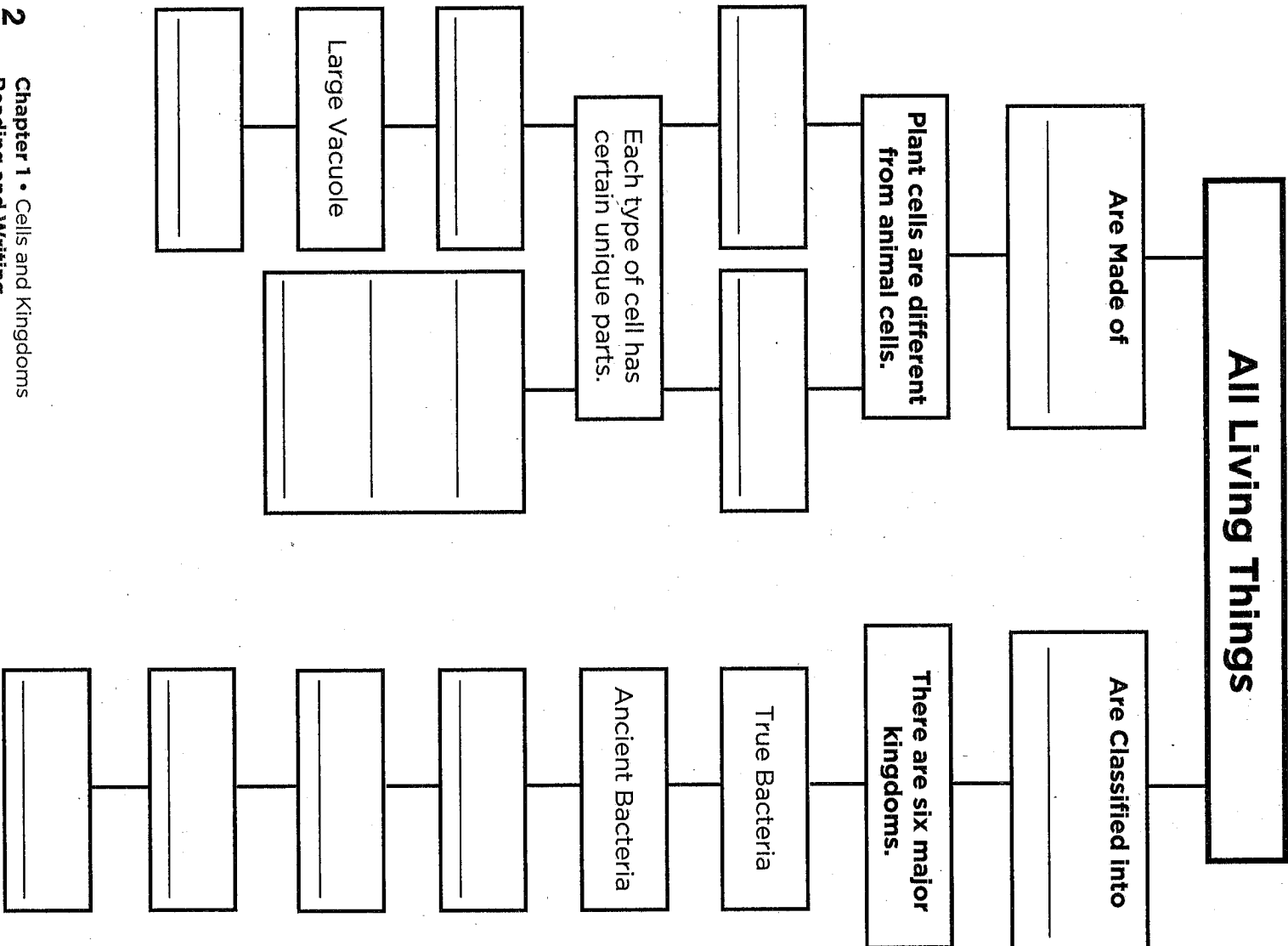


Cells and Kingdoms

Complete the concept map by filling in answers where blanks appear.



Name _____ Date _____

LESSON
Outline

Cells

Use your textbook to help you fill in the blanks.

What are cells?

1. All organisms, or living things, are made of _____.
2. Every cell in every living thing comes from another cell that _____.
3. A single-celled organism that can carry on all its life processes is called _____.
4. Organisms made up of more than one cell are called _____.
5. Scientists estimate that there are more than _____ kinds of unicellular organisms.

What is inside an animal cell?

6. Both plant and animal cells perform life processes by using _____.
7. All cells are surrounded by a(n) _____ that controls the materials that move in and out of the cell.
8. The region between the cell membrane and the nucleus is filled with _____.
9. The cell's control center is called the _____.

10. The tiny power plants in the cell where food is broken down and energy is released are called _____.
11. A structure in a cell used for storage of water, food, and waste is the _____.

What is inside a plant cell?

12. Plant cells have a(n) _____; a rigid structure that serves as an outer covering.
13. A green structure, called a(n) _____, uses the energy from the Sun to produce food for the plant.

How are cells organized?

14. Cells working together at the same job form a(n) _____.
15. Groups of tissues working together form organs, and groups of organs working together form _____.

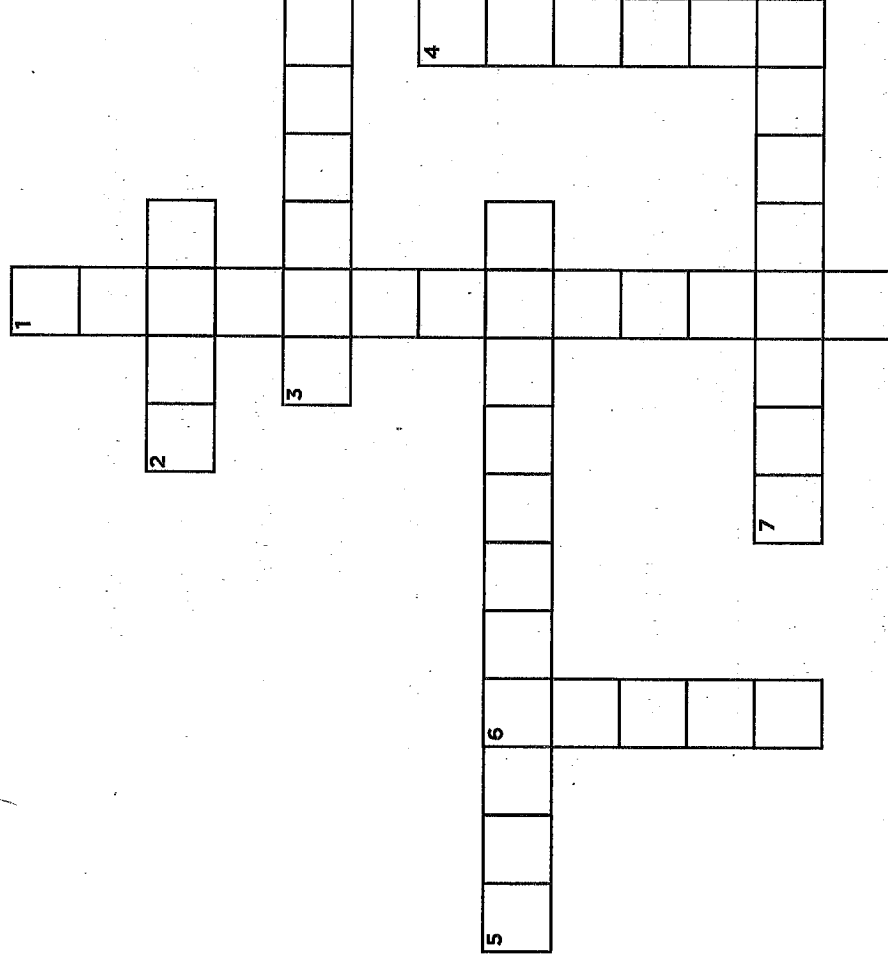
Critical Thinking

16. Compare and contrast the cells of plants, animals, and unicellular organisms.

Cells

Read each clue and fill in the crossword puzzle.

cell	multicellular	organism	tissue
chlorophyll	organ	system	



Across

2. The smallest unit of a living thing that can carry out the basic processes of life.

3. Similar cells working together at the same job.

5. A green chemical that absorbs sunlight.

7. Another name for a living thing.

Down

1. Organisms that contain many different types of cells.

4. Organs that work together to do a certain job.

6. A group of tissues working together to perform a specific job.

Cells

Fill in the blanks.

cell membrane	cytoplasm	nucleus
cell wall	mitochondria	organelles
cells	multicellular	unicellular

When we talk about living things, we can break them down into smaller things. All living things are made up of units called _____. Some organisms are _____; that is, they consist of only one cell. More complex organisms, including plants and animals, are called _____ organisms.

All cells are surrounded by a(n) _____ that controls what moves into and out of the cell. The insides of cells are filled with a gel like fluid called _____. Within this liquid are the cell _____. Both plant and animal cells, as well as many unicellular organisms, contain a(n) _____ and _____, which supply energy for the cell. Plant cells have a(n) _____, one large central vacuole, and _____, one large central vacuole, and _____ chloroplasts. Chloroplasts contain chlorophyll which uses energy from sunlight to produce food for the plant.

Classifying Life

Use your textbook to help you fill in the blanks.

How are organisms classified?

1. Scientists sort, or _____, living things into groups according to shared traits.
2. All organisms are divided into six major groups called _____.
3. The six subgroups used to classify organisms within kingdoms are _____, class, _____, family, genus, and _____.
4. The scientific name of an organism consists of its _____.

What are animals?

5. The two kingdoms that include only multicellular organisms are _____.
6. Plants can make their own food, but _____ obtain energy from other organisms.
7. The two major groups of animals are _____ and _____.

What are plants and fungi?

8. Although they are from two different kingdoms plants and fungi always have _____.

9. The two major groups into which plants are organized are _____ and _____.
10. Unlike plants, _____ get food by breaking down dead organisms.
11. A fungus that makes bread rise is called _____.

What are bacteria and protists?

12. Bacteria are unicellular organisms with no _____ or mitochondria.
13. The two kingdoms used to classify bacteria are the _____ and _____.
14. Protists can be _____ or multicellular.
15. Unlike bacteria, protists have large cells, a nucleus, and bound _____.

What are viruses?

16. Viruses are not classified as living organisms because they carry out no life processes except _____.

Critical Thinking

17. What makes plants and animals different from bacteria?
- _____
- _____
- _____
- _____
- _____

Classifying Life

Match the correct letter with the description.

a. classification	c. kingdom	e. species	g. vertebrate
b. invertebrate	d. nonvascular	f. vascular	h. virus

- _____ contains only closely related organisms
- _____ the broadest group into which an organism can be classified
- _____ helps scientists identify, study, group, and name organisms
- _____ means "contains tubes or vessels"
- _____ animal without a backbone
- _____ type of plant that tends to be small and close to the ground
- _____ animal with a backbone, nervous system, and brain
- _____ organism that carries out only one life process, reproduction

Classifying Life

Fill in the blanks.

classify	kingdom	species
genus	scientific name	unicellular

Living things are often similar to each other. Scientists _____ living things by similarity into smaller and more specific groups. The largest group into which an organism is classified is its _____. The six kingdoms include plants, animals, fungi, protists, "true" bacteria, and "ancient" bacteria.

Each kingdom is divided into progressively smaller groups, as follows: phylum, class, order, family, genus, and species. The narrowest group into which an organism can be classified is a(n) _____. Two words make up the _____ of a living thing. The first is the _____ name. The second is the species name.

The "true" bacteria and the "ancient" bacteria are _____ organisms with no nucleus or mitochondria. "Ancient" bacteria usually live in very harsh environments in which other organisms could not survive.

Meet Angelique Corthals

Getting Ideas

Underline the sentence or sentences in each paragraph that state the main idea of the paragraph.

How can you fit thousands of organisms into one small room? Angelique Corthals knows. She's a scientist at the American Museum of Natural History, and she's been busy preserving tissue samples of many different organisms from around the globe, including samples from species that have become extinct or died out. Angelique is an archaeologist. That's a scientist who studies the past.

Angelique works in the museum's frozen tissues lab. She specializes in the preservation of the information in cells. From bacteria to insects to mammals, she collects, preserves, and organizes the cells of all sorts of living things. Angelique stores the organisms' cells and freezes them in small plastic tubes the size of your finger. Just as food stays fresh in the freezer, freezing cells prevents them from spoiling or decomposing. The tubes are stored in large tanks containing liquid nitrogen. At -150°C (-238°F), this liquid is so cold that all of the cells' biological processes stop.

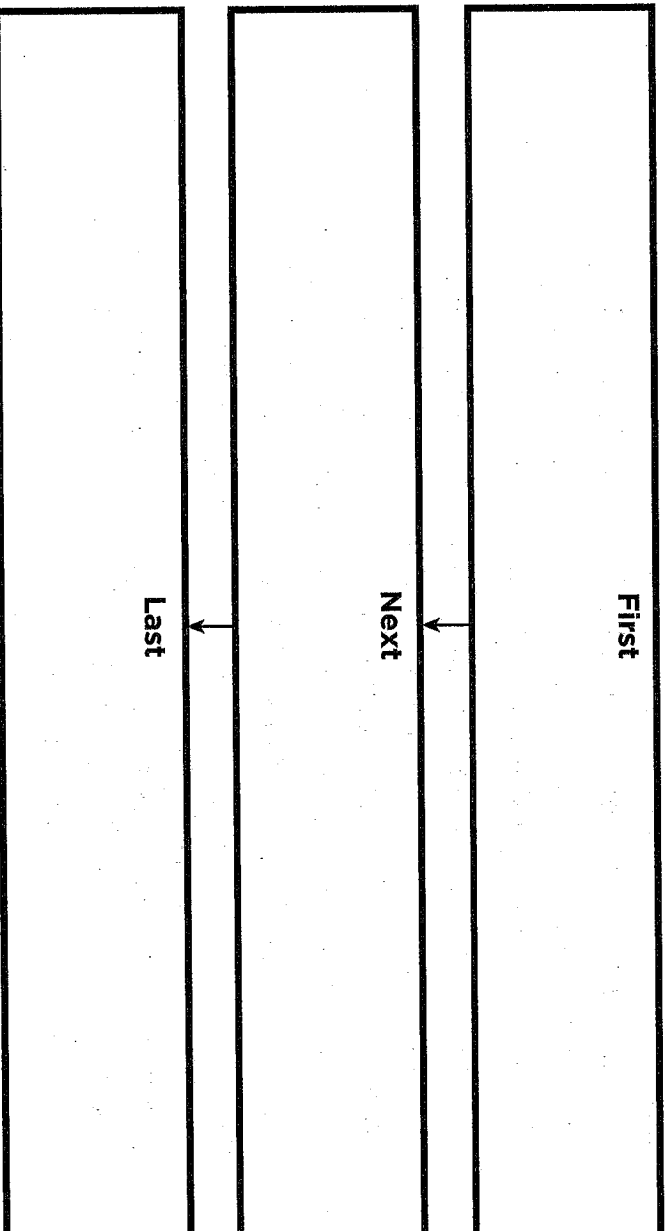
By using this freezing process, the cells can be preserved for many years. When a scientist needs to study an organism, she can request a cell sample from the lab. Whether it's from a small fly or a large humpback whale, each cell contains information about the whole organism. Scientists can use this information to learn how different organisms are related. They can also use this information to learn about living things that have already become extinct and to understand why they died out.



Write About It

Summarize Make a chart that tells the steps for preserving cells. Use your chart to write a summary of the process Angelique uses to freeze cells from organisms.

Sequence Make a chart that tells the steps for preserving cells. Use the blank boxes below.



Summarize In a paragraph, summarize the process that Corthals uses to freeze cells.

Name _____ Date _____

LESSON
Outline

Plants

Use your textbook to help you fill in the blanks.

How are plants classified?

1. Small plants such as mosses which survive without a transport system, are called _____.
2. Plants that have a system of hollowed-out tubes to transport water and nutrients are called _____.
3. A seed plant that does not produce flowers or fruits is called a(n) _____.
4. A seed plant that produces flowers and some kind of fruit is called a(n) _____.

What are roots?

5. Roots absorb minerals and water, store food, and _____.
6. Root hairs absorb water and minerals, and _____ protect root tips.
7. The epidermis is on the outside of the root; just beneath it is the _____ which is used to store food.
At the center of the root is the _____.

What are stems?

- 8. Stems have two main functions: _____ and transport.
- 9. Grasses have _____ stems that are green and bendable; trees have _____ stems.
- 10. A series of tubes that move water and minerals up the plant are _____ moves sugar made in the plant's leaves to other parts of the plant.

What are leaves?

- 11. The function of leaves is to perform _____.
- 12. To perform photosynthesis, chloroplasts need _____ from the air, water from the soil, and _____.
- 13. Air enters and exits plants through _____: pores on the underside of the leaves.

Critical Thinking

- 14. Why do you think some plants have woody stems and some have soft stems?

Name _____ Date _____

LESSON
Vocabulary

Plants

Fill in the blank with a term from the box.

angiosperm	gymnosperm	transpiration
cambium	phloem	xylem
cellular respiration	photosynthesis	

1. A seed plant that does not produce flowers is called a(n) _____.
2. Cells that move sugars up, down, and all around a plant are called _____.
3. A layer in the plant stem that separates xylem and phloem is called the _____.
4. The break down of sugars in plant and animal cells to produce energy and carbon dioxide is called _____.
5. A seed plant that produces flowers is called a(n) _____.
6. Cells that transport water and minerals from roots to shoots in plants are called _____.
7. The process that plants use to produce their food and give off oxygen is called _____.
8. When water moves up the vascular tubes through stomata, _____ occurs.

Plants

Fill in the blanks.

angiosperms	gymnosperms	stomata
cellular respiration	photosynthesis	sugar
chloroplasts	stems	

Seed plants can be divided into two main groups.

Scientists call these groups _____ (flowering plants) and _____ (plants without flowers or fruits). Seed plants have three basic parts—leaves, roots, and _____.

The function of leaves is to absorb sunlight to make sugars, a process called _____. The energy of sunlight is captured by _____ and used to combine carbon dioxide and water. The carbon dioxide comes into the leaf through _____. The sugar made during photosynthesis travels to cells all over the plant, where it is used for _____. During this process, _____ is broken down to release energy to power the cell's functions. The by-products are carbon dioxide and water.

Saving Water the Yucca Plant Way

Read the Writing in Science feature in your textbook.



Write About It

Explanatory Writing Write an article for young gardeners. Explain the process of CAM photosynthesis. Research facts and details for your article.

Planning and Organizing

Help Ray create an outline for his article. Here are some topics he wants to cover. Place them in the outline form below.

- ▶ What happens during the day in CAM photosynthesis?
- ▶ What is the purpose of CAM photosynthesis?
- ▶ What is photosynthesis?
- ▶ What happens at night during CAM photosynthesis?
- ▶ How does the process of CAM photosynthesis work?

I. _____

II. _____

III. _____

A. _____

B. _____

IV. Why is the yucca plant special?

Now create an outline for your own article on a separate sheet of paper. Make it as detailed as possible. Add A, B, C points and subpoints (1, 2, 3) under these as necessary.

Now use a separate sheet of paper to write the first draft of your article.

Revising and Proofreading

Here is part of the report that Ray wrote. Help him combine his sentences. Use the transition word in parentheses. Make sure you punctuate the new sentence correctly.

1. In CAM photosynthesis, the stomata open at night.
The air is cooler and the humidity is higher. (when)

2. CAM photosynthesis is effective. It results in more efficient water use. (since)

Now revise and proofread your article. Ask yourself:

- ▶ Have I introduced my main idea about photosynthesis in yuccas?
- ▶ Have I included facts and details to show how this process works?
- ▶ Have I used examples and language appropriate for my audience?
- ▶ Have I used transition words and phrases to connect ideas?
- ▶ Have I ended with a strong conclusion about why yucca plants are special?
- ▶ Have I corrected all grammar errors?
- ▶ Have I corrected all problems in spelling, punctuation, and capitalization?

Name _____ Date _____

Classifying Animals

Use your textbook to help you fill in the blanks.

What are simple invertebrates?

1. The simplest animals are _____.
They are without real tissues or organs and have a(n) _____ body plan.
2. Jellyfish and hydras are _____.
They possess a mouth and muscle tissue and are _____ symmetrical.
3. Worms that have flat bodies with one body opening and simple eyes are called _____.
4. Worms that have simple digestive and nervous systems are called _____.

What are complex invertebrates?

5. Clams and squids are _____. They have _____ symmetry, a muscular foot, a mantle, and several specialized organs.
6. Sea stars and sea cucumbers are _____.
They have _____ feet and a water pressure system that helps them feed, breathe, and move.
7. Crabs and insects belong to the largest animal group on Earth, the _____ phylum.

What are vertebrates?

8. There are three kinds of fish: _____, such as lamprey and hagfish; _____, such as sharks and skates; and _____.
9. Frogs, toads, and salamanders are _____.
10. Lizards, snakes, turtles, and alligators are _____. They are _____, which means that their body temperature is not steady.
11. Birds are designed for flying: they are warm-blooded and have _____ and feathers that are light and strong.

What are mammals?

12. Animals that are warm-blooded and have hair are called _____.
13. A duck-billed platypus lays eggs. It is a(n) _____.
14. A kangaroo is a(n) _____. It gives birth to partially developed offspring.
15. Lions, whales, and humans are _____. Their offspring develop within the mother.

Critical Thinking

16. Compare 4 different vertebrates.

Name _____ Date _____

Classifying Animals

Read each clue and fill in the blank with the correct answer.

asymmetrical	invertebrates	monotreme	radial
bilateral	marsupial	placental	vertebrates

1. _____ A koala is one. It gives birth to partially developed offspring.
2. _____ Worms have this kind of symmetry because they can be divided along only one plane.
3. _____ Fish, birds, amphibians, reptiles, and mammals.
4. _____ A whale is an example of this kind of mammal.
5. _____ Cnidarians have this kind of symmetry.
6. _____ A mammal that lays eggs.
7. _____ A type of body plan that has no definite shape.
8. _____ Sponges, cnidarians, echinoderms, mollusks, and arthropods.

Classifying Animals

Fill in the blanks.

amphibians	invertebrates	sponges	vertebrates
hollow	reptiles	tentacles	

The animal kingdom contains all the animals. The animal kingdom is separated into two large groups—animals with backbones called _____ and animals without backbones called _____. These two groups are divided into smaller groups called phyla.

Vertebrates include fish, amphibians, reptiles, birds, and mammals. Fish live in the water and breathe through gills. Vertebrates that spend part of their lives in water and part on land are called _____. Lizards, snakes, turtles, alligators, and crocodiles are _____. Birds are designed for flying. Their bones are _____ and light. Mammals produce milk to feed their young.

Invertebrates include sponges, mollusks, worms, and arthropods. The most primitive of the animal groups are called _____. Cnidarians have mouths surrounded by stinging _____. The largest of all the animal groups are called arthropods.

The Underground Life of Mole Rats

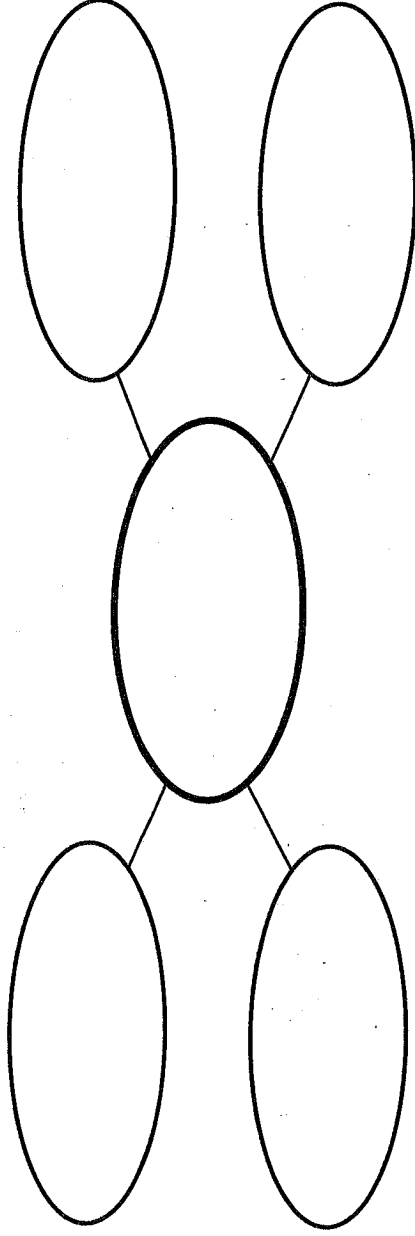


Write About It

Find out the scientific name of an animal you think is cute or ugly. Write a description of the animal. Use words and details that appeal to the senses in your description.

Getting Ideas

Choose an animal to describe. Then use the web below to brainstorm ideas. Write its scientific name in the center circle. Write details that describe it in the outer circles. You can add circles to the web if you like.



Planning and Organizing

Janine wants to describe a ferret. Here are some sentences that she wrote. Write Yes if the sentence contains words and details that create a vivid impression of the ferret. Write No if it does not.

1. _____ The dark black marks around its eyes make it look like a bandit.
2. _____ Its long, lean body curves upward as though in surprise.
3. _____ The ferret has four legs and a tail.

Drafting

Write a sentence to begin your description. Tell what animal you will describe. Make sure your sentence expresses the impression you want to create.

Now write your description. Use a separate piece of paper. Begin with the sentence you wrote above. Tell the animal's scientific name. Include descriptive words and vivid details to help readers experience the animal.

Revising and Proofreading

Here are three sentences that Janine wrote for her description. Help her improve them. Replace each italic word or words with a more descriptive or precise word. Choose a word from the box. Write it in the blank.

bushy	carnivores	nocturnal
-------	------------	-----------

1. _____ Since ferrets are *active during the night*, you will probably find them curled up and sleeping most of the day.
2. _____ Some ferrets have a *hairy* tail with an inky-black tip.
3. _____ Ferrets are *animals that eat meat*. They may eat squirrels, mice, and even prairie dogs.

Now revise and proofread your writing. Ask yourself:

- ▶ Did I create a vivid impression of the animal I chose?
- ▶ Did I use sensory words and vivid details?
- ▶ Did I correct all mistakes in grammar, spelling, punctuation, and capitalization?

Animal Systems

Use your textbook to help you fill in the blanks.

What are the skeletal and muscular systems?

1. Bones, tendons, and ligaments make up the _____ system.
2. Muscles are attached to bones by _____.
3. When a muscle receives a nerve signal, it _____ and pulls on a tendon.

What are the digestive and excretory systems?

4. From the mouth, food travels down the muscular _____ to the stomach.
5. Food is churned with strong acids in the _____.
6. The system that removes wastes such as water, salt, carbon dioxide, and nitrogen from the body is called the _____.
7. The blood carries wastes to the _____, which filter the wastes from the blood.

What are the respiratory and circulatory systems?

8. The _____ and the passageways that lead to them make up the respiratory system in mammals.
9. The heart pumps oxygen-poor blood to the alveoli, where the oxygen enters the blood and _____ leaves the blood.

10. The blood travels to the small intestines and picks up _____ . Next, nutrient and oxygen-enriched blood travels through smaller and smaller blood vessels to body cells.
11. Nutrients and oxygen pass into the body cells and waste materials pass out of the cells into the blood through the _____ .
12. In vertebrates and some other animals, blood is carried in blood vessels. These animals have a(n) _____ . Arthropods and some other invertebrates have _____ circulatory systems.

What are the nervous and endocrine systems?

13. Your brain, spinal cord, nerves, and sense organs are part of your _____ .
14. The endocrine system sends out _____ that cause changes in your body.

Critical Thinking

15. Name two organ systems that work closely together and explain how they interact.

Animal Systems

Who am I? What am I?

Match the correct letter with the description.

- | | | |
|-----------------------|---------------------|-----------------------|
| a. circulatory system | d. excretory system | g. respiratory system |
| b. digestive system | e. muscular system | h. skeletal system |
| c. endocrine system | f. nervous system | |

1. _____ I am a long tube in which food is broken down into nutrients your body can use. Who am I?
2. _____ I produce hormones that are released into your body to change body activity. Who am I?
3. _____ Through me, your blood takes in oxygen from the air.
4. _____ I cause your bones to move. Who am I?
5. _____ I carry oxygen and nutrients to all your body cells. Who am I?
6. _____ I remove wastes from your blood. Who am I?
7. _____ Because of me, you can see, hear, feel, taste, think, and move. Who am I?
8. _____ I am the framework for your body, and I protect your internal organs. Who am I?

Animal Systems

Fill in the blanks.

circulatory system	endocrine system	nervous system
digestive system	excretory system	respiratory system

Your body is made up of several organ systems that work together to carry out basic life functions. The system that is made up of the heart, blood, and blood vessels is called the _____ . The system that brings air into the body and removes carbon dioxide is the _____ .

A long tube in which food is broken down into the nutrients that the body needs for energy, growth, and repair is called the _____ .

The _____ is made up of a group of glands that produce hormones. Hormones are chemicals that control body functions, such as heart rate. The brain, spinal cord, and nerves make up the _____ , which sends, receives, and processes nerve impulses throughout the body.

The kidneys are a part of the _____. They eliminate waste from the blood and form urine.

Cells and Kingdoms

Choose the letter of the best answer.

- The flexible wrapping that surrounds all cells is called the
 - cytoplasm.
 - cell wall.
 - cell membrane.
 - vacuole.
- Which of these structures is found in a plant cell, but not in an animal cell?
 - central vacuole
 - mitochondria
 - nucleus
 - organelles
- Which of the following is in the correct order, from simplest to most complex?
 - cells, tissues, organs, organism, organ systems
 - cells, tissues, organs, organ systems, organism
 - cells, organs, tissues, organ systems, organism
 - cells, tissues, organ systems, organs, organism
- Which phylum has the most species?
 - echinodermata
 - molluska
 - chordata
 - arthropoda
- In which kingdom do all of the members obtain energy by breaking down dead organisms?
 - plants
 - animals
 - fungi
 - protists
- Which life process do viruses carry out?
 - reproduction
 - movement
 - growth
 - use of energy
- Which structure found in vascular plants allows for the transport of water?
 - flower
 - xylem
 - phloem
 - seed

Choose the letter of the best answer.

8. A fir tree is an example of a(n)
a. nonvascular plant.
b. angiosperm.
c. seedless plant.
d. gymnosperm.
9. A carrot root is an example of a(n)
a. taproot.
b. prop root.
c. fibrous root.
d. aerial root.
10. Which of the following moves sugars that are made in the plant's leaves?
a. xylem
b. phloem
c. cambium
d. bark
11. Which group includes the simplest animals?
a. worms
b. mollusks
c. sponges
d. cnidarians
12. Which animals have radial symmetry?
a. sponges
b. worms
c. mollusks
d. cnidarians
13. Which vertebrates have gills when they hatch, and lungs when they are adults?
a. amphibians
b. reptiles
c. fish
d. birds
14. Which organ filters wastes from the blood?
a. bladder
b. kidneys
c. large intestine
d. small intestine
15. Where does blood travel next after returning from the body cells?
a. to the small intestine
b. to the lungs
c. to the liver
d. to the kidneys