

Hello everyone,

First of all I want to say how much I miss seeing you, and know you are enjoying your break from Science and Social Studies! ☺ I know these are uncertain times and we are all trying to do the best we can right now. However, it is so important that your child continues learning and growing in these subjects. I have enclosed lesson plans and packets. Hopefully it will all make sense, but if you should have ANY questions you can always contact me on the Remind app. Also, be looking for my new class FB page. You can search for, Mrs. Vestal's 5th Grade Science. I will be posting additional links on that page. Also, please refer to the school's webpage for important info. www.bigsandyisd.org

I also enclosed two weeks of Social Studies. The students are very familiar with how to complete these and may do so online if they choose. They also need to complete the paper form.

Lastly parents, thank you for all of your help! I truly believe it takes us all working together for your child to be successful and we will make a great team! Hug your kiddos for me. ☺ Hopefully this will end so we can all be back together soon!

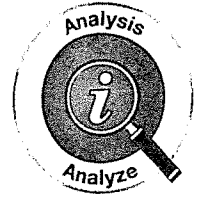
Sincerely,

Mrs. Vestal



Analyzing Rotation

1. Observe the picture of Earth, and draw the position the sun must be in to cause the view shown.



2. Does the picture show day or night where you live? _____

3. How long does it take for Earth to rotate one time? _____

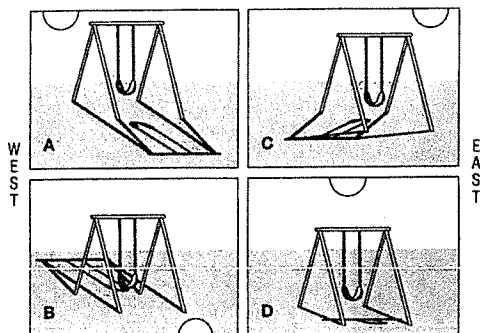
4. Why does the sun appear to move across the sky during the day?

5. If Earth is constantly spinning, why do we not feel the movement?



Scientific Investigation and Reasoning Skills

- 1 Which picture was taken at 9:00 A.M.?
5.2(D)

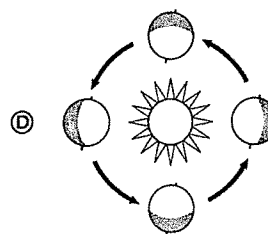
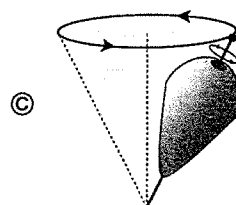
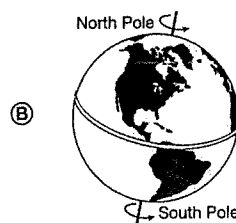
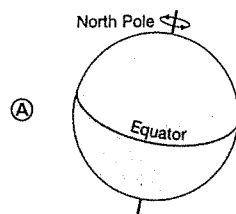


- Ⓐ Diagram A Ⓒ Diagram C
Ⓑ Diagram B Ⓓ Diagram D

- 2 Models are not perfect, but models have been used for many years by scientists to help explain ideas. Scientists use models to make predictions about the future as well as understand the vast world in which we live. Why would a physical model demonstrating Earth's rotation be considered less than perfect? **5.3(B)**

- Ⓕ Models are an exact copy of the object or idea they represent.
Ⓖ Models have limitations in representing the object or idea.
Ⓗ Models are identical to the object or idea they represent.
Ⓙ Models match the object or idea they represent exactly.

- 3 Which of these models does NOT demonstrate how Earth rotates on its axis to cause day and night? **5.3(B)**



- 4 Astronomers are scientists who study the universe. To an astronomer, the word rotate means to — **5.3(C)**

- Ⓕ orbit around another object
Ⓖ move in opposite directions
Ⓗ spin around an axis
Ⓙ revolve around another object

Name _____

Supporting Standard 5.8(D)

Unit 15 Introduction



Motivation Station: Scientific Fact

Our sun, the center of the solar system, is one of many stars. The Milky Way Galaxy alone is estimated to have between 100,000,000,000 and 400,000,000,000 stars. The next closest star is Proxima Centauri and is 4.2 light years from Earth.








Sun, Earth, and the Moon

After this lesson, I will be able to:

- **Identify** and **compare** the physical characteristics of the Sun, Earth, and Moon.

Activity 1: Objects on Earth and the Moon

Describe what would happen if you used each of the objects below on Earth and on the moon.

Object	Earth	Moon
1. Football 		
2. Pogo stick 		
3. Sandcastle 		
4. Trampoline 		
5. Compass 		



Activity 2: Investigating Characteristics of the Sun, Earth, and Moon

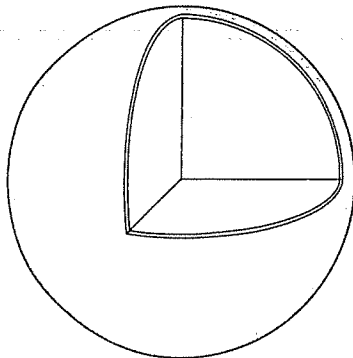
1. Use technology sources to research the physical characteristics of the sun, Earth, and moon. Organize the information in the table.

Physical Characteristics of the Sun, Earth, and Moon

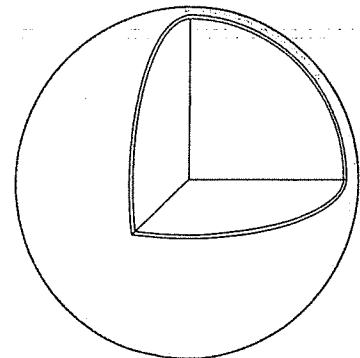
Sun	Earth	Moon

2. Research the layers of the sun, Earth, and moon. Then, illustrate and label the layers. Include labels to identify the temperature of each layer.

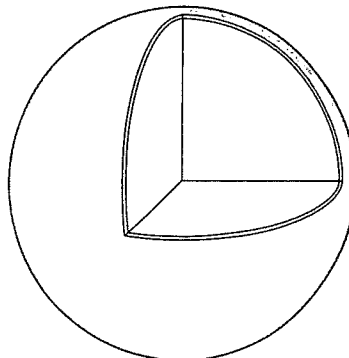
Layers of the Earth



Layers of the Sun



Layers of the Moon



3. What did you discover when comparing the temperatures of the sun, Earth, and moon?

Name _____

Reporting Category 3 Assessment



- 1** Students create a model of sedimentary rock by mixing sand and plaster in a paper cup. After the mixture solidifies, students remove the paper. Then, students chip apart the rock using an iron nail to simulate weathering. Which piece of additional equipment should students use while breaking the rock model? **5.1(A)**

(A) Balance
(B) Fire extinguisher
(C) Microscope
(D) Safety goggles

- 2** Palo Duro Canyon near Amarillo, Texas, gets deeper every year. Which of the following is most likely the cause of this process?

(F) Soil deposition
(G) Heat and pressure
(H) Water erosion
(J) Hail storms

- 3** Storms in the Gulf of Mexico are common during the summer when the sun's rays hit Earth at a more direct angle. Which statement best explains the role the sun plays in the summer storms?

(A) The sun's energy causes ocean water to evaporate into the air, which later condenses and forms storm clouds.
(B) The sun's energy causes ocean water to condense on nearby boats and ships.
(C) The sun's energy causes ocean water to create larger waves, which form thunderstorms and hurricanes.
(D) The sun's energy causes ocean water to transpire into the air and form storm clouds.

- 4** In an activity, students compare the sun, moon, and Earth. They describe each by its size on a scale of 1–3, with 1 being the greatest and 3 being the least. Which chart correctly shows these comparisons? **5.2(G)**

(F)

	Size
Sun	1
Moon	3
Earth	2

(G)

	Size
Sun	1
Moon	2
Earth	3

(H)

	Size
Sun	3
Moon	2
Earth	1

(J)

	Size
Sun	3
Moon	1
Earth	2

- 5** Which of the following is NOT a characteristic of both the moon and Earth?

(A) Impact craters
(B) Oceans
(C) Trench-like valleys
(D) Rocky surfaces



Reporting Category 3 Assessment

Name _____

- 6 How many times does the sun appear to rise in a week?

(F) One
(G) Five
(H) Seven
(J) Not here

- 7 Which of these can be used to complete the chart? **5.2(G)**

Renewable	Nonrenewable
Crops	Coal
Livestock	Natural Gas
Hydroelectricity	

(A) Wind
(B) Oil
(C) Wood
(D) Grain

- 8 What is necessary to have an accurate description of the climate during springtime in Texas? **5.2(C)**

(F) Take the temperature one day during springtime and record it on a chart
(G) Record the climate during fall because spring is the same
(H) Record temperatures and weather conditions each spring over a period of many years
(J) Record the climate every day because climate changes daily

- 9 Students examine four different types of soil using hand lenses. They create a poster showing the properties of each soil. What is NOT a safe practice that should be used during this investigation? **5.1(A)**

(A) When observing the smell of each soil sample, use a hand to "waft" the odor toward your nose
(B) Wash hands after handling soil samples
(C) Taste a small sample of each soil to determine its texture
(D) Follow directions given by the teacher for proper disposal of soil samples

- 10 A student draws a solar system model and uses the labels in the order shown.

Sun, Mars, Venus, Earth, Mercury, Jupiter, Saturn, Uranus, Neptune
--

How should the labels be corrected on the solar system model? **5.3(B)**

(F) Venus should be before Mars. Neptune should be between Saturn and Uranus.
(G) Mars should be after Venus. Jupiter should be after Saturn.
(H) Earth should be after Mercury. Saturn should be before Jupiter.
(J) Mercury should be after the Sun. Mars should be between Earth and Jupiter.

Name _____

Reporting Category 3 Assessment



- 11** During the month of January, students record the daily temperature, precipitation, and wind speed.

Jan. 3	Jan. 4	Jan. 5	Jan. 6	Jan. 7
5°C	0°C	-1°C	-1°C	0°C
1.2 cm	1.5 cm	2.3 cm	1.6 cm	0.75 cm
14 kph	14 kph	12 kph	15 kph	16 kph

If similar weather conditions continue, what kind of weather will the students most likely see on January 8? **5.2(C)**

- Ⓐ Windy and hot with small amounts of ice
- Ⓑ Warm and calm with large amounts of rain
- Ⓒ Cold and windy with small amounts of ice or snow
- Ⓓ Warm and windy with large amounts of rain

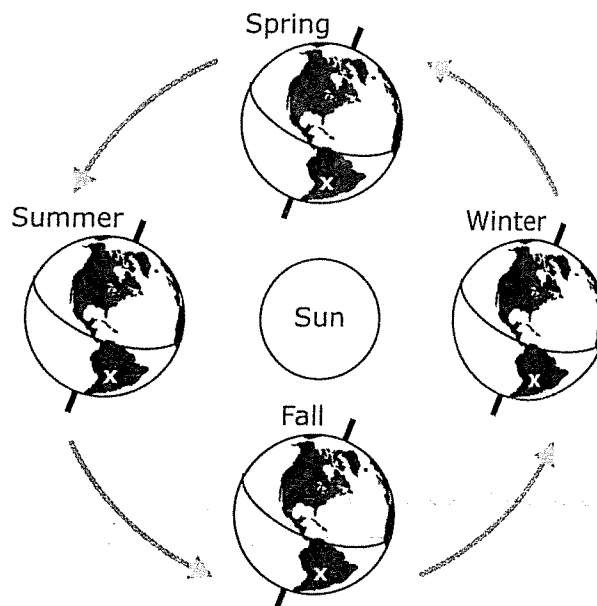
- 12** Which planet in the solar system has the shortest year?

- Ⓕ Neptune
- Ⓖ Mars
- Ⓖ Saturn
- Ⓙ Mercury

- 13** Before beginning an investigation to test evaporation and the water cycle, a student proposes that the water will turn into gas after it is heated. What did the student formulate? **5.2(B)**

- Ⓐ A conclusion
- Ⓑ A hypothesis
- Ⓒ An observation
- Ⓓ All of the above

- 14** As Earth spins on its axis and travels around the sun, the amount of light Earth receives changes. The picture shows the position of Earth as the seasons change. The X on each image represents a country in South America, which is located in the Southern Hemisphere.



Based on the picture, which season will it be in South America during summer in North America? **5.2(D)**

- Ⓕ Spring
- Ⓖ Fall
- Ⓖ Summer
- Ⓙ Winter

- 15** Students make piles of soil, place small objects near the top, and pour water on top of the soil. They notice that the soil and objects slide when water is poured. What does this model represent? **5.3(B)**

- Ⓐ Earthquake
- Ⓒ Volcanic eruption
- Ⓑ Landslide
- Ⓓ High winds

- 16** Which is NOT necessary for the formation of sedimentary rocks?

- Ⓕ Sediment
- Ⓖ Pressure
- Ⓖ Time
- Ⓙ Wood

**Reporting Category 3 Assessment**

- 17** After creating a model of a sand dune, a student concludes that wind is a major cause of the formation of sand dunes. Is the student's conclusion accurate? **5.2(F)**

(A) No, because water is the main cause of the formation of sand dunes.

(B) No, because ice is the major cause of the formation of sand dunes.

(C) Yes, because a conclusion is a guess, and all guesses are valid.

(D) Yes, because wind causes the formation of sand dunes.

- 18** A student reads the following information in a textbook related to soils.

Soil that is rich in humus is able to hold water and has plenty of nutrients.

Desert soil is loose and dry soil with very little humus. Which correctly describes desert soil?

(F) Desert soil allows for good drainage and retains nutrients because it does not have much humus.

(G) Desert soil retains very little water and nutrients because it is not rich in humus.

(H) Desert soil holds water but has very few nutrients because it does not have much humus.

(J) Desert soil allows water to drain away and nutrients to be lost because it is rich in humus.

- 19** Students investigate the water cycle in wet and dry environments. The students make two terrariums, one representing a desert and another representing a rain forest. They add 100 mL of water to the desert terrarium and 50 mL of water to the rain forest terrarium. The students observe that the desert terrarium looks too wet, so they remove the lid. They keep the rain forest terrarium enclosed. How can students design a more valid investigation? **5.2(A)**

(A) Students should test only one variable at a time and keep all other conditions the same.

(B) Students should test other environments, such as ocean environments.

(C) The investigation should be conducted outside so that the extra water in the desert terrarium evaporates faster.

(D) The desert terrarium should be placed outside, and the rain forest terrarium should be placed inside.

- 20** In an activity, students record the position of the sun in the sky. They notice the sun appears low in the sky in the morning, high in the sky in the afternoon, and low in the sky in the evening. Why does the sun appear to move across the sky? **5.2(D)**

(F) Earth is tilted and spins around the sun each day.

(G) Earth rotates around the sun each day.

(H) Earth rotates on its axis once each day.

(J) Earth changes position on its axis each day.



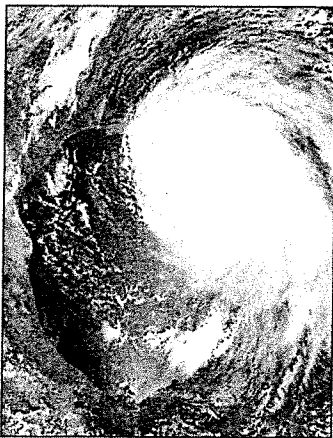
- 21 A student collects data about four phases of the moon.

New Moon	First Quarter	Full Moon	Last Quarter
Sep. 16	Sep. 22	Sep. 30	Oct. 8
Oct. 15	Oct. 22	Oct. 29	Nov. 7

When will the next full moon occur? **5.2(D)**

- Ⓐ Between November 7 and November 13
- Ⓑ Between November 13 and November 20
- Ⓒ Between November 20 and November 28
- Ⓓ Between November 28 and December 6

- 22 Satellite photographs such as the image shown help meteorologists predict tomorrow's — **5.3(C)**



- Ⓐ climate
- Ⓑ season
- Ⓒ weather
- Ⓓ meteors

- 23 The San Andreas Fault in California is an area where the Pacific and North American tectonic plates meet. What occurrence is caused by the plate movement along the San Andreas Fault?

- Ⓐ Tornadoes
- Ⓑ Earthquakes
- Ⓒ Tsunamis
- Ⓓ Volcanoes

- 24 A fifth-grade class learns that all resources, whether renewable or nonrenewable, should be conserved. The class makes a list of ideas to conserve resources.

- | |
|--|
| 1. Use both sides of notebook paper |
| 2. Arrange a car pool to and from school |
| 3. Create a backyard compost pile |
| 4. Plant flowers in front of the school |
| 5. Ride bikes to school |
| 6. Turn off the lights when not in use |

Which ideas from the list are ways to conserve renewable resources? **5.1(B)**

- Ⓐ Ideas 1, 2, and 3
- Ⓑ Ideas 1, 3, and 4
- Ⓒ Ideas 2, 3, and 4
- Ⓓ Ideas 4, 5, and 6

- 25 Students perform an investigation in which they place ice in a pan on a hot plate. They hold a lid several inches above the pan and observe changes. Eventually the ice melts, and they notice drops of water forming on the lid of the pan. What part of the water cycle do the drops on the pan represent?

- Ⓐ Condensation
- Ⓑ Evaporation
- Ⓒ Collection
- Ⓓ Runoff

- 26 Meteorologists make predictions every day using maps, satellites, and computers. What area of science is the specialization of meteorologists? **5.3(C)**

- Ⓐ Fossils
- Ⓑ Forces
- Ⓒ Weather
- Ⓓ Meteors

Chart Your Success

Color Mike or Molly green if your answer was correct and red if your answer was incorrect.

Sedimentary Rocks and Fossil Fuels

Question 1	Question 16

Total Correct	Total Possible
	2

Sun, Earth, and the Moon

Question 4	Question 5

Total Correct	Total Possible
	2

Landforms

Question 2	Question 17

Total Correct	Total Possible
	2

Properties of Soils

Question 9	Question 18

Total Correct	Total Possible
	2

Weather and Climate

Question 8	Question 22

Total Correct	Total Possible
	2

Renewable and Nonrenewable Resources

Question 7	Question 24

Total Correct	Total Possible
	2

Sun, Ocean, and the Water Cycle

Question 3	Question 19

Total Correct	Total Possible
	2

Weather

Question 11	Question 26

Total Correct	Total Possible
	2

Earth's Rotation

Question 6	Question 20

Total Correct	Total Possible
	2

Water Cycle

Question 13	Question 25

Total Correct	Total Possible
	2



- 1 Which of the following nonliving components do all living organisms depend on for survival?

Ⓐ Water, grass, air
Ⓑ Sun, air, water
Ⓒ Soil, sun, rocks
Ⓓ Water, rocks, air

- 2 Dogs and ticks share the same ecosystem. How do dogs and ticks interact within an ecosystem?

Ⓔ Ticks benefit by feeding on dogs' blood.
Ⓕ Dogs benefit by obtaining nutrients from ticks.
Ⓖ Neither dogs nor ticks benefit from the relationship.
Ⓙ Both dogs and ticks benefit from the relationship.

- 3 How does the strangler fig interact with its ecosystem in order to survive?

In the rain forest, strangler fig seedlings begin growing on other trees, wrapping roots around the host tree. When the roots reach the ground, the strangler fig takes root and grows larger than the host tree, taking nutrients from the host tree and growing to the height of the rain forest canopy.

Ⓐ The fig produces its own food and does not use nutrients from other trees.
Ⓑ The rain forest floor does not receive much sunlight, so the fig must compete for sunlight and nutrients.
Ⓒ The fig roots rot in the wet rain forest.
Ⓓ None of these

- 4 In Africa, lions chase and kill their prey. The lion family eats all it wants and then vultures come and finish the rest. The interaction between the lions and the vultures is an example of —

Ⓔ the lions benefiting by consuming the vultures as food
Ⓕ the lions benefiting from the relationship and the vultures being harmed
Ⓖ the lions not being harmed by the relationship and the vultures benefiting
Ⓙ both the lions and the vultures competing with one another for food

- 5 Scientists observe that the deer population is growing and worry there will not be enough plants for the deer during the winter. Which best describes the relationship between the deer population and the plants?

Ⓐ The deer need water stored in plants to survive in winter, but the plants do not.
Ⓑ Deer receive energy from eating plants.
Ⓒ The plants are nonliving components.
Ⓓ The plants use oxygen which deer need in order to survive.

- 6 Colorado elk need food, water, and air to sustain their population. Based on this information, what statement is true regarding the elk's ecosystem?

Ⓔ Elk lack dependence on living and nonliving components in their environment.
Ⓕ Too many factors limit the elk's survival within their ecosystem.
Ⓖ Living organisms are independent of nonliving components within the ecosystem.
Ⓙ Living and nonliving components work together to keep the elk's ecosystem functioning.

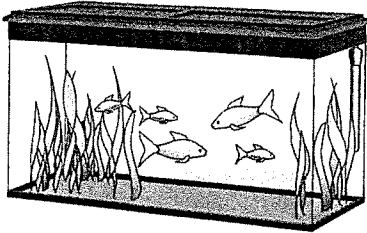
Name _____

Readiness Standard 5.9(A)

Unit 23 Guided Practice



- 1 Specific environments meet the needs of organisms. The school aquarium below shows what is needed for these organisms to survive in their environment.



The aquarium pictured is a good model of — **5.4(A)**

- (A) a terrarium (C) a tide pool
(B) an ecosystem (D) a swamp

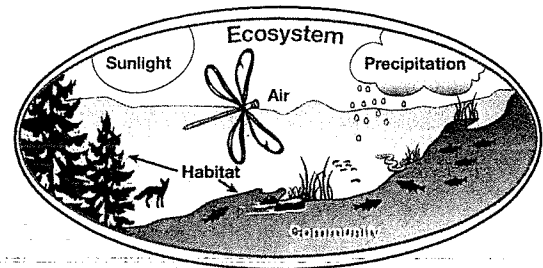
- 2 What is one interaction of how organisms live and survive in their environment?

- (F) Grass supplying food to a rabbit
(G) A deer providing food to a shrub
(H) Rocks and water eroding a hillside environment
(J) All of the above

- 3 A student wants to display the way organisms live and survive in their ecosystem. The student decides to construct a diorama as a representation of the relationships organisms have within an environment. The diorama is a/an — **5.3(B)**

- (A) diagram (C) aquarium
(B) model (D) investigation

- 4 How are the living and the nonliving components connected to one another in this diagram?



- (F) The plants and animals receive oxygen from the sun, water, and air.
(G) The water and air recycle to help the sun provide energy to plants and animals.
(H) The sun, water, and air provide necessary resources to the plants and animals.
(J) The animals provide shelter for the plants, enabling them to grow.

- 5 Some facts about an animal called the prairie dog are listed in the box shown below.

Facts about the Prairie Dog



1. Prairie dogs are native to North American grasslands.
2. Prairie dogs provide a food source for many grassland predators.
3. The prairie dog digs burrows in the soil for shelter.
4. Prairie dog burrows provide homes for many other species.

Which fact describes one way the prairie dog changes the environment to meet its needs? **5.2(D)**

- (A) Fact 1 (C) Fact 3
(B) Fact 2 (D) Fact 4

Name _____

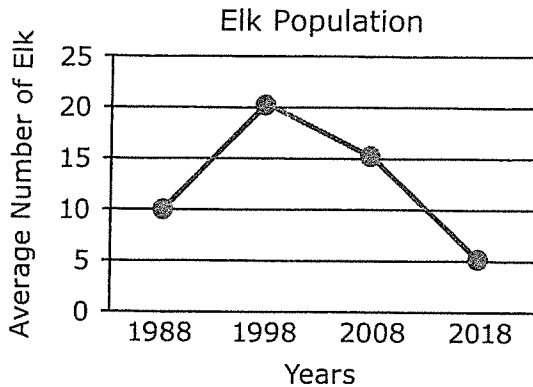
Readiness Standard 5.9(A)

Unit 23 Process Practice



Scientific Investigation and Reasoning Skills

- 1 What can be concluded using the data shown below? **5.2(G)**

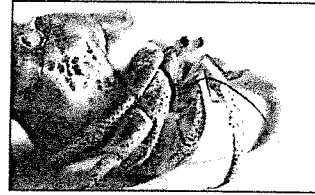


- Ⓐ Elk population increased over a 30-year period.
- Ⓑ Elk population decreased over a 20-year period.
- Ⓒ Elk population decreased over a 30-year period.
- Ⓓ Elk population increased over a 20-year period.

- 2 When studying ecosystem interactions, students collect living and nonliving objects found in the schoolyard and take them back to the classroom to observe. Which science equipment would be important to use while collecting objects outdoors? **5.1(A)**

- Ⓐ Terrariums
- Ⓑ Gloves
- Ⓒ Celsius thermometers
- Ⓓ Notebooks

- 3 For protection, hermit crabs use gastropod shells to hide their bodies so that only their heads are visible. Students research why the population of hermit crabs has been decreasing.



One question they should ask is — **5.2(B)**

- Ⓐ Who has a hermit crab for a pet?
- Ⓑ Do hermit crabs make sounds?
- Ⓒ What colors are hermit crabs?
- Ⓓ Have any changes occurred in their ecosystem?

- 4 Which title would best replace Title B? **5.2(G)**

Title A

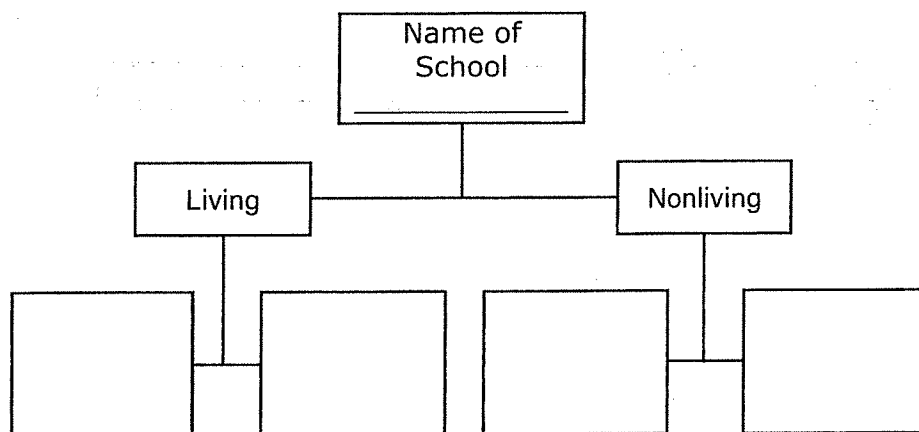
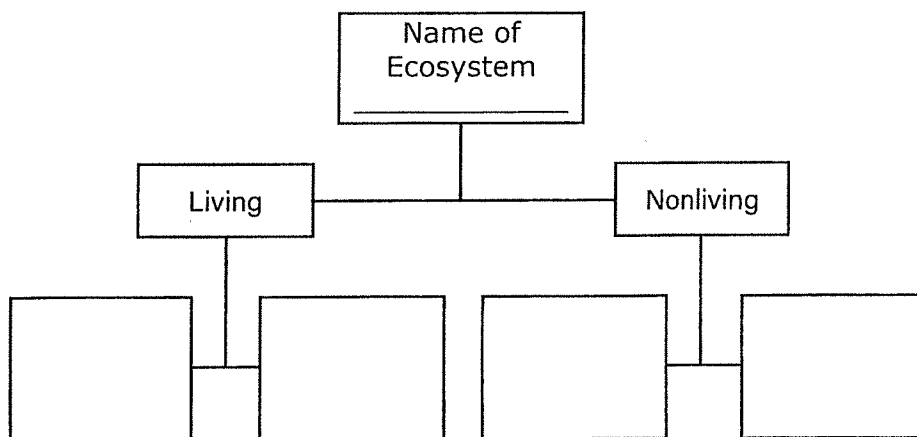
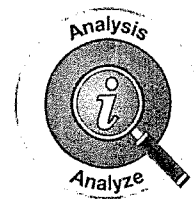
Living Organisms	Title B
Prairie dog	Soil, water, air, food
Bison	Plants, water, air
Jackrabbit	Plants, water, air
Snake	Animals, water, soil, air
Grass	Water, soil, air

- Ⓐ Animal Survival Needs
- Ⓑ Competition between Living and Nonliving Components
- Ⓒ Survival Needs
- Ⓓ Nonliving Components



Ecosystem Analogy

1. Compare and contrast an ecosystem to a school. For each, include two different living and nonliving components which make up the ecosystem and the school and describe how they interact and rely on one another.



2. Generate a list of ecosystem interactions.

Ecosystem Interactions

Interactions with Living Organisms	Interactions with Nonliving Components

Name _____

Readiness Standard 5.9(A)

Unit 23 Science Vocabulary Builder



Define and illustrate each vocabulary term in the boxes below.

living organism	
definition	illustration

nonliving component	
definition	illustration

ecosystem	
definition	illustration

environment	
definition	illustration

survive	
definition	illustration

competition	
definition	illustration

interact	
definition	illustration

interdependence	
definition	illustration



1. Scientists observe animal behaviors using a tool called an *ethogram*.
 - Observe an animal, such as a pet, to watch how it interacts with other living things and its environment.
 - Fill out the ethogram below to organize observations.
 - Each minute, look to see what the animal is doing.
 - Use tally marks to collect data.
 - If unable to observe an animal, visit: <http://nationalzoo.si.edu/Animals/WebCams/default.cfm>

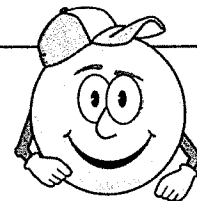
Time	Eating	Playing	Fighting	Resting	Bathing/cleaning themselves
1 minute					
2 minutes					
3 minutes					
4 minutes					
5 minutes					
6 minutes					
7 minutes					
8 minutes					
9 minutes					
10 minutes					

2. Describe the ecosystem where the animal lives. _____

3. Describe what surprised you about the animal. _____

Home Extensions

1. Discuss the observed animal with your child. Talk about living and nonliving components of the ecosystem.
2. Visit a zoo with your child to see real-life examples of ecosystems and the interactions between the plants and animals that live in them.





- 1 Which of the following best describes one relationship between living organisms and another living organism in an ecosystem?

(A) Deer grazing in a meadow
(B) Fish using gills to breathe
(C) Ants building a mound in soil
(D) Moose drinking water from a pond

- 2 A group of students uses their outdoor classroom to investigate the way organisms live and survive in their ecosystem. They notice a trail of ants carrying bits of food into a mound of dirt. The students are making a/an — **5.2(C)**

(F) hypothesis (H) conclusion
(G) observation (J) graph

- 3 Ecologists study the soil particles from a desert biome to learn how the nutrients in the soil sustain plant survival. Which of the following tools is most beneficial for observing the particles of soil? **5.4(A)**

(A) Collecting net (C) Microscope
(B) Magnet (D) Telescope

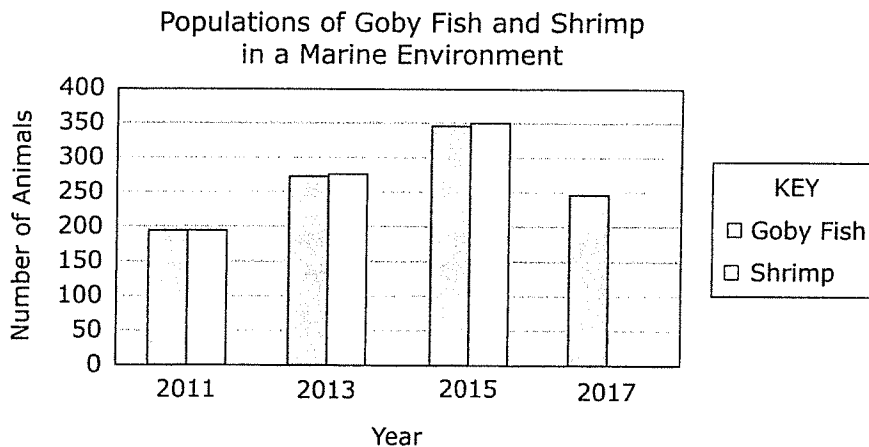
- 4 After observing an ecosystem, a student writes the following conclusion in a notebook.

Ecosystems are only made of living things.

Is the student's conclusion logical? **5.3(A)**

(F) Yes, because ecosystems are made of living things that interact.
(G) No, because ecosystems are made of living and nonliving components.
(H) Yes, because *ecosystem* is another name for habitat.
(J) No, because an ecosystem has nothing to do with living things.

- 5 A pistol shrimp is a burrowing shrimp with poor eyesight. The shrimp digs a hole for both it and the goby fish to live. The shrimp uses its antennae to stay in contact with the tail of the goby fish. When danger approaches, the goby fish swishes its tail and the shrimp quickly hides in the burrow.



Based on the data shown above, what will most likely happen to the shrimp population in 2017? **5.2(G)**

(A) It will increase. (C) It will stay the same.
(B) It will decrease. (D) It will die out completely.

Name _____

Readiness Standard 5.9(A)

Unit 23 Cross-Curricular Connection



Science Journal

Describe the ecosystem in which you live, and compare it to an ecosystem you would like to visit.

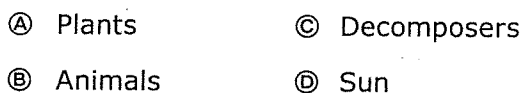
STEM: Technology Connection

Plan a digital product to explain ecosystem interactions. Provide examples of interactions between living and nonliving components. In the chart, plan information to share in the digital product.

Living ↔ Living
Living ↔ Nonliving

Readiness Standard 5.9(B)

3 Which statement below best describes how energy flows in a food web?



- Ⓕ The direction of energy flow
- Ⓖ The type of food each organism prefers
- Ⓗ The organism's place in the ecosystem
- Ⓙ The space separating each organism on a food web

The diagram illustrates a food web with the following energy flow paths:

- Grass → Mouse
- Grass → Rabbit
- Grass → Frog
- Mouse → Snake
- Rabbit → Eagle
- Frog → Lizard
- Lizard → Eagle
- Snake → Eagle

- Ⓕ What would happen if one of the organisms was removed from the food web?
- Ⓖ What are consumers?
- Ⓗ Which organism is a producer?
- Ⓙ What might a food web from a marine environment look like?

Niches of Antarctic Organisms

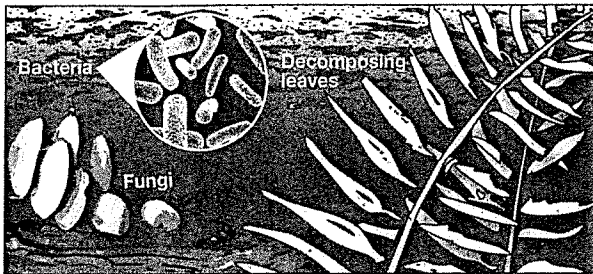
Organism	Niche	Prey	Predator
Algae	Producer		Fish
Killer whale	Consumer	Fish	
Fish	Consumer	Algae	Killer whale

Ⓐ Exhausting the fishery through overfishing Ⓒ Removing the algae from the ocean

Ⓑ The extinction of killer whales Ⓓ A decrease in the bird population



- 1 Which statement correctly describes the role of bacteria as part of a food web?

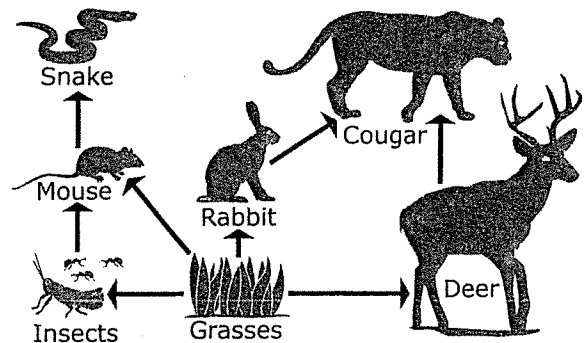


- (A) Bacteria are decomposers that break down waste and remains of dead animals and plants.
- (B) Bacteria cause plant and animal illnesses which are always harmful to the environment.
- (C) Bacteria are predators which catch and consume their prey.
- (D) Bacteria are producers that make their own food from the sun's energy.
- 2 The sun is important in many ways. What is the purpose of the sun in a food web?
- (F) The sun provides energy for animals to stay warm.
- (G) The sun provides light for animals to see.
- (H) The sun provides warmth for plants to survive.
- (J) The sun provides energy for plants to make food.
- 3 What happens to plants and animals when they die?
- (A) They become food for decomposers.
- (B) They become food for producers.
- (C) They make their own food.
- (D) They provide energy for the sun.

- 4 Why is the sun an important factor in the transfer of energy in an ecosystem?
- (F) The sun supplies nutrients to consumers to be transferred to producers.
- (G) The sun supplies energy to consumers so they can create their own food.
- (H) The sun provides energy to producers so they can create their own food.
- (J) The sun provides nutrients so consumers and scavengers can create their own food.

- 5 A food web is made of —
- (A) interconnected food chains
- (B) multiple food webs
- (C) a single food chain
- (D) all of the above

- 6 According to the food web below, which organism is both predator and prey?

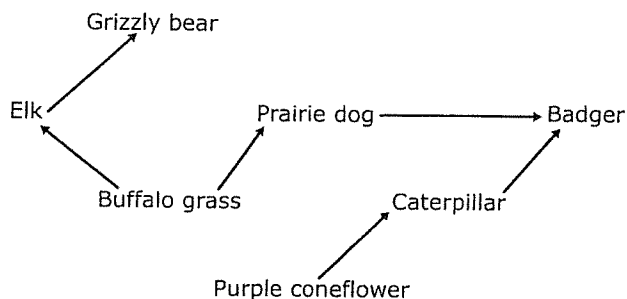


- (F) Grasses
- (G) Cougar
- (H) Mouse
- (J) Snake



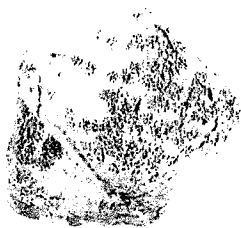
Scientific Investigation and Reasoning Skills

- 1 Which of the following would best complete the food web shown? **5.3(B)**



- Ⓐ Producer Ⓒ Decomposer
Ⓑ Consumer Ⓓ All of the above

- 2 Students grow mold on bread to learn about the role of decomposers in a food web. For two weeks, students record their observations by taking pictures of the changes in mold growth.



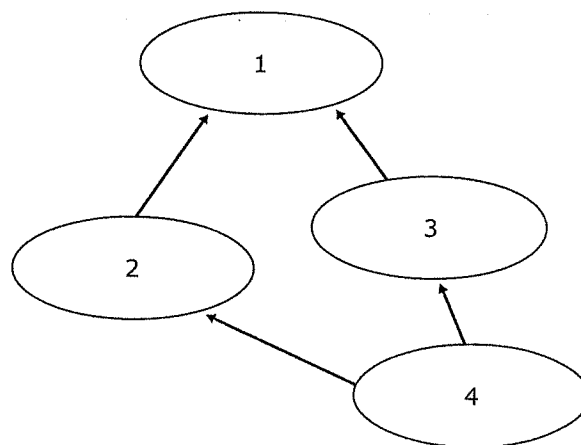
When conducting an investigation with decomposers, it is important for the students to — **5.1(A)**

- Ⓕ keep a fire extinguisher nearby
Ⓖ wear gloves and other protective equipment
Ⓗ taste samples of the mold growth
Ⓙ feed the molded bread to the classroom pet

- 3 Several animals are kept as pets in the classroom. Students are responsible for feeding, watering, and cleaning the cages. Which of the following best reflects the science safety rule students should remember to follow upon entering the room? **5.1(A)**

- Ⓐ Sharpen pencils
Ⓑ Write in notebooks
Ⓒ Visit quietly with neighbors until the bell rings
Ⓓ Ask permission before working with the animals

- 4 A food web diagram is shown.



Which organism in this food web eats only consumers? **5.3(B)**

- Ⓔ Organism 1
Ⓖ Organism 2
Ⓗ Organism 3
Ⓙ Organism 4



Creating a Food Web

Circle an ecosystem from the box below.

wetland	desert	prairie	forest	pond
	ocean	tropical	Arctic	



1. Using the chosen ecosystem, illustrate and label a food web.

2. Which organisms in the food web above represent producers?

3. Which organisms represent consumers?

4. Which organisms represent decomposers?

5. Describe what would happen if one of the organisms was removed from the food web.

Name _____

Readiness Standard 5.9(B)

Unit 24 Science Vocabulary Builder



Write a description, and create an illustration for each vocabulary term. Use the three vocabulary terms and information in the graphic organizer to write a summary of the information learned during this unit.

Term producer	Illustration
Description	

Term consumer	Illustration
Description	

Term decomposer	Illustration
Description	

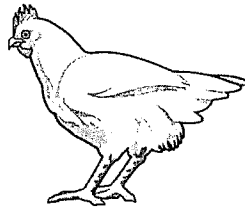
Summary



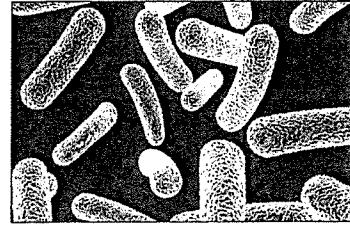
1. Label the images as producers, consumers, or decomposers.



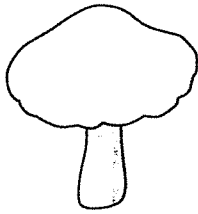
Corn



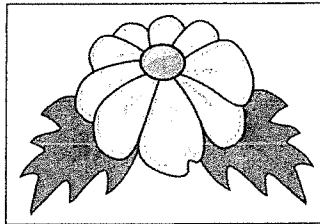
Chicken



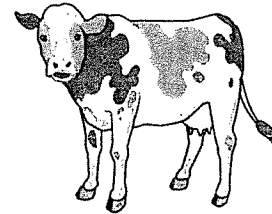
Bacteria



Mushroom



Flower



Cow

2. What is the role of a producer? Give examples of producers.

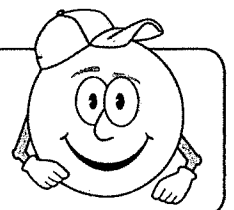
3. What is the role of a consumer? Give examples of consumers.

4. What is the role of a decomposer? Give examples of decomposers.

5. What is the sun's role in a food web?

Home Extensions

1. Discuss producers, consumers, and decomposers with your child. How would humans be classified?
2. Discuss how the sun provides energy to plants, which enables them to grow.





Unit 24 Post-Assessment

Name _____

Readiness Standard 5.9(B)

- 1 If all the organisms in the table were placed in their correct places on a food web, which organism would start the flow of energy between organisms? **5.2(D)**

Organism	Niche
Algae	Producer
Killer whales	Consumer
Fish	Consumer

- (A) Killer whales (C) Algae
(B) Seals (D) Birds

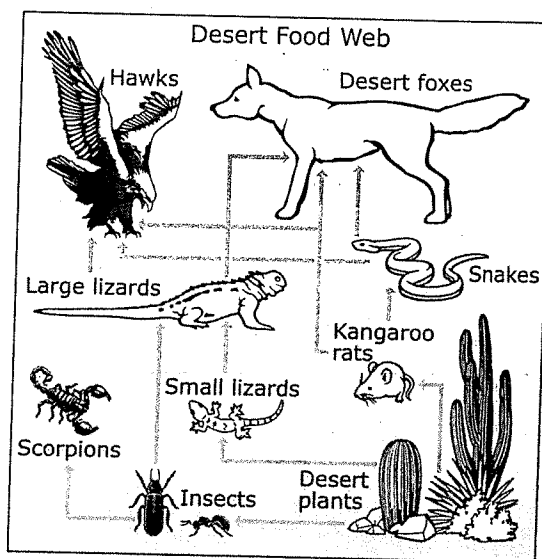
- 2 In an investigation, students grow mold on bread to learn about decomposers. They place 20 mL of water into two bags. In one of the bags, they place a slice of white bread. In the other bag, they place a slice of wheat bread. The bags are sealed, and students record notes about the growth of the mold in notebooks. What is the variable in the investigation? **5.2(A)**

- (F) Amount of water used
(G) Type of bread used
(H) Amount of time bread was left in the bags
(J) Number of mold spots that grew

- 3 A local restaurant offers an all-you-can-eat special of grilled mushrooms. People ordering the special will be consuming —

- (A) producers (C) decomposers
(B) consumers (D) scavengers

- 4 Which organisms in the food web below would be most affected by the removal of insects? **5.3(B)**



- (F) Hawks and desert foxes
(G) Desert plants and snakes
(H) Large lizards and scorpions
(J) Small lizards and desert plants

- 5 Students create food chains to learn how energy flows through an ecosystem. After completing several chains, students notice some of the same animals appear on several food chains. The students conclude that within an ecosystem, food chains combine to create food webs. Do the students reach a logical conclusion? **5.3(A)**

- (A) No, because most animals only eat one type of food.
(B) Yes, because most living things consume a variety of foods in order to survive.
(C) No, because producers make their own food.
(D) Yes, because food chains and food webs are the same.

Name _____

Readiness Standard 5.9(B)

Unit 24 Cross-Curricular Connection



Science Journal

Use pictures and words to describe how energy in food webs flows through an ecosystem. Begin your description with the sun.

Music Connection

Compose an original song about food webs. Include the roles of producers, consumers, and decomposers in your song. Perform the song for the class.

Name _____

Supporting Standard 5.9(C)

Unit 25 Guided Practice



- 1** Humans are part of the ecosystem and therefore impact it. Which of the following events in an ecosystem may produce a negative effect?
- Ⓐ Preventing deer from depleting food resources
 - Ⓑ Restoring a natural habitat
 - Ⓒ Wildlife rangers minimizing disturbances
 - Ⓓ A lumber company clearing a forest
- 2** Scientific evidence predicts events that will occur because of the overpopulation of grazers. Which of the following is NOT a change caused by the overpopulation of grazers? **5.2(D)**
- Ⓕ Grazers have less food to eat.
 - Ⓖ Grazers wander into unnatural habitats.
 - Ⓗ Grazers have access to unlimited resources.
 - ⓓ Grazers are susceptible to more diseases.
- 3** Which of the following is a way humans can positively impact ecosystems?
- Ⓐ Waste dumping
 - Ⓑ Using biodegradable products
 - Ⓒ Overhunting animals
 - Ⓓ Industrial pollution
- 4** Scientific research shows that as tundra vegetation zones continue to move northward with the changing climate, caribou and reindeer may have a more difficult time finding food. Which prediction below best explains the effect of this change on caribou and reindeer? **5.2(D)**
- Ⓕ Caribou and reindeer populations may increase because of their dependence on tundra vegetation.
 - Ⓖ Caribou and reindeer populations will not be affected by this change to the ecosystem.
 - Ⓗ Caribou and reindeer populations may decline because of their dependence on tundra vegetation.
 - ⓓ Caribou and reindeer populations will increase as the food supply decreases.
- 5** Overpopulated animals cause severe damage to an ecosystem and the surrounding landscape. Additionally, overpopulation can affect food webs, water routes, and land. Based on the information provided, which of the following is the best conclusion about the effects of overpopulation? **5.2(F)**
- Ⓐ Overpopulation is destroying the entire United States.
 - Ⓑ Overpopulation does not impact food webs.
 - Ⓒ Overpopulation can change the entire structure of an ecosystem.
 - Ⓓ Overpopulation causes serious issues with the water cycle.



- 1 Hunting is an environmental management tool that helps control wildlife populations. Hunting is an example of —
 - Ⓐ the deer population creating change in an ecosystem
 - Ⓑ the food web creating change in an ecosystem
 - Ⓒ humans creating change in an ecosystem
 - Ⓓ a cycle creating change in an ecosystem

- 2 Which of the following is a positive effect of building highways in an ecosystem?
 - Ⓐ Enhancing access between existing communities
 - Ⓑ Destruction of existing homes and businesses
 - Ⓒ Prohibiting some species from migrating
 - Ⓓ Increase in noise and air pollution

- 3 Which human activity puts the greatest number of animals at risk for becoming endangered?
 - Ⓐ Starting forest fires
 - Ⓑ Destruction of habitat
 - Ⓒ Hunting and fishing
 - Ⓓ Making pets of wild animals

- 4 What is an effect of cutting down forests for the development of land and cities?
 - Ⓐ Increase in amount of oxygen for animals
 - Ⓑ Decrease in energy provided for producers
 - Ⓒ Lack of habitat areas for plants and animals
 - Ⓓ Gain of habitat areas for new species of animals and plants

- 5 The Texas blind salamander lives in the underwater caves of the Edwards Aquifer, which is used to provide drinking water for many Texans. The Texas blind salamander has been on the endangered list since 1967. Which could NOT be a possible cause for the salamanders being on the endangered list?
 - Ⓐ Motor oil draining into the sewer
 - Ⓑ Using lots of water for irrigation
 - Ⓒ Lower average rainfall totals
 - Ⓓ Swimming and fishing activities

- 6 Biologists observe and record the deer population. They notice that the population is four times larger than the habitat can support. Which is LEAST likely to occur from the overpopulation of deer?
 - Ⓐ The grass population in the deer's habitat will begin to decrease.
 - Ⓑ The deer population will be stronger and healthier.
 - Ⓒ The area's water source will be reduced or depleted.
 - Ⓓ The deer will spread disease to other animals and humans.

**Scientific Investigation and Reasoning Skills**

- 1 Based on the information given in the chart, why do overpopulated animals wander?

5.2(G)**Effects of Overpopulation
of Grazers**

- | |
|--|
| 1. Wander into areas populated by humans |
| 2. Wander onto roads and highways and get killed |
| 3. Rummage through garbage and destroy crops |

- Ⓐ Their natural ecosystem can no longer support them.
- Ⓑ They migrate to compete with other species for garbage.
- Ⓒ Their natural ecosystem has a vast supply of food and water.
- Ⓓ They migrate to areas where there are fewer producers.

- 2 In order to reduce the negative impact on the ecosystem, it is important that people —

5.1(B)

- Ⓐ make informed choices in conservation
- Ⓑ demonstrate safety practices
- Ⓒ record data using technology
- Ⓓ neglect wildlife regulations

- 3 In class, students learn that conserving water reduces the human impact on area watersheds. Students investigate whether 4th graders or 5th graders use the most water when washing their hands. Which part of the investigation should be recorded?

5.2(A)

- Ⓐ Height of the students
- Ⓑ Time the faucet is turned on and off
- Ⓒ Size of the sink
- Ⓓ Location of area watersheds

- 4 Students conduct outdoor investigations in a marshy area. They collect water samples for viewing under the microscope to determine if pollution has impacted the health of the pond. The water is oily and shiny, and students are not sure what is in the water. All are good precautions to use while gathering the water samples EXCEPT —

5.1(A)

- Ⓐ wearing rubber gloves
- Ⓑ running around the pond
- Ⓒ keeping long hair tied back
- Ⓓ staying with the group

**Human Impact**

Humans impact ecosystems in many ways. Some of the ways people cause changes to ecosystems include urban development, building roads, water development, pollution, and starting forest fires.

For each of the activities listed below, describe how the event impacts people. Then, predict how the event changes ecosystems.



Event	Urban Development
Impact to people	
Changes to ecosystem	

Event	Building Roads
Impact to people	
Changes to ecosystem	

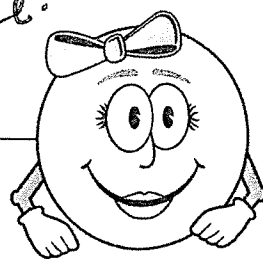
Event	Pollution
Impact to people	
Changes to ecosystem	

Event	Starting Forest Fires
Impact to people	
Changes to ecosystem	

Event	Introducing an Invasive Species to a New Habitat
Impact to people	
Changes to ecosystem	

Science Glossary

* Use as a reference!



A

absorb – to soak up or take in

accumulation – a part of the water cycle in which water collects in large bodies of water

accuracy – being error free, exact, or precise

accurate – error free, exact, or precise

acquired trait – a trait that occurs in response to the environment

adaptation – a structure or behavior that helps an organism survive in its environment

adult – a fully grown plant or animal

aftershock – a smaller earthquake which comes after a larger earthquake, occurring in the same area as the original quake

air – a natural resource that people breathe, but cannot see, taste, or smell

air pressure – a force exerted by the weight of air pressing down on everything

amphibian – a cold-blooded vertebrate that starts life in water and lives on land as an adult

analyze – to study the parts of something carefully

animal – an organism made of many cells that moves on its own and eats other organisms

apparent movement – seeing movement of an object when no movement is actually taking place

appearance – something that comes into sight

aquarium – a tank that is used to hold live organisms

aquatic – to live in or be connected with water

Arctic – the area near the North Pole that is covered with ice and snow most of the year

asteroid – a large rocky object that orbits the sun

asteroid belt – doughnut-shaped ring located between the orbits of Mars and Jupiter that contains numerous asteroids

astronaut – a person trained to travel in outer space

astronomer – a scientist who studies the celestial bodies in the universe

astronomy – the study of celestial bodies in the universe

atmosphere – the layer of air that surrounds Earth

attract – to pull toward

attribute – a property or characteristic of an object such as color, size, or shape

autumn – the season following summer, also known as fall

axis – an imaginary line around which a planet rotates

B

bacteria – one-celled organisms with no nucleus

balance – a tool used to measure the mass of an object

barometer – a weather instrument for measuring atmospheric pressure

basic need – something an organism needs to live such as air, water, food, and shelter

battery – a device containing a dry cell that supplies a direct current by converting chemical energy into electrical energy

beaker – a container with a pouring spout and measurement marks

behavioral adaptation – something an organism does to survive, such as migration or hibernation

biologist – a scientist who studies plants and animals

biology – the study of plants and animals

biome – a large region that has a specific climate and specific types of plants and animals

blizzard – a heavy snowstorm with strong winds

botanist – a scientist who studies plants

botany – the study of plants

bulb – the glass part of an electrical lamp that gives off light

buoyancy – the ability of an object to float or rise in a liquid or gas

burial – a process by which layers of sediment or dead organisms are covered by new layers of sediment

buzzer – an electrical device that makes a buzzing noise

C

calculator – a tool used to perform mathematical operations

camera – a tool used to take photographs

camouflage – a color, shape, or pattern that helps an animal blend into its surroundings

canyon – a valley between steep cliff sides formed by running water, such as a river or stream

capacity – the amount that can be held by a container

carbon dioxide – a colorless, odorless gas that animals breathe out and plants use to produce food

career – a job or occupation

carnivore – an animal that eats other animals for food

cave – a natural, hollow, underground space

Celsius – a unit of measure for temperature

Celsius thermometer – a tool used to measure temperature in degrees Celsius

centimeter – a metric unit used to measure short lengths

century – a period of time one hundred years long

change – to make or become different

chaparral – a thicket of dense shrubs, bushes, and small trees

characteristic – a trait or feature

chart – a table or diagram that shows recorded data

chemical splash goggles – a pair of glasses that protects the eyes and surrounding skin from exposure to chemicals

chemist – a scientist who studies the properties of matter

chemistry – the study of matter and its properties

chlorophyll – the green substance in plants that captures sunlight and makes food

chrysalis – the pupa stage of a butterfly, occurring between the larva and adult stages

circuit – the path of an electric current

claim – a statement of something as a fact

classify – to sort objects into groups that are alike in some way

clay – a type of soil, with very fine particles, that is pliable when wet and hard when dry

climate – the pattern of weather conditions in a region over a period of many years

clock – a tool used to measure time

closed circuit – an electrical path with no breaks or gaps

cloud – a group of water droplets or ice crystals floating in the air

cloudy – a weather condition in which clouds are present

coal – a fossil fuel used for energy which was formed from decomposed plant material

cocoon – a case which holds the larva of some insects during the pupa stage

cold front – the leading edge of a cooler air mass

collect – to gather or assemble

collecting net – a tool used for gathering living organisms

collection – the process of the water cycle in which water returns to bodies of water

color – a property of reflecting light

combine – to join

communicate – to give information

community – a group of organisms that live together in the same environment and depend on one another

compaction – a process by which sediment is pressed and squeezed together

compare – to look for ways that objects are alike or different

compass – a tool with a needle that always points to magnetic north

competition – a contest between organisms for food, territory, or other resources

complete metamorphosis – the life cycle of an organism whose appearance changes greatly at each of the four stages

compost – dead and decaying plant matter broken down by decomposers to provide nutrients for plants

computer – a tool that performs calculations and organizes and stores data

concave lens – a type of lens which is thinner in the middle

conclusion – a statement telling the results of an investigation based on data and observations

condensation – the change from gas to liquid as a result of cooling

conductor – a material that easily transfers heat or electricity

conservation – the wise use of natural resources in order to protect them

conserve – to use only what you need

construct – to build or form

consumer – an organism that receives energy by eating other organisms

continuous – repeating without interruption

contribution – the role or influence of an individual

control – a condition or factor that is kept the same throughout an experiment

convection zone – a layer of the sun in which energy is transferred by convection

convex lens – a type of lens which is thicker in the middle

cooling – to make or become colder

core – the innermost layer of Earth, sun, or moon

corona – the atmosphere of gas surrounding the sun

craters – bowl-shaped holes

critique – to analyze

crust – the outermost, rocky layer of the Earth or the moon

current – the flow of electricity through a conductor

cycle – a sequence of events that is repeated over and over

D

data – facts or information

data table – a table used to record facts or information

day – a period of time lasting 24 hours; the amount of time it takes Earth to make one complete rotation on its axis

decade – a period of time ten years long

deciduous forest – a forest containing trees which lose their leaves in fall

decomposer – an organism that receives energy by breaking down dead matter, returning nutrients to the environment

deforestation – to cut down trees in a forest

delta – soil deposited at the mouth of a river, usually in a triangular shape

demonstrate – to show or make evident

density – the amount of matter compacted into a given volume of a substance

deposition – a process by which wind or water drops sediment in a new location

describe – to tell in written or spoken words

desert – an environment with very little precipitation

design – to create or plan

develop – to form into a more complex state

differentiate – to identify the differences between two or more things

direct – straightforward and readily observed

disposal – the action of getting rid of something

dissolve – to mix completely with another substance to form a solution

diverse – varied, unique, or different

dominant trait – the characteristic visible when at least one dominant allele for a trait is inherited

draw – to produce a likeness or to illustrate

drought – a long period of little or no rain

E

Earth – a small, rocky planet that is unique because it has liquid water which enables it to support life

earthquake – a sudden tremor of Earth's surface

eclipse – when one object in space blocks light from reaching another object

ecologist – a scientist who studies the relationships between living organisms and their environments

ecology – the study of the relationships between living organisms and their environments

ecosystem – all living and nonliving things in a certain environment

effect – a change resulting from an action

egg – the first stage in the life cycle of some animals

electrical energy – the form of energy that consists of a flow of electric charges through a conductor

electricity – energy created by charged particles

emerge – to come out or appear

endangered – in danger of dying off or becoming extinct

energy – the ability to do work or cause change

environment – the surroundings of an organism

environmentalist – a scientist who studies and works to solve environmental problems

epicenter – the point on the surface of Earth directly above an earthquake's starting point or focus

equipment – tools used in science investigations

erosion – the movement of sediment by wind, water, or ice

eruption – an ejection of material, such as lava

ethogram – a tool used to record animal behavior and activity

evaluate – to judge or examine

evaporation – the process by which a liquid changes to a gas

evidence – information or proof which helps form a conclusion

examine – to inspect or investigate

exhale – to breathe out

experiment – a test conducted to discover something

experimental investigation – a type of investigation in which variables are tested

experimental test – a procedure followed that uses controls to determine the validity of a hypothesis

explain – to make something clear

explanation – a description of how or why something happens based on observations and investigations

explore – to search or investigate

extinct – a species that is no longer in existence

extinction – the death of all members of a species

F

fall – the season following summer

fault – a place where a break in Earth's crust causes movement

filter – a tool used to separate smaller particles from larger particles

fire blanket – a piece of equipment made of fire-resistant materials used to extinguish fires

fire extinguisher – a piece of equipment that discharges water, foam, or chemicals to extinguish fires

first quarter moon – a moon phase occurring after waxing crescent in which the right half is lit and visible from Earth

float – to stay on top of a liquid or a gas

flood – an event which occurs when a large amount of water overflows onto a normally drier area

flow – the movement of energy, water, mud, or lava

flower – the part of a plant that makes seeds

fog – water vapor which has condensed close to the ground

food chain – the sequence that traces food energy in an ecosystem

food web – a system of overlapping and connecting food chains in an ecosystem

force – a push or pull that causes an object to move, stop, or change direction

forecast – a prediction of the weather

forest – a place with many trees growing close together

formation – the way something is structured or created

formulate – to devise and express in a definite way

fossil – the traces or remains of organisms preserved in rock

fossil fuel – a nonrenewable resource formed from the remains of prehistoric plants and animals

fossilization – the process by which remains of organisms are preserved as fossils

freeze – to change a liquid to a solid

freshwater – water that is not salty

friction – the force that resists motion when two surfaces rub against each other

fruit – the part of a flowering plant that contains seeds

full moon – a moon phase occurring after waxing gibbous in which the entire side of the moon facing Earth is visible from Earth

function – the job or work done by a particular structure

G

gas – a state of matter that does not have definite shape or volume

gas giant – a large, gaseous planet in the outer solar system

generation – a group or level of offspring exhibiting traits inherited from parent organisms

genetic trait – an inherited characteristic determined by the combination of genes from the parent organisms

geologic fault – a break in Earth's crust along which movement occurs

geologist – a scientist who studies the structure of Earth

geology – the study of the structure of Earth

germinate – to begin sprouting from a seed

geyser – a hot spring that erupts by throwing a column of hot water into the air at various intervals

glacier – a large mass of slowly moving ice and snow that carves new features and deposits sediments

gloves – a type of safety equipment used to protect the hands

glucose – sugar produced by plants through photosynthesis

graduated cylinder – a container marked with a graded scale used to measure the volume of liquids

gram – the basic unit of mass in the metric system

graph – a diagram that shows information; to plot information on a diagram showing the relationship between two variable qualities

grassland – an area of land consisting mainly of grasses, such as a prairie, meadow, or savanna

gravel – a type of soil made of large-sized particles and pebbles

gravity – a force that pulls objects toward each other

grazers – herbivores that usually feed on grass

groundwater – water that percolates, or drains, through soil and rocks and collects in underground reservoirs

growth – increase in size

H

habitat – the place in an ecosystem where an organism lives

hail – a form of precipitation made from lumps of ice

hand lens – a handheld magnifying glass

hardness – the ability of a material to resist being scratched

hatch – to break out of an egg

hazard – a possible source of danger

hearing – the sense that receives sound

heat – transfer of energy between two objects when the objects are different temperatures

heating – to make or become warmer

herbivore – a consumer that eats only plants

heredity – the passing of genetic traits from parent organisms to offspring

hibernate – to go into a deep sleep for the winter

hibernation – a survival behavior in which some animals go into a deep sleep for the winter

high pressure – an area where the atmospheric pressure is greater than the pressure of the surrounding areas

history – a record of past events

homogeneous – the same in composition, as in a mixture in which the solute is evenly distributed throughout the solvent

hooves – structures covering the feet of certain animals

hot plate – a burner used for heating materials

human – a person who is a member of the human race

human impact – the effect humans have on the environment

humidity – the amount of moisture in the air

humus – a rich, dark layer of soil made of decaying plants and animals

hurricane – a powerful storm with strong winds and heavy rains

hypothesis – a statement that can be tested by an investigation or observation

I

ice – the frozen, solid form of water

identify – to indicate the characteristics of an object

igneous rock – a rock that forms when magma or lava cools and hardens

illustrate – to make clear using drawings or examples

implement – to carry out or put into effect

incomplete metamorphosis – the life cycle of an organism whose appearance does not change greatly and has three growth stages

increase – to make or become greater

indirect – inferred; not readily observed

individual – a single member of a population of organisms

infer – to reach a conclusion based on something known or assumed

information – knowledge learned through the senses

ingredient – a component of a mixture

inhale – to breathe in

inherited trait – a characteristic passed from parents to offspring

insect – an invertebrate that has three body parts and six legs

insoluble – a substance that will not dissolve in a liquid

instinct – a behavior that is inherited by an organism

insulator – a material that stops or slows the flow of heat, electricity, or sound

interact – to work together

interdependence – the dependence of two or more organisms on each other

interdependent – when organisms depend on each other for survival

interpret – to explain the meaning

invasive species – an organism that is introduced to an area in which it would not have naturally lived

investigate – to observe or study by close examination

investigation – the act or process of using inquiry to gather facts

iron filings – small pieces of iron

J

Jupiter – a gas planet, fifth from the sun, and the largest of all planets

K

key – a part of a map or graph explaining what each symbol means

L

lake – a large body of water with land all around it

landform – a physical feature on Earth's surface

landslide – sudden collapse of land causing a rapid change to Earth's surface

larva – an early stage in the life cycle of an insect

lava – molten rock that erupts from a volcano

leaf – the part of the plant that makes food for the plant

learned behavior – behavior that is taught or acquired through experience

legend – a list explaining the symbols on a map

lens – transparent pieces of glass or plastic used for refracting light

life cycle – the sequence of stages or changes in the life of an organism

light energy – a type of electromagnetic radiation that can be seen

lightning – electricity that moves between clouds or between clouds and the ground

limitation – a shortcoming, defect, or restriction

limited consumption – controlling or limiting the amount of resources used

liquid – matter that flows and takes the shape of its container

liter – the basic unit of capacity in the metric system

litter – trash that is thrown around carelessly

live – to be alive

living organism – something that grows, changes, and makes other living things

loam – a type of soil containing a mixture of other soils and rich in humus and nutrients

logic – a reasonable way to think about or understand something

logical – makes sense based on information learned previously

low pressure – an area where the atmospheric pressure is lower than the pressure of the surrounding areas

lunar cycle – the different appearances of the moon caused by the moon's orbit around Earth

lunar eclipse – an eclipse in which the moon passes partially or entirely through the Earth's shadow

M

magma – liquid, molten rock beneath Earth's surface

magnet – an object that attracts iron or steel

magnetism – the pulling force of a magnet

magnify – to make an object appear larger than it is using a science tool

maintain – to continue or keep going

mantle – the thick layer of rock between Earth's crust and core

map – a visual representation that shows features of an area

marine biologist – a scientist who studies organisms living in saltwater ecosystems

marine biology – the study of organisms living in saltwater ecosystems

Mars – a small, rocky planet; fourth from the sun

marsh – an area of waterlogged land

mass – the amount of matter in an object

matter – anything that takes up space and has mass

measurable – capable of being measured

measure – to use tools to find the length, mass, capacity, or temperature of an object

mechanical energy – the energy in an object due to its position or motion

medium – a substance through which energy or waves travel

melt – to change from a solid to a liquid

Mercury – the smallest planet and closest in relation to the sun

metals – elements that are usually hard, shiny solids and good conductors of heat and electricity

metamorphic rock – a rock that has been changed by heat or pressure into another kind of rock

metamorphosis – a change in the way an organism looks as it grows

meteorologist – a scientist who studies weather, climate, and Earth's atmosphere

meteorology – the study of weather, climate, and Earth's atmosphere

meter – the basic unit of length in the metric system

meter stick – a tool used to measure length

method – a process used for doing something

metric ruler – a tool used to measure the length of an object using centimeters or millimeters

microscope – an instrument that uses lenses to make small objects look larger

migration – the seasonal movement of some animals from one place to another for survival

milliliter – a small unit of capacity in the metric system

mimicry – an animal's resemblance to another organism or object in color, shape, or design in order to escape predators or to attract prey

mineral – a nonliving solid object with a crystal structure found in nature

mirror – a reflective surface, usually silver in color

mixture – a combination of two or more substances that keep their own properties

model – a copy or replica of an object

molt – to shed skin, fur, or feathers

month – one of the 12 parts in which a year is divided, each lasting around 30 to 31 days

moon – a natural satellite in space that revolves around a planet

moon phases – the changes in the appearance of the moon as seen from Earth

motion – movement of an object

movement – the act of motion

N

natural gas – a fossil fuel used for energy which was formed, through heat and pressure, from the remains of ancient plants and animals

natural resource – a material found in nature that is useful to humans

nature – the external world in its entirety

Neptune – a gas planet, eighth from the sun, made primarily of methane gas

new moon – a moon phase occurring after waning crescent in which none of the side of the moon facing Earth can be seen

newton (N) – the SI unit of force

Newton's Laws of Motion – three laws that are used to explain the movement of all objects in the universe

niche – the special role that a species fills in its habitat

night – the period of darkness which occurs each day when the opposite side of Earth is facing the sun

nocturnal – active at night

nonliving component – an object that is not alive

non-native species – a species introduced to an area in which it would not naturally be found

nonrenewable resources – resources that cannot be readily replaced

North Pole – the northernmost point of Earth

notebook – a tool used to record notes, findings, and information gathered during investigations

nutrient – a substance needed by an organism to grow and survive

nymph – a stage of incomplete metamorphosis in which the insect resembles the adult but is not fully developed

O

object – something that can be seen and touched

observable – capable of being observed

observation – the act of gathering information using the senses

observational test – to carry out an investigation using information gathered by the senses

observe – to gather information using the senses

ocean – a large body of saltwater

offspring – the young of a person, animal, or plant

oil – a liquid fossil fuel formed by heat and pressure from the remains of ancient plants and animals

omnivore – an organism that eats both plants and animals

opaque – allowing no light to pass through

open circuit – a broken or incomplete electrical path

orbit – the path an object takes as it moves around another object in space

organism – any living thing

organize – to place things in order

overfishing – to excessively exhaust the supply of fish

overpopulation – a situation that occurs when a population becomes too great in number for the area they occupy

oxygen – a colorless, odorless gas that makes up about one-fifth of Earth's atmosphere and is necessary for life

P

paleontologist – a scientist who studies ancient life using fossils

paleontology – the study of ancient life using fossils

pan balance – a tool used to compare the masses of two objects

parent – an organism that produces offspring

part – a piece of a whole or a system

particle – a small piece or part of a substance

past – occurring in a time period before the present

path – the course or route something travels

pattern – a repeating design or series of numbers or events

permeability – the rate something passes through a medium

petroleum – a liquid fossil fuel, also known as oil, formed from the remains of ancient plants and animals

photosphere – the visible, outer layer of the sun

photosynthesis – the process by which plants use light to produce food

physical characteristic – a physical feature of an object

physical property – a characteristic of a substance that can be observed or measured without changing the substance

physical state – a form of matter

physicist – a scientist who studies force, energy, and motion

physics – the study of force, energy, and motion

physiological adaptation – an adaptation which occurs as a response to an environmental change, such as an animal's heart rate lowering to conserve energy

pitch – how high or low sound is, determined by the frequency of sound waves

plan – to form, design, or develop

planet – a large body that moves in an orbit around a star

plant – a living thing that makes its own food and does not move from place to place

plate tectonics – the movement of tectonic plates on the fluid mantle, causing major geological events such as ocean basins, earthquakes, volcanic eruptions, and mountain building

poaching – to hunt or fish illegally

pole – the place on a magnet where the force is the strongest

pollen – the powdery substance in flowers that is needed to make seeds

pollination – the movement of pollen from the stamen to the pistil of a flower

pollution – material that harms air, land, or water

pond – a small body of freshwater

population – all the members of a species living in the same environment

porosity – the ability to allow fluids to pass through

position – the location of an object

potting soil – a type of soil rich in nutrients

prairie – a grassland area found in North America

precaution – an action taken before a science investigation to guard against possible danger

precipitation – any form of water falling from the clouds to Earth

predation – the feeding relationship in which one species becomes a food source for another

predator – an animal that hunts other animals for food

predict – to tell what you think will happen

pressure – a force applied to something else in direct contact with it

prey – an animal that is hunted and eaten by a predator

primary consumer – an organism in a food chain that eats plants

prism – a transparent, three-dimensional shape used to separate white light into the color spectrum

process – a method or series of steps

producer – an organism that makes its own food

prominence – a steam or gas that erupts from the surface of the sun

property – a characteristic of an object or substance

pull – a force that moves something closer

pupa – the stage of metamorphosis in which an insect changes from a larva to an adult

push – a force that moves something away

Q

question – the problem in an experimental investigation

R

radiative zone – the layer of the sun closest to the core in which energy is transferred to the outer layers

rain – water that falls from clouds to Earth in drops

rain forest – a tropical forest where rain falls almost every day

rain gauge – a graduated weather instrument used for measuring precipitation

rapid – very quickly or swiftly

reasonable – based on logic and good sense

reasoning – to think and understand using logic

recessive trait – a characteristic that is visible only when two recessive alleles for the same trait are inherited

recognize – to identify from knowledge or appearance

reconstruction – restoring an area to replace the resources used

record – to write or draw what has been observed

recycle – to take the resource from a product and use it to make a new product

reflection – light energy that bounces off a surface

refraction – the bending of light rays as they pass from one substance to another

relation – in reference to something

relationship – a connection between two or more things

reliability – the degree to which the results of an investigation are valid and dependable

renewable resources – resources that can be replaced as they are used

repeated investigation – an investigation that is conducted multiple times

repel – to push away

represent – to stand for something else

reproduce – to have offspring or to produce more of a given animal or plant

resource – anything people can use

results – outcomes of an investigation

retain – to hold in or keep

reusable resource – a natural resource that can be used more than once

reuse – to use again

revolve – to travel in a path around another object

Richter scale – a scale used to measure an earthquake's strength or magnitude

river – a large body of flowing water

rock – a hard, nonliving thing made of minerals

role – the function of something in a particular situation

root – the part of a plant that usually grows below the ground, holds the plant in place, and takes in water and minerals

rotate – to turn on an axis

rotation – the act of spinning or turning around a center or an axis

ruler – a tool used to measure the length of an object

runoff – water from rain or melted snow that flows along Earth's surface into bodies of water

S

safe practices – procedures used to keep one safe from danger or harm

safety – freedom from danger or harm

safety equipment – specialized equipment used to protect against health or safety hazards

safety goggles – a pair of glasses worn for protection during science investigations

saltwater – water that has salt in it

sample – a small part of something larger used for analysis

sand – tiny pieces of broken rocks

sand dune – a hill of sand created by the wind

satellite – an object that revolves around a larger object in space

Saturn – a gas planet, second largest and sixth from the sun, with many rings encircling it

savanna – a flat grassland found in tropical and subtropical areas

scale – a ratio on a map comparing actual distances to locations shown on the map

scarcity – something that is in short supply

scavenger – an animal that feeds on the remains of dead animals or garbage

science – a branch of knowledge that uses observations, descriptions, and experimental investigations to explain phenomena

science tools – tools used in science investigations

scientific evidence – information that either supports or disputes a scientific theory or hypothesis

scientific explanation – an explanation of how or why something happens based on observations and investigations

scientist – a person who investigates, researches, and studies processes, patterns, and events

season – one of four periods of the year caused by the tilt of Earth away or toward the sun as it revolves around the sun

secondary consumer – an organism in a food chain that eats primary consumers

sediment – small particles of rock, soil, sand, or shell deposited by water, wind, or ice

sedimentary rock – a type of rock formed when layers of sediment are pressed together and harden over time

sedimentation – the process of settling or being deposited as a sediment

seed – the part of a plant that can grow into a new plant

seedling – a young plant

seismic wave – a vibration that travels through Earth, usually caused by an earthquake

seismologist – a scientist who studies earthquakes

seismology – the study of earthquakes

senses – how we gather information about our surroundings

separate – to take apart

sequence – a specific order or arrangement

shadow – an image cast when light is blocked by an opaque object

shelter – a place where an animal can be safe

SI system of measurement – the International System of Units developed by scientists as a worldwide system of measurement

silt – a type of soil made of fine-grained sediment

sink – to drop to the bottom of a liquid or gas

size – a physical property determined by measuring length, width, or height

sleet – a form of precipitation made of ice pellets

snow – ice crystals that form from water vapor in the air and fall to Earth

soil – the layer of Earth's surface consisting of small pieces of rock, decayed plant and animal matter, and minerals

solar – relating to the sun

solar energy – energy from the sun

solar flare – a burst of energy from the sun's surface

solar system – a star and all the objects in orbit around it

solid – matter that has a definite shape and volume

solubility – a property of a material that enables it to be dissolved in or by another substance

soluble – able to be dissolved in or by a liquid

solute – the substance which is dissolved in the solvent

solution – a mixture of two or more substances that are evenly distributed throughout

solvent – in a solution, the part of the mixture in which other substances are dissolved

sort – to group things by an attribute

sound energy – a type of energy produced by vibrating sound waves

sound wave – a vibration that travels as a wave passing through air, liquid, or solids to cause a sound that can be heard

source – a point where something begins or starts

South Pole – the southernmost point of Earth

species – the smallest group of organisms of the same kind that are able to produce offspring

spring – the season following winter

spring scale – a tool to measure weight using the force of gravity

sprout – to begin to grow

stalactite – a cave formation which grows downward from the ceiling, created by mineral deposits from dripping water

stalagmite – a cave formation which grows upward from the ground, created by mineral deposits from dripping water

star – a huge ball of gases in space that releases heat and light

state of matter – one of the forms of matter

stationary front – a weather front in which the line between a cold front and a warm front is immobile

stem – the part of a plant that holds it up and moves water and food to the other parts of the plant

stopwatch – a tool used to measure time

stream – a body of flowing water that is smaller than a river

stream table – a container used to model the effects of rivers and streams

structural adaptation – a physical feature of an organism

structure – relating to the physical composition of an object

substance – the material something is made of

summer – the season after spring

sun – the star at the center of our solar system which provides energy for Earth

sunspots – dark spots on the sun's surface

support – to help sustain or maintain

surface – the outside layer of something

surface water – the usable freshwater that moves over Earth's surface and is located in creeks, rivers, ponds, lakes, and reservoirs

survive – to stay alive

switch – a device that closes or opens a circuit

system – a group of things or parts that work together

T

table – a structure used to organize and record information in rows and columns

tadpole – the aquatic larva of an amphibian

Taiga – a subarctic forest consisting mainly of coniferous evergreen trees

technology – product designed to meet the needs of research, society, or an individual

tectonic plate – a giant, irregular piece of Earth's outermost layer that moves around on the fluid mantle below

telescope – an instrument that magnifies distant objects and makes them appear closer

temperate forest – a forest with a moderate climate

temperature – how hot or cold something is; a measure of the average kinetic energy of the particles of matter

terrarium – a small, closed container in which organisms can be observed and kept

tertiary consumer – an organism in a food chain that eats secondary consumers

test – to carry out an investigation

testable – a question or hypothesis which can be investigated through experimentation

texture – how something feels

thermal energy – the energy of moving particles that produces heat

thermometer – a tool used to measure temperature in degrees

third quarter moon – a moon phase occurring after waning gibbous, also called last quarter, when the left half of the moon is visible from Earth

threatened – an organism which is at risk of becoming endangered

thunderstorm – a rainstorm with thunder and lightning

time – a measure of the past, present, and future

timing device – a tool used to measure time, such as a clock, stopwatch, or timer

tool – a piece of equipment used to observe, measure, or make a task easier

topsoil – the top layer of soil, often the richest in nutrients for plant growth

tornado – a powerful funnel of very strong winds that can form during a thunderstorm

trait – a characteristic of an organism

translucent – allowing some light to pass through

transparent – allowing all light to pass through

transpiration – the release of water vapor by plants

travel – to move from one place to another

trial – one of several repetitions of an investigation

triple beam balance – a scale that uses three bars to measure the mass of an object

tsunami – a large wave caused by an underwater earthquake

tundra – a flat, cold area with no trees

U

unlimited consumption – consuming a resource without limiting how much of the resource is used

Uranus – a gas planet, seventh from the sun, that is tilted “sideways” so that the South Pole is pointed almost directly at the sun

U-shaped valley – a valley with a characteristic u shape formed by a glacier

V

valid – reasonable and justifiable

valley – low-lying land between mountains or hills

variable – a condition or factor that changes in an investigation so the effects can be observed

Venus – a rocky planet, second from the sun, similar in size to Earth

vibration – a rapid back and forth movement

volcanic – relating to a volcano

volcano – an opening in Earth’s crust through which lava and ash erupt

volume – the amount of space an object takes

V-shaped valley – a valley with a characteristic v shape formed by moving water

W

waning crescent – a moon phase occurring after the third quarter, in which a crescent shape of light is visible on the left side of the moon

waning gibbous – a moon phase occurring after the full moon, in which over half of the moon is visible on the left side of the moon

warm front – the leading edge of a warmer air mass

water – a clear liquid that falls from the sky and fills oceans, rivers, and lakes

water cycle – the movement of water through Earth’s environment

watershed – the region of land drained by a river system

water vapor – water that has changed into a gas

waxing crescent – a moon phase occurring after a new moon, in which a crescent shape of light is visible on the right side of the moon

waxing gibbous – a moon phase occurring after the first quarter, in which over half of the moon is visible on the right side of the moon

weather – the outside atmospheric conditions

weathering – the breaking down of rocks by water, wind, and ice

weather instruments – tools used by meteorologists to gather data

webbed feet – feet with toes which are connected by a membrane

wind – the movement of air

winter – the season following fall

wires – thin strands made of metal used to carry electricity

Y

year – the time it takes a planet to make a complete revolution around the sun

Z

zoologist – a scientist who studies animals

zoology – the study of animals

**5th Grade Ecosystems**

12 Questions

NAME : _____

CLASS : _____

DATE : _____

1. Which statement below best describes an ecosystem?
☐ a) An area with lots of plants and animals. ☐ b) A natural environment.
☐ c) An area made of living and non-living things. ☐ d) An animal's habitat.
2. What is the producer's role in a food chain?
☐ a) To make their own food using the sun's energy. ☐ b) To hunt other animals for food.
☐ c) To break down waste and dead plants. ☐ d) To eat both plants and animals.
3. A deer eats grass and leaves from bushes and trees. What kind of consumer is a deer?
☐ a) herbivore ☐ b) omnivore
☐ c) carnivore
4. A hawk flies low over the grassland, hunting for a prairie dog.
Which organism is the predator?
☐ a) The hawk ☐ b) The prairie dog
☐ c) Neither are predators.
5. Which aquatic ecosystem listed below is an example of brackish water?
☐ a) Lake ☐ b) Pond
☐ c) Ocean ☐ d) Estuary
6. What model is used to show how food chains connect to one another?
☐ a) Energy Pyramid ☐ b) Food Web
☐ c) Ecosystem Drawing ☐ d) Herbivore
7. Which is an example of a food chain?
☐ a) grass, rabbit, snake, owl ☐ b) rabbit, grass, snake, owl
☐ c) grass, fox, mouse, owl
8. Terrestrial ecosystems include forest, rainforest, grasslands, deserts, tundra, and oceans.
☐ a) True ☐ b) False
9. Terrestrial ecosystems means land ecosystems.
☐ a) True ☐ b) False

10. Living things that get energy by eating

☐ a) producer

☐ b) consumers

☐ c) decomposer

11. living things that make their own food

☐ a) producer

☐ b) consumers

☐ c) decomposer

12. a living thing that gets energy by breaking down wastes and dead plants and animals

☐ a) producers

☐ b) consumers

☐ c) decomposers

QUIZIZZ

Food Chains

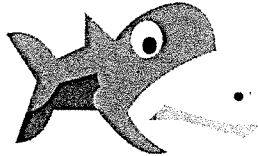
19 Questions

NAME : _____

CLASS : _____

DATE : _____

1. Which best describes what a food chain shows you?



- ☐ a) Energy flow through an ecosystem ☐ b) Food flowing through an ecosystem
☐ c) Consumers going into other consumers ☐ d) Who eats who

2. What are plants called in a food chain?



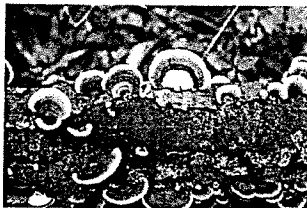
- ☐ a) Producers ☐ b) Consumers
☐ c) Decomposers ☐ d) Scavengers

3. What are animals called in a food chain?



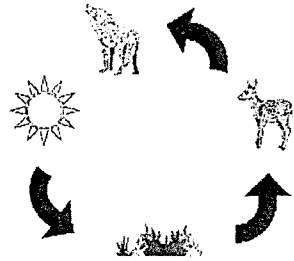
- ☐ a) Producers ☐ b) Consumers
☐ c) Decomposers ☐ d) Plants

4. What are the organisms that break down dead stuff?



- ☐ a) Producers ☐ b) Consumers
☐ c) Decomposers ☐ d) Organisms

5.



Where does the energy start in this food chain?

☐ a) Plant☐ b) Sun☐ c) Deer☐ d) Wolf

6.



What is the role of a producer?

☐ a) Use sunlight to make food☐ b) Gain energy from eating other organisms☐ c) Keep other species from overpopulating☐ d) Breaking down dead stuff

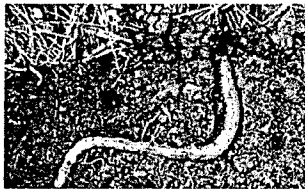
7.



What's the role of consumers in a food chain?

☐ a) Use sunlight to make food☐ b) Eat other species and keep them from overpopulating☐ c) Break down dead stuff☐ d) Add nutrients to the soil

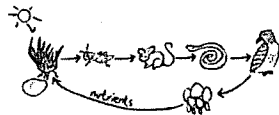
8.



What is the role of decomposers in a food chain?

☐ a) Use sunlight to make food☐ b) Eat other organisms to gain energy☐ c) Make the food for the whole food chain☐ d) Break down dead organisms and add nutrients to the soil

9.



Which of these organisms would receive energy from the snake?

☐ a) Plant☐ b) Rabbit☐ c) Mouse☐ d) Hawk

10.



Which type of consumer eats plants only?

☐ a) Herbivores☐ b) Omnivores☐ c) Carnivores☐ d) Scavengers

11.



Which type of consumer eats meat only?

☐ a) Producers☐ b) Herbivores☐ c) Carnivores☐ d) Omnivores

12.



Which type of consumer eats meat and plants?

☐ a) Herbivores☐ b) Carnivores☐ c) Omnivores☐ d) Plants

13.



Which type of consumer is always a first consumer?

☐ a) Herbivore☐ b) Omnivore☐ c) Carnivore☐ d) Producer

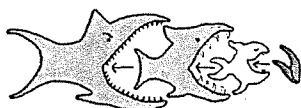
14.



Which type of consumer could be a first or second consumer?

☐ a) Herbivore☐ b) Omnivore☐ c) Carnivore☐ d) Producer

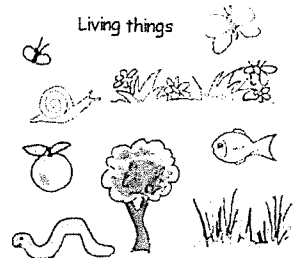
15.



Which is the correct food chain order?

☐ a) Plant--> 1st Consumer--> 2nd Consumer☐ b) Plant <-- 1st Consumer <-- 2nd Consumer☐ c) 2nd consumer --> 1st consumer --> Plant☐ d) 1st Consumer --> 2nd consumer --> Plant

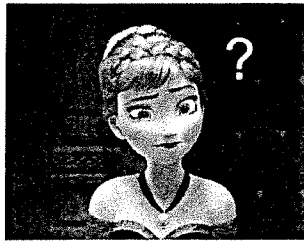
16.



Which of the following is a producer?

☐ a) Maple tree☐ b) Sunfish☐ c) Bunny☐ d) Bear

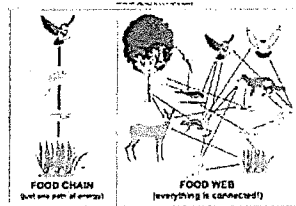
17.



Which of these is a decomposer?

☐ a) Fungi☐ b) Hawk☐ c) Dog☐ d) Grass

18.

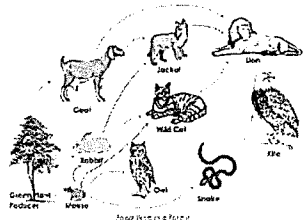


True/False

Food webs show you everything an animal eats. Food chains show you one thing.

☐ a) True☐ b) False

19.



Which of these is true about this food web?

☐ a) The Owl gets its energy from the producer.☐ b) The Lion gets its energy only from a wild cat.☐ c) The Kite gets its energy from the goat.☐ d) The Mouse is most likely to die, several ways.

What are the parts of an ecosystem?

**I will know TEKS 9A**

I will know how organisms live and survive by interacting with living parts of their ecosystem. I will know how organisms live and survive by interacting with nonliving parts of their ecosystem. (Also **1A, 2A, 2B, 2C, 2D, 4A, 4B**)

Vocabulary

ecosystem
habitat
population
community


Did you know that the Panhandle of Texas is part of the Great Plains?

What are the Panhandle of Texas and the Great Plains?

The Panhandle is the part of Texas that borders Oklahoma and New Mexico. On a map, the area looks like the handle of a pan. The Great Plains is a vast area with a grasslands ecosystem. It is located in the middle of the United States.

Can you help me find the Panhandle of Texas on the map?

**Connect to
Social Studies**

Identify a large Texas city that is located in the Texas Panhandle.  **Social Studies TEKS 7B**

Focus on Main Idea and Details

You will practice the reading strategy of identifying **main idea and details**. The **main idea** is the most important idea in a reading selection. Supporting **details** tell more about the main idea.

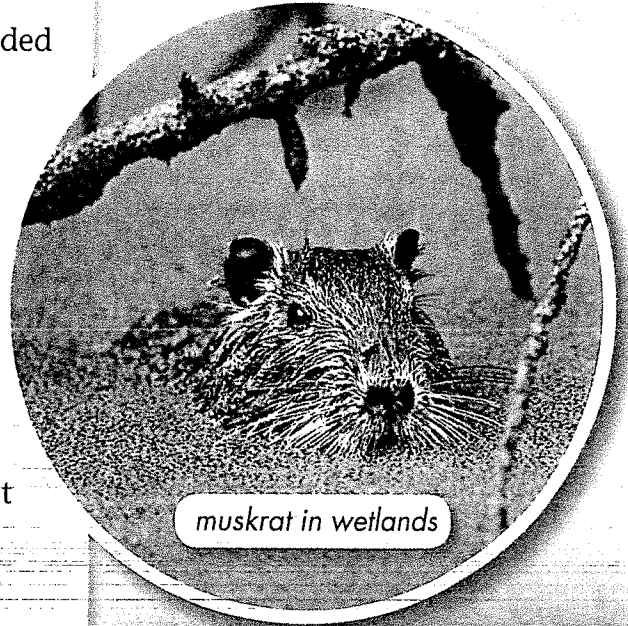
Wetlands

A wetland is partly covered with water or is flooded at least part of the year. There are many kinds of wetlands, including swamps, marshes, and bogs. A swamp has many trees and bushes. Plants such as water lilies, vines, and cypress trees grow in some swamps. Animals such as alligators, turtles, frogs, and insects may live there too.

Another kind of wetland is a marsh, which is grassy with no trees. Muskrats and wading birds often live in this kind of wetland. Bogs are another kind of wetland. Bogs contain peat, a material that floats on the water and is formed by decomposing plants. Evergreen trees, shrubs, and moss are some plants that grow in bogs. Moose, deer, and lynx are some animals that live near bogs.

Connect to

Reading



Practice It!

Complete the graphic organizer below to show the main idea and details in the example paragraph.

Main Idea

Detail

Detail

Detail

★ TEKS 9A, 1A, 2A, 2B, 2C, 2D, 4A, 4B

What do some molds need to grow?

- ☐ **1.** Put on the gloves. Rub some mold from a strawberry onto a piece of bread and onto a piece of foil.
- ☐ **2.** Put the bread in a bag. Put the foil in the other bag. Place 10 drops of water onto the areas where you rubbed the mold.
- ☐ **3.** Place the sealed bags in a warm, dark place for 4 days. Use a hand lens to **observe** the way the mold organism lives and survives in the ecosystem by interacting with nonliving elements.
- ☐ **4. Communicate** What did you observe in each bag?

 _____

Explain Your Results

- 5. Draw a Conclusion** Why did the mold grow only in one bag?

Materials

protective gloves
moldy strawberry
bread slice (without preservatives)
foil square
2 resealable plastic bags
plastic cup with water
dropper
hand lens

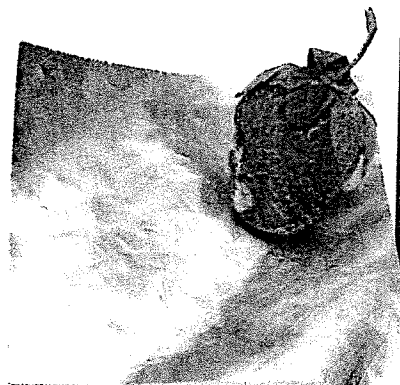
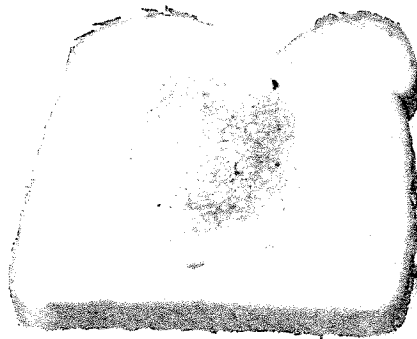


Texas Safety LAB RULES

Tell your teacher if you have allergies, such as to certain foods or to latex gloves.

Use safety equipment by wearing protective gloves.

Wash your hands thoroughly upon completing the activity.



Ecosystems

An **ecosystem** is all the living and nonliving things in an area and their interactions.

Ecosystems can be large, like a desert, or small, like a puddle. Even your classroom can be considered an ecosystem. The organisms in an ecosystem live in a habitat. A **habitat** is a place that provides all the things an organism needs to live. These things include food, water, and shelter.

There are many parts to an ecosystem. For example, ecosystems contain biotic and abiotic factors. Biotic factors are all the living organisms in an ecosystem, such as plants, animals, bacteria, and fungi. Abiotic factors are the nonliving parts in an ecosystem. Air, water, soil, temperature, and sunlight are some abiotic factors.

- 1. Main Idea and Details** Complete the graphic organizer below. Write two details about ecosystems.

An aquarium ecosystem has similar elements to a pond ecosystem. Organisms live and survive in their ecosystem by interacting with living and nonliving elements.

Main Idea

There are many parts to an ecosystem.


Ecosystems can be large or small.

Detail

Detail

Detail

Algae interact with the nonliving elements (abiotic factors) in an aquarium ecosystem when it uses sunlight that comes through the glass to make its food.



Freshwater snails interact with other living organisms when they eat algae that grow on the glass and other items inside the tank of an aquarium.

Plants and animals in the aquarium interact with nonliving elements: carbon dioxide and oxygen. Plants use carbon dioxide exhaled by fish and other animals to make their food. The animals use the oxygen the plants give off to live.

Living elements in the aquarium ecosystem interact when they mate and when they eat other organisms. When fish mate, they produce young that can be food for other species.

2. Identify Read the description of the ecosystems on these pages. **Underline** the details in each description that tell how some organisms survive in their environment.

3. Classify What is an example of a population in the picture below of the coral reef?



Types of Ecosystems

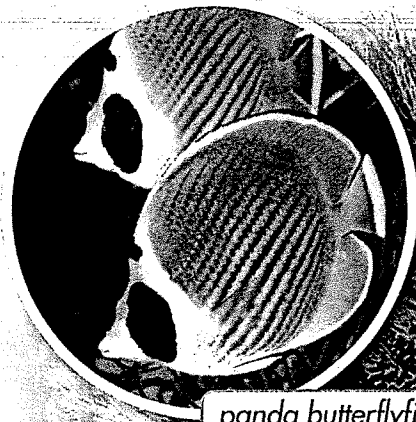
There are many different types of ecosystems. The abiotic factors in an ecosystem often determine what kinds of organisms live in it. For example, only organisms that can withstand the extreme heat and dryness of a desert can live there.

Organisms in an ecosystem often have similar traits, or characteristics. These traits help them survive in their ecosystem. Frogs, turtles, and alligators have webbed feet that help them swim in a water ecosystem, such as a swamp.

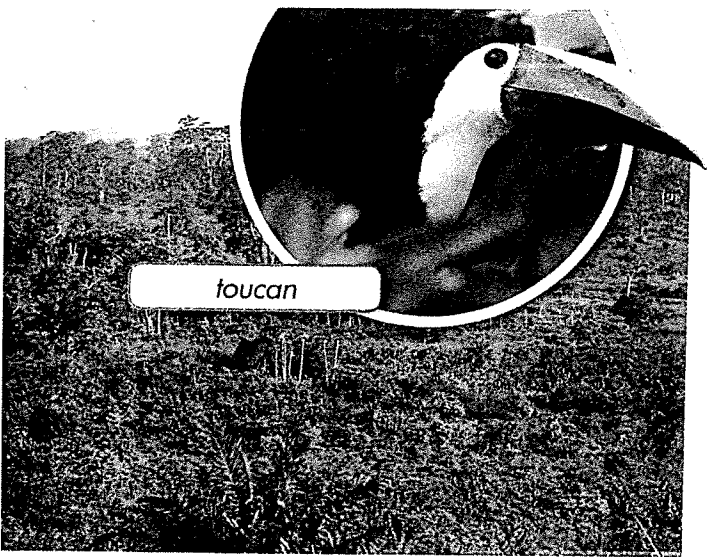
All types of ecosystems contain populations and communities. A **population** is a group of organisms of one species that live in an area at the same time. A population may be all the oak trees in an area. Different populations in an area make up a **community**. A community may have populations of oak trees, maple trees, and pine trees. Members of a community depend on one another to fill their needs, such as food and shelter.

Coral Reef

Organisms that live in a coral reef have traits that help them live in warm, clear, shallow water. For example, some algae carry on photosynthesis. As a result, they grow only in shallow water where sunlight can reach them. The coral reef can support the algae, which produce food for other organisms, including the coral. A coral reef may have many colorful animals, such as clown fish, anemones, and sponges. A reef is made up mostly of the skeletons of dead coral animals. The coral animals on the top part of the reef are alive.



panda butterflyfish



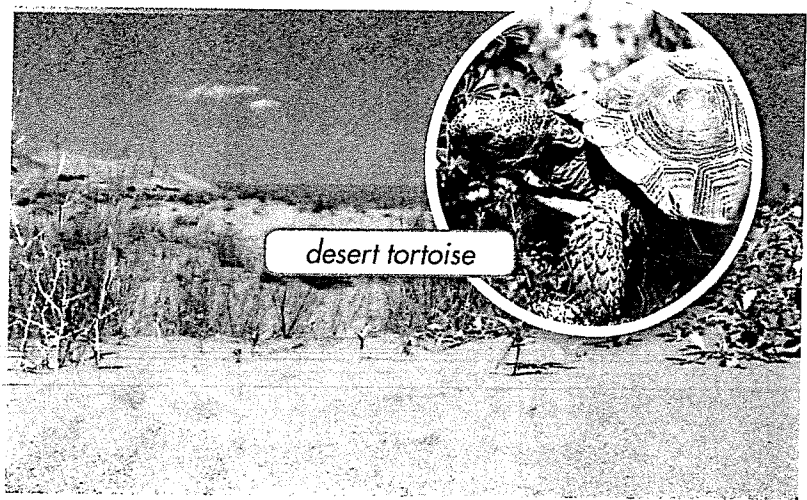
toucan

Tropical Rain Forest

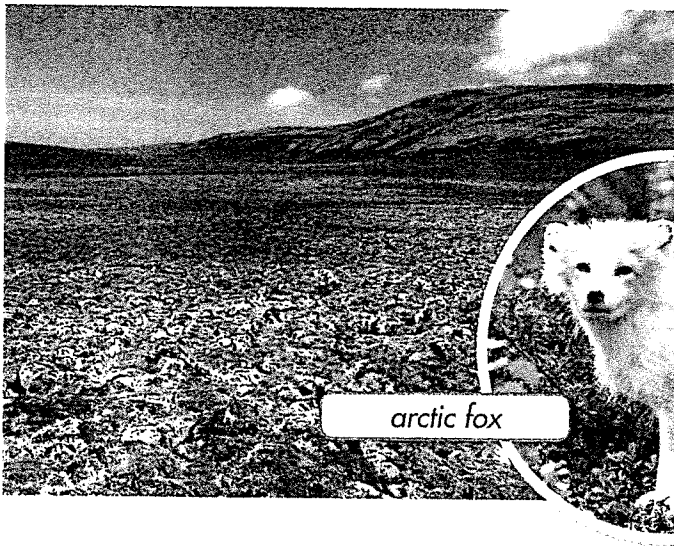
The traits of organisms that live in a tropical rain forest help them survive in a warm, rainy climate all year long. The shape of the leaves of some plants cause rain drops to fall off the plants quickly. The high amount of moisture in the air allows other plants, such as orchids, to grow on trees, not in soil. Butterflies, tree frogs, monkeys, and parrots are some animals that live in this ecosystem.

Desert

Deserts have little rain. Most have hot days and cool nights. Some deserts have sand dunes. Some are rocky. Others are covered by a layer of salt. Organisms living in the desert have traits that help them survive the hot, dry conditions. Plants, such as cactuses, can store water in their stems when it rains. To deal with high temperatures, many animals rest during the day. Animals such as coyotes, desert tortoises, lizards, and rattlesnakes live in deserts in the United States.



desert tortoise



arctic fox

Tundra

The traits of organisms that live in a tundra help them survive cold weather with little rain. Thick fur coats cover many of the animals that live there. Most tundras are found in the most northern areas of Earth or high up in mountains. Rodents, rabbits, and caribou feed on small plants and grasses. Weasels, polar bears, and foxes also live on the tundra.

4. **Compare** How are the traits of organisms living in a desert similar to the traits of organisms living in a tundra?

.....

.....

Balance in Ecosystems

Every organism in an ecosystem has a niche and a habitat. A *niche* is the role that an organism has in an ecosystem. The niche of a northern pygmy owl in the mixed forest is that of a hunter. It eats small animals, such as mice and chipmunks. A habitat is the place where an organism lives. A habitat is made up of the soil, air, and water, as well as the plants of the area. The habitat of northern pygmy owls is the trees and the land on which they live. The trees' habitat is the land.

All the relationships among the parts of an ecosystem keep it balanced. For example, in a forest owls eat small animals, such as mice. If the number of mice in the forest decreases, the owls have less food. So, the number of owls will decrease. But with fewer owls hunting, fewer mice will be eaten. As a result, the population of mice will grow. Then, with more mice to hunt, the number of owls will increase again. In this way, the populations of owls and mice balance.

northern pygmy owl
hunting a mouse



5. Main Idea and Details Read the first paragraph again. **Underline** the main idea. **Circle** the details.

6. CHALLENGE Think of a local ecosystem. Draw an organism you might find there. Label your organism and describe its niche.



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Limiting Factors

The number of organisms that can live in a habitat is called the carrying capacity. Factors that limit the carrying capacity of a habitat are the amount of food, water, space, and shelter. With the right conditions, such as plenty of food, few diseases, and few predators, a population in a habitat will grow larger. But a population may grow only to a certain size and still have all its needs met. Overcrowding may happen if a population grows larger than the carrying capacity. When overcrowding occurs, food supplies can run out. Organisms must move to another area or they will not survive.

7. **Predict** What may happen to the population of deer if it increases too much?

.....

.....

.....

Lab[®] zone Quick Lab

Eco-Walk

With an adult, take a walk outside. Observe and record the living and nonliving things you see. Then read about ecosystems in your region and compare what you learn with what you observed outside.

TEKS 9A



black-tailed deer

Got it?

3. **Describe** Identify an ecosystem near where you live. Describe the living and nonliving things in that ecosystem.

.....

.....

4. **Compare** How are the traits of some plants living in a tropical rain forest similar?

.....

.....

Stop! I need help with

Wait! I have a question about

Go! Now I know

Texas



LESSON

2

How do organisms interact in ecosystems?



I will know TEKS 9A, 9B

I will know how organisms interact with living and nonliving elements in their ecosystem. I will describe how energy flows and is transferred through an ecosystem. (Also 1A, 2B, 2C, 2D, 2F, 4A)

Vocabulary

predator
prey
producer
consumer
decomposer
food chain
food web

Connect to Math

 **Math TEKS 2B**

Zebra mussels are not a native species in North America. They were first discovered in the mid-1980s in Lake St. Clair, Michigan. It is believed that the zebra mussels were brought in on ships from eastern Europe. Zebra mussels multiply quickly, and they have no natural predators in North America.

Zebra mussels are now found in many lakes in North America, including some in Texas. They are a threat to native species because they out-compete these species. Zebra mussels consume food, shelter, and other resources quickly.

Very young zebra mussels are extremely small and are able to swim. If the shells of two young zebra mussels measure 0.099 mm and 0.110 mm, use the symbol $>$ or $<$ to indicate which shell is larger.

0.099 mm ____ 0.110 mm



Quick Lab

TEKS 9A, 1A, 2B, 2C, 2D, 2F, 4A

How do organisms survive in their ecosystems?

- ☐ 1. Your teacher will take you to the area where you will observe interactions in an ecosystem. Demonstrate safe practices during an outdoor investigation by observing the boundaries of the area you are studying and by staying within those boundaries. Demonstrate the use of safety equipment during an outdoor investigation by wearing the kinds of shoes and clothing described on the right.
- ☐ 2. **Observe** the way organisms in the area live and survive in their ecosystem by interacting with the living and nonliving elements. Using your hand lens, collect and analyze information by observing plants or other tiny living organisms.
- ☐ 3. **Record and analyze** information, including your detailed observations, using your science notebook. Make sketches of any interactions that you want to illustrate.

Explain Your Results

- 4. **Draw a Conclusion** Analyze and interpret your information to construct reasonable explanations from direct (observable) evidence. Explain how an organism survives in its ecosystem by interacting with other living organisms.

Materials

hand lens

science notebook



Texas Safety LAB RULES

Demonstrate the use of safety equipment during outdoor investigations.

Wear shoes that enclose the feet.

In hot weather, you may want to wear lightweight, loose-fitting, and light-colored clothing.

Stay in the area directed by your teacher.

Tell your teacher if you have allergies, such as to certain plants or foods.

Wash your hands thoroughly upon completing the activity.



Interactions in Ecosystems

Ecosystems are made up of living and nonliving things. The living things in ecosystems interact with each other in a variety of ways. Some organisms help one another meet their needs. Some organisms may eat other organisms and get energy or nutrients from them. Some organisms compete with one another for space or food.

In some ecosystems, birds may flock near larger animals. The animals may disturb insects in high grasses. As the insects fly or jump away, the birds are able to catch them for food. The birds are helped by this relationship, but the larger animal is not affected.

Some animals in an ecosystem must hunt other organisms to fill their energy needs. In this type of interaction, only one organism is helped. An animal that hunts and eats another animal is called a **predator**. Any animal that is hunted by others for food is called **prey**. The predator gets energy from the prey when the predator eats the prey.



Ticks are parasites. They often feed on the blood of deer, birds, and other organisms. If too many ticks feed on an animal or if the tick infects the animal with a disease, the animal can become weak and die.

Each environment or ecosystem has its own relationships among organisms. These white-tailed deer eat the grass in the field. The grass is a living organism that makes its own food by photosynthesis.



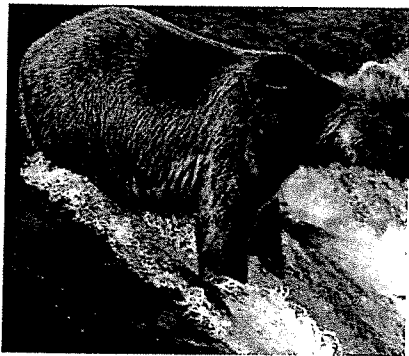
Cottontail rabbits often are found in the same environments as white-tailed deer. Rabbits also eat plants. So white-tailed deer and cottontail rabbits could compete for the same plants as food.



These plants make their own food. They are producers.



*The moose eats the plants.
Moose are herbivores.*



*Bears are omnivores.
They eat plants and animals.*

Energy Roles in Ecosystems

Perhaps the most common interaction in an ecosystem occurs when organisms get energy. All organisms need energy to live. How an organism gets its energy determines its energy role. An organism's energy role makes up part of its niche in an ecosystem. Each organism in an ecosystem fills the energy role of producer, consumer, or decomposer.

Producers

Plants and some other organisms are producers.

Producers make their own food for energy. Most producers use energy from the sun to make food. Some producers use chemicals from their environment for energy. Producers either use the energy to grow or store it for later. The food they make is often a source of energy for other organisms.

Consumers

Many organisms depend on producers to get energy.

Consumers are organisms that cannot make their own food. They get energy from producers or other consumers. All animals and some microorganisms are consumers.

There are several kinds of consumers. They are classified by what they eat. Herbivores, such as moose, eat only plants. Carnivores eat only other animals. One example of a carnivore is a lion. Omnivores eat both plants and animals. Black bears are omnivores.

Some carnivores feed on dead animals. These consumers are called *scavengers*. Vultures and hyenas are two examples of scavengers.

2. Give an Example Write two examples of consumers. Tell whether they are herbivores, omnivores, carnivores, or scavengers.



.....

.....

.....

.....

1. Classify Classify each animal in these pictures as predator or prey. Explain their roles.



Great horned owls also might share the ecosystem with the other organisms.

Snakes also are found in this type of ecosystem. This rat snake eats mice, rats, and other small animals, as well as eggs. The snake is the predator, and a mouse or a rat is the prey in this relationship.



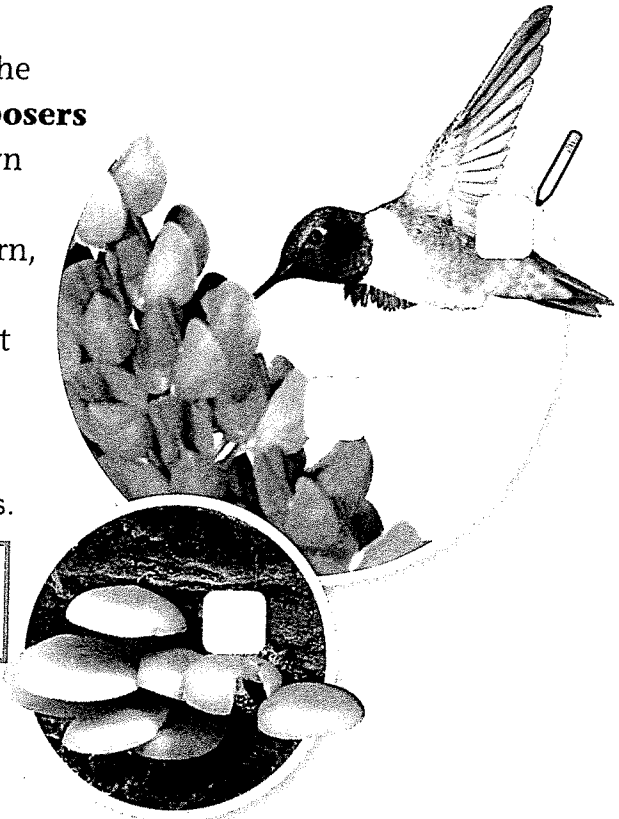
Decomposers

Producers and consumers take in nutrients from the environment as they use energy and grow. **Decomposers** are organisms that get their energy by breaking down wastes and dead organisms. During this process, decomposers return materials to an ecosystem. In turn, other organisms reuse these materials for their own needs. Most decomposers are too small to see without a microscope.

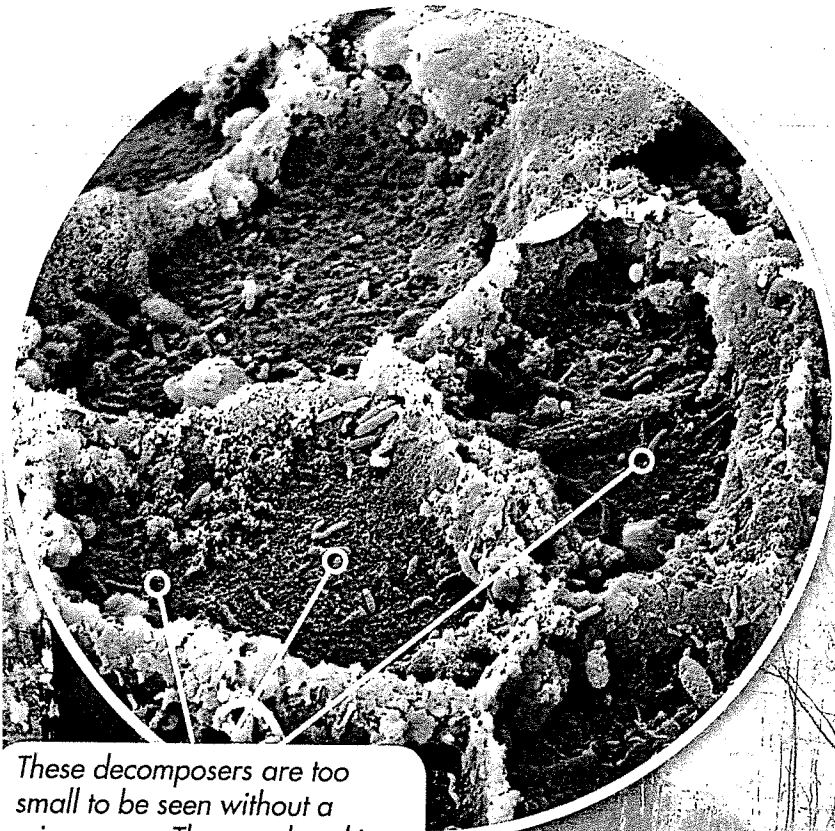
- 3. Classify** Read the caption to the right about the organisms shown. Use the key to label the organisms.

Key

C = consumer **P** = producer **D** = decomposer



The plant gets its energy from sunlight. The hummingbird sips nectar from the plant's flower for food. The mushrooms get energy from the dead tree.




These decomposers are too small to be seen without a microscope. They are breaking down a dead leaf.





Quick Lab

You in the Food Chain

Think about a fresh food you ate or drank yesterday, such as an apple or a glass of milk. Describe how the flow of energy derived from the sun, used by producers to create their own food, is transferred through a food chain to you.  **TEKS 9B**


Food Chains

Energy passes through an ecosystem when food is eaten. This energy often begins as the sunlight that producers, like plants, use to make food. Energy can take many different paths in an ecosystem. This movement of energy through an ecosystem can be shown in food chains. A **food chain** is a series of steps by which energy, derived from the sun, moves from one type of living thing to another. The shortest food chains involve only a producer, which uses the energy from the sun to create its own food, and a decomposer. Other food chains involve a carnivore or an omnivore too. Arrows on a food chain show the path in which energy moves.

4. **Fill in the Blanks** Write a word that best describes each part of the Prairie Food Chain diagram below.

Prairie Food Chain

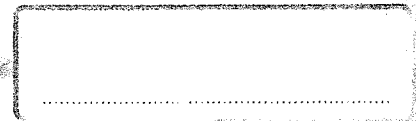
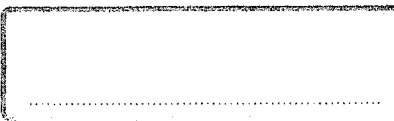
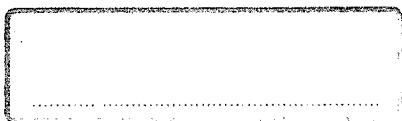


 Grass is an example of a

Deer eat grass. They are

Coyotes eat deer. They are

5. **Sequence** Water oak trees are a source of food for termites. Black bears often look in rotting logs for insects such as termites to eat. Make a food chain for these organisms.



Food Webs

Relationships among organisms in an ecosystem can be complicated. There are many food chains in an ecosystem, but a food chain can describe only one way energy flows in an ecosystem. To see how these food chains are all connected in an ecosystem, you can use a food web. A **food web** is a diagram that combines many food chains into one picture. Like a food chain, a food web uses arrows to show the energy relationships among organisms as the energy flows from the sun to producers that use it to make their own food, and then to consumers.

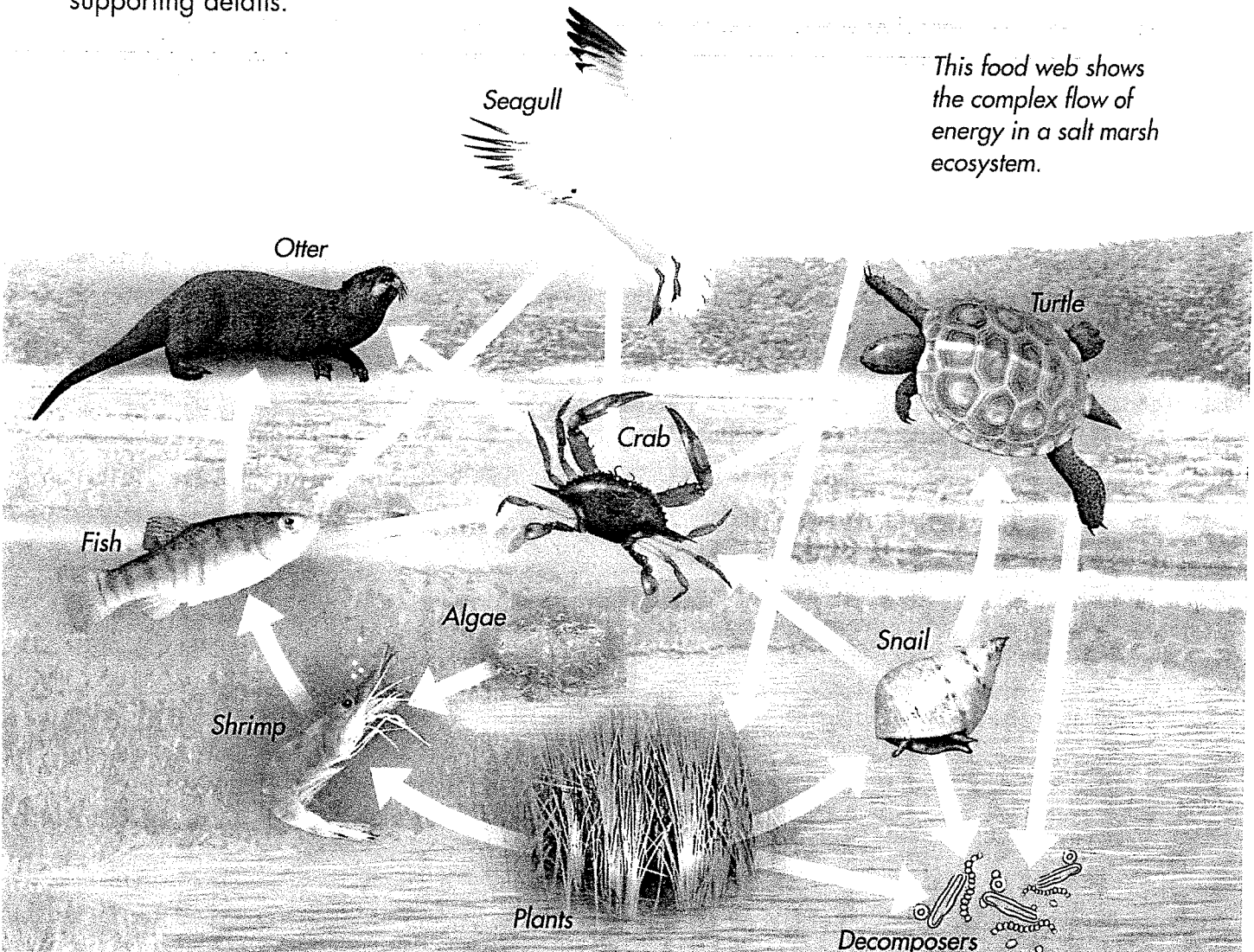
At any point in the food web, a consumer or a producer may die. The energy from the Sun that has been stored in its body can then be used by decomposers, such as fungi and bacteria.

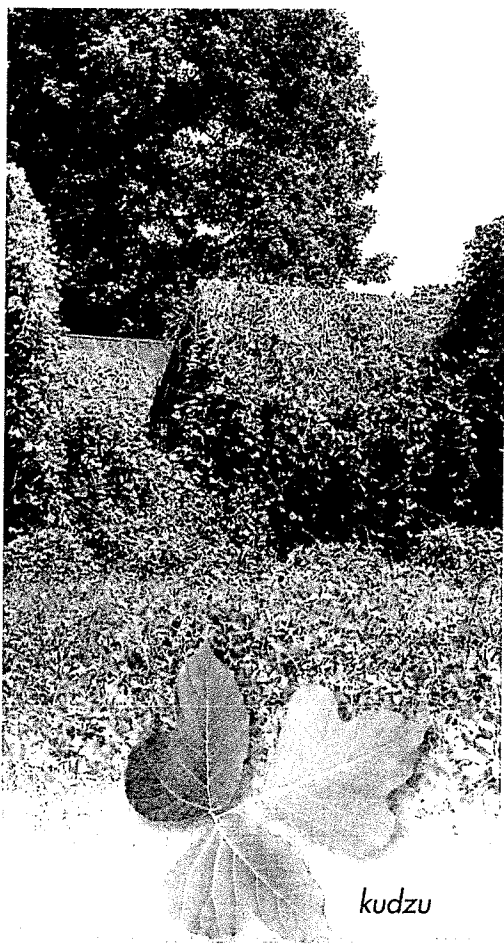
6. **Main Idea and Details** Underline the main idea in the paragraph about food chains. Circle the supporting details.

7. Look at the food web below. Describe how the energy derived from the sun, used by producers to create their own food, is transferred through the web to consumers and decomposers.

Sun

This food web shows the complex flow of energy in a salt marsh ecosystem.





Roles in Ecosystems

Every organism in an ecosystem has a niche, or role in that ecosystem. A niche includes the type of food the organism takes in, how it gets its food, and which other species use the organism as food. An organism may compete for the things it needs. Plants may compete for sunlight, soil, or water. Animals may compete for territory, water, light, food, or mates. For example, male black bears will compete with each other for territory and mates. Rabbits, mice, and other animals of a desert community compete with one another for plants to eat. An animal that cannot compete may die or be forced to move away.

- 8. Infer** Kudzu is a vine that quickly grows and covers other plants. What is one resource for which kudzu competes with other plants?

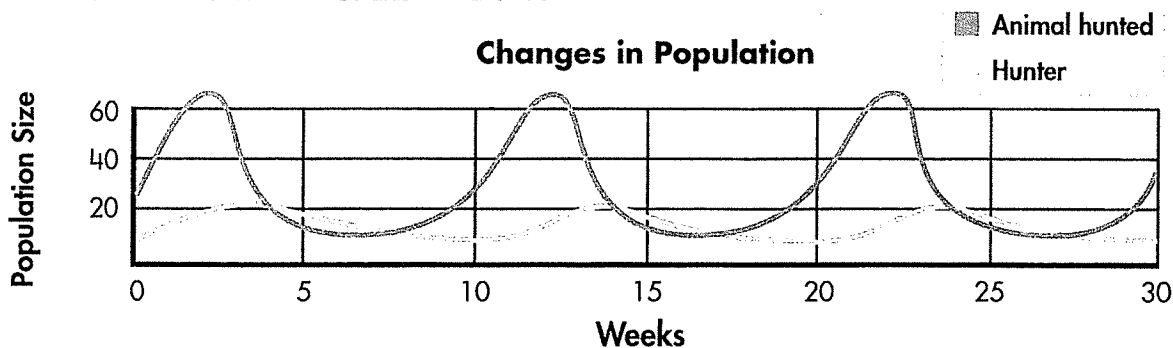
Connect to Math

Math TEKS 1A, 1B, 9C

Read a Graph

The graph shows how the population sizes of a hunter, such as an owl, and the animal it hunts might change over time. Use the graph to answer these questions.

- 1** Which is a reasonable estimate for the difference between the greatest and the least number of hunters?
- A.** 5 **B.** 12 **C.** 22 **D.** 40
- 2** What happens after the hunter's population becomes greater than the hunted animal's population?
- A.** This never happens.
B. The hunter's population decreases to zero.
C. The hunter's population decreases.
D. The hunted animal's population increases.

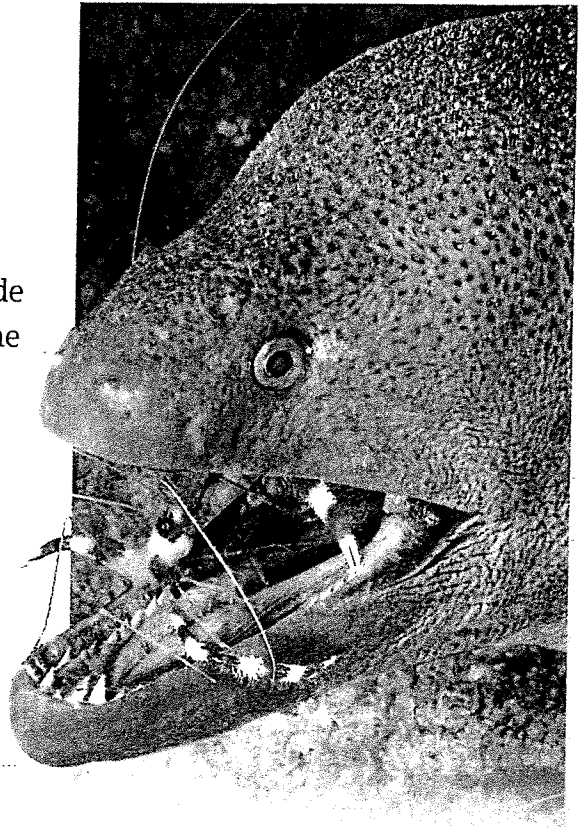


Symbiosis

A long-term relationship between two different organisms is called symbiosis. One organism is always helped. The other organism might be harmed, helped, or not affected. A *parasite* is an organism that lives on or inside of another organism. Parasites take nutrients away from the organisms where they live, which harms organisms.

In other relationships, both organisms are helped. For example, the cleaner shrimp eats parasites from the eel's mouth. The shrimp gets food and the eel keeps its teeth clean and free of parasites.

9. **CHALLENGE** Think about the interaction between bees and apple trees. How is this an example of symbiosis?



moray eel with
cleaner shrimp

Got it?

1. **Compare and Contrast** How are food chains and food webs alike and different?

1. **Describe** What are the roles of producers, consumers, and decomposers in a food chain?

Stop! I need help with

Wait! I have a question about

Go! Now I know

Fungal Gardens



***Atta texana*, a species of leaf-cutter ant in Texas, grows its own food in underground gardens. These leaf-cutter ants cut green leaves from plants. Then, they carry the leaves through underground tunnels to garden chambers. Inside these chambers, specific kinds of fungi decompose the leaves. The fungi grow and reproduce using the leaves as their food source. The fungi are the ants' primary food source.**

The ants and fungi have a symbiotic relationship in which both species benefit from the relationship. The fungi get food and shelter, and the ants get a food source.



These ants are carrying ant larvae in the fungal garden. The green pieces in the photo are fragments of green leaves.

This colony of Texas leaf-cutting ants has collected leaves from several species of plants. They use the chewed-up leaves to grow a fungus in their nest. Describe how the flow of energy derived from the sun, used by producers to create their own food, is transferred through a food chain to a decomposer.

Texas



LESSON

3

How do ecosystems change?



I will know TEKS 9C

I will know that living things, including humans, can change ecosystems. I will know how to predict the changes in ecosystems caused by living organisms, including humans. (Also 1A, 1B, 2B, 2C, 2D, 2F, 4A)

Vocabulary

environment
competition



I heard about plans to build a huge new shopping mall just outside of San Antonio.

I am not sure. They didn't say anything about that on the news.


Wow! Think of all the organisms that the mall will affect.

What is going to happen to the ecosystem where they want to build the mall?



Connect to

Social Studies

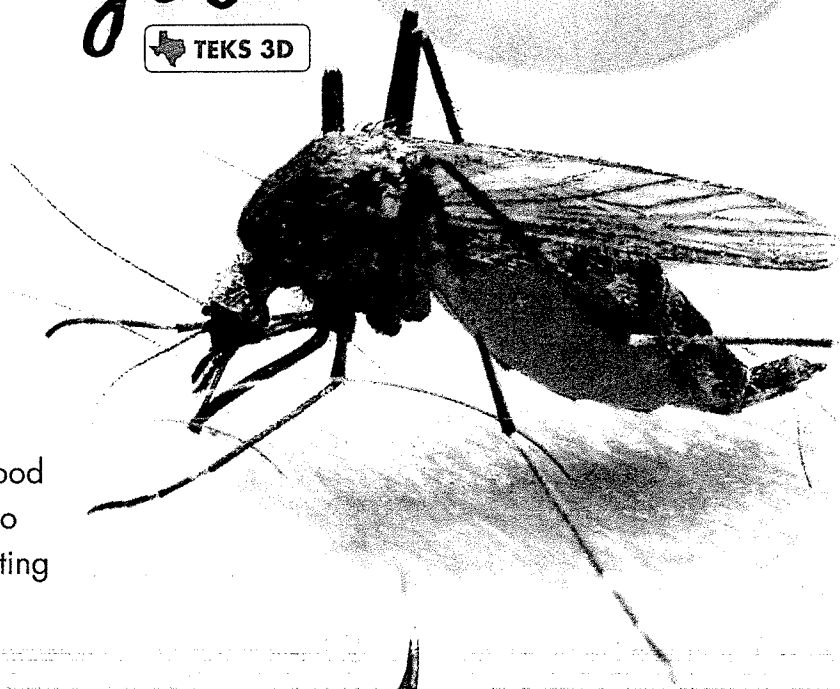
Write two well-organized paragraphs that describe how you think the ecosystem might be affected if a new shopping mall is built.  **Social Studies TEKS 26A**

Entomologist

Science
Careers

TEKS 3D

If you find insects interesting, you might want to become an entomologist. An entomologist studies insects, which are a large group of organisms on Earth. Some insects, like mosquitoes, are considered pests. Mosquitoes can carry diseases, such as malaria and West Nile virus, that infect humans. Other insects, like honeybees, are considered beneficial. Honeybees pollinate crops and help ensure that farmers get a good crop yield. Entomologists might study how to control mosquitoes to keep people from getting sick, or they might study factors that reduce bee populations.



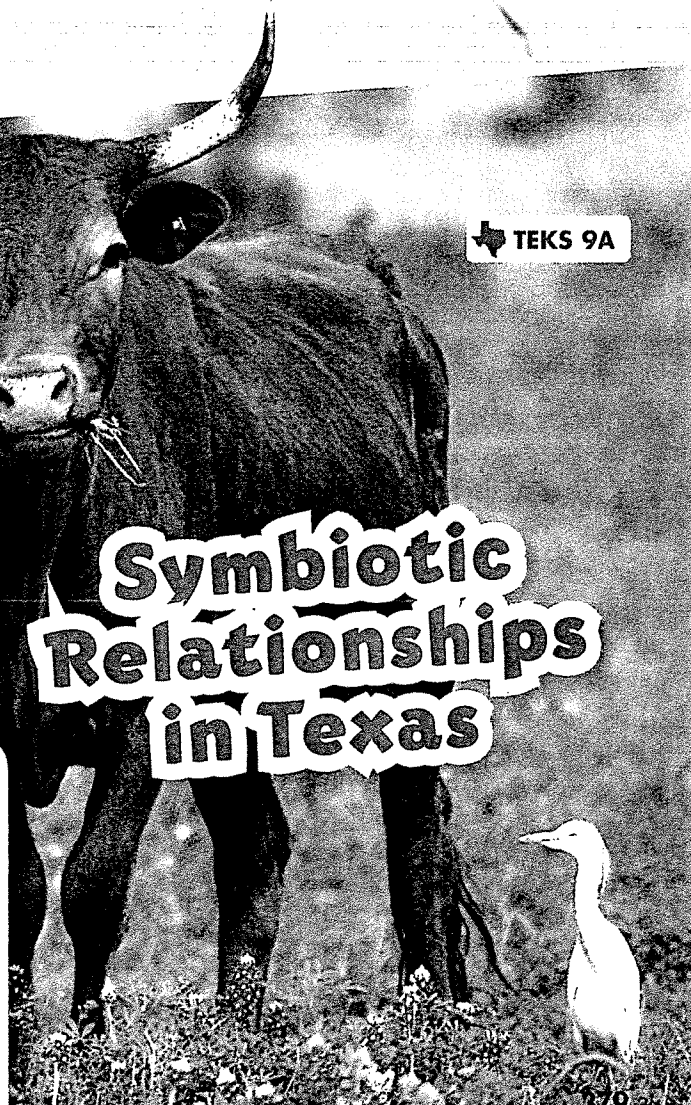
Symbiotic relationships are common in Texas. Cattle egrets are birds that follow grazing animals and eat the insects that the cattle scare with their movements. When the insects fly, the egrets catch them and eat them. Brown-headed cowbirds lay their eggs in the nests of other birds. When the cowbirds hatch, they compete for food against the baby birds from the nest. The offspring of the nest builders die, and the nest builders raise the cowbirds.

TEKS 9A

Symbiotic Relationships in Texas

Infer What might happen if the population of brown-headed cowbirds increases in an ecosystem?

0



TEKS 9C, 1A, 2B, 2C, 2D, 2F, 4A

What does a microscopic ecosystem look like?

- ☐ **1.** Use a marker and masking tape to label your plastic jar or bottle. If possible, your teacher will take you to collect a sample of pond water from an outdoor pond.
- ☐ **2.** Demonstrate the use of safety equipment by wearing protective gloves. Use your jar or bottle to transport your pond water sample.
- ☐ **3.** Follow your teacher's instructions and prepare a microscope slide with cover using the pond water.
- ☐ **4. Observe** Collect information by using a microscope to observe the pond water. **Draw** a picture of what you see under the microscope in your science notebook.
- ☐ **5.** Use the lid to *loosely* cover the jar or bottle. Place the jar in a sunny window for a week.
- ☐ **6.** Repeat Steps 3 and 4. Note: Pond water often contains water fleas, insect larvae, and other organisms that are small but not microscopic. These are easy to observe. Collect and analyze information about these organisms using a collecting net to catch and observe them separately.

Explain Your Results

- 7. Communicate** Analyze information using a microscope. Explain what happened in the jar or bottle during the week.

- 8. Analyze and Interpret** Did the ecosystem change over time?

Materials

marker
masking tape
clear plastic jar or bottle with lid
protective gloves
pond water sample
dropper
microscope slide
microscope slide cover
microscope
collecting net (optional)

Texas Safety LAB RULES

In hot weather, you may want to wear lightweight, loose-fitting, and light-colored clothing.

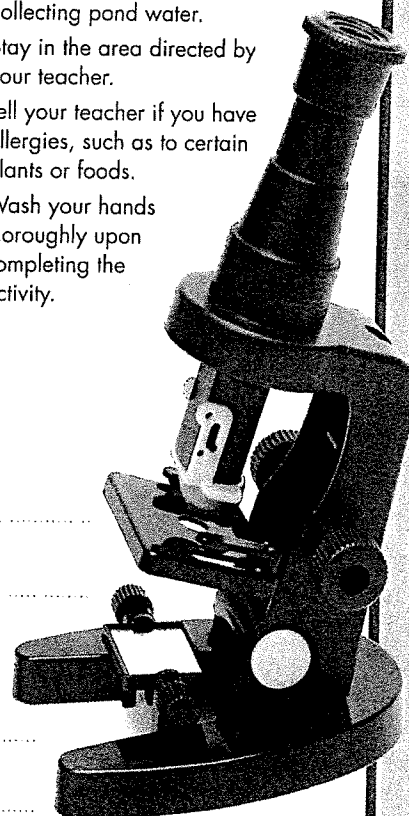
Wear shoes that enclose the feet.

Wear protective gloves when collecting pond water.

Stay in the area directed by your teacher.

Tell your teacher if you have allergies, such as to certain plants or foods.

Wash your hands thoroughly upon completing the activity.



Environmental Changes

All organisms live in particular environments where their needs are met. An **environment** is all of the conditions surrounding an organism. Environments may be hot or cold and on land or in water.

Environments change naturally as resources change. For example, a population of millipedes lives in an environment with dead plant matter. As the population grows, it needs more food, water, and living space. As these resources decrease, each millipede will have less food, water, and space. Some millipedes will die or move away. More resources will be available for the remaining millipedes. The population will grow, and the cycle will start again. Species must change to take advantage of new opportunities and protect themselves from new dangers in a changed environment.

- 1. Explain** Puddles like this may be home to frogs, fish, worms, or fairy shrimp. Which of these animals might be able to survive after the puddle is dry? Why?

- 2. Cause and Effect** Use the graphic organizer to list one cause and one effect from the text.

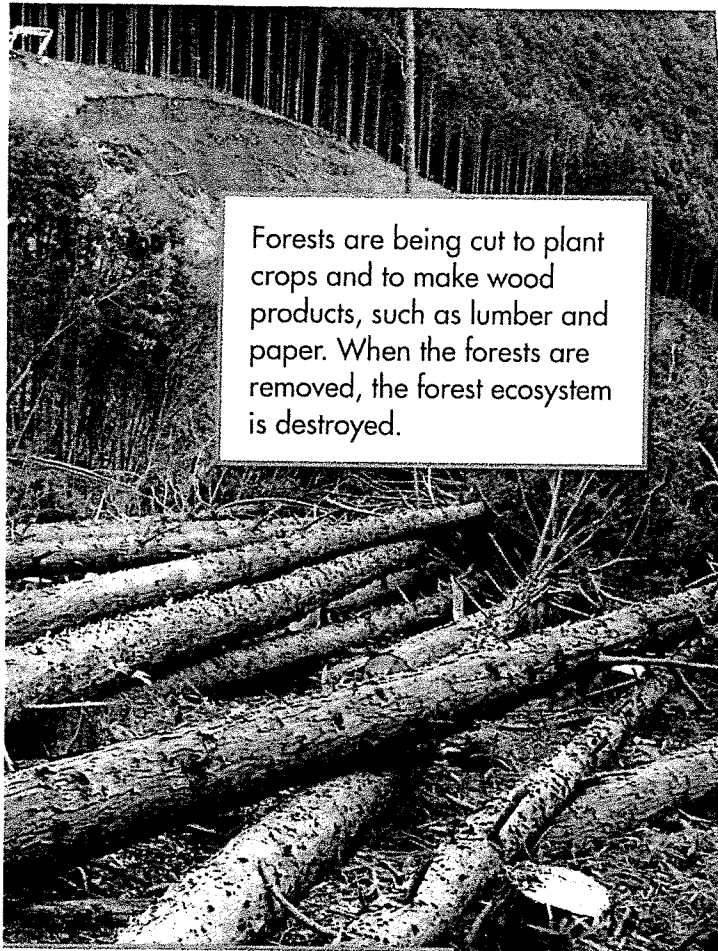
Cause

Effect

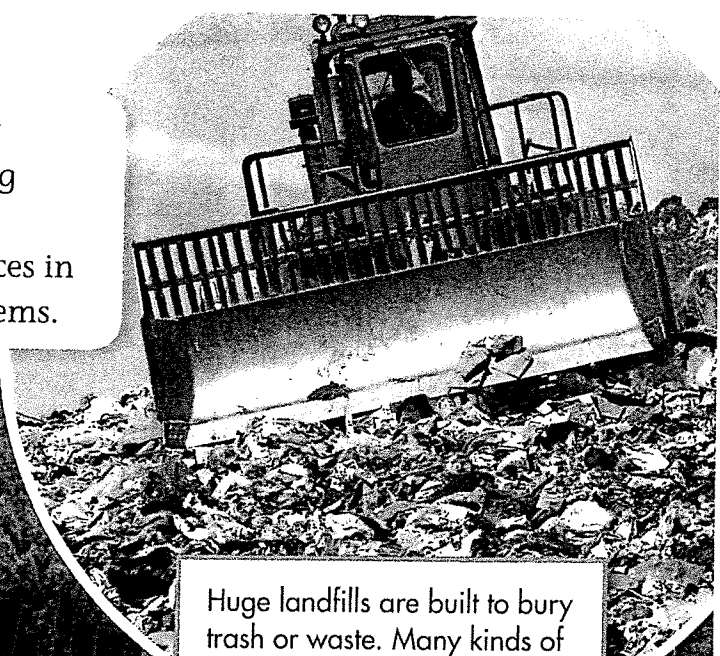
This puddle has been drying up for some time, and the mud around it is cracking as it dries.




Life in a modern American city requires a lot of resources and generates a lot of waste. Getting those resources and disposing of wastes causes environmental changes. Making informed choices in the disposal of materials helps conserve ecosystems.




Forests are being cut to plant crops and to make wood products, such as lumber and paper. When the forests are removed, the forest ecosystem is destroyed.



Huge landfills are built to bury trash or waste. Many kinds of waste, such as batteries, have to be disposed of carefully so that they do not cause environmental damage.



Sometimes toxic materials are accidentally released into the environment. This happens in oil spills. Fish, birds, and other organisms are affected by such spills.



Mining for copper, sulfur, and other natural resources causes environmental changes. Many of these resources can be recycled to reduce environmental damage.



Very slowly, the orange lichens growing on this rock are helping break down the rock to form new soil.



Quick Lab

Long Ago

Work with an adult. Find out what your region was like 10 years ago. What was it like 100 years ago? What was it like 1,000 years ago? Discuss how your region has changed.

Slow Changes

Sometimes environments change very slowly. For example, the climate in a region may become drier and drier over thousands of years. This has happened in the Sahara, which has had both wet and dry periods in the past.

Seasons change slowly every year. This gives animals time to grow winter fur. Plants have time to grow new leaves for the summer.

The continents also change their position over millions of years. For example, Antarctica used to be much closer to the equator, and much warmer.

Rocks are slowly broken down by the weather and by plants and animals. They become part of the soil.

Fast Changes

Hurricanes, floods, and fires, along with volcanic eruptions and earthquakes, are natural events that can quickly change the environment. A hurricane's strong winds can rip up trees and flatten plants. Heavy rains and huge waves can flood a coastal community. When lightning strikes a tree, it can start a forest fire that burns almost everything in its path.

These rapid changes may force species to leave the area because the resources they need are no longer available.

3. Underline two examples of slow environmental changes. **Circle** two examples of fast changes.

4. Give an Example What is another type of fast environmental change?



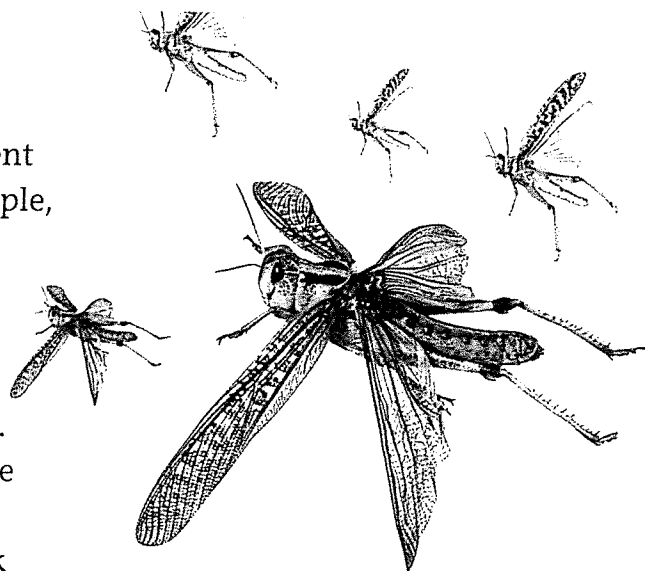
A volcano can quickly destroy or bury many organisms, but it can also cover the soil with nutrients that other organisms can use.

Changes Caused by Organisms

Organisms themselves may alter their environment as they feed, grow, and build their homes. For example, locusts are insects that travel in large groups called swarms. The members of these large swarms can quickly eat all the plants in large fields and destroy farm crops. After locusts pass through, an area that was green and full of plants will look dead and bare.

Plants also cause changes. In fact, plants affect the quality of the air for the entire planet. They absorb carbon dioxide from the air and release oxygen back into the atmosphere.

- 5. Suggest** What kind of animal might benefit from a locust swarm?



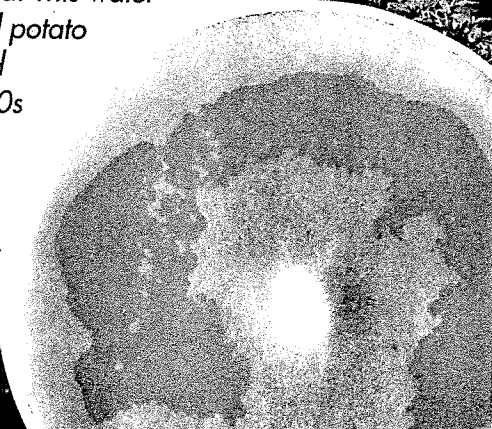
A swarm of locusts can be many kilometers long and eat tons of plant matter.

A water mold is using this potato for food. The water mold starts consuming the potato in the field. An entire crop can be destroyed before it can be harvested.

A healthy potato has cream-colored flesh.

This microscopic organism is a water mold. It uses the leaves, stems, and potatoes as food. This water mold destroyed potato crops in Ireland during the 1800s and caused widespread famine.

When a single type of plant is grown close together, it is easy for organisms to go from plant to plant. An entire crop can be destroyed in a short period of time.



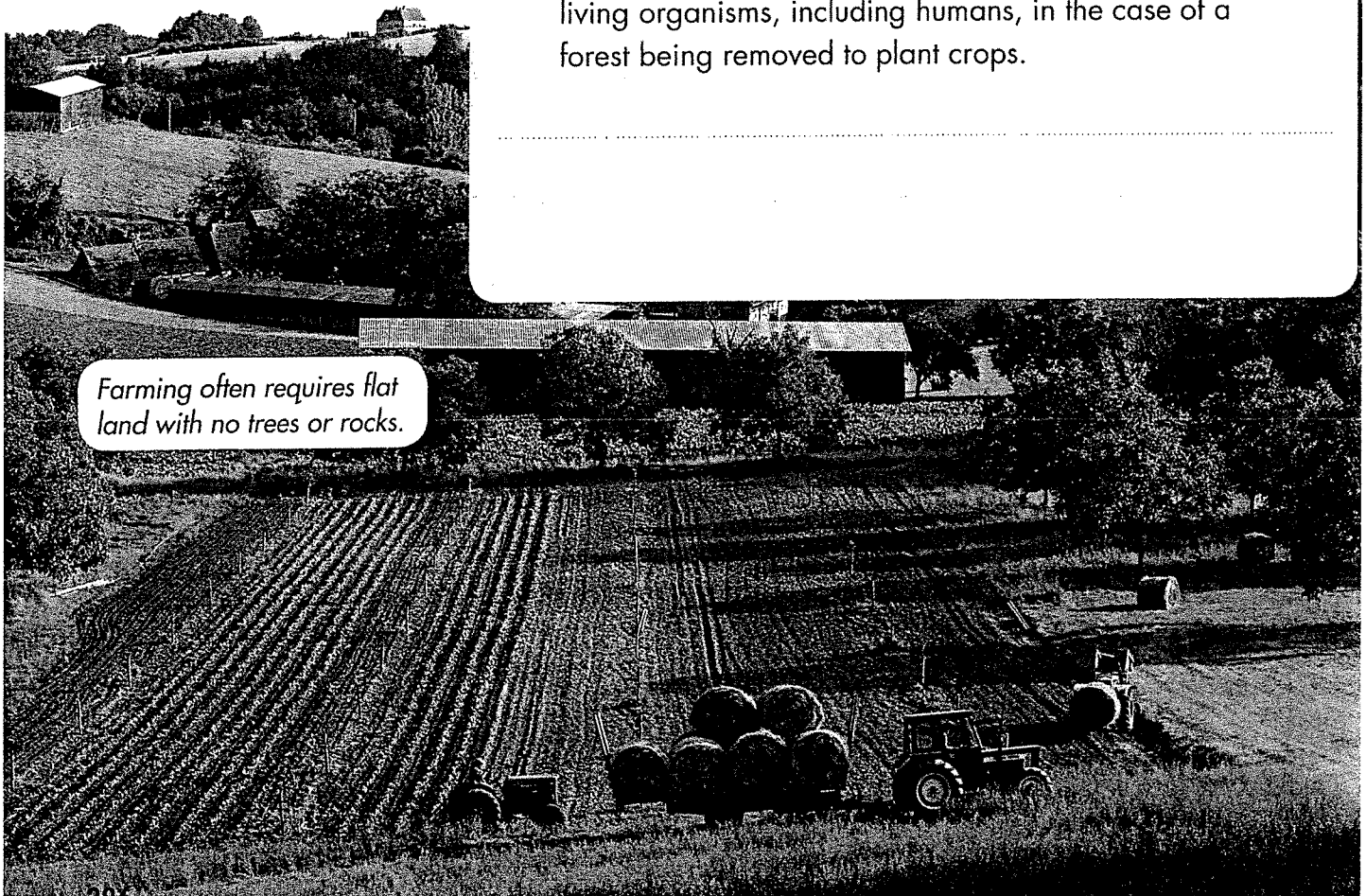
Changes Caused by Humans

Humans are one of the most important causes of environmental change. We change the land to plant crops, build dams to get energy, fish to get food, and clear forests to get construction materials. We change the environment when we build buildings and highways, and when we burn fuel.

There are many ways in which we can reduce the impact of human activity on the environment. For example, tunnels have been built in some places with busy traffic so that animals can cross from one side of the road to the other without getting hit by cars. We can recycle things like paper or construction materials to reduce the number of trees we cut down.

- 6. Classify** Look at the picture of a farm on this page. What parts of this environment probably were not there before people arrived?

- 7.** Predict the effects of changes in ecosystems caused by living organisms, including humans, in the case of a forest being removed to plant crops.



Adapting to Changes

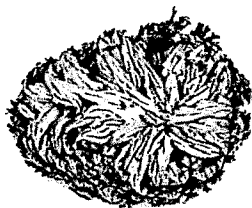
Changes that are harmful for some organisms may be beneficial for others. A forest fire destroys trees and bushes that help protect the soil from being washed away by rainwater. In addition, a forest fire adds smoke and carbon dioxide to the atmosphere and destroys the habitats of many animals. However, a forest fire may also help organisms in a forest. A forest fire clears away dead and dying plant matter, making room for new plants to grow. It also returns nutrients to the soil in the form of ashes.

In any environment, resources are limited. The struggle of organisms for the same limited resources is called **competition**. Organisms must succeed in this struggle in order to survive.

8. **Explain** How can competition affect a group of organisms in an environment?







Resurrection plants can survive very dry seasons because they can dry up without dying. The plant below is the same plant as above, only one day after being watered.



Survival

In any species of plant or animal there are differences among individuals. A plant that has deeper roots than other plants may be able to reach deeper into the soil to get water. An animal that runs a little faster than others of its kind has a better chance of escaping from a predator. Even a small advantage can help a plant or animal survive. Only the individuals that survive will be able to reproduce and pass along their beneficial characteristics to their offspring.

- 9. Infer** How do you think the environment of a resurrection plant might change over time?

Connect to Math

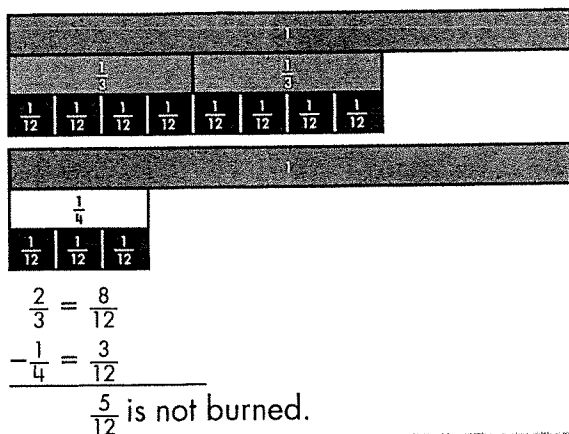
Math TEKS 3H

Subtracting Fractions

When subtracting fractions from a whole, use equivalent fractions.

Example

A forest fire destroys $\frac{1}{3}$ of a forest. If another $\frac{1}{4}$ of the forest area burns, what fraction of the forest is left unburned?



- 1** One year, $\frac{1}{2}$ of a sea turtle population could not find nest space on a beach. The next year, another $\frac{1}{3}$ of the population relocated. What fraction of the turtle population is left?

**The wood frog can survive the winter because its body can be frozen without killing the frog.*

10. **CHALLENGE** What do you think might help the wood frog stay alive when it is frozen?



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Got it?

TEKS 9C

1. **Decide** Do you think plants and animals can adapt more easily to slow changes or fast changes? Explain.

.....

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2. Think about what you learned in this lesson. Give an example of how a change in the environment can affect the way living things interact.

.....

.....

Stop! I need help with

Wait! I have a question about

Go! Now I know

Texas



LESSON

4

What are some natural cycles?

I will know TEKS 9C, 9D

I will know how to predict the effects of changes in an ecosystem caused by living organisms, including humans. I will know how to identify the significance of the carbon dioxide-oxygen cycle to the survival of plants and animals. (Also 1A, 2C, 2D, 2F, 4B)

Vocabulary

nitrogen cycle
carbon cycle

Connect to

Social Studies

TEKS Social Studies 25B, 25E

The Amazon rain forest is a huge forested area in South America. Tropical rain forests are located in warm climates, and they receive a lot of rainfall per year. As a result, tropical rain forests have an abundance of different kinds of organisms, including green plants. Green plants take in carbon dioxide from the atmosphere and use it during photosynthesis to produce food. The process of photosynthesis gives off oxygen, which is released into the atmosphere. Many animals, including humans, must breathe oxygen to survive, and the same animals exhale carbon dioxide into the atmosphere. The Amazon rain forest contains so many plants that it is considered a global producer of oxygen and global user of carbon dioxide.

Explain what might happen to oxygen-breathing animals if large numbers of trees and other plants were removed from the Amazon rain forest.

