a totem pole and discuss how the carver gave *form* to each of the symbols that were carved.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Formline design is used in the weaving of Chilkat robes and in other visual arts.

Genotype

PLACE-BASED PERSPECTIVE

Show students the symbols XX & XY and discuss with them that girls have a *genotype* of XX chromosomes and boys have a genotype of XY chromosomes.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Examples of *Genotypes* can be found in Southeast Alaska in a variety of locations. This would include different types of wildlife.

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Parallel

PLACE-BASED PERSPECTIVE

Show a picture of train tracks and discuss how they must always be *parallel* or else the train will go off the track.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Dog sleds have *parallel* runners. House posts, boats, and art forms all contain parallel lines.

Pathways

PLACE-BASED PERSPECTIVE

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Pathways within the human body include the digestive system, respiratory system, and others. The use of different oils, roots, tree bark, and plants enhanced the internal and external pathways.

Phenotype

PLACE-BASED PERSPECTIVE

Show a picture of a boy and a girl and discuss how the physical differences are apparent in their *phenotype*.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Tissue

PLACE-BASED PERSPECTIVE

Give each student three squares of two-ply toilet paper. Have them peel the layers apart and stack them so that they are six layers thick. Explain to them that skin is layers of cells, called *tissue*, that form skin.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Given the Native people's daily interactions with their environment, they learned about all parts of the animals and plants. This included *tissues*.

Trace

PLACE-BASED PERSPECTIVE

Ask students to *trace* the path from their home to school to their best friend's houses.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Hunting involves the *tracing* of animal tracks. Also, Native peoples can trace their lineages through the oral narratives.

Artificial Selection

PLACE-BASED PERSPECTIVE

Show the students pictures of different breeds of dogs. Discuss the fact that the dogs were bred, using *artificial selection*, to create their distinctive traits.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

Language Skills

Language & Skills Development

LISTENING

Use the activity pages from the Student Support Materials.

Roll 'Em Again Sam

Provide each student with two flashcards. Each student should then write a number between 1 and 6 on each of his/her cards - one number per card. When the students' number cards are ready, toss two dice. Call the two numbers showing on the dice. Any student or students who have those two numbers on their number cards must then find a vocabulary illustration you name (you may wish to have the vocabulary illustrations mounted on the chalkboard and numbered, for easy identification). The students may change number cards after each round of the activity.

SPEAKING

Flip of the Coin

Provide each student with a penny. Keep one penny for yourself. Mount the vocabulary illustrations on the chalkboard. Have the students (gently) toss their pennies into the air. Each student should look to see which side of his/her penny is face-up. Toss your penny into the air in the same way. Call the side of your penny that is face-up. The students who have the same side of coin face-up must then identify (orally) a vocabulary illustration you point to. For example, if the "heads" side of your coin is face-up, the students who have "heads" showing on their coins must then orally identify the vocabulary illustration you point to. Repeat this process a number of times.

READING

Use the activity pages from the Student Support Materials.

Half Time Concentration

Before the activity begins, cut each of the sight words in half. Mix all of the word halves together and spread them on the floor or on a table, face down. Group the students around the word halves. Call upon a student to select one of the word halves. The student should show that word half to the other students. Then, the student should take another word half. The student should show *that* word half to the other students. If the two word halves go together to create a sight word, the student should keep the two halves. However, if the two halves do not go together, he/she should place them in their original locations on the floor. Continue in this way until all of the sight word cards have been encoded correctly. The winner or winners of this activity are those students who collect the greatest number of sight words.

WRITING

Use the activity pages from the Student Support Materials.

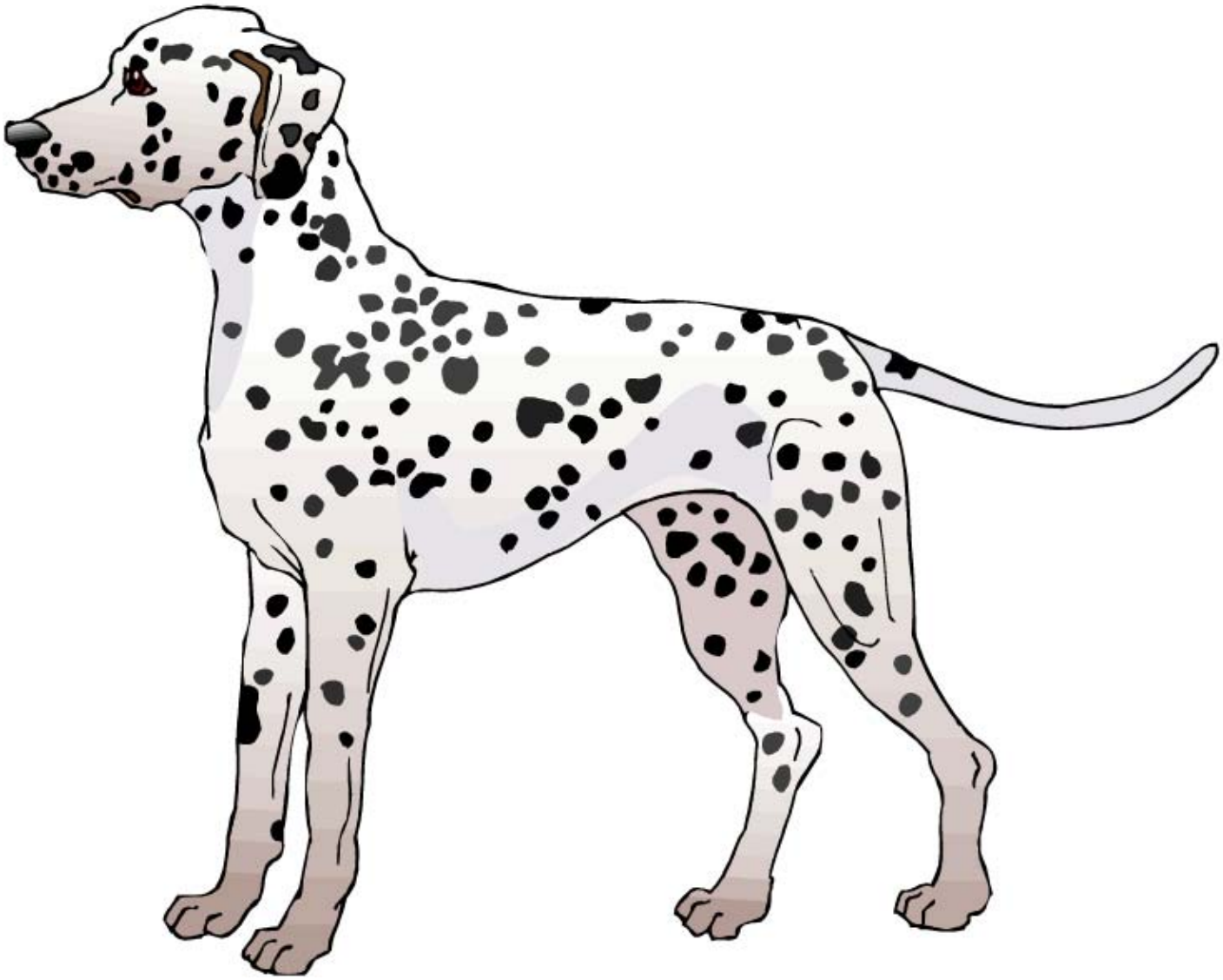
Funny Grams

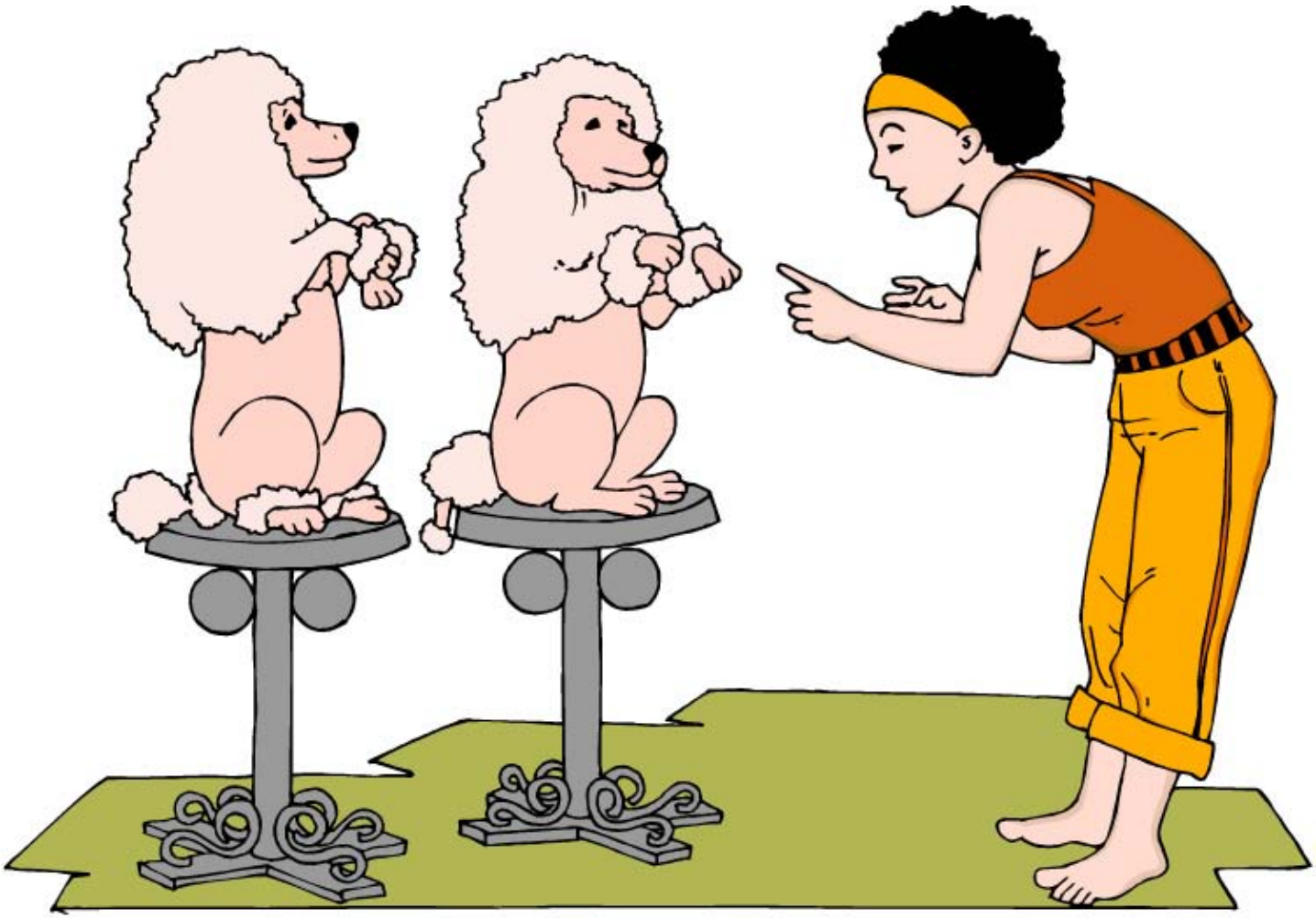
Mount a set of sight word cards on the chalkboard. Provide the students with writing paper and pencils/pens. Each student should select one of the sight words to write a "funny gram." To do this, the student uses the letters of the sight word as the initial letters of words in a sentence. For example, for the word "recent," a student might write:

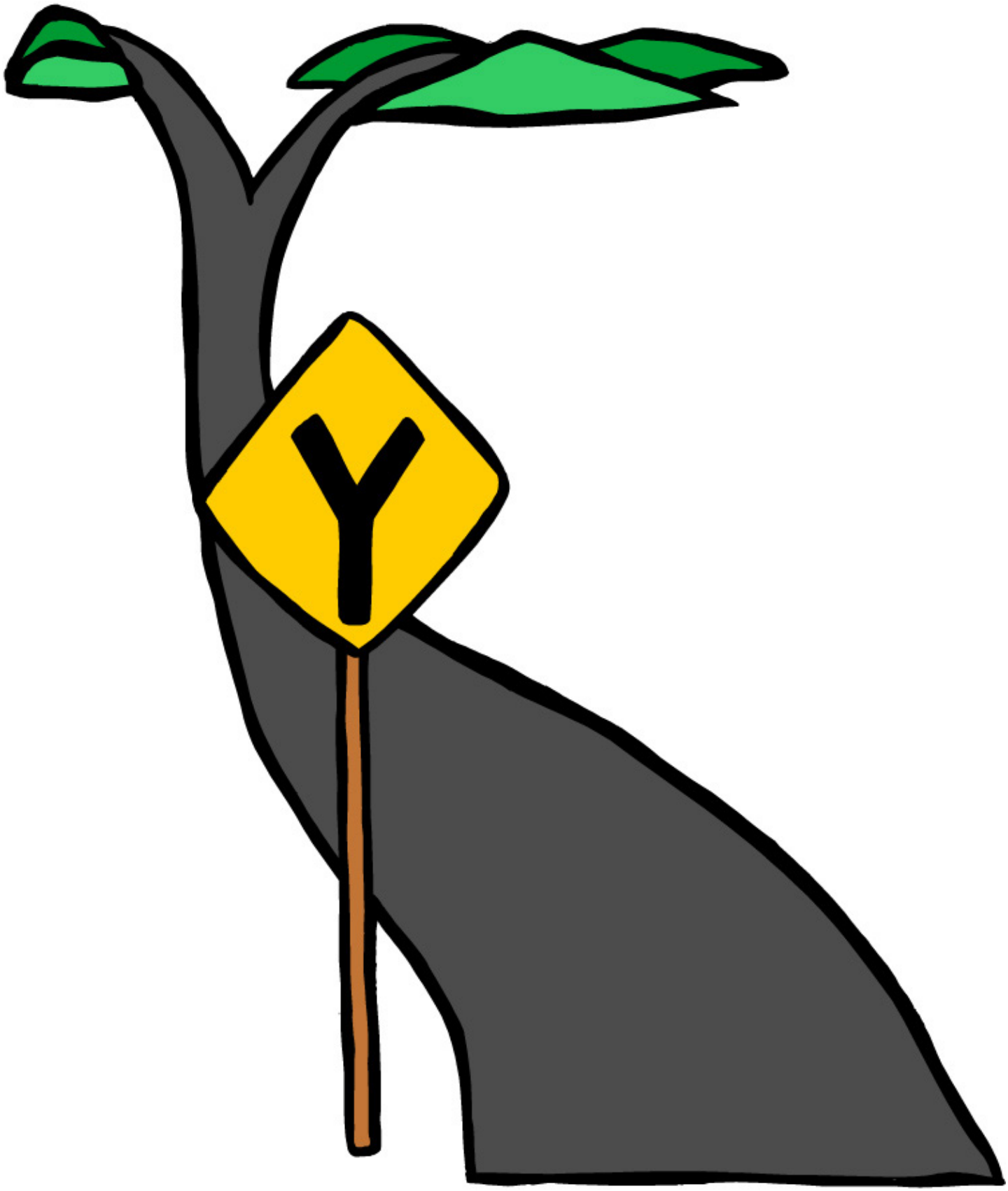
***R**oyal **e**ngineers **c**riticize **e**very **n**ew **t**enant.*

When the students have completed their "funny grams," have a student read his/her sentence to the others. The other students should name the sight word used by the student to write the sentence. You may wish to have the students write a "funny gram" for each sight word.

Vocabulary Images



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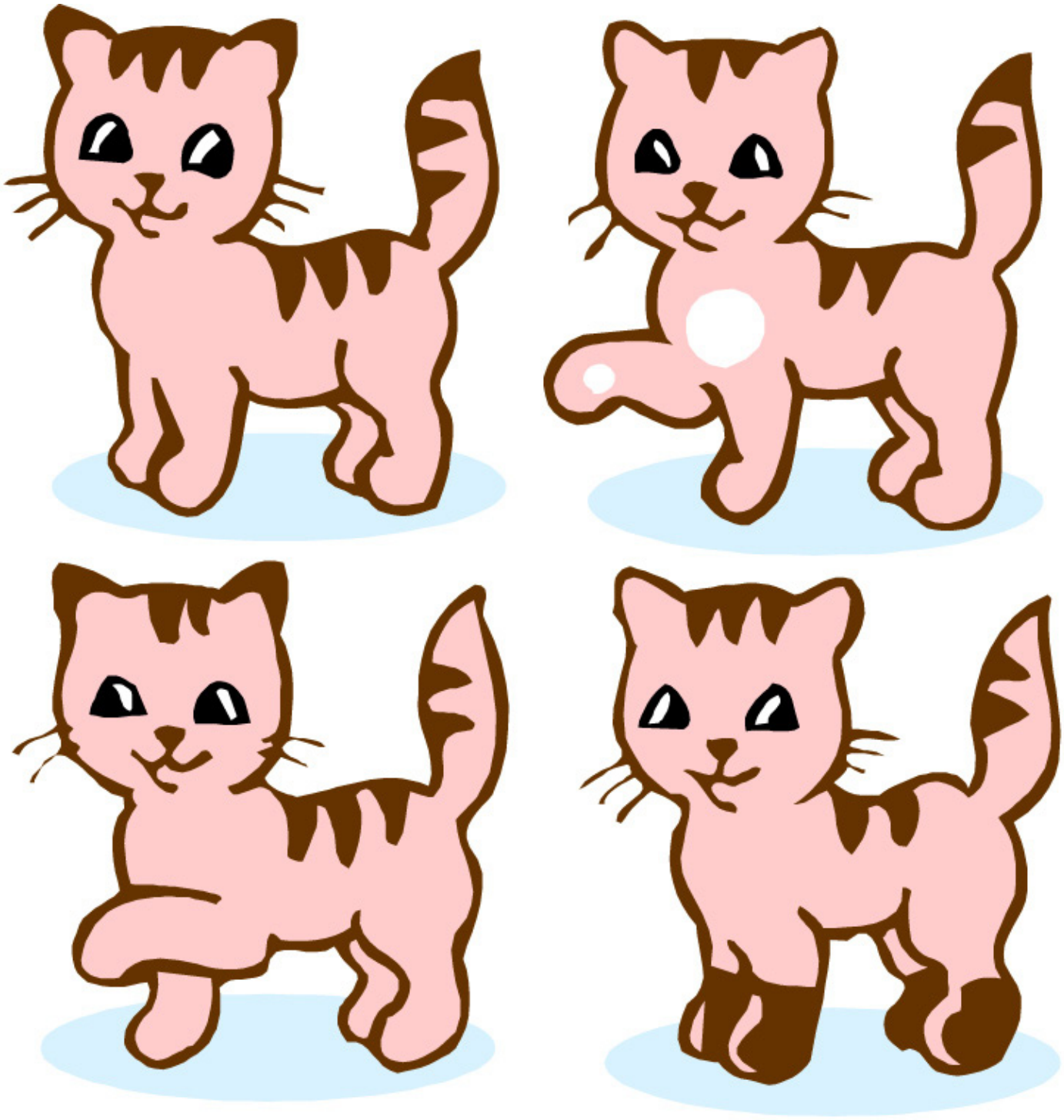
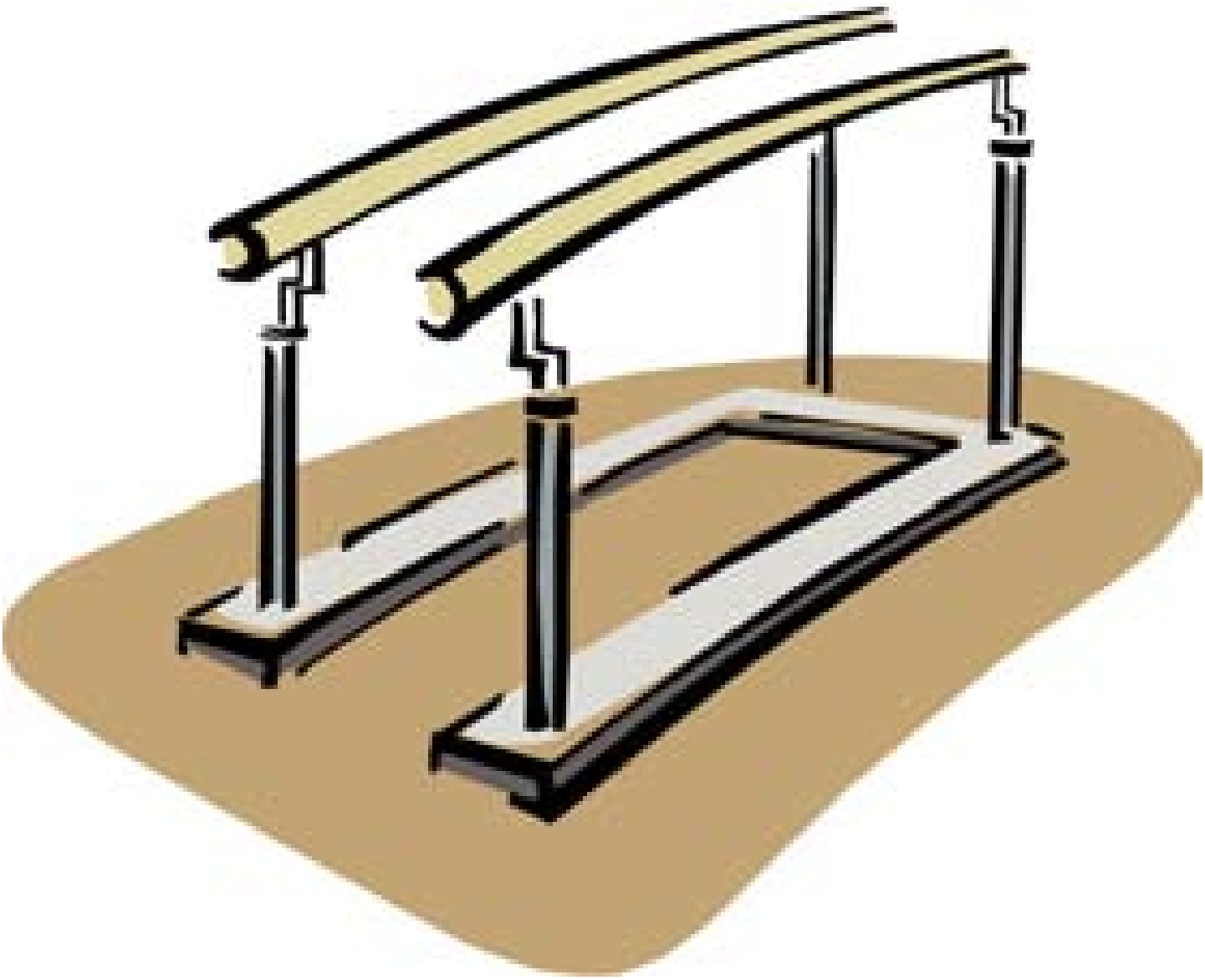
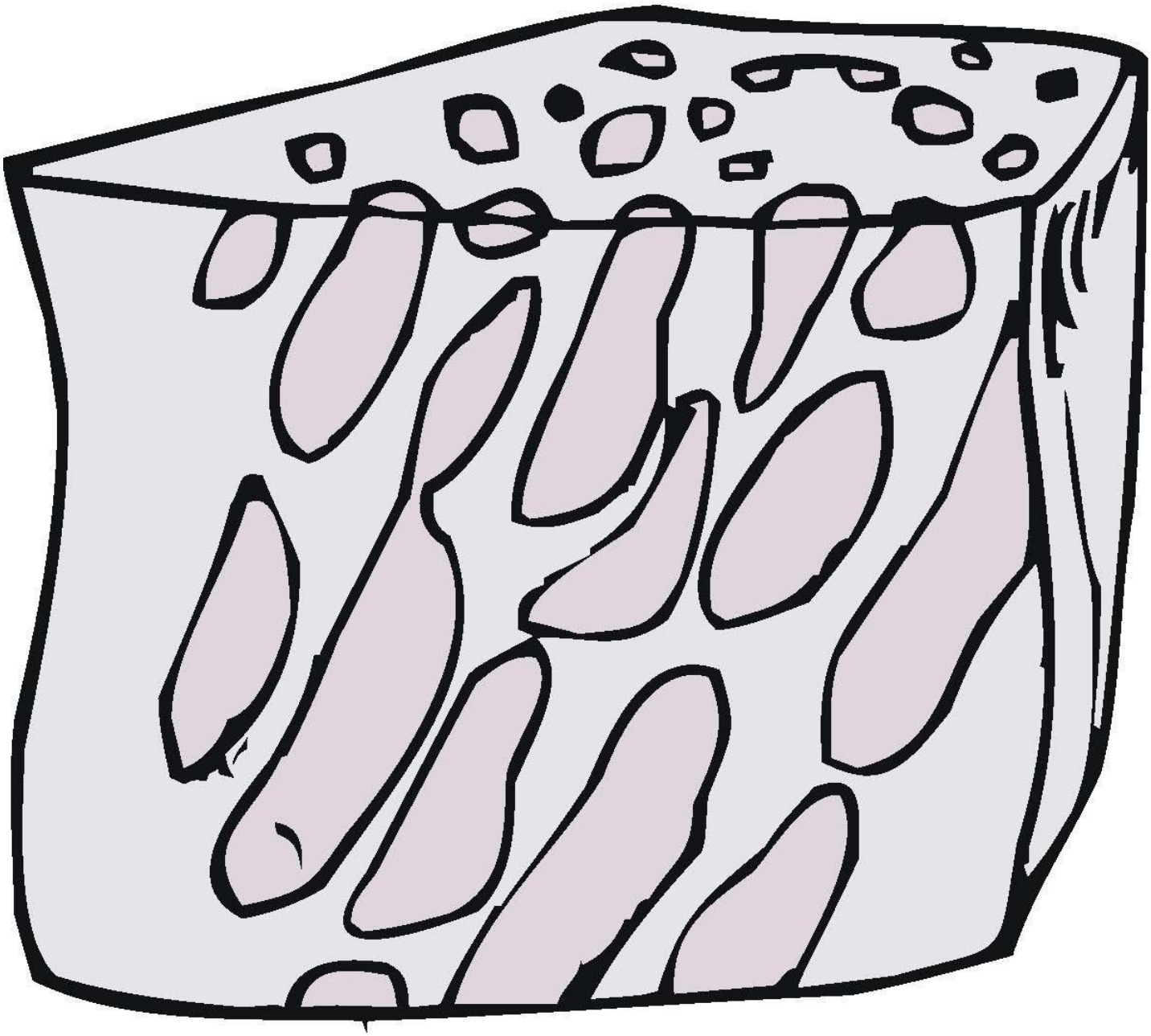
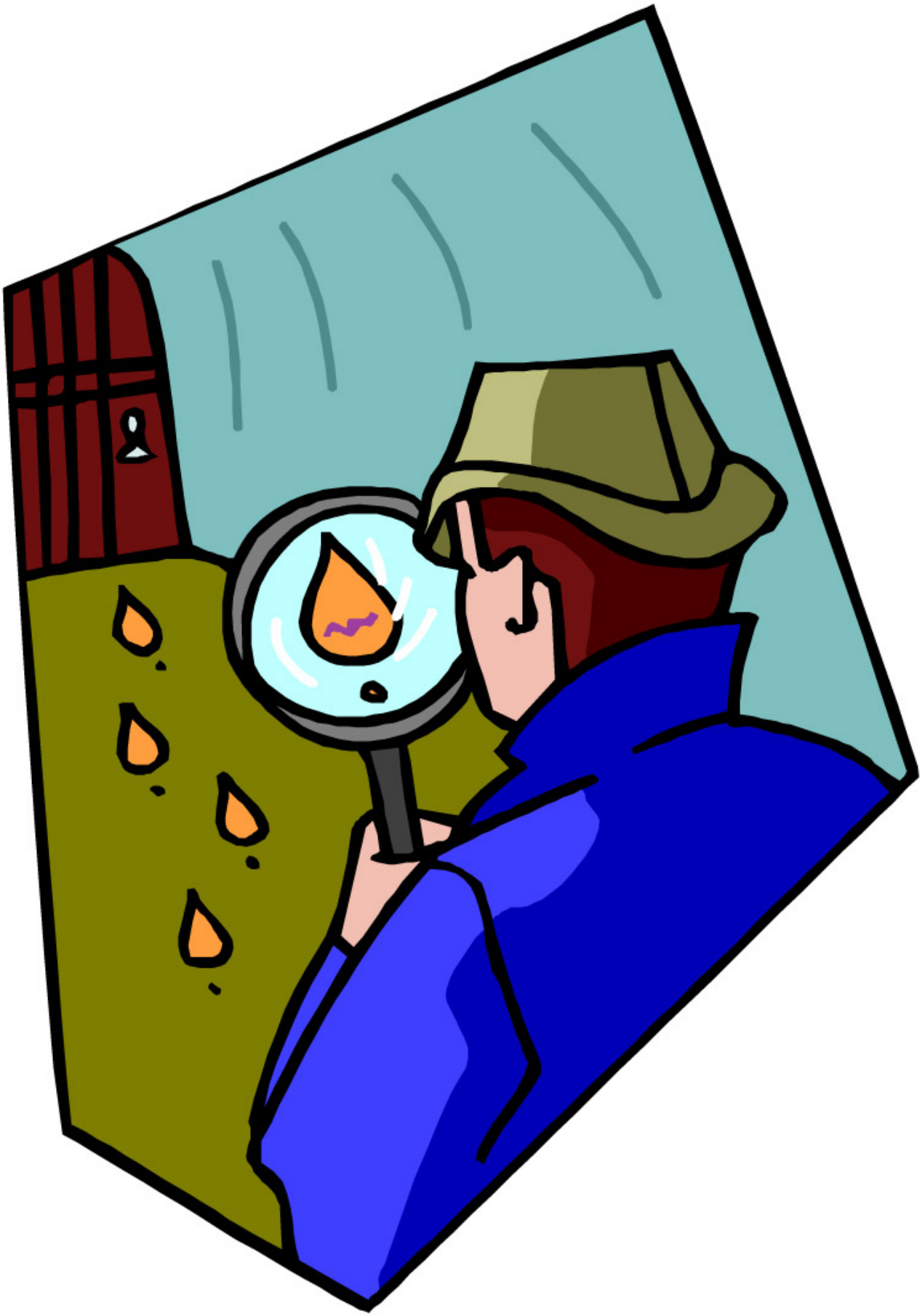




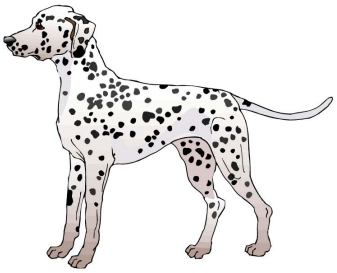


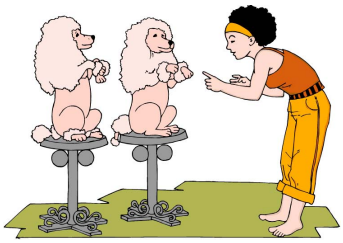


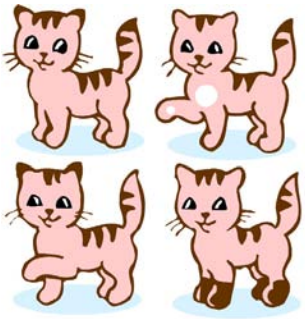
STUDENT SUPPORT MATERIALS

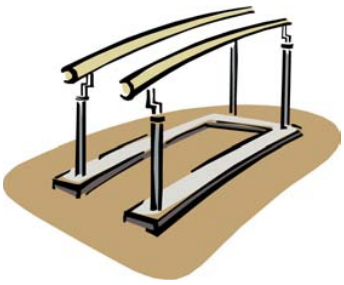
Listening

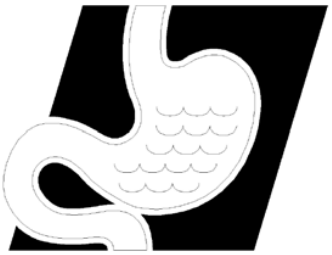
Say these words to the students - they write the numbers of the words under the pictures.
1. phenotype, 2. form, 3. clone, 4. favorable, 5. trace, 6. artificial selection, 7. genotype
8. tissue, 9. parallel, 10. convergent, 11. pathways, 12. divergent











Fill-in The Blanks, Paragraph

Read the sentences to the students. The students should name the "missing words."

Biology is the study of life, its evolution, and the relationships between organisms on our planet. Biology encompasses a number of more specialized fields. For example, it includes physiology – concerned with ____1____ the ____2_____ within an organism and the functions inside cells that afford life. Cells of multicellular organisms are often specialized, performing specific tasks. These cells are then grouped together into _____3_____ that themselves comprise organs. Organs are grouped into major organ systems (e.g. the respiratory system that includes the lungs where gas is exchanged), that perform complicated processes necessary for the functioning of multicellular animals. Another major organ system in the human body is that of the internal skeleton, which provides structure for the body.

Fundamental to the study of Biology is evolution. The primary (but not the only) mechanism of evolution is natural selection, often described as survival of the fittest. Essentially, conditions are not equally _____4_____ to all individuals, and those that are most adapted survive. This leads to speciation, as individuals in isolated populations adapt to local conditions. In some cases, _____5_____ evolution occurs – where completely different species, subjected to the same evolutionary processes, arrive at similar adaptations. An example of this are the wings of birds and bats. ____6_____ evolution refers to the branching of species away from each other. For example, one branch of reptiles led to the dinosaurs and subsequently birds (and other reptiles) whereas one lineage diverged – and mammals evolved. In some cases, the evolution of species _____7_____, for example, as the red wolf populations in the Southeastern U.S. became very small, they began breeding with coyotes and the evolution of these species converged in local regions. There is now a debate as to whether the red wolf underwent complete extinction, or whether it did not, as the population now consists of hybrids.

The field of biology also includes genetics, itself a field that encompasses a wide variety of seemingly unrelated fields. For example, a farmer who is selectively breeding sheep is practicing _____8_____. The farmer is selecting specific combinations of genes, the _____9_____, by focusing on visible characteristics – the _____10_____, of the animals. Thus, the farmer is practicing genetics! The field of genetics seeks to describe the relationship between what is seen, and the DNA that codes for what is seen. Many issues associated with genetics, such as the creation of _____11_____ that have the same_____12_____, are controversial. Regardless, our understanding of genetics is greatly enhancing our understanding of biological processes and the evolutionary history of life on this planet.

ANSWERS
1. tracing, 2. pathways, 3. tissues, 4. favorable, 5. parallel, 6. divergent, 7, converges
8. artificial selection, 9. genotype, 10. phenotype, 11. clones 12. forms

True Or False?

Read the following sentences to the students. The students should write "true" or "false" for each of the sentences.

1) It is important to know how cellular pathways are influenced by various prescriptions when considering the prescription of multiple pharmaceuticals

2) Each pathway in a cell that requires energy usually has a specific enzyme that catalyzes it.

3) Survival of the fittest is based on artificial selection.

4) The moving apart of continents is a feature of convergent plates.

5) Divergent plate boundaries are usually associated with intense earthquakes.

6) The streamlined form of fishes and birds living in a marine environment resulted from parallel evolutionary pressures.

7) Cloned bacteria have not been useful medically.

8) Every element can only be found in a single form.

9) Convergent patters go in opposite directions.

10) A tissue is a collection of organs.

11) Each pathway in a cell that requires energy usually has a specific enzyme that catalyzes it.

ANSWERS
1. F, 2. F, 3. T, 4. T, 5. T, 6. F, 7. T, 8. T, 9. F, 10. F, 11. F

STUDENT SUPPORT MATERIALS

Sight Words

clone

convergent

divergent

favorable form genotype

parallel pathway phenotype

tissue

trace

artificial selection

STUDENT SUPPORT MATERIALS

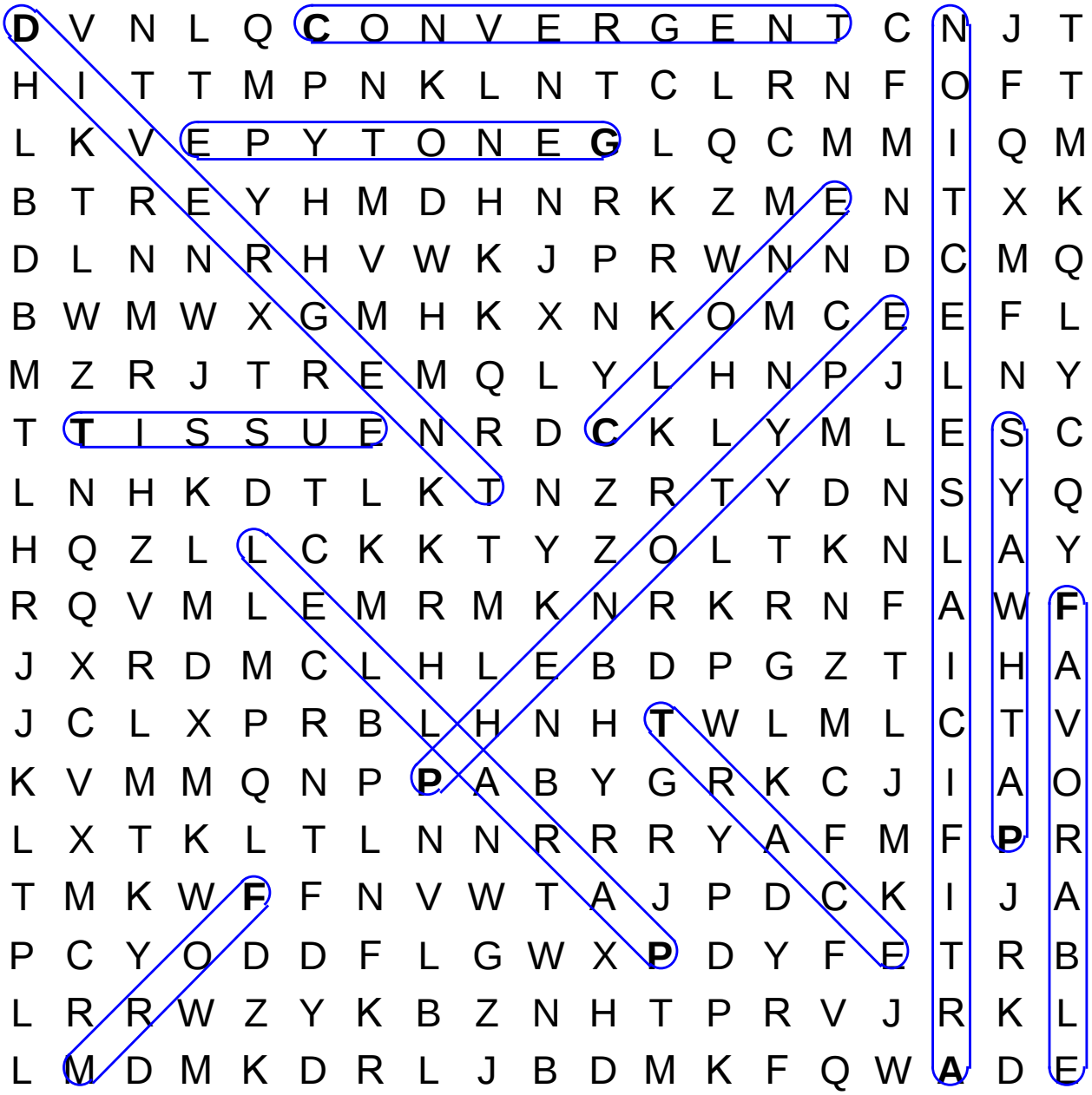
Reading

Word Find

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

Artificial Selection
Clone
Convergent
Divergent
Favorable
Form
Genotype
Parallel
Pathways
Phenotype
Tissue
Trace

Word Find Solution



Sight Words Activity Page

Have the students highlight or circle the words for the pictures.

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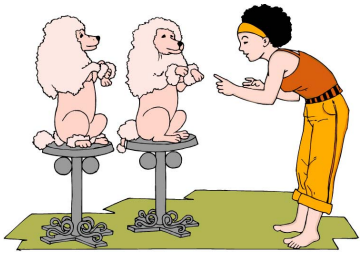
parallel
pathway
phenotype
tissue
trace
artificial selec-
tion



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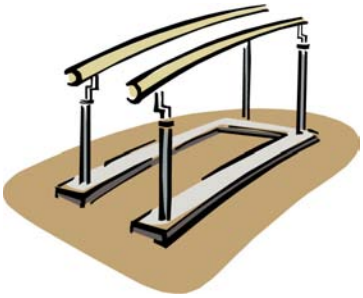

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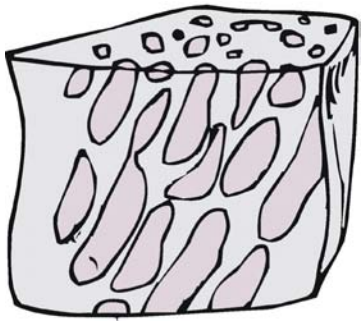

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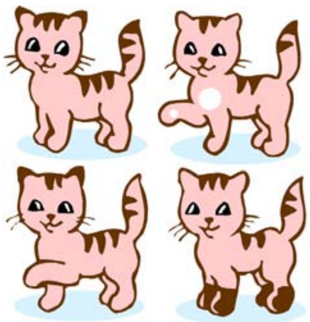
Sight Words Activity Page

Have the students highlight or circle the words for the pictures.



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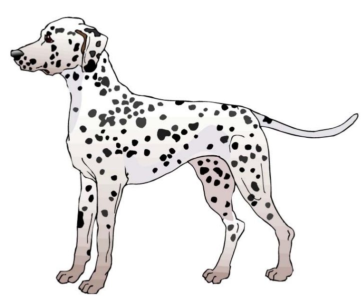

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Sentence Halves

Have the students write the numbers/letters for sentence halves that match.

1) The process by which more favorable heritable traits become more
2) Radioactive phosphorus
3) A pathway that imports substances across the cell membrane that involves energy
4) Dairy cattle have been created that are more efficient at producing milk
5) The divergence of early reptiles led
6) The streamlined bodies of fish and marine mammals are the result of
7) The genotype of an organism is
8) The realized combination between the influence of the environment and
9) Boba-fett was a
10) Although fish are found in several forms,
11) The conditions in the tropical oceans
12) The tissue pathway that carries oxygen in the

A. Most are streamlined.
B. Described by its allelic combination.
C. Genetic potential is called the phenotype.
D. Has been used to trace the replication process of DNA.
E. Prevalent in a population is called natural selection.
F. Is called active.
G. Than wild bovine by the process of artificial selection.
H. Are favorable for coral reefs.
I. To the mammals and the reptile groups alive today.
J. Parallel factors on survival.
K. Clone.
L. human body is called blood.

ANSWERS

1/E 2/D 3/F 4/G 5/I 6/J 7/B 8/C 9/K 10/A 11/H 12/L

Word & Definition Match

Have the students write the word numbers on their matching definitions.

a course followed by a body part or process	*shape*	*advantageous*	*deviating*	*to follow the course*
having the same tendency	*to act together in order to perform specific functions in the body*	*a cell product*	*merging*	*the visible part of a genotype*
the genetic makeup of an organism	*this is when human traits are bred for in a population*			

1. clone
2. convergent
3. divergent
4. favorable
5. form
6. genotype
7. parallel
8. pathway
9. phenotype
10. tissue
11. trace
12. artificial selection

What's The Answer?

Have the students read the questions and then select the correct answer for them. They should fill-in the appropriate circles, beside the answers of their choice.

1) When conditions are favorable, the populations of most organisms:
   - (a) increase;
   - (b) stay the same;
   - (c) go extinct.

2) The development of hybrid corn that grows in conditions corn could not be grown in initially, best describes:
   - (a) natural selection;
   - (b) artificial selection;
   - (c) natural breeding.

3) When the range of two species that exploit similar resources converge:
   - (a) one of the species will survive at the expense of the other;
   - (b) the species will breed together and create a new species;
   - (c) both species will live in harmony together.

4) the divergence of reptiles:
   - (a) gave rise to the birds, mammals, and other species of reptiles seen today;
   - (b) was limited and had nothing to do with the development of mammals;
   - (c) resulted in the breeding of mammals and some birds – creating the bat.

5) the evolution of:
   - (a) other species led, sequentially, to the development of humans;
   - (b) all species has proceeded at the same rate;
   - (c) other animals parallels our own.

6) the genotype of an organism:
   - (a) is the expression of the DNA by an organism;
   - (b) is the genetic potential of an organism;
   - (c) is the way an organism appears on the outside only.

7) the phenotype of an organism:
   - (a) is the expression of the DNA by an organism;
   - (b) the genetic potential of an organism;
   - (c) the way an organism appears on the outside only.

8) Which of the following is not generally referred to as a clone:
   - (a) a bacterium into which the Insulin Gene has been spliced – which is then allowed to populate;
   - (b) a sheep egg in which the DNA inside has been removed and replaced with other DNA;
   - (c) a strawberry plant that originated from the stolen (above ground stem) of another strawberry plant.

What's The Answer?

Have the students read the questions and then select the correct answer for them. They should fill-in the appropriate circles, beside the answers of their choice.

9) When conducting scientific research, it is important to:
   - (a) describe methodologies well so that others may duplicate the work;
   - (b) work in secret so as to reserve technological rights;
   - (c) avoid anything that is controversial.

10) Tissues consist of:
   - (a) specialized cells;
   - (b) a collection of organs;
   - (c) specialized systems.

11) Radioactive elements are sometimes used to:
   - (a) determine how old a living organism is:
   - (b) trace a particular biological pathway;
   - (c) determine how fast an animal can run.

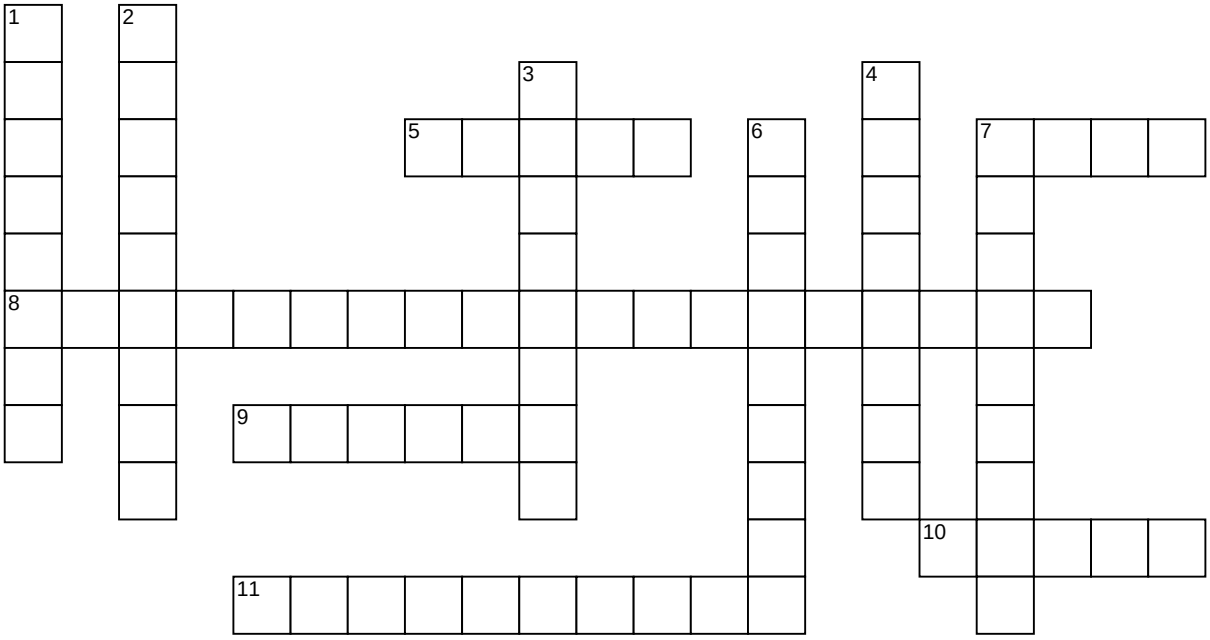
12) All of the functions in the body are performed in:
   - (a) each cell of a multi-cellular organism;
   - (b) reactions called pathways;
   - (c) singular organ systems.

STUDENT SUPPORT MATERIALS

Writing

10th C-1 Concepts of Life Science

Unit 2



ACROSS

5 to track.
7 the shape of a thing.
8 a human endeavor in which certain traits, or combinations of traits, are intentionally bread for in a population.
9 an aggregation of morphologically similar cells and associated intercellular matter acting together to
10 an organism that is genetically identical to the unit or individual from which it was derived.
11 tending to come together.

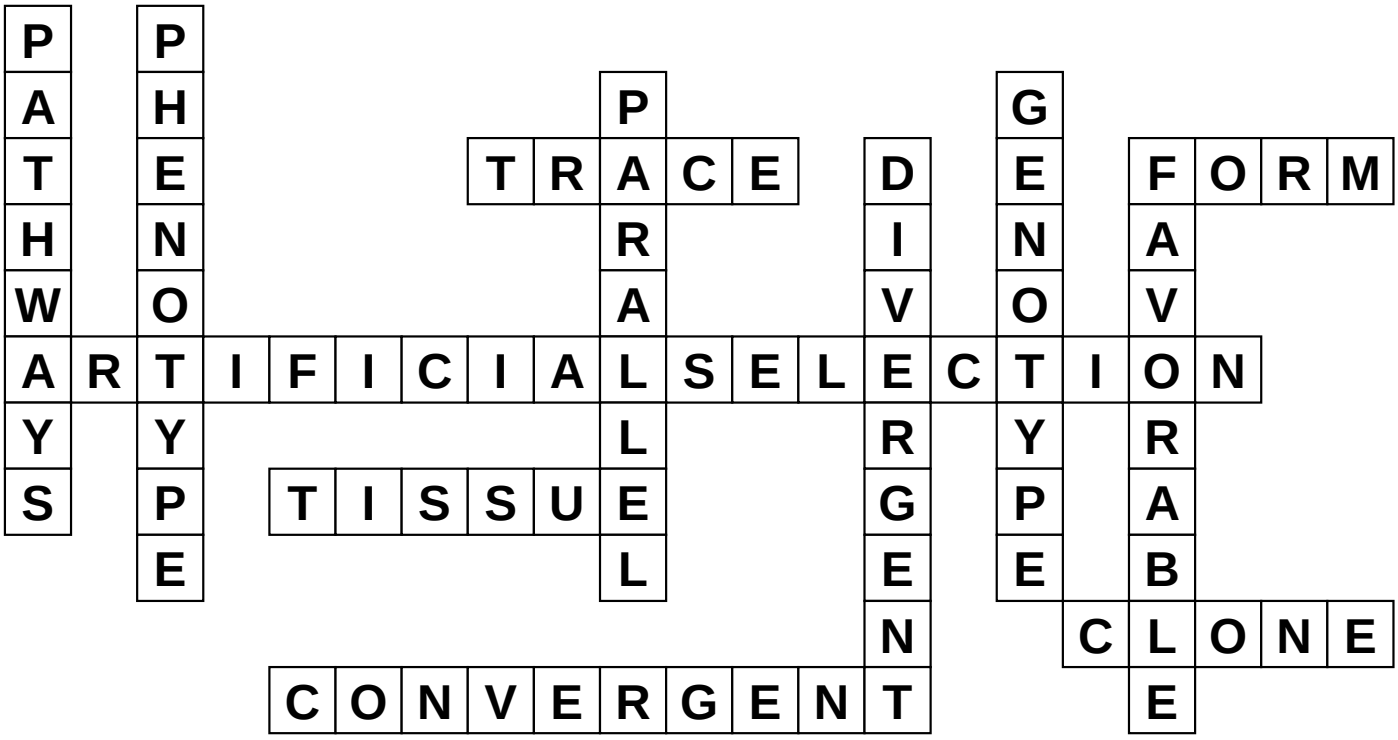
DOWN

1 a course usually followed by a body party or process.
2 the observable constitution of an organism, the visible part of the genotype.
3 extending in the same direction, having the same course or tendency.
4 the genetic makeup of an organism or group of organisms.
6 tending to separate.
7 positive, pleasing, affording advantage, opportunity, or convenience.

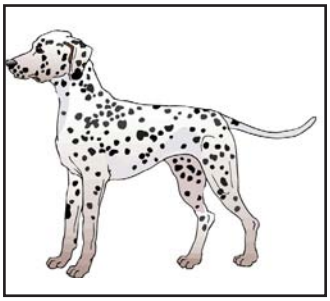
10th C-1 Concepts of Life Science

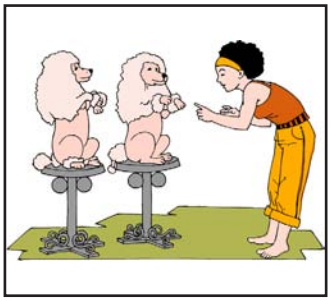
Unit 2

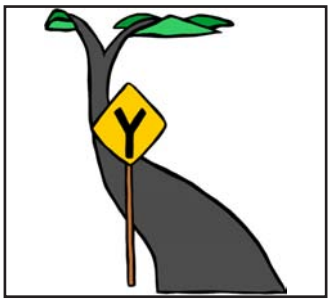
Solution:

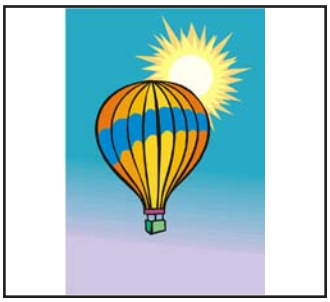


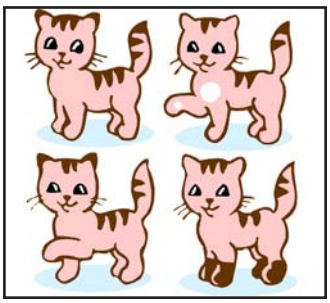
Write The Words!

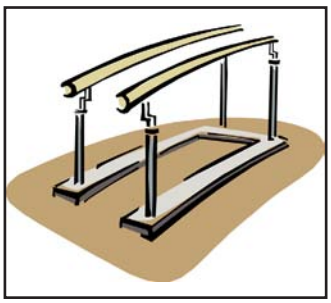


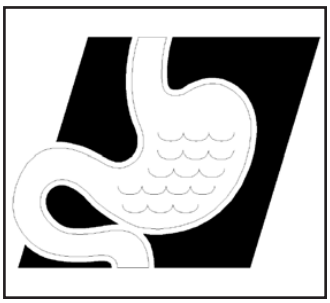




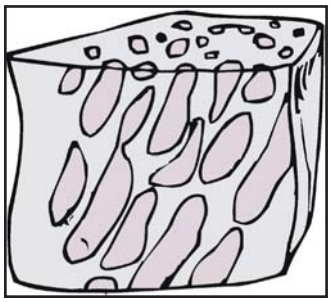


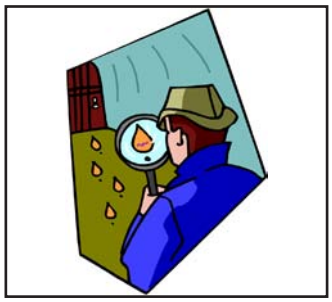






Write the Words!





Complete The Sentence

Have the students write the key words in the blanks.

1. When conditions are _____ bacteria reproduce at an exponential rate.
2. Agricultural advances are largely due to _____.
3. When two species suited for a particular habitat _____, competition results.
4. The _____ of beaks in finches on the Galapagos Islands is an excellent example of natural selection and adaptation.
5. Evolutionary history does not consist of linear steps, but rather _____ paths among groups of organisms.
6. The _____ represents the chromosomal information present in the chromosomes.
7. The _____ represents how an organism appears.
8. A genetic copy produced by manipulating cell genes and growth is referred to as a _____.
9. _____ consists of a group of cells that perform a particular function.
10. Biochemists often work to _____ the fate of a particular nutrient in a cell.
11. Physiology describes the _____ within the body.
12. _____ refers to the shape of a thing.

ANSWERS
1. favorable, 2. artificial selection, 3. convergent, 4. divergence, 5. parallel, 6. genotype, 7. phenotype, 8. clone, 9. tissue, 10. trace, 11. pathways, 12. form

Creative Writing Activity Page

Have the students write sentences of their own, using the key words from this unit. When the students' sentences are finished, have them take turns reading their sentences orally. The students should say "Blank," for the key words; the other students must name the "missing" words. You may wish to have the students write the "definitions" for the key words.

clone

convergent

divergent

favorable

form

genotype

parallel

pathway

phenotype

Creative Writing Activity Page

Have the students write sentences of their own, using the key words from this unit. When the students' sentences are finished, have them take turns reading their sentences orally. The students should say "Blank," for the key words; the other students must name the "missing" words. You may wish to have the students write the "definitions" for the key words.

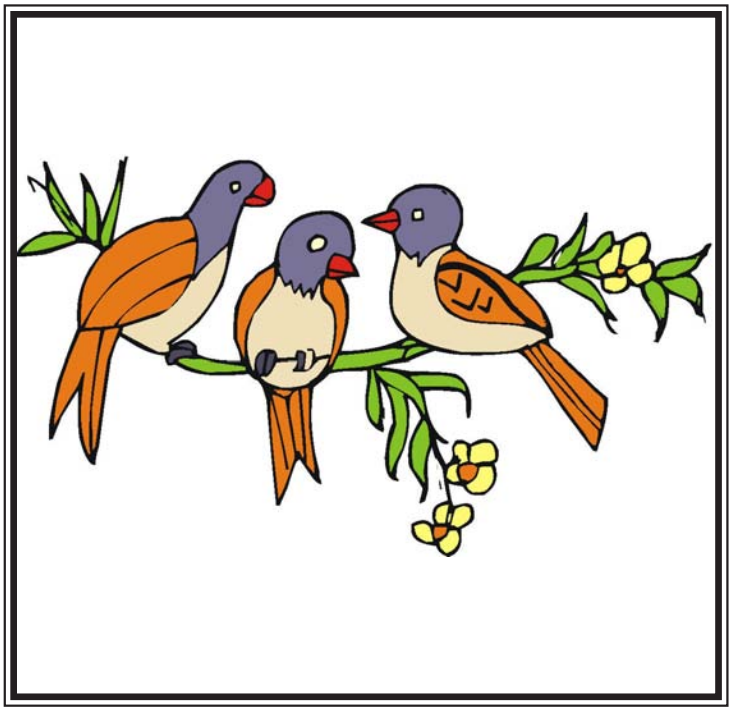
tissue

trace

artificial selection

Creative Writing Activity Page

Have the students write sentences of their own, based on the picture below. When finished, have each student read his/her sentences to the others.



STUDENT SUPPORT MATERIALS

Reinforcement Activities

Ecology Games

Ecological factors influence an organism's ability to succeed or fail in environments. The idea of this game is for students to play in pairs or small groups. Each student picks an animal that lives in an agreed ***biome***, but has a different ***niche*** from the other players' animals. Each player needs to have a coin and each group needs to have a dice.

Each player's animal will be subjected to varying degrees of positive and negative interactions. Some will be positive (like ***symbiosis***) and some will be negative (like ***parasitism***). These will be marked with a + for positive or a – for negative in the *Degree of Interaction* column. Students will throw the die and record the results in the *Response* column.

Some interactions may go either way and will be determined by the luck of a coin toss. If a coin lands on heads put a + in the blank *Degree of Interaction* column and if the coin lands on tails put a – in the blank *Degree of Interaction* column. Students then use the die to record the result in the *Response* column.

Students then total up the *Response* column to see whose animal was able to survive best.

Ecological factors	positive or negative	Degree of Interaction	Response
climate			
symbiosis	+		
parasitism	-		
mutualism	+		
biotic factors			
abiotic factors			

Total points for Response to ecological factors

Questions for students:

1. Name three biotic factors that would be positive for your selected animal.
2. Name three abiotic factors that woud be negative for your animal.
3. How could climate positively or negatively affect your animal?

Unit Assessment

Unit 2 Quiz

Grade 10 C1 Unit 2 Concepts of Life Science Quiz

Name: _____
Date: _____

Fill in the Blank: Write a word in the blank for each item that best completes the statement. Choose your words from the choices provided in the Word Bank.

Word Bank		
artifiicial selection	convergent	divergent
form	parallel	pathway

1) When objects or matter tend to come together and merge they are _____.

2) When things tending separate or deviate, they are _____.

3) The shape of a thing is its _____.

4) A course usually followed by a body part or process is its _____.

5) When object s extend in the same direction and have the same course or tendency, they are _____.

6) The observable constitution of an organism, the visible (acting) part is the _____.

a) genotype

b) chromosomes

c) phenotype

Multiple Choice: Read each statement carefully and choose the best answer from the choices provided. Circle your answer.

7) The genetic makeup of an organism or group of organisms is its _____.

a) phenotype

b) chromosome

c) genotype

8) A cell, cell product, or organism that is genetically identical to the unit or individual from which it was derived is called its _____.

a) genotype

b) identical twin

c) clone

9) An aggregation of morphologically similar cells and associated intercellular matter acting together to perform one or more specific functions in the body is/are called _____.

a) tissue

b) organs

c) glands

10) A positive and pleasing advantage, an opportunity, or convenience are all considered to be _____.

a) favorable

b) convenient

c) a pathway

11) Sometimes animals or plants are bred for certain traits, or combination of traits within a population. For example, a dog breed is a group of domestic animals within a species whose appearance or athletic skills have been bred over generations, like sled dogs for racing. This kind of breeding is known as _____.
.

Grade 10 C1 Unit 2 Concepts of Life Science Quiz

Name: _____
Date: _____

Fill in the Blank: Write a word in the blank for each item that best completes the statement. Choose your words from the choices provided in the Word Bank.

Word Bank		
artifiicial selection	convergent	divergent
form	parallel	pathway

1) When objects or matter tend to come together and merge they are **convergent** .

2) When things tending separate or deviate, they are **divergent** .

3) The shape of a thing is its **form** .

4) A course usually followed by a body part or process is its **pathway** .

5) When object s extend in the same direction and have the same course or tendency, they are **parallel** .

6) The observable constitution of an organism, the visible (acting) part is the _____.

a) genotype

b) chromosomes

c) phenotype

Multiple Choice: Read each statement carefully and choose the best answer from the choices provided. Circle your answer.

7) The genetic makeup of an organism or group of organisms is its _____.

a) phenotype

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10) A positive and pleasing advantage, an opportunity, or convenience are all considered to be _____.

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b) convenient

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11) Sometimes animals or plants are bred for certain traits, or combination of traits within a population. For example, a dog breed is a group of domestic animals within a species whose appearance or athletic skills have been bred over generations, like sled dogs for racing. This kind of breeding is known as **artifiicial selection** .
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UNIT 3
Sealaska Heritage Institute

INTRODUCTION OF

Key Vocabulary

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Caron Cycle

PLACE-BASED PERSPECTIVE

Show a picture of the *carbon cycle* and discuss how carbon from photosynthesis is incorporated into plants through photosynthesis, into animals through digestion, and back into the atmosphere through biotic and abiotic processes.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

In traditional Native cultures, all things had their places and all things worked together. This included a variety of *cycles* in the environment.

Global

PLACE-BASED PERSPECTIVE

Show students a globe. Discuss how *global* events span oceans and continents.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Native peoples of Southeast Alaska were aware that the world was larger than their immediate surroundings. This was reflected in their oral histories and in their languages.

Climate

PLACE-BASED PERSPECTIVE

Show students a world map with weather patterns like El Nino. Discuss how weather is a small local event during a short period of time and *climate* is global event that occurs over a long period of time.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

People's homes, clothing, and life styles were well-suited to the *climate* of Southeast Alaska. This included pitched roofs to shed rain and snow, waterproof clothing, and dependenc upon the sea.

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Competition

PLACE-BASED PERSPECTIVE

Discuss how a basketball game is a *competition* between two teams. .

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Traditionally, *competition* occurred through running, tug of war, wrestling, canoe races, and a lacrosse-like game.

Niche

PLACE-BASED PERSPECTIVE

Explain how bats fill a special *niche* of flying mammals.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

The natural habitata of Southeast Alaska represents a wealth of *niches*. This includes the habitats of both plants and animals. For example, in areas where logging has removed the trees, blueberry bushes abound.

Symbiosis

PLACE-BASED PERSPECTIVE

Discuss with students how puffball fungi have a mycorrhizal *symbiosis* with trees. The trees get minerals from the fungi and the fungi gets nutrients from the trees.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Tree fungi are called “tree crackers” by the Native peoples of Southeast Alaska.

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Biome

PLACE-BASED PERSPECTIVE

Discuss how the predominant *biome* of Southeast Alaska is a temperate rain forest.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

The whole of Southeast Alaska is a coastal *biome*.

Commensal

PLACE-BASED PERSPECTIVE

Discuss how barnacles have a *commensal* relationship with bivalves like clams and oysters. The barnacles get a place to live without hurting the bivalves.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

Parasitism

PLACE-BASED PERSPECTIVE

Discuss how tapeworms are *parasites* that live in the intestines of mammals. The host animal is harmed for the benefit of the parasite.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Native peoples are well aware of *parasites*, especially the worms found in fish.

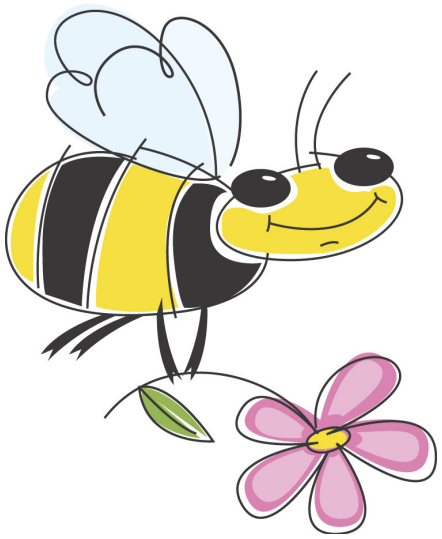
Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Mutualism

PLACE-BASED PERSPECTIVE

Discuss how lichens are a *mutualistic* relationship between algae and fungi.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.



Population

PLACE-BASED PERSPECTIVE

Write the words local, state, and national on the board. Have students describe the people in each of these groups. Discuss how each group is a *population* or group of organisms of the same species that live together.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

There are many wildlife *populations* in Southeast Alaska. This includes bald eagles of the Chilkat, and the brown bears of Admiralty Island.

Ecology

PLACE-BASED PERSPECTIVE

Bring in a sample of soil and discuss the *ecology* of the living and non-living factors.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Native peoples of Southeast Alaska were very knowledgeable about the *ecology* of their environments. This would include extensive knowledge of plants and animals.

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Community

PLACE-BASED PERSPECTIVE

Discuss how bears living in close proximity to each other forms *communities*.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Clans from ancestral lands moved to new locations for various reasons to form new *communities*. This may have been due to natural disasters such as flooding the the movement of glaciers.

Biotic Factor

PLACE-BASED PERSPECTIVE

Discuss with students how the number of lynx is a *biotic factor* that limits the number of rabbits in an area.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Human beings and their mismanagement of natural resources represents a major *biotic factor* in Southeast Alaska. This is evidenced by the depletion in the number of salmon harvested each year.

Abiotic Factor

PLACE-BASED PERSPECTIVE

Discuss with students how rain is an *abiotic factor* that may limit the number of rabbits in an area.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Harsh winters, with lots of snow, limit the deer population the following year. Also, climatic changes have reduced the growth and reproduction of yellow cedar trees.

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Limiting Factor

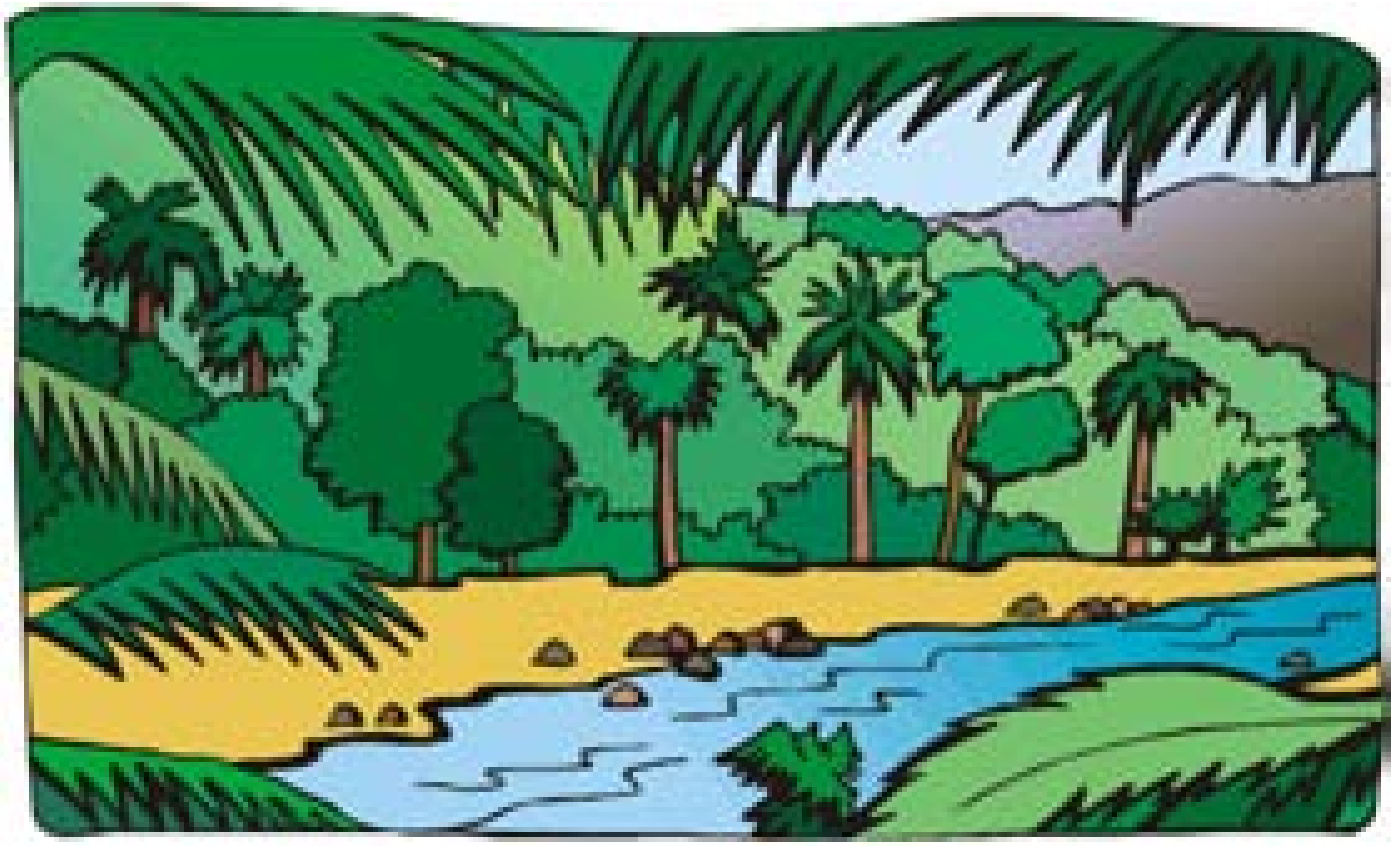
PLACE-BASED PERSPECTIVE

Show students a picture of a moose with large antlers. Discuss with them that size and weight are *limiting factors* for how large moose antlers grow.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

The size of a clan house was a *limiting factor* in terms of how many people could live in it. When the clan outgrew the clan house, new houses were built.



Language Skills

Language & Skills Development

LISTENING

Use the activity pages from the Student Support Materials.

Funnel Vision

Before the activity begins, collect a large funnel. Have a student stand at the front of the classroom, with his/her back to the other students. Give the student the funnel. Give the vocabulary illustrations to the other students in the class. The students should hold their illustrations up, facing the front of the classroom. Say a vocabulary word. When you say "Go," the student with the funnel should place the funnel over his/her eyes and turn to face the other students. The student must then look through the funnel to find the illustration for the vocabulary word you said. This activity may be conducted with two players (each player having a funnel). The winner of each round is the student who locates the correct illustration first. Have the students in the class exchange illustrations for each new round of the activity. Repeat with other pairs of players until all students have participated.

SPEAKING

Make A Change

Say a sentence that contains one or more of the vocabulary words. Call upon a student to repeat the sentence, making ONE change in it. The student may add a word to the sentence, delete a word, change the tense, etc. Then, call upon another student to make another change in the sentence. Continue in this way until as many changes as possible have been made in the sentence. Begin each round with a new sentence.

READING

Use the activity pages from the Student Support Materials.

Mended Words

Mount the sight word cards on the chalkboard. Cut the matching vocabulary illustrations for the sight words in half (or, prepare photocopies of the vocabulary illustrations). Mix all of the halves together and distribute them to the students. Point to one of the sight words on the chalkboard. The two students who have the illustration halves for that sight word must stand and name the sight word. Repeat until all sight words have been identified in this way. This activity may be repeated more than once by collecting, mixing and redistributing the illustration halves to the students.

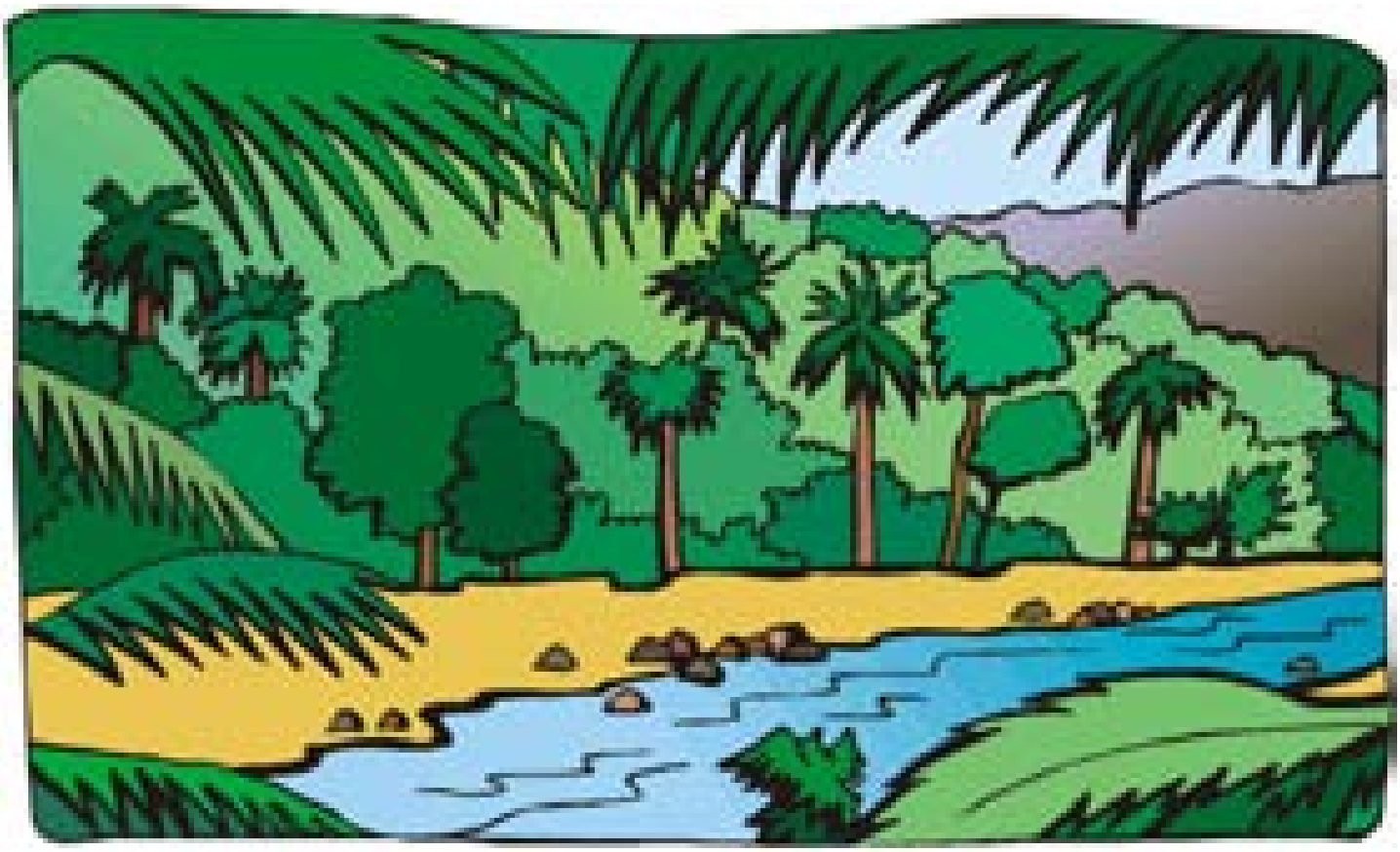
WRITING

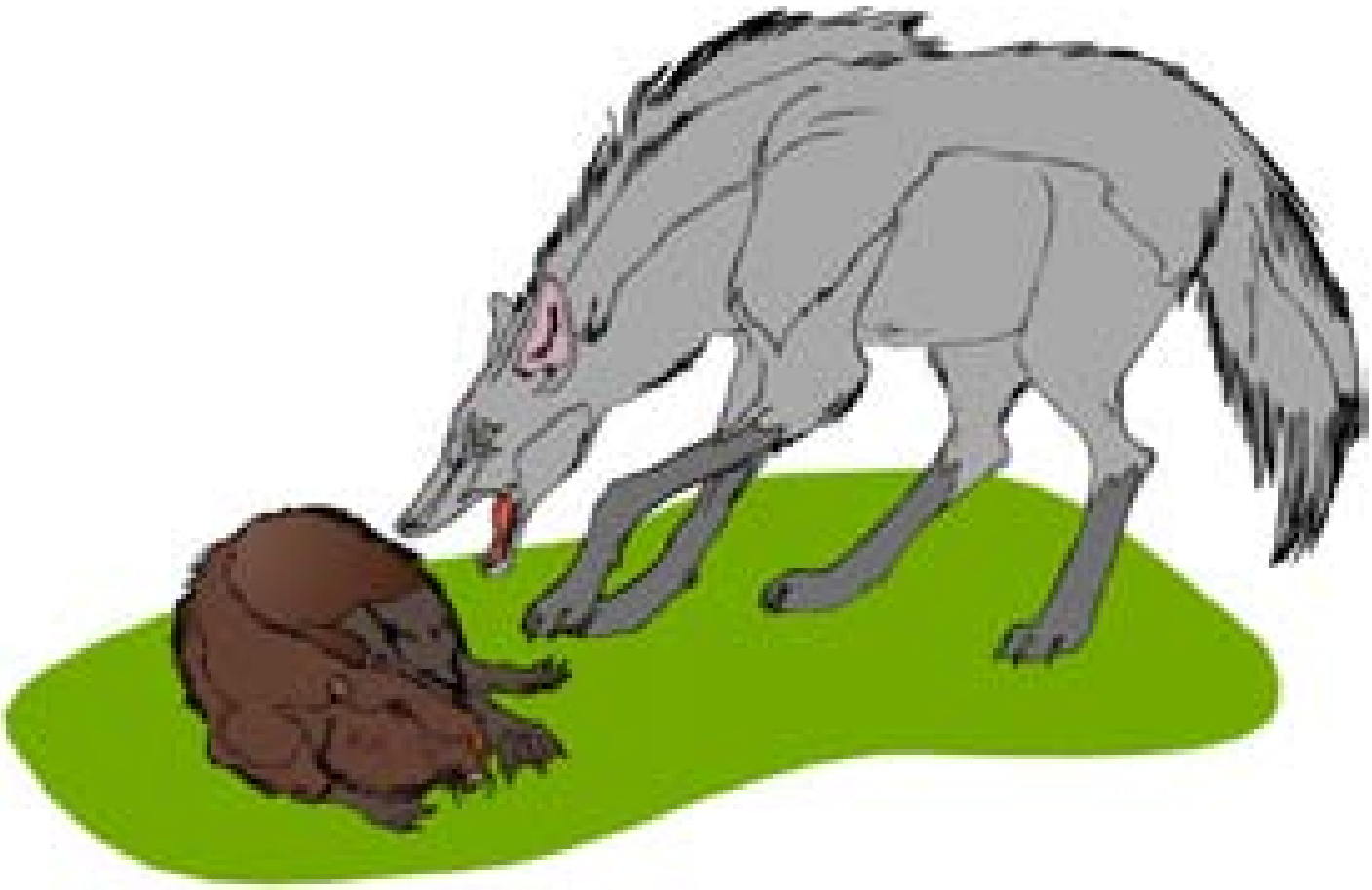
Use the activity pages from the Student Support Materials.

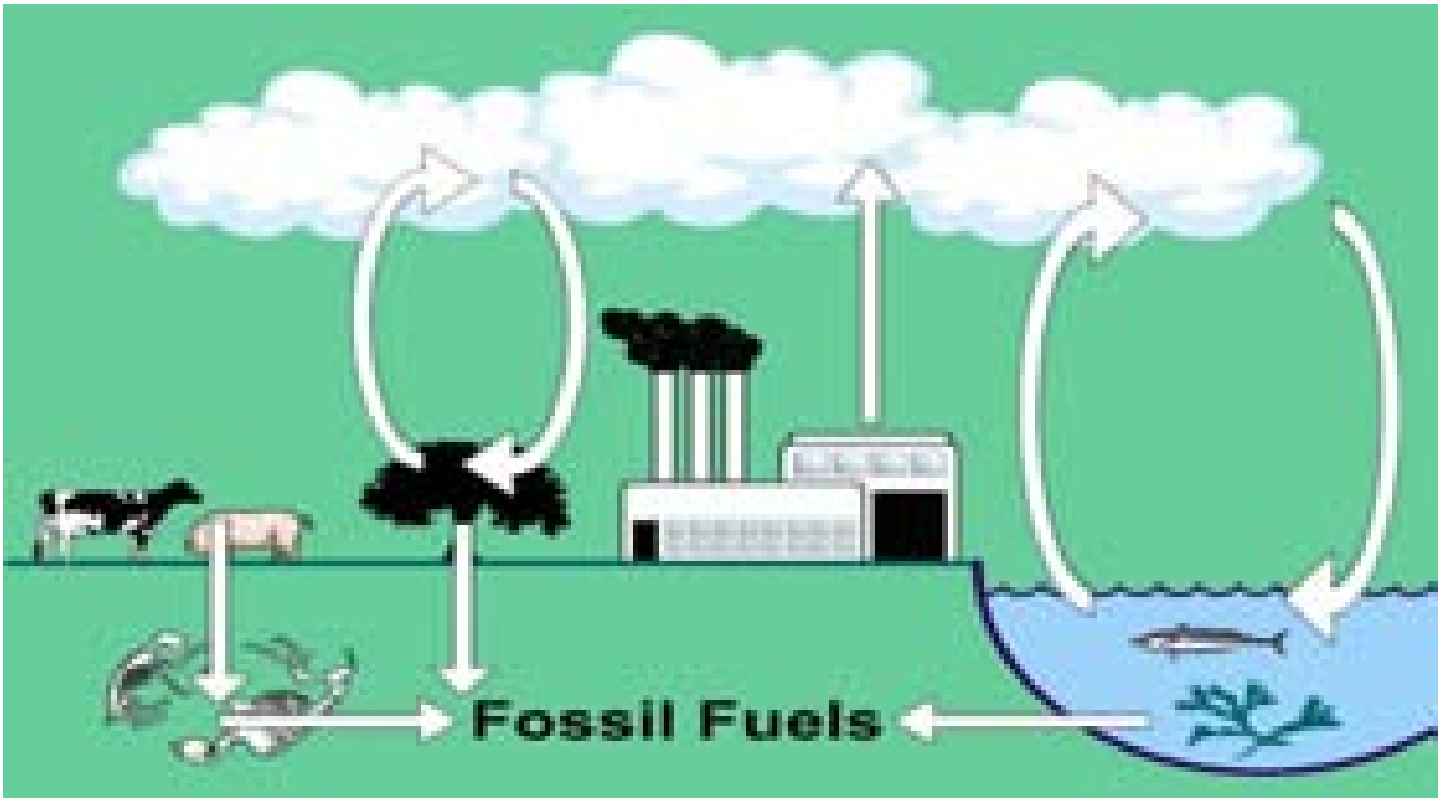
Meshy Words

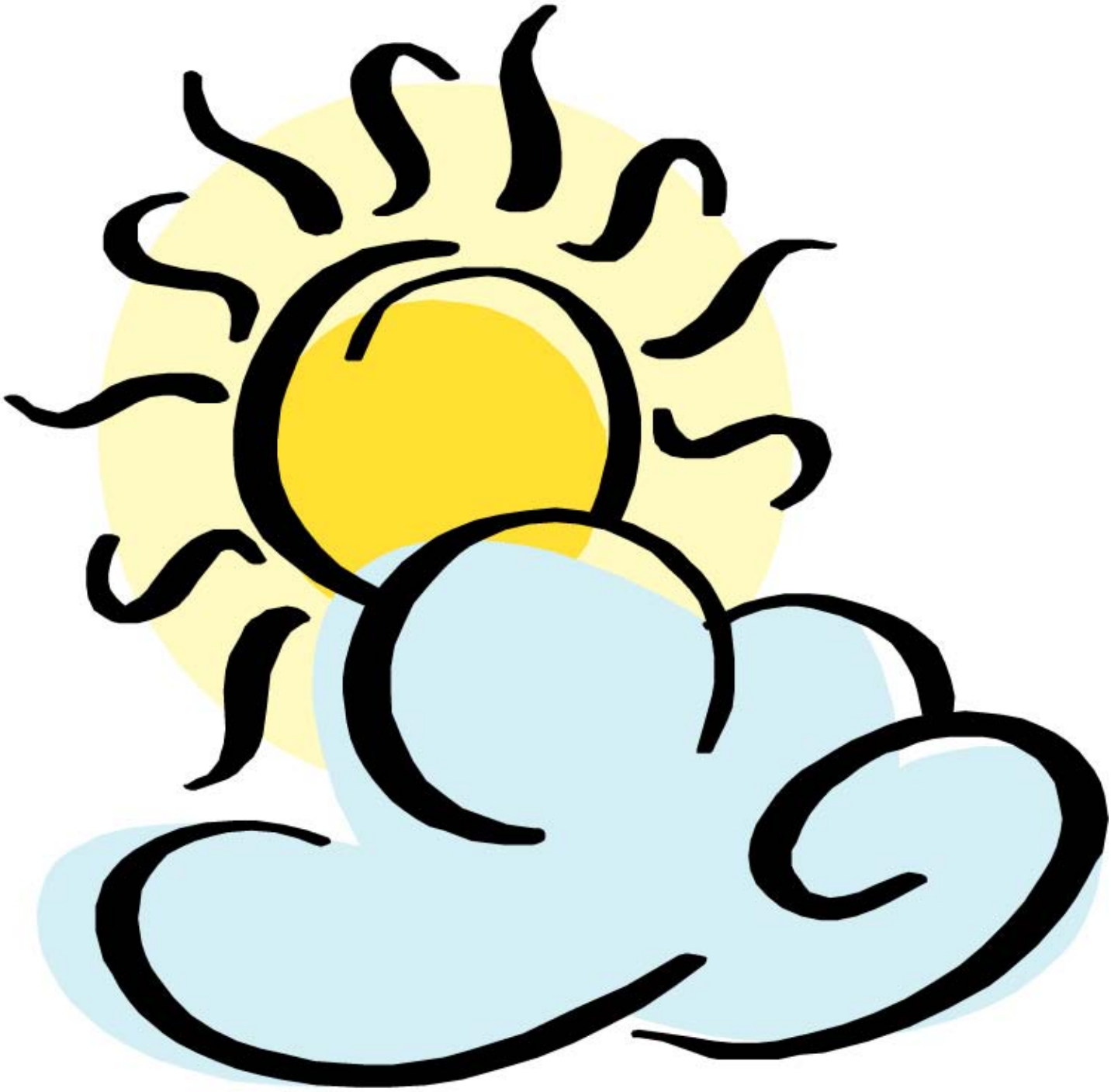
Write a "meshword" on the chalkboard. To create a meshword, use two word halves (from different words) together. For example, *erosion* and *deposition* to make *erosition*. Provide each student with writing paper and a pen. The students should look at the meshword you have written and attempt to identify the words from which the halves were chosen. Each student should then write those two sight words on his/her sheet of paper. Repeat this process with other meshwords.

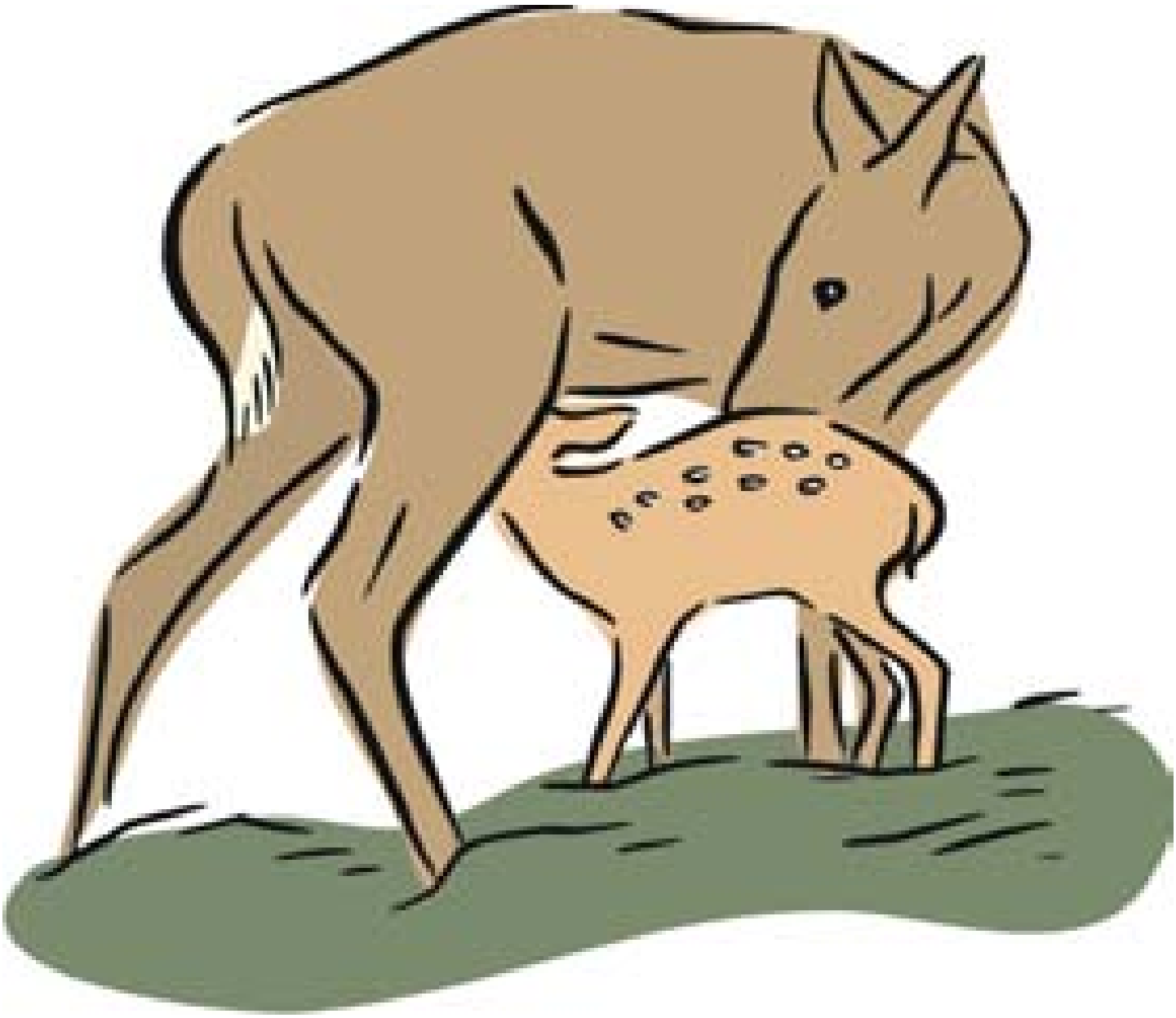
Vocabulary Images

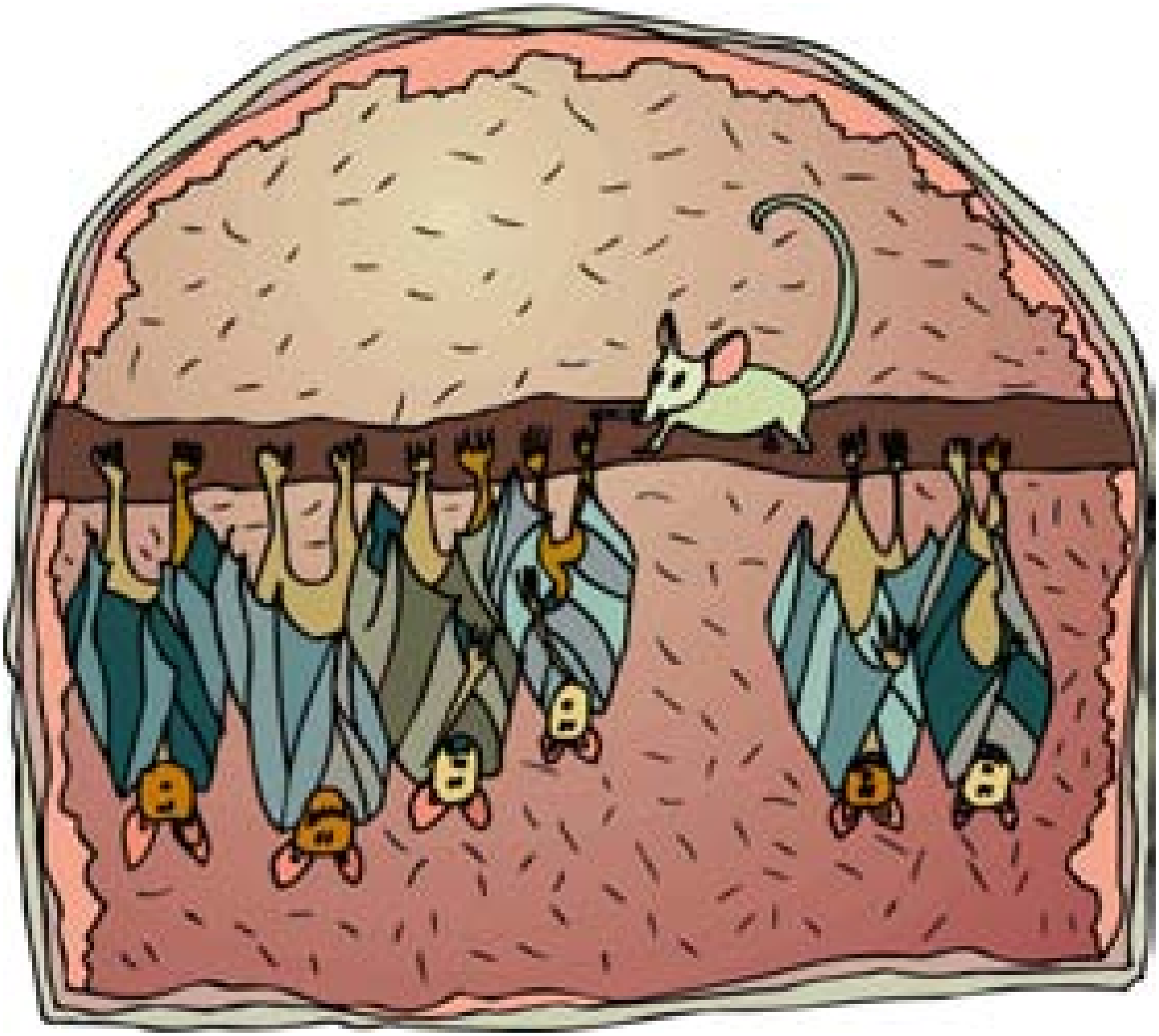


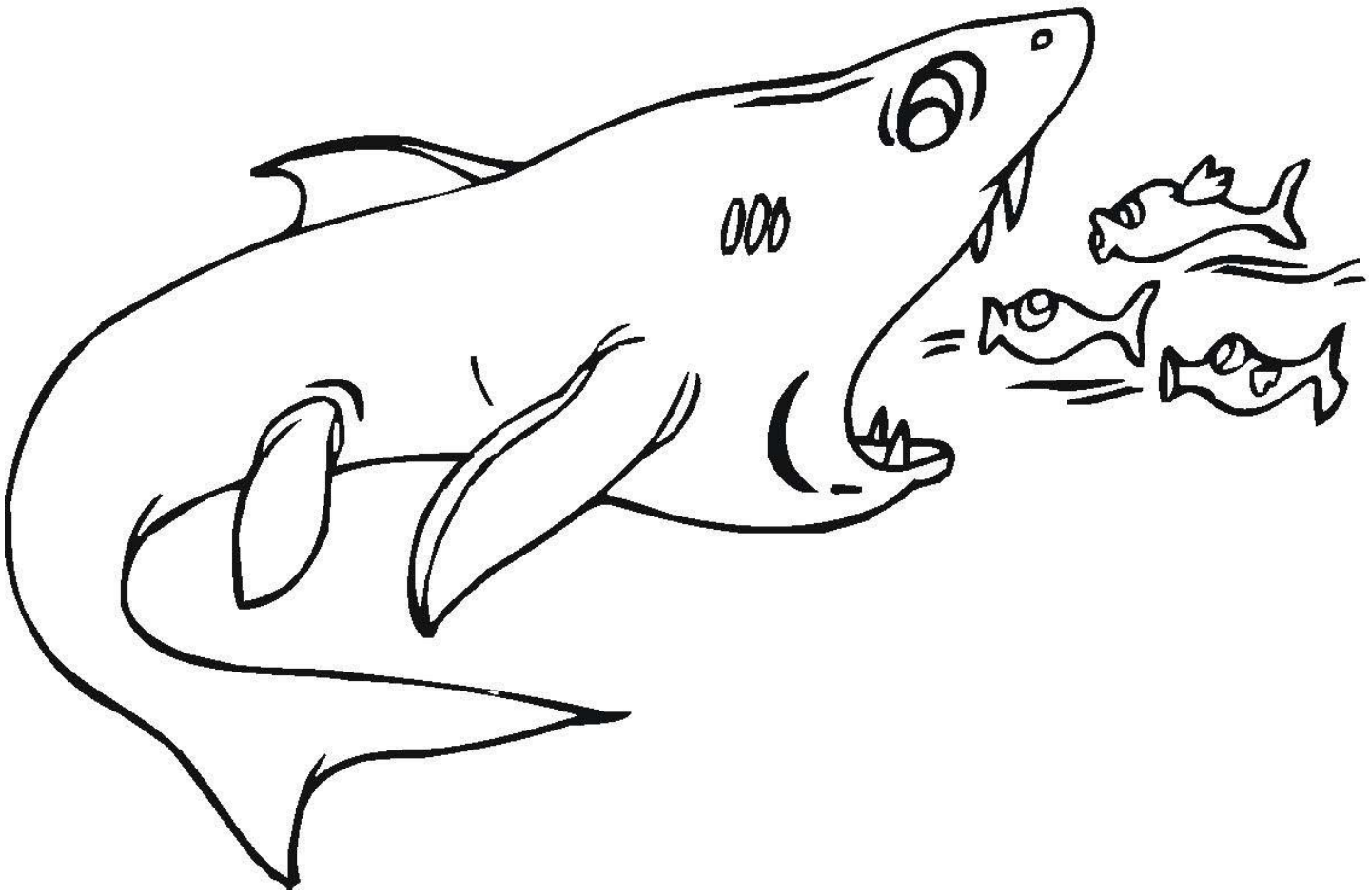


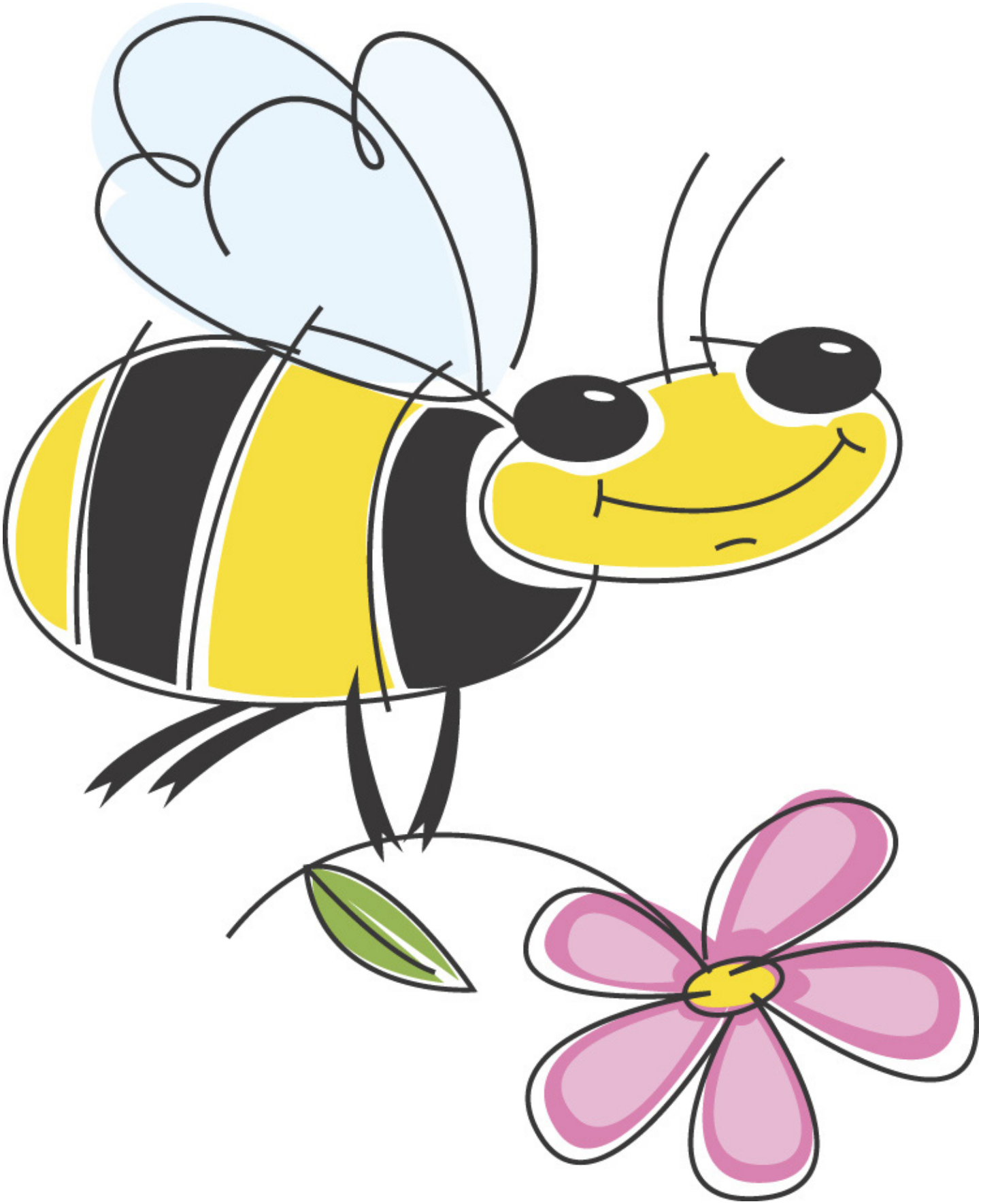

Fossil Fuels



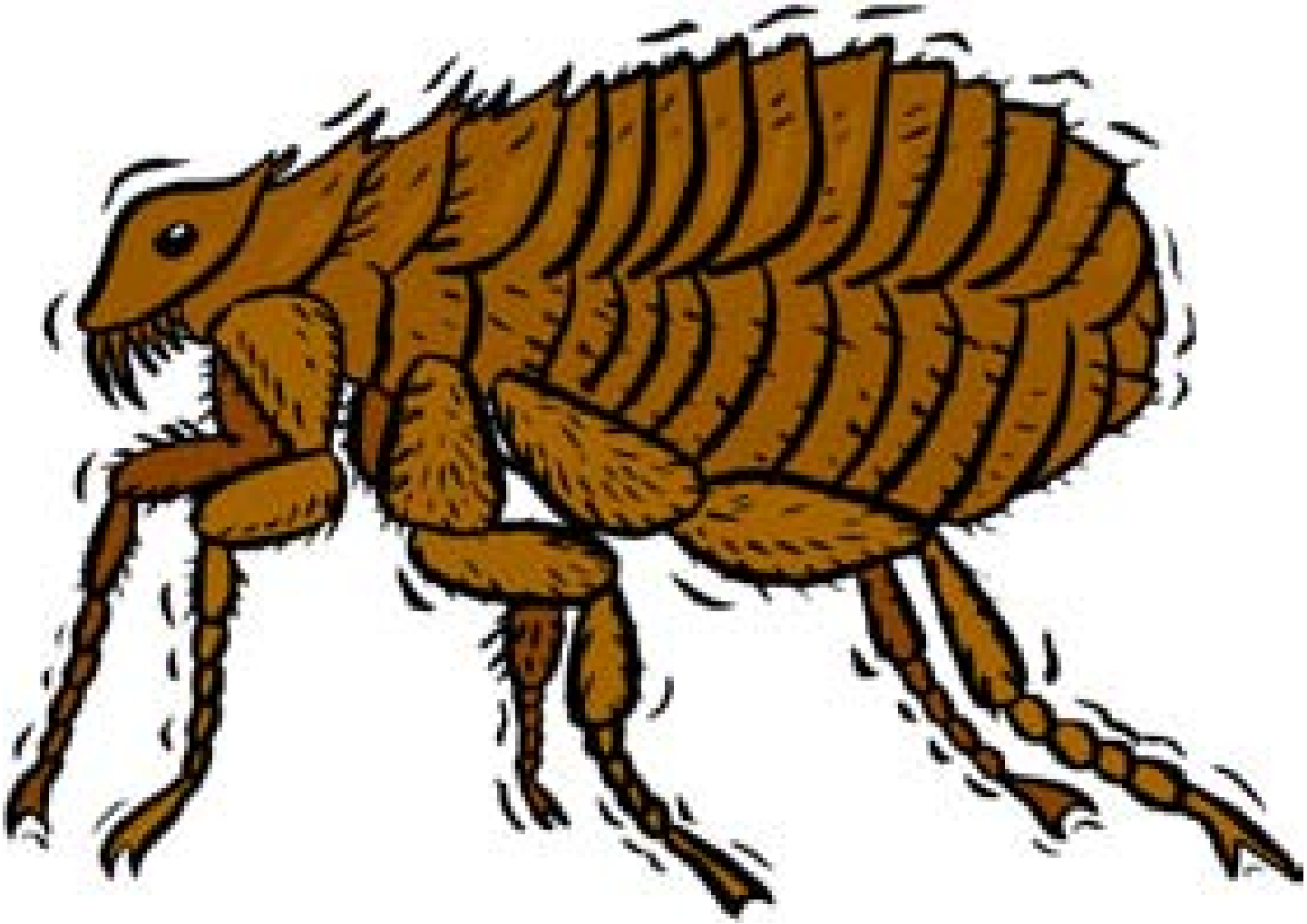




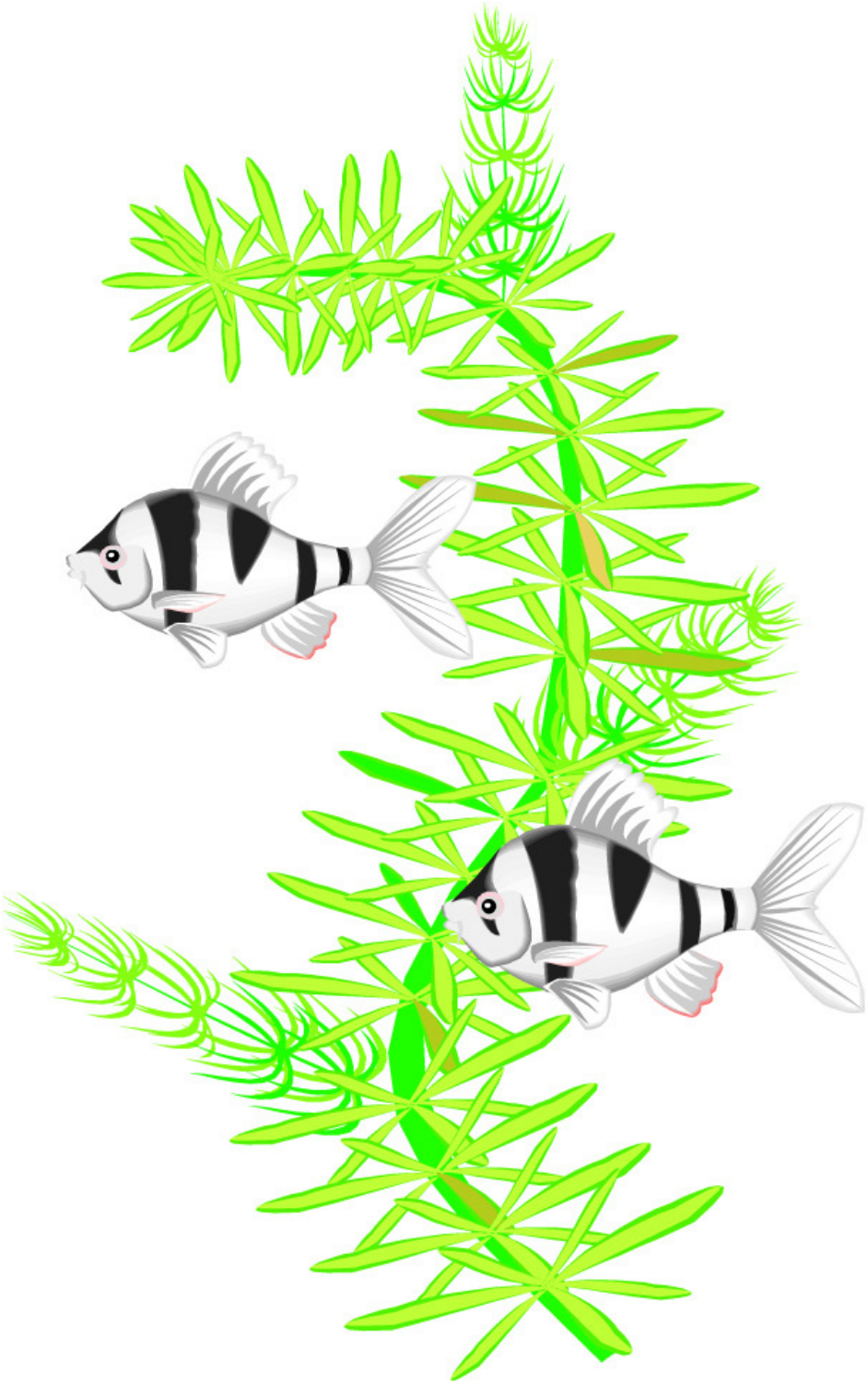




niche



population

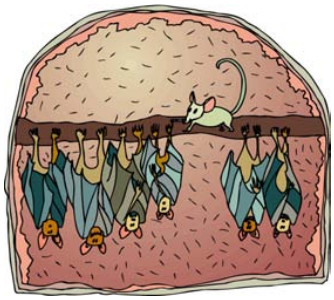


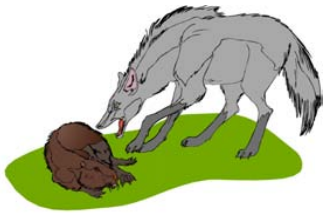
ROTALA WALLICHII

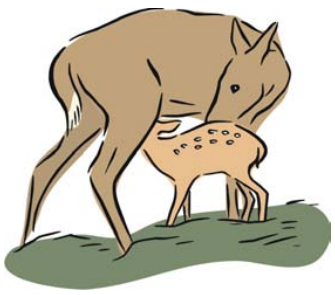
STUDENT SUPPORT MATERIALS

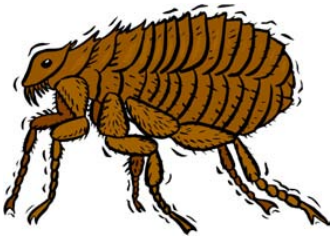
Listening

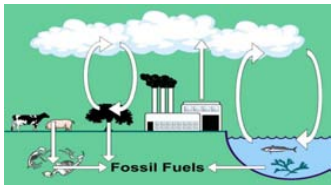
Say these words to the students - they write the numbers of the words under the pictures.
1. climate, 2. parasitism, 3. community, 4. biotic factor, 5. abiotic factor, 6. population, 7. global
8. commensal, 9. symbiosis, 10. carbon cycle, 11. biome, 12. mutualism, 13. competition
14. ecology, 15. limiting factor, 16. niche











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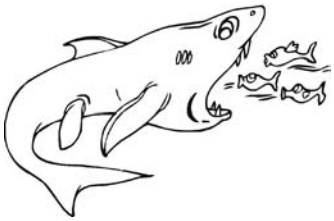


Fill-in The Blanks, Paragraph

Read the sentences to the students. The students should name the "missing words."

1. The _____ includes a gas form (carbon dioxide) and solid form (glucose).
2. We now have a _____ economy due to the ease of worldwide communication and trans portation.
3. According to scientists, excess carbon dioxide in the atmostphere is responsible for global _____ change.
4. The _____ at the Olympics is stiff so an Olympian needs to train hard if she plans to win.
5. Darwin's finches on the Galapagos Islands were able to fill different _____ because they developed different beaks that could do different things.
6. My relationship with my wife is _____ since we live together, but it is unclear how much each of us is harmed or helped from this relationship.
7. A _____ is a large area with similar flora, fauna, microorganisms, and climate.
8. A _____ relationship is one in which one organism benefits while the other is not harmed.
9. A tapeworm is considered a _____ since the tapeworm benefits from living in another ani mal's gut but the other animal is harmed.
10. Countries that are on equal ground economically and militarily often have _____ relationships since one is not strong enough to exploit the other.
11. China began the "One Child" policy because the government thought the country's _____ needed to be controlled.
12. _____ is the study of the interactions of organisms, but it is also the study of the non-liv ing factors in the environment.
13. Some people like to do _____ service in order to better the lives of those around them and improve the quality of life in their own town.
14. Predation is a _____ in the environment of an organism since it stems from another living organism.
15. The availability of water is an _____, since water is not a living organism.
16. The amount of available oxygen will probably never be a _____ for terrestrial organisms, but it sometimes is among aquatic life, especially in areas where the temperature of the water has increased due to human causes.

ANSWERS

1. carbon cycle, 2. global, 3. climate, 4. competition, 5. niche, 6. symbiotic, 7. biome
8. commensal, 9. parasite, 10. mutualistic, 11. population, 12. ecology, 13. community
14. biotic factor, 15. abiotic factor, 16. limiting factor

True Or False?

Read the following sentences to the students. The students should write "true" or "false" for each of the sentences.

1. The carbon cycle is powered by geothermal energy.
2. When people say "Think global, act local" they are encouraging others to consider the problems in their own town and do something on the national level to help change them.
3. A positive school climate fosters the development and learning necessary for students to become productive, contributing members of a democratic society.
4. Competition for resources is not a factor in survival rates, especially during times of shortage.
5. Some organisms fill a small niche, like dung beetles, while others are generalists, like the coyote.
6. There is a wide variety of symbiotic relationships including mutualistic, commensal, and parasitic relationships.
7. The terrestrial biome can be divided into smaller biomes or ecosystems, such as arctic, savannah, and desert.
8. My relationship with my son is a commensal relationship because we both benefit from interacting with each other.
9. Parasites benefit the host by helping them grow through suffering.
10. Mutualism is a type of parasitic relationship.
11. If a population of an organism decreases to unsustainable levels the organism may go extinct.
12. One can study ecology without looking at abiotic factors.
13. A community is a group of interacting organisms that do not share an environment.
14. Biotic factors are environmental factors that have a biological (living) aspect.
15. Abiotic factors are environmental factors that have a non-living aspect.
16. The availability of food and moisture is often the limiting factor in microbial communities.

ANSWERS
1. F, 2. F, 3. T, 4. F, 5. T, 6. T, 7. T, 8. F, 9. F, 10. F, 11. T, 12. F, 13. F, 14. T, 15. T, 16. T

STUDENT SUPPORT MATERIALS

Sight Words

biome

climate

commensal

community

competition

ecology

population

symbiosis

abiotic factor

global

biotic factor

mutualism

carbon cycle

niche

limiting factor parasitism

STUDENT SUPPORT MATERIALS

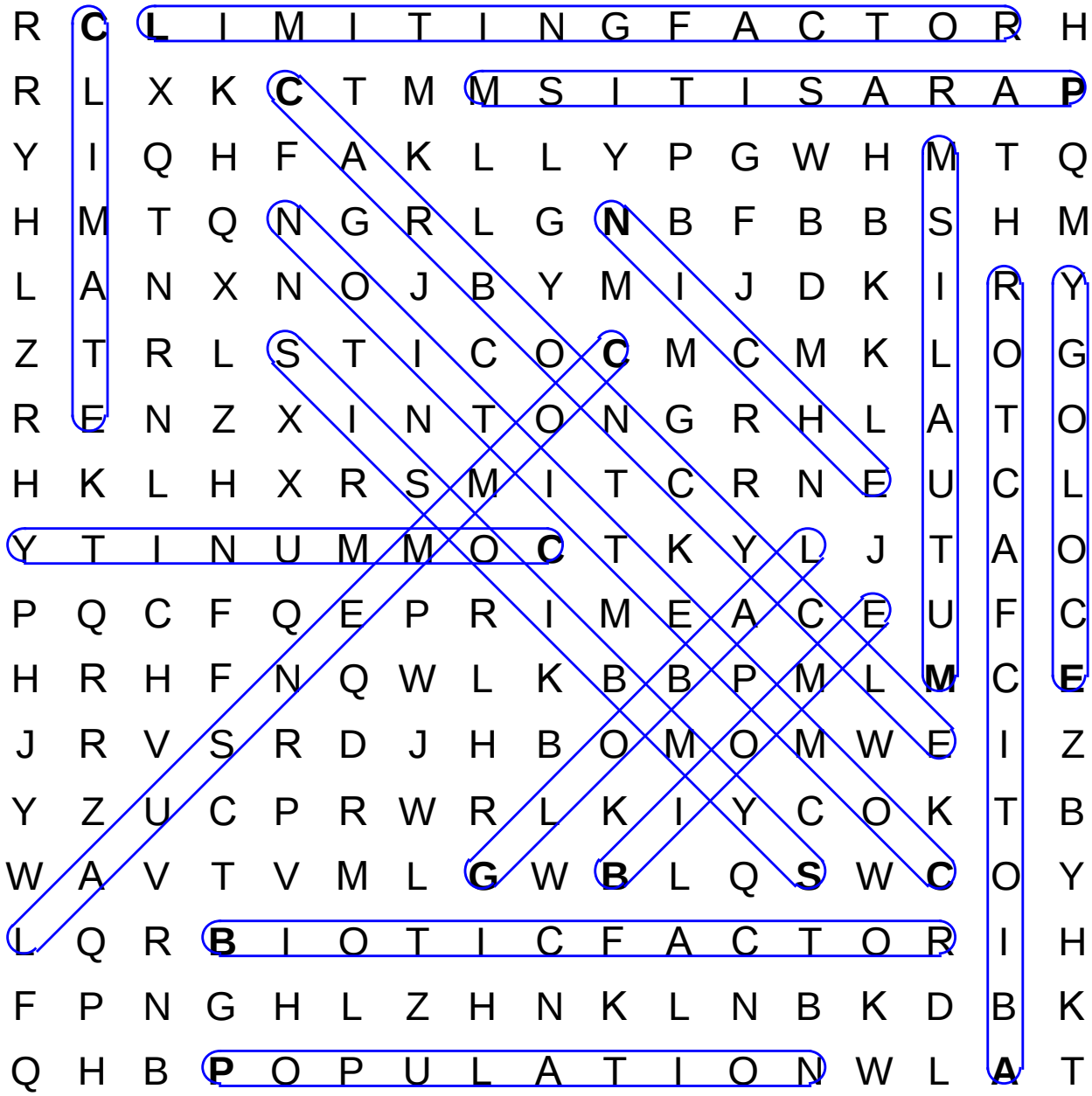
Reading

Word Find

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

Abiotic Factor
Biome
Biotic Factor
Carbon Cycle
Climate
Commensual
Community
Competition
Ecology
Global
Limiting Factor
Mutualism
Niche
Parasitism
Population
Symbiosis

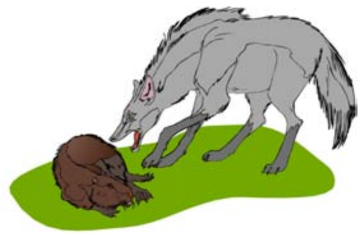
Word Find Solution



Sight Words Activity Page

Have the students highlight or circle the words for the pictures.

abiotic factor
biome
biotic factor
carbon cycle
climate
commensal
community
competition
ecology
global
limiting factor
mutualism
niche
parasitism
population
symbiosis



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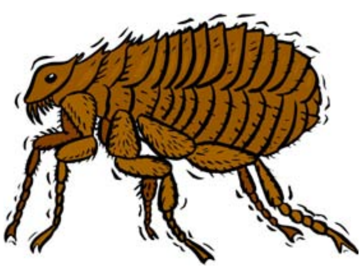

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global
limiting factor
mutualism
niche
parasitism
population
symbiosis

Sight Words Activity Page

Have the students highlight or circle the words for the pictures.

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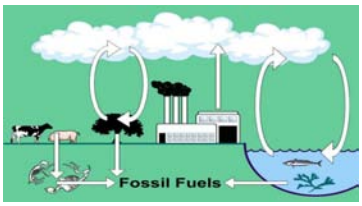

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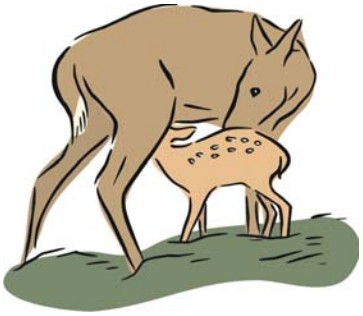

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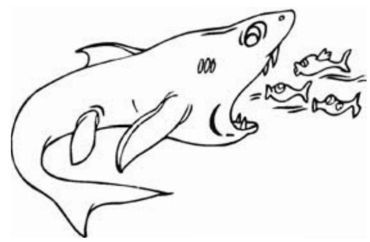

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Sentence Halves

Have the students write the numbers/letters for sentence halves that match.

1. The carbon cycle includes
2. If a company is a global entity
3. Climate change is slow
4. Competition for natural resources
5. If you fill a niche perfectly you
6. There are various types of symbiotic relationships, including
7. The term “biome”
8. Commensal relationships are one-sided with regards to benefits, but
9. The parasite benefits while the host
10. The relationship between polinators and flowering plants is an example of mutualism because
11. Sometimes a disease will affect an
12. Ecology is the study the interactions of organisms with each other and
13. A community of organisms is different than a population of organisms
14. Predation is a biotic factor
15. Light availability is considered an abiotic factor
16. Limiting Factors can change

A. But it can have huge effects.

B. Are probably very specialized in your behavior or habits.

C. From season to season or year to year, depending on the weather and resource availability.

D. Mutualism, commensalisms, and parasitism.

E. In that a community of organisms is typically made up of different species while a population is a group of organisms that interbreed.

F. It probably has an impact all over the world.

G. Is often used interchangeably with the word “ecosystem.”

H. If it is due to seasonal or geographic location, but not if it is due to one organism shading out another.

I. neither organism is harmed.

J. Is a common point of conflict between organisms and nations.

K. The flowing plant benefits from having its pollen spread around while the pollinator benefits by drinking nectar or eating some of the pollen.

L. Entire population of organisms.

M. Fossil fuel burning, photosynthesis, and cellular respiration.

N. with their environment.

O. Is harmed.

P. Because biological organisms prey on other organisms.

ANSWERS

1/M 2/F 3/A 4/J 5/B 6/D 7/G 8/I 9/O 10/K 11/L 12/N 13/E 14/P 15/H 16/C

Word & Definition Match

Have the students write the word numbers on their matching definitions.

concerns all parts of the world

the study of interactions

one organism benefits, the other is harmed

factor that controls the population of an organisms

two organisms that interact with eachother

both organsisms benefit from one another

the sum total of habitat parameters

associated with the atmosphere and temperature of an area

the biological aspect of the environment, affecting other organisms

one organism benefits, the other is not harmed

a group of organisms residing in the same area

a group of organisms living in the same area

a terrestrial environment difined by climax community vegetation

non-living aspect of the environment that affects other living organisms

the cycle of carbon through the earth's biosphere

when two organisms require the same limited resource

1. abiotic factor
2. biome
3. biotic factor
4. carbon cycle
5. climate
6. commensal
7. community
8. competition
9. ecology
10. global
11. limiting factor
12. mutualism
13. niche
14. parasitism
15. population
16. symbiosis

Which Belongs?

Have the students circle/identify the word that is correct for each sentence.

1. We are a part of the carbon cycle/competition because we breath, heat our homes and run our cars with combustion, and plant crops.
2. A global/niche perspective is one that takes into consideration many cultural views.
3. While some will argue the extent that humans play, global ecology/climate change is a reality.
4. Symbiosis/Competition among the job applicants was fierce because there were few job openings and many qualified applicants.
5. Some animals occupy a very small ecology/niche in the environment and are greatly impacted by habitat distruction.
6. Some mutualistic/symbiotic relationships hurt one of the participants, while others benefit both while harming neither.
7. The aquatic biome/community can be subdivided into several smaller ecosystems.
8. Nobody is harmed in a commensal/parasitic relationship, but one of the participants benefits.
9. Cowbirds are brood parasites/mutualists—that is, they lay their eggs in another bird's nest.
10. Tutoring is a form of parasitism/mutualism because one of the participants learns the material while the other is paid.
11. A population/limiting factor of the deer on Mithrel Island is threatened because of the forest fire that was followed by heavy rain and snow.
12. Ecotoxicology is a sub-discipline of symbiosis/ecology that looks at the effects of toxins in the environment.
13. Deer, bear, shrews, humans, and moss are all part of the same population/community in Southeast Alaska.
14. The amount of snowfall is not a biotic/limiting factor for deer on the far side of the mountain.
15. The weather is a(n) abiotic/biotic factor that influences animal populations.
16. Level of innate intelligence will not be a limiting/abiotic factor in ones level of success in life—proper preparation and the ability and willingness to work hard will play a much bigger role.

ANSWERS

1. carbon cycle, 2. global, 3. climate, 4. competition, 5. niche, 6. symbiotic, 7. biome

8. commensal, 9. parasites, 10. mutualists, 11. population, 12. ecology, 13. community

14. biotic, 15. abiotic, 16. limiting

What's The Answer?

Have the students read the questions and then select the correct answer for them. They should fill-in the appropriate circles, beside the answers of their choice.

1. The carbon cycle is one of many…
   - (a) Water cycles
   - (b). Geochemical cycles
   - (c) Nutrient curves

2. If a company is "going global" it is doing what?
   - (a) Opening stores in North America and focusing on those markets exclusively.
   - (b) Staying local.
   - (c) Offering their services worldwide.

3. If you live in Alaska and are looking for a change in climate, you should travel in which direction?
   - (a) West
   - (b) South
   - (c) East

4. If you are into competition you might consider which of the following?
   - (a) Sports
   - (b) Chopping wood
   - (c) Writing poetry

5. If you have found your niche, what have you done?
   - (a) You have found a place that fits you and works for you.
   - (b) You have become like a fish on a bicycle—out of place, uncomfortable, and unable to breathe.
   - (c) You have accomplished a goal.

6. Which of the following is not an example of a symbiosis?
   - (a) Mutualism
   - (b) Commensalism
   - (c) Predation

7. What term is often used interchangeably with the term "biome"?
   - (a) Ecosystem
   - (b) Ecology
   - (c) Environment

8. Which of the following is an example of a commensal relationship?
   - (a) Gut bacteria—they consume the food we eat and produce needed vitamins for us.
   - (b) Barnacles on whales—they hitch a ride to good feeding areas and the whale is unaffected.
   - (c) Fungus in my toenails—the fungus consumes my tissue and my toes are ugly and they hurt.

What's The Answer?

Have the students read the questions and then select the correct answer for them. They should fill-in the appropriate circles, beside the answers of their choice.

9. My parents tell me that I am a parasite for living at home, but I don't think I am because…
   - (a) I hardly eat any food, and I dirty only a couple dishes a day.
   - (b) I only play video games and watch T.V. in their room when they are at work.
   - (c) I pay rent, which is a benefit to them.

10. Why could the relationship between teacher and student be considered mutualistic?
   - (a) Because the teacher is not harmed by the relationship while the student gains knowledge.
   - (b) Because the student suffers while the teacher is under pressure to make the students do work.
   - (c) Because the teacher benefits from the relationship through earning wages and the joy of teaching, while the student gains knowledge and life skills.

11. What is a downside of population growth?
   - (a) Increased competition for mates and resources.
   - (b) Increased availability of interesting people with which to interact.
   - (c) Decreased anxiety about being alone.

12. Ecology is the study of biological factors as well as
   - (a) Biographical factors.
   - (b) Non-living factors.
   - (c) Astrological factors.

13. Why do isolated island communities tend to follow different evolutionary paths than mainland communities?
   - (a) Islands have different evolutionary pressures than the mainland, and since organisms are not interbreeding between island and mainland they become genetically isolated and diverge.
   - (b) Islands have different spirits, which pull the genetics of the organisms in different directions, causing speciation.
   - (c) The organisms that live on islands have more carefree and relaxed attitudes which allows evolution to speed up.

14. Which biotic factor listed tends to decrease the numbers of organisms?
   - (a) Increased availability of mates.
   - (b) Increased competition for food.
   - (c) Increased prey numbers.

15. Which of the following is an abiotic factor in the environment?
   - (a) Sunlight
   - (b) Interspecies competition
   - (c) Predation

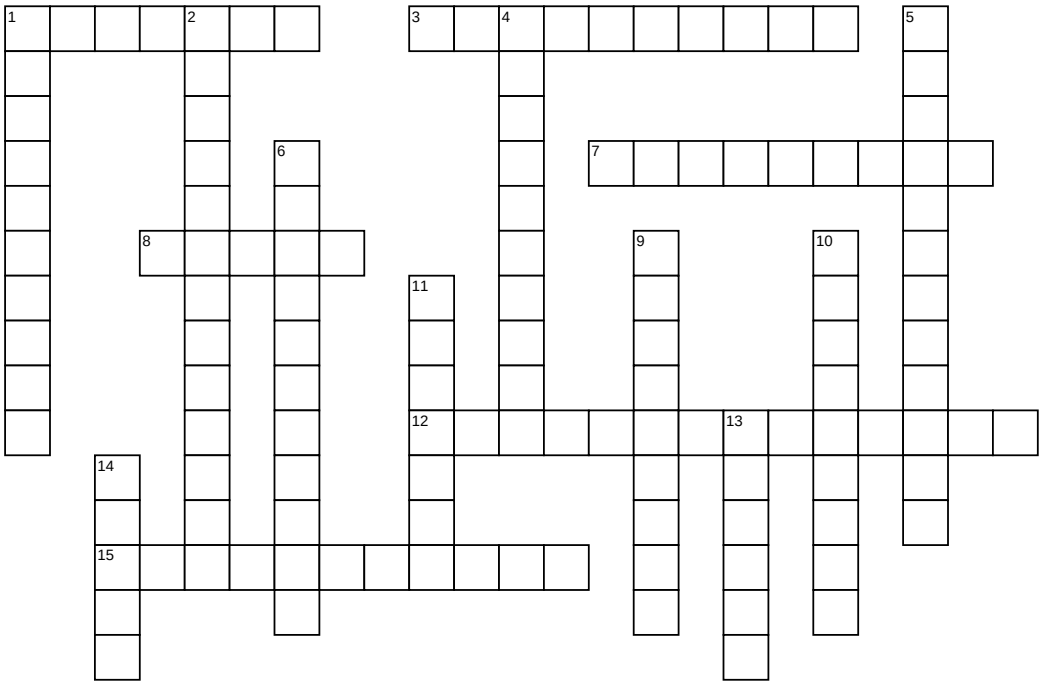
16. I would purchase a new car, but how is my tiny income influencing this process?
   - (a) My income is acting as the "limiting factor."
   - (b) My income is acting as the "beneficiary factor."
   - (c) My income is acting as the "enabling factor."

STUDENT SUPPORT MATERIALS

Writing

10th C-1 Concepts of Life Science

Unit 3



ACROSS

1 refers to the physical conditions associated with the atmosphere and temperature of an area, or the world.
3 group of organisms of the same species living in the same area sharing a gene pool.
7 a group of organisms residing in the same area.
8 a major terrestrial environment defined by climax community vegetation, or a marine environment typified by light and/or proximity to shore.
12 the factor that controls the population of an organism.
15 the physical cycle of carbon through the Earth's biosphere, geosphere, hydrosphere and atmosphere that includes such processes as photosynthesis, decomposition, and respiration.

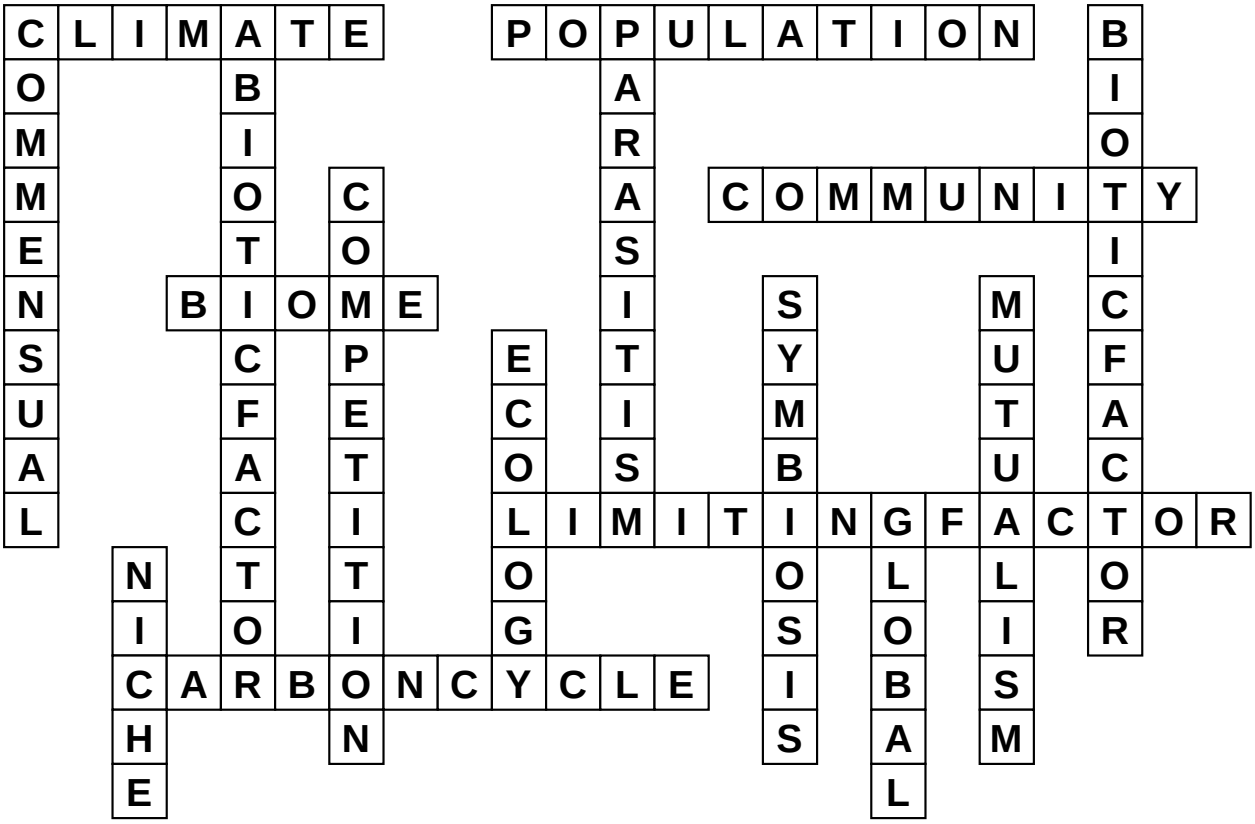
DOWN

1 symbiosis in which one organism benefits and the other is not harmed.
2 non-living aspect of the environment that affects living organisms.
4 symbiosis in which one organism benefits and the other is not harmed.
5 biological aspect of the environment that affects other living organisms.
6 occurs whenever two organisms require the same limited resource.
9 the interactions of two organisms that live together.
10 symbiosis in which both organisms' benefits.
11 the study of interactions of all living and non-living factors.
13 concerning all parts of the world.
14 the sum total of habitat parameters that a particular organism occupies.

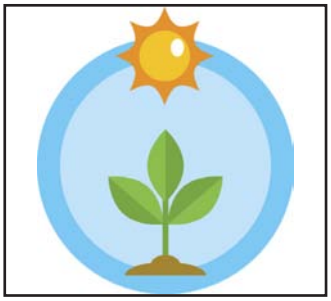
10th C-1 Concepts of Life Science

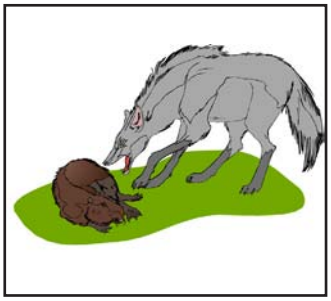
Unit 3

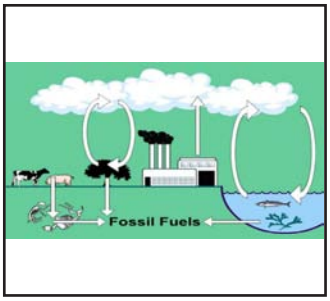
Solution:

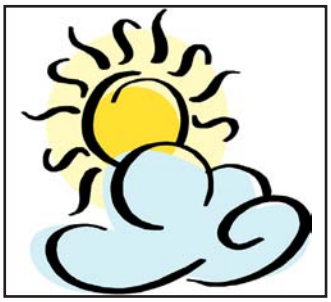


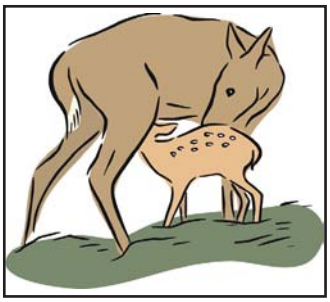
Write The Words!

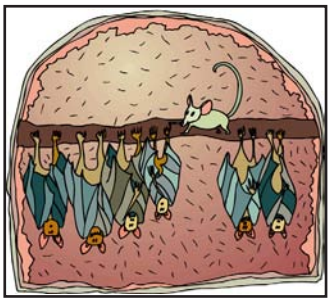


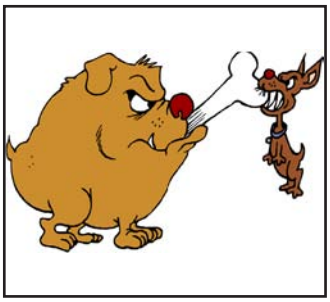












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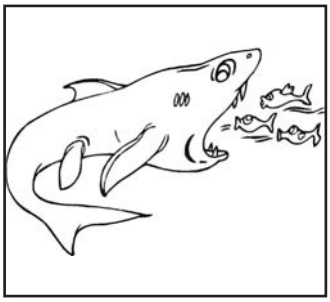

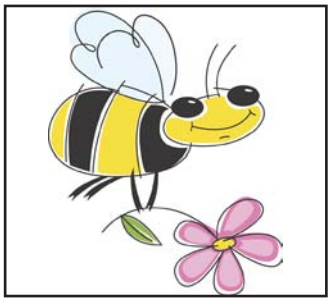

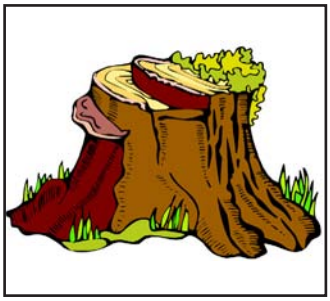

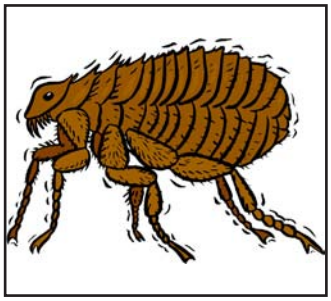

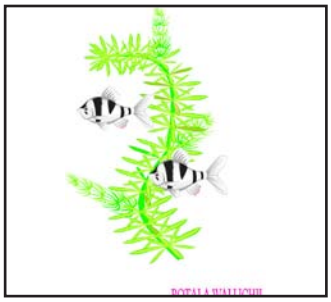

Creative Writing Activity Page

Have the students write sentences of their own, using the key words from this unit. When the students' sentences are finished, have them take turns reading their sentences orally. The students should say "Blank," for the key words; the other students must name the "missing" words. You may wish to have the students write the "definitions" for the key words.

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biotic factor

carbon cycle

climate

commensal

community

competition

ecology

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global

_____

limiting factor

_____

mutualism

_____

niche

_____

parasitism

_____

population

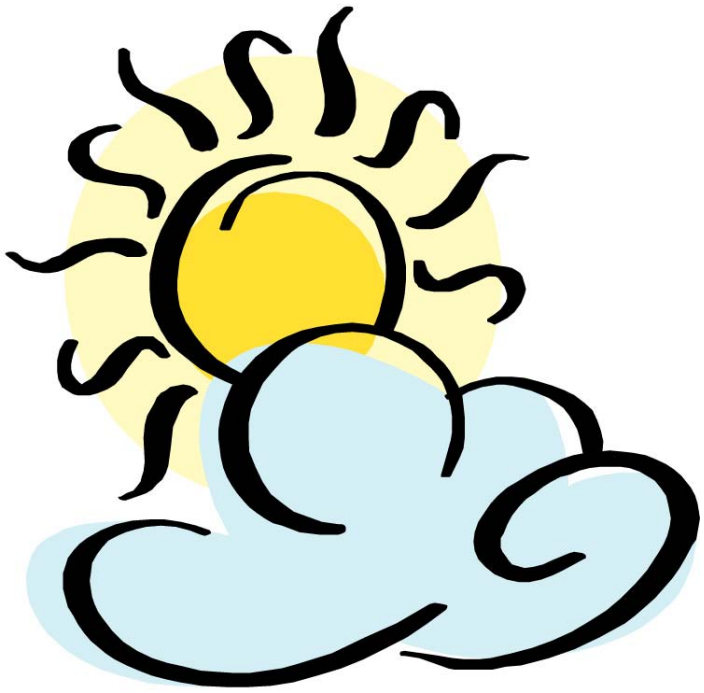
_____

symbiosis

_____

Creative Writing Activity Page

Have the students write sentences of their own, based on the picture below. When finished, have each student read his/her sentences to the others.



Unit Assessment

Unit 3 Quiz

Grade 10 C1, Unit 3 Quiz

Name: _____
Date: _____

Matching: Read each item carefully. Choose the answer that is most likely correct. Circle your answer.

1) The factor that controls the population of an organism is the....

   a) limiting factor

   b) biotic factor

   c) abiotic factor

2) Biological or living aspects of the environment that affect other living organisms are called...

   a) abiotic factor

   b) biotic factor

   c) limiting factor

3) Nonliving aspects of the environment that affect living organisms such as sunlight, are called

   a) abiotic factors

   b) limiting factors

   c) biotic factors

4) The physical cycle through the Earth2019s biosphere, geosphere, hydrosphere and atmosphere that includes such processes as photosynthesis, decomposition, and respiration is known as the _____ cycle.

   a) global

   b) carbon

   c) climatic

Fill in the Blank: Flll in the blanks below using the best word to complete each sentence. Choose from the words provided below in the Word Bank.

Word Bank		
commensual	community	competition
ecology	mutualism	parasitism
symbiosis		

5) A group of organisms residing in the same area form a _____.

6) When we study the interactions of all living things and nonliving factors in our environment we are studying _____.

7) When two organisms require the same limited resource, _____ is created.

8) As you have learned, symbiosis is the interaction of two organisms that live together. Sometimes both organisms benefit. Sometimes they don't. When one organism benefits and the other is not harmed it it called _____ symbiosis. When one organisms benefits and the other is harmed, the symbiosis is known as _____ . When both organisms benefit from the interaction or symbiosis it is called _____.

9) When there is a situation in the environment in which both organisms benefit from the other it is called _____.

True/False: Read the next two items carefully and decide if the statements are true or false. Circle your answer.

10) The word GLOBAL refers to the North American continent only

a) True

b) False

11) CLIMATE refers to the physical conditions associated with the atmosphere and temperature of an area.

a) True

b) False

Illustration Section: Illustrations of key vocabulary will be used to answer the following questions.

12) Describe or illustrate the **Biome** in which you live. (marine environment, arctic tundra, coniferous forest....)

13) Define OR illustrate the key vocabulary word, **NICHE**.

Grade 10 C1, Unit 3 Quiz

Name: _____
Date: _____

Matching: Read each item carefully. Choose the answer that is most likely correct. Circle your answer.

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Word Bank		
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ecology	mutualism	parasitism
symbiosis		

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6) When we study the interactions of all living things and nonliving factors in our environment we are studying **ecology** .

7) When two organisms require the same limited resource, **competition** is created.

8) As you have learned, symbiosis is the interaction of two organisms that live together. Sometimes both organisms benefit. Sometimes they don't. When one organism benefits and the other is not harmed it it called **commensual** symbiosis. When one organisms benefits and the other is harmed, the symbiosis is known as **parasitism** . When both organisms benefit from the interaction or symbiosis it is called **mutualism** .

9) When there is a situation in the environment in which both organisms benefit from the other it is called **symbiosis** .

True/False: Read the next two items carefully and decide if the statements are true or false. Circle your answer.

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12) Describe or illustrate the **Biome** in which you live. (marine environment, arctic tundra, coniferous forest....)

Have a written description or an illustration that explains the students BIOME...with label.

13) Define OR illustrate the key vocabulary word, **NICHE**.

Illustrations OR written definition: the sum total or habitat parameters that a particular organism occupies