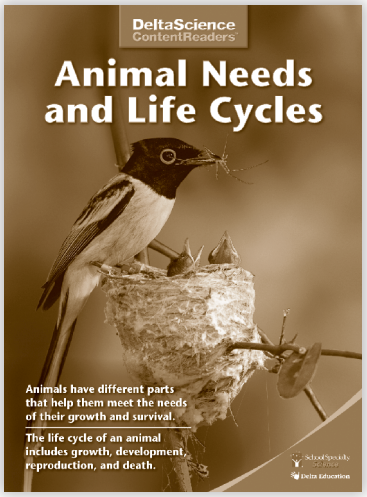


Red Edition
Grade 3–4
reading level

Purple Edition
Grade 4–5
reading level

Objectives

- List the things all animals have in common.
- Understand how scientists group, or classify, different kinds of animals.
- Describe the things all animals need to stay alive.
- Explain ways that animals' bodies help them meet their needs.
- Explain ways that animals' behaviors help them meet their needs.
- Compare the life cycles of different animals.
- Discuss a change some animals go through called metamorphosis.

Reading Comprehension Skills

Preview the Book ◆ Main Idea and Details

How to Read Diagrams

Skillbuilders are available for this title.

Supporting English Learners

Set Objectives Motivate English Learners, and help them work toward clearly defined goals. Determine both content and language goals for students. Identify what they should know about animal needs and life cycles. Discuss the Find Out About statements before reading each section.

Summary

In the Delta Science Content Reader *Animal Needs and Life Cycles*, students are introduced to the incredible diversity of animals on Earth. The book explores the common characteristics and needs of all animals, as well as the differences scientists use to classify animals into large groups. Students then learn about various adaptations animals have to help them meet their needs. The book concludes with a discussion of the major similarities and differences between the life cycles of different animals.

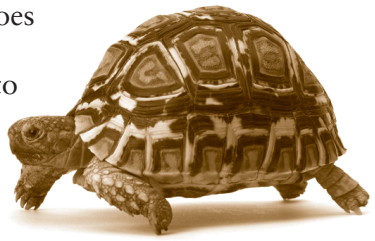
Science Background

Earth is home to well over a million different species of animals. Scientists classify animals according to common characteristics. The two main animal groups are invertebrates, or animals that do not have a backbone, and vertebrates, or animals that have a backbone. Scientists further subdivide these groups into smaller groups of increasing specificity.

Though animals differ greatly in their habitats, structures, and behaviors, all animals have certain characteristics in common. All animals grow and develop, consume food to get energy, breathe oxygen, excrete wastes, reproduce, sense and respond to stimuli in their own bodies and their environments, and are composed of cells. Animals also share the same basic needs for food, water, air, shelter, and space.

Traits that help animals meet their needs and survive in their environments are called adaptations. Some adaptations are body structures, such as a turtle's protective shell. Other adaptations are behaviors. Behaviors can be instinctual, such as a bird migrating for winter, or learned, such as a pet learning to perform tricks.

The series of changes and stages an animal goes through as it develops together comprise its life cycle. Although every animal's life cycle is different, most adhere to a similar pattern. After an animal is born, it undergoes a period of growth and development leading up to adulthood. As an adult, the animal is capable of reproducing.



What Do Animals Need? (pages 2–9)

Before Reading

Discuss the Cover

Cover Image Discuss the photograph on the cover of *Animal Needs and Life Cycles*. Use the information on the inside front cover to support the discussion.

Science Statement Discuss the science statements. Ask: *How do you think this bird's body parts help it meet its needs?* (Possible answer: Its beak helps it catch food.)

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 headings.

> **Think Aloud** *What can I learn from the headings? On page 4, I see the red heading "About Animals." This must be the main topic. The next two headings, on pages 5 and 6, are smaller and blue. These headings must break down ideas about animals into smaller parts.*

Guide students as they finish previewing *Animal Needs and Life Cycles*. 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 9.

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
Some animals hatch from eggs.	What are the stages in an animal's life cycle?	

Make a Connection (page 3)

Make a Connection Discuss the Make a Connection question. Use this discussion to build background and activate prior knowledge about the needs of animals. (Possible answers: water, air, place to live) If students have difficulty thinking of the moose's needs, encourage them to first identify their own needs or the needs of their pets. You may also wish to review the difference between needs and wants. Needs are things a person or other living thing must have to survive. Wants are things a person wishes they had but could live without. For example, you might want a puppy, but you need food.

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 *Types of Animals* in the center. Have students suggest examples as they read.

During Reading

About Animals (page 4)

- Discuss the photographs of the owl and the toucan on page 4. Ask: *How are these two species' physical features alike and different?* (Possible answers: Alike: have beak, eyes, feathers, talons; Different: shape and size of body, shape and size of beak, coloring, texture of feathers, only owl has visible ears, only toucan has long tail)
- Ask: *What are some things that all animals do?* (Possible answers: grow, eat, breathe, get rid of wastes, reproduce, sense and respond to changes in their own bodies and their surroundings)
- Ask: *What are cells?* (tiny living building blocks that make up every animal's body)
- Emphasize that cells are too small to see without the aid of a microscope.
- Ask: *What are the three main features of all arthropods?* (jointed legs; bodies with sections, or segments; hard outer covering called exoskeleton)
- Discuss the chart on page 5. Ask: *What are some major kinds of invertebrates?* (arthropods, mollusks, worms)

- Ask: *What are the main jobs of a skeleton?* (to give the body shape and support, to help the animal move, to help keep other body parts safe)
- Point out that while invertebrates do not have skeletons as vertebrates do, they often have structures that serve similar functions, such as exoskeletons.
- Explain that the spinal cord is a long, tubelike structure located in the backbone, or spine, of vertebrates. The spinal cord carries nerve signals, such as those that tell a body part to move, between the brain and other parts of the body.
- Ask: *What is one difference between a mammal and a reptile?* (Possible answer: A mammal is warm-blooded and a reptile is cold-blooded.)
- Discuss the chart on page 7. Ask: *Which kind of vertebrate are humans?* (mammals)

Checkpoint (page 6) (Alike: grow, eat, breathe, get rid of wastes, reproduce, sense and respond to changes, made of cells; Different: vertebrates have backbone, invertebrates do not)

Animal Needs (page 8)

- Ask: *Where does an animal get what it needs?* (from its environment)
- Emphasize that an environment includes physical things, such as rivers, plants, animals, and rocks, as well as conditions, such as temperature, amount of sunlight, and amount of rainfall.
- Ask: *How do land animals and water animals breathe differently?* (Many land animals have lungs to get oxygen from the air. Many water animals have gills to get oxygen from the water.)
- Ask: *Why is shelter important for animals?* (It protects them from weather and from other animals that might eat them.)
- Ask: *Imagine birds and bears in one area both eat the same kind of berries. What is this struggle for resources called?* (competition)

Checkpoint (page 9) (food, water, air, shelter, space)

After Reading

Reflect on Reading (page 9) Have students discuss the charts on pages 5 and 7 with a partner before answering. (Possible answer: The charts helped me understand how different kinds of vertebrates and invertebrates are alike and different.)

Apply Science Concepts (page 9) This activity applies a concept from Find Out About on page 3. (Possible answers: We breathe oxygen from the air, drink water that once fell as rain or snow, eat food grown in the soil on farms and in gardens, and build shelters such as houses out of wood from trees.)

What Are Adaptations? (pages 10–17)

Before Reading

Build Reading Skills (page 10)

Main Idea and Details Use Build Reading Skills on page 10 to review how to identify main idea and details. Discuss the tips. Then model how to identify the main idea and details in the first paragraph on page 12.

> **Think Aloud** *What is this paragraph mostly about? As I read, I learn that an adaptation is something that helps an animal stay alive in its environment. This sounds like the main idea. I know details can answer Who, What, When, Where, Why, and How questions about the main idea. Do the details in this paragraph answer some of those questions about adaptations? One detail is that thick fur is an adaptation that helps sea otters live in cold water. This tells me who: sea otters. It tells me what: thick fur. It tells me where: in cold water.*

Guide students as they practice identifying the main idea and details in the second paragraph on page 12. Students can apply the skill in the Reflect on Reading activity on page 17.

Make a Connection (page 11)

Make a Connection Discuss the Make a Connection question. Use this discussion to build background and activate prior knowledge about adaptations. (Possible answers: claws, stingers, ability to run fast or climb trees, hard shell, living in groups)

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 T-chart on the board for examples of *instincts* and *learned behaviors*. Have students suggest examples as they read.

During Reading

Ways Animals Meet Their Needs (page 12)

- Ask: *What is heredity?* (the passing of traits to young) *How does heredity help species develop adaptations?* (Animals with an adaptation reproduce and pass that trait to their young. Over many generations, the species changes.)
- Ask: *What is the difference between instincts and learned behaviors?* (Animals are born with instincts. Learned behaviors are things animals learn to do by trying or by watching others.)

Checkpoint (page 13) (Possible answers: Structural: otter's thick fur, webbed feet of some birds, elephant's long trunk; Behavioral: spider spinning web, birds building nests)

Finding Food (page 14)

- Ask: *What kind of adaptation is migration?* (instinct)
- Discuss the photograph of the arctic tern. Ask: *What body part adaptation probably helps the arctic tern migrate?* (Possible answer: long wings)

Checkpoint (page 14) (Possible answers: tiger's strong legs, sharp claws and teeth; mallard duck's rounded bill with fringe for straining food; arctic tern's migration)

Staying Safe From Enemies (page 15)

- Ask: *What are some body structures and behaviors that help animals stay safe from enemies?* (Body structures: hard shells, scales; Behaviors: playing dead, living in groups)
- Discuss the photographs of the hoverfly and the bee. Ask: *How is this an example of mimicry?* (The hoverfly has stripes that make it look like a bee.)

Checkpoint (page 15) (They blend in with their environments, so it is hard for enemies to see them.)

Having and Caring for Young (page 16)

- Ask: *What are some examples of body structures that help animals find mates or care for their young?* (peacock's colorful feathers help it attract a mate, mother kangaroo's pouch helps keep young kangaroo safe)

Checkpoint (page 16) (Some animals build nests. Others migrate to safer places to lay their eggs.)

Responding to Environmental Changes (page 17)

- Ask: *What are some changes in their environments that animals must respond to?* (changes in temperature, amount of rain, amount of food available)
- Ask: *How might a crocodile respond to warmer weather?* (It may cool off in water or mud.) *Why does it need to do this?* (It is cold-blooded.)

Checkpoint (page 17) (body temperature drops, breathing and heart rate slow down, body uses less energy)

After Reading

Reflect on Reading (page 17) (Possible answers: Main idea: An adaptation is a body part or behavior that helps an animal stay alive in its environment. Details: Adaptations develop over many generations. Migrating helps some animals find food. Camouflage and mimicry help some animals stay safe from enemies. Hibernating helps some animals stay alive in the cold winter.)

Apply Science Concepts (page 17) This activity applies a concept from Find Out About on page 11. (Possible answer: An animal with camouflage might be able to sneak up on an animal that it hunts and eats without being seen.)

What Are Some Animal Life Cycles? (pages 18–23)

Before Reading

Build Reading Skills (page 18)

How to Read Diagrams Use Build Reading Skills on page 18 to review how to read diagrams. Discuss the tips. Discuss with students that arrows,

numbers, keys, legends, symbols, and color coding can be important features of diagrams. Then model how to read the diagram on page 21.

Think Aloud *The title tells me that the diagram shows the life cycle of a robin. The steps are numbered, so the life cycle must begin at step one, "egg." I follow the arrows to step two, "young," then to step three, "juvenile," then to step four, "adult," and back to step one again.*

Guide students as they practice reading the diagram of the life cycle of a monarch butterfly on page 22. Students can apply the skill in the Reflect on Reading activity on page 23.

Make a Connection (page 19)

Make a Connection Discuss the Make a Connection questions. Use this discussion to build background and activate prior knowledge about animal life cycles. (Possible answers: The fawns are smaller than their mother, and they have white spots. As they get older, they might get bigger, lose their spots, and maybe grow antlers.)

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 *Animal Life Cycles* in the center. Have students add information to the web as they read.

During Reading

Growth and Development (page 20)

- Ask: *What are four stages of a human's life cycle?* (infant, child, adolescent, adult)
- Ask: *What is the pattern most animals' lives follow?* (After an animal is born, it grows. Its body parts may change as it develops into an adult. Adult animals can reproduce.)
- Ask: *What are two different ways animals are born? Give some examples.* (Possible answer: Almost all animals, such as insects, frogs, turtles, and birds, hatch from eggs laid by the mother. The young of other animals, including most mammals, are born live from the mother.)

Checkpoint (page 21) (A life cycle is the series of changes and stages that a living thing goes through in its life.)

Metamorphosis (page 22)

- Ask: *What are some examples of animals that go through metamorphosis?* (Possible answers: frogs, butterflies, moths, ants, bees, flies, beetles, grasshoppers, praying mantises, dragonflies)
- You may wish to provide names for the larvae of insects that go through metamorphosis. Butterfly and moth larvae are caterpillars; beetle, bee, and wasp larvae are grubs; and fly larvae are maggots.
- Ask: *What happens in the pupa stage of a monarch butterfly's life cycle?* (The monarch's body changes into the adult form.)
- Discuss the diagram of the life cycle of a grasshopper on page 23. Ask: *Does a grasshopper nymph have mostly the same or mostly different body parts as an adult?* (mostly the same)

Checkpoint (page 23) (Metamorphosis is a change in body form that takes place in the life cycle of certain animals. Possible answers: tadpole grows into frog, monarch butterfly changes from larva to pupa to adult butterfly, grasshopper changes from nymph to adult with wings)

After Reading

Reflect on Reading (page 23) Have students review Build Reading Skills on page 18 before completing the activity. Encourage them to check their understanding of the diagram they choose by redrawing it before explaining it to their partner.

Apply Science Concepts (page 23) This activity applies a concept from Find Out About on page 19. Help students compare the animal they choose to the animals in the descriptions and diagrams on pages 20–23 in order to determine the stages in the animal's life cycle. You may wish to point out that except for most mammals, almost all animals hatch from eggs. Also, most amphibians and insects undergo metamorphosis, while most other familiar animals do not.

Continued on last page

Name: Date:

Test: **Animal Needs and Life Cycles**

Part A: Vocabulary

adaptations	classify	competition	environment
heredity	instincts	life cycles	reproduce

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

1. When animals _____, they have young, or offspring.

2. Scientists _____ animals into two main groups, invertebrates and vertebrates.

3. An animal must get what it needs from its _____.

4. There can be _____ between animals that share the same resources.

5. Animals are born with certain behaviors called _____.

6. Elephants' long trunks and birds' migration are _____ that help these animals meet their needs.

7. The passing of traits from parents to young is called _____.

8. In most mammals' _____, mothers give birth to live young.

Part B: Science Concepts

Mark the best answer to each question.

9. All animals need _____ to help them release the energy in food.

Ⓐ lungs
Ⓒ vitamins
Ⓑ gills
Ⓓ oxygen

10. Which of these traits is a feature of insects and other arthropods?

Ⓐ backbone
Ⓒ moist skin
Ⓑ exoskeleton
Ⓓ sack-like body

Test: **Animal Needs and Life Cycles** *(continued)*

11. Most frogs and other _____ start their lives in water but live on land as adults.

Ⓐ reptiles
Ⓒ amphibians
Ⓑ fish
Ⓓ birds

12. A polar bear's white fur helps it blend in with the snow and ice in its environment. What is this an example of?

Ⓐ camouflage
Ⓒ mimicry
Ⓑ metamorphosis
Ⓓ diversity

Write the answer.

13. What is the main difference between vertebrates and invertebrates? Give some examples of each kind of animal.

_____

_____

_____

14. Tell what happens to an animal's body when it hibernates. Is hibernation an instinct or a learned behavior? Explain.

_____

_____

_____

_____

15. Look at the diagram. Label the stages in the monarch butterfly's life cycle. What is the name for the monarch butterfly's change in body form?

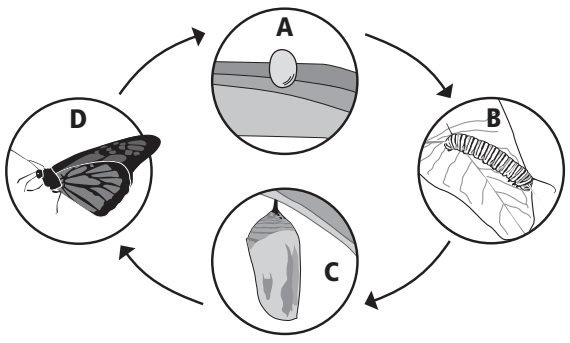
A _____

B _____

C _____

D _____

_____



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** (Body parts and behaviors that help animals meet their needs are called adaptations. Some adaptations, such as webbed feet, are body parts. Others, such as migrating, are behaviors. Different animals have different life cycles. Some animals go through metamorphosis, which means their body changes form.)
2. (energy to live, nutrients such as vitamins and minerals)
3. (Structural adaptations, such as an elephant's long trunk, are body parts that help animals meet their needs. Behavioral adaptations, such as birds' ability to build nests, are behaviors that help animals meet their needs.)
4. (Most mammals are born live from the mother, but insects, frogs, turtles, and birds hatch from eggs laid by their mother.)
5. **Main Idea and Details** (Details: grow, eat food to get energy, breathe, get rid of wastes from their bodies, reproduce, sense and respond to changes in their own bodies and in their surroundings, are made of cells)
6. **Write** (Details of students' stories will vary, but should include the following life cycle stages for the chosen animal: Robin: egg, young, juvenile, adult; Butterfly: egg, larva, pupa, adult; Grasshopper: egg, nymph, adult. Stories about butterflies and grasshoppers should also include an explanation of metamorphosis.)

Try It! Help partners conduct their research as needed. Guide them to include all the stages in the animal's life cycle, along with descriptions of the structures, behaviors, and changes at each stage. Encourage them to use the life cycle diagrams and descriptions on pages 21–23 as a model.

Science at Home Have students do this activity at home with a family member or friend. Encourage students to review and share the information from the charts on pages 5 and 7 to help them decide which group each animal they find belongs in.

Answers to Test

(Teacher's Guide pages 6–7)

1. reproduce **2.** classify **3.** environment **4.** competition **5.** instincts **6.** adaptations **7.** heredity **8.** life cycles **9.** D **10.** B **11.** C **12.** A **13.** Vertebrates have a backbone, but invertebrates do not. Vertebrates: mammals, birds, reptiles, amphibians, fish; Invertebrates: arthropods, mollusks, worms **14.** The animal's body temperature drops. Its breathing and heart rate slow down. Its body uses less energy. It is an instinct because an animal is born with this trait. **15.** A: egg; B: larva; C: pupa; D: adult; metamorphosis

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.**

This teacher's guide is available online at

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Animal Needs and Life Cycles Teacher's Guide

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