

**Red Edition**  
Grade 3–4  
reading level

**Purple Edition**  
Grade 4–5  
reading level

## Objectives

- Describe living and nonliving things, including ways in which all living things are alike.
- Discuss cells and how they work together.
- Explore tissues, organs, and organ systems.
- Compare plant and animal cells.
- Understand how and why scientists classify living things, and explore the six kingdoms of life.
- Describe animals, plants, and other kinds of living things.
- List levels of classification.
- Explain what fossils show us about the past, and discuss extinct and endangered species.

## Reading Comprehension Skills

Preview the Book ♦ Compare and Contrast  
How to Read Charts ♦ Main Idea and Details

**Skillbuilders are available for this title.**

## Supporting English Learners

**Develop Vocabulary** Create meaningful opportunities for English Learners to use new vocabulary in speaking, reading, and writing. Provide multiple exposures to science vocabulary such as *bacteria* and *vertebrate*. Emphasize word-learning strategies such as using the word part *micro-* in a word such as *microscope*. Also emphasize the use of context clues, dictionaries, and thesauruses.

## Summary

In the Delta Science Content Reader *Cells and Classification*, students learn about characteristics all living things share, including that they are all composed of cells. They learn how cells work together to perform various functions and explore the structures of plant and animal cells. Students then discover how scientists classify organisms into six kingdoms of life. The book concludes with a discussion of what fossils can teach us about extinct organisms and those still alive today.

## Science Background

Cells—the smallest units of living things—are the building blocks of life. Most organisms, including bacteria and some algae, are made up of just one microscopic cell, inside which all functions needed for life take place. Other organisms, such as plants and animals, are multicellular.

Multicellular organisms have specialized cells. A group of one type of cells that works together to perform a certain task is called a tissue. A group of tissues working together form an organ. Groups of organs form organ systems. The organs in an organ system work together to do a highly complex job for the organism. For example, the heart is an organ in the circulatory system. The heart contains heart muscle tissue, which consists of heart muscle cells.

Plant and animal cells share similar structures. Each contains a nucleus, cytoplasm, and a cell membrane. Plant cells, however, have two structures not found in animal cells. In plants, a stiff cell wall surrounds the cell membrane and helps support and protect the cell. Most plant cells also contain chloroplasts, green structures that use water, carbon dioxide, and sunlight to help plants make their own food.

Scientists classify organisms based on common traits. The most widely accepted classification system divides organisms into six main groups called kingdoms.

Kingdoms are further subdivided into levels of increasing specificity. Classification allows scientists to organize and share information about the great diversity of life.



# What Are Living Things? (pages 2–5)

## Before Reading

### Discuss the Cover

**Cover Image** Discuss the photograph on the cover of *Cells and Classification*. Use the information on the inside front cover to support the discussion.

**Science Statement** Discuss the science statements. Ask: *What do you think classify means?* (put into groups) *Why might scientists classify living things?* (Possible answer: to study them as a group, such as all trees or all rabbits)

### Build Reading Skills (page 2)

**Preview the Book** Use Build Reading Skills on page 2 to review how to preview the book. Discuss the steps. Then model previewing the Table of Contents.

**Think Aloud** *The Table of Contents lists what is in the book. In this book, there are four main sections and a Glossary. I read the titles of the main sections and learn that I am going to read about what living things are, what cells are, how living things are classified, and what we can learn from fossils.*

Guide students as they finish previewing *Cells and Classification*. Focus on nonfiction text features.

- Prompt them to look at the headings, photographs, captions, and diagrams. Ask questions such as *Why do you think that feature is there? How will it help you understand what you read?*
- Prompt them to look at the bold Vocabulary words. Guide the class in looking up a Vocabulary word in the Glossary.

Students can apply the skill in the Reflect on Reading activity on page 5.

**K-W-L Chart** Have students begin a K-W-L chart. They should add to it after each section.

What I Know	What I Want to Learn	What I Learned
Animals and plants are living things.	How do scientists classify living things?	

### Make a Connection (page 3)

**Make a Connection** Discuss the Make a Connection questions. Use this discussion to build background and activate prior knowledge about living things. (Possible answers: flowers, insects, snakes, cows; I think that all living things need water and that they all grow.)

**Find Out About** Read each statement to help students set a reading purpose. Explain that these are the important topics that they will learn about in this section.

**Vocabulary** Read the Vocabulary words aloud. Explain to students that they will see these words in bold in this section. Start a word web on the board with *organism* in the center. Have students add information about the word as they read.

## During Reading

### Features of Living Things (page 4)

- Discuss the photograph of the real and stuffed dogs on page 4. Ask: *What features does a real dog have that the stuffed animals do not?* (Possible answer: The real dog grows and changes, senses and responds to its environment, and eats food.)
- Ask: *What is one way you respond to your environment?* (Possible answers: sweat when hot, shiver when cold)
- Ask: *Where do living things get energy?* (from food)
- ✓ **Checkpoint** (page 5) (grow and change, sense and respond to their environments, reproduce, get rid of wastes, use energy)

## After Reading

**Reflect on Reading** (page 5) Remind students to read the captions when they look at the pictures. (Possible answer: The pictures of the small plant and the giraffes helped me understand features living things have in common.)

**Apply Science Concepts** (page 5) This activity applies a concept from Find Out About on page 3. Emphasize that students' drawings should depict two distinct stages in the organism's life. Have students share their drawings with a partner and explain how the organism changed.

# What Are Cells?

(pages 6–11)

## Before Reading

### Build Reading Skills (page 6)

**Compare and Contrast** Use Build Reading Skills on page 6 to review how to compare and contrast. Discuss the tips. Then model comparing and contrasting the information about one-celled and many-celled organisms on page 9.

**Think Aloud** *I read that most living things are tiny organisms made of only one cell. Larger organisms, such as plants and animals, are made of many cells. How are all these organisms alike? They are made of cells that carry out basic life jobs. How are they different? The cell of a one-celled organism carries out all the activities for life, but different kinds of cells in a many-celled organism do different jobs.*

Guide students to compare and contrast cells, tissues, organs, and organ systems in the diagram on page 9. Students can apply the skill in the Reflect on Reading activity on page 11.

### Make a Connection (page 7)

**Make a Connection** Discuss the Make a Connection question. Use this discussion to build background and activate prior knowledge about cells. (Possible answer: This picture is so close up that it does not even look like a pine needle anymore, except that it is mostly green. I know a microscope lets you look at things up close. Maybe this picture was taken with a special microscope.)

**Find Out About** Read each statement to help students set a reading purpose. Explain that these are the important topics that they will learn about in this section.

**Vocabulary** Read the Vocabulary words aloud. Explain to students that they will see these words in bold in this section. Start a word web on the board with *cell* in the center. Have students add information about the word as they read.

## During Reading

### Cells and Their Functions (page 8)

- Ask: *What made the discovery of cells possible?* (the microscope) Note that objects that cannot be seen without the aid of a microscope are called microscopic.
  - Ask: *What are three life jobs, or functions, all cells do?* (use energy, get rid of wastes, reproduce) Point out that these functions of all cells are also features common to all living things.
  - Ask: *How are cells and tissues related?* (Tissues are made of groups of similar cells working together.)
- ✓ **Checkpoint** (page 9) (They are the smallest units of living things.)

### Plant and Animal Cells (page 10)

- Have students compare and contrast the diagrams on pages 10 and 11. Ask: *What two parts does a plant cell have that an animal cell does not have?* (cell wall, chloroplasts)
  - Ask: *What do chloroplasts do?* (make food for the plant)
  - Ask: *What different types of cells might an animal have that a plant does not have?* (Possible answers: muscle, blood, bone, skin, nerve)
- ✓ **Checkpoint** (page 11) (Nucleus: controls activities of cell; Cytoplasm: jelly-like material that fills cell and holds cell parts; Cell membrane: thin covering that surrounds cytoplasm and protects cell; Vacuole: sac for storing food, water, or wastes; Mitochondria: give energy to cell)

## After Reading

**Reflect on Reading** (page 11) (Plant cells: have cell wall to add support, have chloroplasts to make food; Animal cells: no cell wall or chloroplasts; Both: have nucleus, cytoplasm, cell membrane, vacuole, mitochondria)

**Apply Science Concepts** (page 11) This activity applies a concept from Find Out About on page 7. Before students complete the activity, elicit that scientists need microscopes to study cells. (Possible answers: telescopes, cameras, eyeglasses, hand lenses, binoculars, peepholes) After students have completed their lists, discuss how some lenses make objects look larger, but others make them look smaller.

# How Are Living Things Classified? (pages 12–19)

## Before Reading

### Build Reading Skills (page 12)

**How to Read Charts** Use Build Reading Skills on page 12 to review how to read charts. Discuss the tips. Point out the chart on page 15, and model how to use the column headings and row headings.

**Think Aloud** *From the title, I know that this chart is about the six kingdoms of life. The red headings across the top tell me that the chart gives traits and examples of each kingdom. If I want to know a trait of plants, I go down the Kingdom column to the Plants row and then follow the row to the right to the Traits column. I see one plant trait is that they cannot move.*

Guide students as they use the chart headings to identify traits and examples of organisms in each kingdom. Students can apply the skill in the Reflect on Reading activity on page 19.

### Make a Connection (page 13)

**Make a Connection** Discuss the Make a Connection question. Use this discussion to build background and activate prior knowledge about how living things are classified. (Possible answer: I know that plant and animal cells are different. Maybe scientists look at a living thing's cells to tell if it is a plant or an animal.) Note that a coral reef is a mound or ridge formed from living animals called coral, coral skeletons, and mineral deposits from other organisms.

**Find Out About** Read each statement to help students set a reading purpose. Explain that these are the important topics that they will learn about in this section.

**Vocabulary** Read the Vocabulary words aloud. Explain to students that they will see these words in bold in this section. Start a word web on the board with *kingdoms* in the center. Have students add information to the web as they read.

## During Reading

### Classifying Organisms (page 14)

- Ask: *How do you classify something?* (You look at its traits, then group it with other things that have the same traits.)
  - Ask: *What are some traits of an organism that scientists might look at?* (its cells, parts, and movement; how it gets food and reproduces)
  - Discuss the chart on page 15. Ask: *Imagine you are trying to classify a many-celled organism that cannot move. What trait could help you decide whether it belongs with plants or fungi?* (whether or not it can make its own food)
- ✓ **Checkpoint** (page 14) (one of the six main groups of living things; Possible answers: animals, plants, fungi, protists, true bacteria, ancient bacteria)

### Animal Kingdom (page 16)

- Ask: *What are the two main groups in the animal kingdom?* (vertebrates, invertebrates)
  - Elicit students' reactions to the fact that almost all kinds of animals on Earth are invertebrates. Ask: *What are some invertebrates you know of?* (Possible answers: flies, bees, ants, spiders, crabs, clams, worms)
- ✓ **Checkpoint** (page 16) (whether they have backbones)

### Plant Kingdom (page 17)

- Ask: *How does chlorophyll help a plant make food?* (Chlorophyll takes in energy from the Sun. Plants use this energy, along with water and carbon dioxide gas from the air, to make food.)
  - Ask: *How are the two main groups in the plant kingdom different?* (Vascular: have tubes running through them for moving materials; Nonvascular: do not have tubes, pass materials directly from cell to cell)
- ✓ **Checkpoint** (page 17) (Same: have many cells, each cell has a nucleus; Different: Animals can move from place to place, but plants cannot. Animals must eat, but plants make their own food.)

### Other Kingdoms of Life (page 18)

- Ask: *What is one main difference between protists and bacteria?* (Protists have a nucleus, but bacteria do not.)

- ✓ **Checkpoint** (page 18) (fungi, protists, true bacteria, ancient bacteria)

## Levels of Classification (page 19)

- Discuss the classification chart. Ask: *Is a gray wolf more like a dog or a tiger?* (dog)

- ✓ **Checkpoint** (page 19) (phylum; Each level is divided into narrower levels with fewer kinds of organisms, and phylum is above genus.)

## After Reading

**Reflect on Reading** (page 19) Assist students in correlating the descriptions of the levels of classification with the traits of the animals at those levels. (The tiger is a vertebrate, a mammal, and a carnivore. The ladybug must not have a backbone.)

**Apply Science Concepts** (page 19) This activity applies a concept from Find Out About on page 13. Encourage students to be creative with their mnemonics, but remind them to keep the levels of classification in order. (Possible answer: **K**ids **P**refer **C**heese **O**ver **F**ried **G**reen **S**pinach)

# What Can We Learn From Fossils?

(pages 20–23)

## Before Reading

### Build Reading Skills (page 20)

**Main Idea and Details** Use Build Reading Skills on page 20 to review how to identify main idea and details. Discuss the tips. Then model how to identify the main idea in the first paragraph on page 23.

**Think Aloud** *I know the main idea is in the topic sentence of a paragraph. The topic sentence is often the first sentence. The first sentence of this paragraph tells that most species that ever lived on Earth are now extinct. That sounds like the main idea. I'll read on to look for details that support this idea.*

Guide students as they identify details about extinct species. Students can apply the skill in the Reflect on Reading activity on page 23.

## Make a Connection (page 21)

**Make a Connection** Discuss the Make a Connection questions. Use this discussion to build background and activate prior knowledge about what we can learn from fossils. (Possible answers: I once heard the dinosaurs all died when a meteorite hit Earth. We know about them because we have dug up some of their bones.) The fossil shown is of a hypacrosaurus. This dinosaur lived about 73 million years ago in what is now western North America. It grew to about 30 feet long and 15 feet tall and weighed about 8,000 pounds.

**Find Out About** Read each statement to help students set a reading purpose. Explain that these are the important topics that they will learn about in this section.

**Vocabulary** Read the Vocabulary words aloud. Explain to students that they will see these words in bold in this section. Start a word web with *extinct* in the center. Have students add information about extinct organisms to the web as they read.

## During Reading

### About Fossils (page 22)

- Ask: *What is an extinct organism?* (a kind of organism that is no longer living)
- ✓ **Checkpoint** (page 23) (A fossil is a body part or trace of a living thing from the past. From fossils we can learn what an organism looked like, how it acted, or how it lived; clues about Earth's past; how living things have changed over time; and how organisms may be related.)

## After Reading

**Reflect on Reading** (page 23) Assist students in creating their webs as needed. (Possible answers: Main idea: A fossil is a body part or a trace of a living thing from the past. Details: Bones, teeth, eggs, footprints, and leaves can become fossils. Scientists classify extinct organisms using fossils. They compare fossils to other fossils.)

**Apply Science Concepts** (page 23) This activity applies a concept from Find Out About on page 21. (Alike: mammoth has trunk, tusks, similar body shape to an elephant; Different: mammoth's tusks bigger than elephant's, ears smaller, body much hairier)

➔ **Continued on last page**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Test: Cells and Classification

## Part A: Vocabulary

cell	classify	extinct	fossil
kingdom	microscope	nucleus	trait

Choose the correct vocabulary word for each sentence. Write the word on the line.

1. The \_\_\_\_\_ helped the scientist look at the fungus up close.
2. The \_\_\_\_\_ controls the activities of a cell.
3. Bacteria are tiny organisms made of only one \_\_\_\_\_.
4. Grouping together animals that have backbones is an example of how scientists \_\_\_\_\_ organisms.
5. One \_\_\_\_\_ of an organism is how it gets food.
6. Protists make up one \_\_\_\_\_ of life.
7. Kinds of organisms that are no longer living are \_\_\_\_\_.
8. A dinosaur \_\_\_\_\_, such as a tooth, might give clues about what that dinosaur ate.

## Part B: Science Concepts

Mark the best answer to each question.

9. Which of the following is a nonliving thing?  

(A) coral	(C) moss
(B) water	(D) algae
10. A group of the same kind of cells working together to do a job make up \_\_\_\_\_.  

(A) an organ	(C) a tissue
(B) an organ system	(D) an environment

## Test: Cells and Classification (continued)

**11.** Scientists put plants into two main groups. What word do they use for plants that have tubes for moving materials?

- (A) nonvascular
- (B) invertebrate
- (C) vertebrate
- (D) vascular

**12.** Which level of classification below kingdom contains the largest number of organisms?

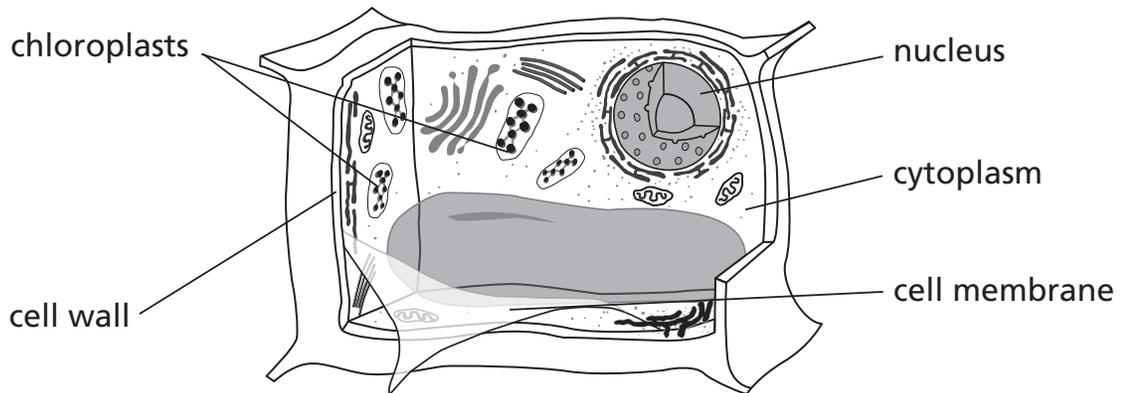
- (A) phylum
- (B) species
- (C) family
- (D) class

**Write the answer.**

**13.** Suppose you are trying to decide if something is a living thing. What are two questions you could ask about it?

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**14.** Look at the diagram of a plant cell. Tell which parts you would not find in an animal cell. Explain what those parts are and what they do for the plant cell.

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**15.** Explain what scientists can learn about extinct species by studying fossils.

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# Let's Review

## (inside back cover)

Have students complete their K-W-L charts before answering these questions. Possible answers are shown.

- 1. Cover Connection** (All organisms are made up of cells, the smallest units of living things. Most organisms, such as protists and bacteria, are one-celled. Others, such as plants and animals, are many-celled. Scientists classify living things according to traits that are the same, such as whether an animal has a backbone or whether a plant has tubes for moving materials.)
- 2.** (All living things grow and change, sense and respond to their environments, reproduce, get rid of wastes, use energy, and are made up of cells.)
- 3.** (Cells are the smallest units of living things. A tissue is a group of similar cells working together to do a job. An organ is a group of different tissues working together. An organ system is a group of organs working together.)
- 4.** (They need to know if it is one-celled or many-celled, if it has a nucleus in each cell, and how it moves, gets food, and reproduces.)
- 5.** (Yes. All living things are made up of cells, and dinosaurs were living things.)
- 6. How to Read Charts** (The headings of the rows tell the names of the kingdoms of life. There are six kingdoms, so there are six rows in the chart.)

**7. Write** (Stories should include where the scientist finds the fossil, information about the kind of fossilized organism found, and at least one conclusion the scientist draws based on the fossil, such as what it looked like, how it acted, or what living organisms it might be related to.)

**Try It!** Some students may have mold allergies, so it is important to keep the bag sealed at all times. If possible, have students look at the bread mold under a microscope.

**Science at Home** Have students do this activity at home with a family member. Remind students that things are classified according to traits they have in common. Encourage them to include several levels of classification in their charts.

## Answers to Test

### (Teacher's Guide pages 6–7)

**1.** microscope **2.** nucleus **3.** cell **4.** classify **5.** trait **6.** kingdom  
**7.** extinct **8.** fossil **9.** B **10.** C **11.** D **12.** A **13.** I could ask whether it grows and changes, senses and responds to its environment, reproduces, gets rid of wastes, uses energy, and is made up of cells.  
**14.** Cell wall: stiff outer layer that adds support and often gives the cell a shape like a box; Chloroplasts: green cell parts that make food for the plant **15.** Studying fossils gives scientists clues about what extinct organisms looked like and how they lived and acted, about how organisms have changed over time, and about how organisms may be related.

**ADDITIONAL ASSESSMENT OPPORTUNITIES** Use the Checkpoints, Reflect on Reading, and Apply Science Concepts features and Let's Review questions as additional assessment opportunities.

*Delta Science Content Readers* are 24-page nonfiction student books with informative, engaging text and full-color photos and illustrations. The readers present key science content and vocabulary found on state tests, present key reading skills and strategies useful for reading informational text, support and extend the experiences and content of hands-on activities, promote scientific inquiry, and serve as a home-school link. They are available in two editions: Red Edition for Grades 3–4 and Purple Edition for Grades 4–5.

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**Cells and Classification**  
**Teacher's Guide**  
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*This teacher's guide is available online at*

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