

Grade 3 Science

Unit 3: Habitats and Change

17 lessons and a unit quiz. Use this pack with the **Habitats and Change Student Reader** (print it, or download it once from the course) to teach the whole unit without the internet.

What is in this pack

- A lesson plan for each chapter: the Big Question, words to know, which pages to read, questions to talk over and the activity pages.
- The unit quiz, ready to print.
- Answers for the teacher at the back: every discussion question and the quiz key.

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Lesson schedule

Two or three lessons a week, about 30 minutes each. Tick each one off as you go.

	Lesson	Reader pages	Activity pages
☐	Lesson 1: Where Organisms Live	—	AP 1.1
☐	Lesson 2: Habitats	PDF pages 6–11	AP 2.1
☐	Lesson 3: Investigating Traits and Adaptations	—	AP 3.1
☐	Lesson 4: Adaptations in Living Things	PDF pages 12–17	AP 4.1
☐	Lesson 5: Living Things in Groups	PDF pages 18–23	AP 5.1, AP 5.2
☐	Lesson 6: Suited for Survival	—	AP 6.1, AP 6.2, AP 6.3, AP 6.4, AP 6.5, AP 6.6, AP 6.7, AP 6.8, AP 6.9, AP 6.10, AP 6.11, AP 6.12, AP 6.13, AP 6.14, AP 6.15, AP 6.16, AP 6.17
☐	Lesson 7: Beaver Dam Case Study	—	AP 7.1, AP 7.2
☐	Lesson 8: Nature and Changing Ecosystems	PDF pages 24–29	AP 8.1
☐	Lesson 9: Humans Cause Ecosystem Change	PDF pages 30–35	AP 9.1
☐	Lesson 10: Living Things Respond to Change	PDF pages 36–39	AP 10.1
☐	Lesson 11: Ecosystem Problems and Solutions	PDF pages 40–45	AP 11.1, AP 11.2
☐	Lesson 12: Local Environmental Project	—	AP 12.1, AP 12.2
☐	Lesson 13: Hidden Clues About Earth’s Past	—	AP 13.1
☐	Lesson 14: Fossils and How They Form	PDF pages 46–51	AP 14.1, AP 14.2
☐	Lesson 15: Fossil Clues About Changing Habitats	PDF pages 52–57	AP 15.1
☐	Lesson 16: Solving a Fossil Mystery	—	AP 16.1, AP 16.2
☐	Lesson 17: Habitat Changes and Extinction	PDF pages 58–63	—
☐	Unit review and assessment	—	AP UR.1
☐	Words quiz	—	—

Page numbers are the PDF page numbers of the Student Reader file, so they match what your PDF reader shows.

Lesson 1: Where Organisms Live

THE BIG QUESTION

What is a habitat?

Words to know

- **survive** — to stay alive
- **trait** — a characteristic or quality that may be physical or behavioral

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 25–30: the steps, materials and timing for this lesson.

Talk it over

1. What things do people get where they live that they need to stay alive?
2. In what ways do organisms, such as alligators, bats, polar bears, and cacti, have “addresses,” too?
3. Where might be a good place to design and make this habitat?
4. What changes in the habitat might need to happen to encourage a bluebird to stay a while?
5. In what area near our school should the bluebird habitat be located?
6. What will you do to meet the bluebirds’ needs for space?
7. What will you do to meet the bluebirds’ needs for water?
8. What will you do to meet the bluebirds’ needs for food?
9. What will you do to meet the bluebirds’ needs for shelter?
10. What does your living place offer you that you need to survive?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What is a habitat?
- Use one of today’s words in a sentence of your own.

Activity pages

- Activity Page 1.1: The Needs of Bluebirds — Teacher Guide PDF page 135

Lesson 2: Habitats

THE BIG QUESTION

What do all habitats have in common?

Words to know

- **habitat** — the natural place where an organism lives
- **survive** — to stay alive
- **ecosystem** — all the living and nonliving things in a place and their interactions
- **desert** — a dry habitat that is often hot and sandy
- **forest** — a habitat that is thick with trees
- **fresh water** — water with little to no natural salt content
- **interact** — to act upon one another, such as trees, worms, birds, and soil in an ecosystem
- **organism** — a single living thing
- **salt water** — water with a naturally high salt content
- **tundra** — a very cold habitat that is often rocky and flat

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 31–37: the steps, materials and timing for this lesson.

Read

Read Student Reader, Chapter 1: “Habitats”: PDF pages 6–11. Look at the pictures and maps together.

Talk it over

1. What differences did these habitats have?
2. What habitats are near our school?
3. How do you know that arctic hares get all the things they need from their habitat, the tundra?
4. There are not any large trees or bushes in the tundra, so what else might arctic hares eat in the tundra habitat?
5. What do desert and tundra habitats have in common?
6. How are deserts and tundra habitats different?
7. How do you know the tall saguaro cactus gets what it needs in the desert?
8. Why don't tall trees with many branches and leaves live in this habitat?
9. Would you expect to find kit foxes living in the ocean or tundra? What is your evidence?

10. What do you notice with your eyes?
11. How does the air feel on your skin?
12. What animals do you see in this habitat?
13. What is one difference between pond and ocean habitats?
14. What if we were to set up an aquarium in our school? Why would we have to think about the kind of water we put in it?
15. What are the living and nonliving things in this photo?
16. How might they interact in this ecosystem?
17. What other interacting parts of this ecosystem cannot be seen in the photo?
18. Collect the completed What Lives in a Grassland?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What do all habitats have in common?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 2.1: What Lives in a Grassland Habitat? — Teacher Guide PDF page 136

Lesson 3: Investigating Traits and Adaptations

THE BIG QUESTION

How do specific traits benefit an organism in a particular habitat?

Words to know

- **habitat** — the natural place where an organism lives
- **trait** — a characteristic or quality that may be physical or behavioral

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 38–41: the steps, materials and timing for this lesson.

Talk it over

1. Distribute and review What Is the Advantage of the Adaptation Called Blubber?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How do specific traits benefit an organism in a particular habitat?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 3.1: What Is the Advantage of the Adaptation Called Blubber? — Teacher Guide PDF pages 137–138

Lesson 4: Adaptations in Living Things

THE BIG QUESTION

What are adaptations?

Words to know

- **adaptation** — a body part or behavior that helps a living thing survive
- **advantage** — a natural or learned condition that helps an organism adapt to a particular habitat
- **camouflage** — a pattern of coloration that makes an organism difficult to see against the background in its habitat
- **dominance** — strength or power over other weaker individuals and Student Reader page numbers tional vocabulary terms related n and that are often used within the numbers listed. Vocabulary words are

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 42–48: the steps, materials and timing for this lesson.

Read

Read Student Reader, Chapter 2: “Adaptations in Living Things”: PDF pages 12–17. Look at the pictures and maps together.

Talk it over

1. What evidence did you have that a layer of fat can keep an animal warm in cold water?
2. What adaptation does a whale or walrus have that functions like the shortening?
3. What other adaptations do animals have to stay warm when their environment is very cold?
4. What are two groups of adaptations described on this page?
5. What other kinds of plants have spines for protection?
6. What other kinds of animals use camouflage for protection?
7. Direct students to the image of the capybara, and ask: What other kinds of animals protect themselves by swimming, running, or flying away from danger?
8. What happened to the water on the paper towel?
9. What happened to the water on the waxed paper?
10. How are the results of your investigation evidence to explain how the outer layer of a cactus works?
11. Collect the completed What's My Adaptation?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What are adaptations?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 4.1: What's My Adaptation? — Teacher Guide PDF pages 139–140

Lesson 5: Living Things in Groups

THE BIG QUESTION

How do organisms work together for survival?

Words to know

- **behavioral trait** — a way an organism behaves, or acts
- **role** — a specific job or prescribed behavior in an interaction

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 49–55: the steps, materials and timing for this lesson.

Read

Read Student Reader, Chapter 3: “Living Things in Groups”: PDF pages 18–23. Look at the pictures and maps together.

Talk it over

1. Build on what students learned about adaptations in Lesson 4 and in Student Reader Chapter 2. Ask: What adaptations do animals have for getting food?
2. Remind students that the ways organisms act can also be adaptations. Ask: How is the time of day an owl hunts for food an adaptation?
3. Have students look at the image and caption on the page, and ask: What are some behavioral traits of wolves?
4. What other behavioral traits of wolves do you know about?
5. Then, discuss the following question: Do you think it is dangerous to be the sentry who stands tall while the others in the group are low to the ground or inside their burrow? What evidence would support your answer?
6. Where is the calf in this photo? Allow students to share the location of the calf with a reading partner. Ask: Was the calf hard for you to see? How does hiding the calf in a group of larger elephants protect it?
7. Point out to students that they have just used evidence to support an argument. Ask: What was your argument to explain how the calf is protected?
8. Collect the completed How Big Are Animal Groups?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How do organisms work together for survival?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 5.1: Advantages of Living in Groups — Teacher Guide PDF page 141
- Activity Page 5.2: How Big Are Animal Groups? — Teacher Guide PDF page 143

Lesson 6: Suited for Survival

THE BIG QUESTION

What are some examples of successful adaptations of organisms to their habitats?

Words to know

- **habitat** — the natural place where an organism lives
- **survive** — to stay alive
- **adaptation** — a body part or behavior that helps a living thing survive
- **trait** — a characteristic or quality that may be physical or behavioral

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 56-61: the steps, materials and timing for this lesson.

Talk it over

1. How would you describe this habitat?
2. What are some adaptations you noticed?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What are some examples of successful adaptations of organisms to their habitats?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 6.1 — Teacher Guide PDF page 144
- Activity Page 6.2 — Teacher Guide PDF page 145
- Activity Page 6.3 — Teacher Guide PDF page 146
- Activity Page 6.4 — Teacher Guide PDF page 147
- Activity Page 6.5 — Teacher Guide PDF page 148
- Activity Page 6.6 — Teacher Guide PDF page 149
- Activity Page 6.7 — Teacher Guide PDF page 150
- Activity Page 6.8 — Teacher Guide PDF page 151
- Activity Page 6.9 — Teacher Guide PDF page 152
- Activity Page 6.10 — Teacher Guide PDF page 153
- Activity Page 6.11 — Teacher Guide PDF page 154
- Activity Page 6.12 — Teacher Guide PDF page 155
- Activity Page 6.13 — Teacher Guide PDF page 156

- Activity Page 6.14 — Teacher Guide PDF page 157
- Activity Page 6.15 — Teacher Guide PDF page 158
- Activity Page 6.16: Getting to Know You — Teacher Guide PDF pages 159–160
- Activity Page 6.17: Survival Conference — Teacher Guide PDF pages 161–162

Lesson 7: Beaver Dam Case Study

THE BIG QUESTION

How do habitats change?

Words to know

- **habitat** — the natural place where an organism lives
- **ecosystem** — all the living and nonliving things in a place and their interactions
- **advantage** — a natural or learned condition that helps an organism adapt to a particular habitat
- **disadvantage** — a condition or trait that is harmful or presents a challenge
- **ecosystem change** — a natural or human-caused influence in a habitat
- **environment** — the conditions or surroundings in which plants and animals live

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 64–68: the steps, materials and timing for this lesson.

Talk it over

1. internet access and the means to project video for whole-class viewing How Do Beavers Change the Environment?
2. Where does the beaver build the dam?
3. How does the dam change the water flow?
4. Why might the beaver build the dam in the place where it does?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How do habitats change?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 7.1: The Effects of Beaver Dams on Living Things — Teacher Guide PDF page 163
- Activity Page 7.2: How Do Beavers Change the Environment? — Teacher Guide PDF page 164

Lesson 8: Nature and Changing Ecosystems

THE BIG QUESTION

How do natural changes to an environment affect the organisms that live there?

Words to know

- **ecosystem** — all the living and nonliving things in a place and their interactions
- **invasive species** — an organism that causes harm in a place where it does not normally live
- **disrupt** — to cause a disturbance or problem
- **interact** — to act upon one another, such as trees, worms, birds, and soil in an ecosystem
- **native** — a plant or animal that is found naturally in a habitat
- **overpopulation** — too many of one kind of species in an ecosystem

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 69–76: the steps, materials and timing for this lesson.

Read

Read Student Reader, Chapter 4: “Nature and Changing Ecosystems”: PDF pages 24–29. Look at the pictures and maps together.

Talk it over

1. What kind of impact could changes to coral reefs have on people?
2. There are many types of bugs that like to eat flowers. If there is a sudden increase in bugs that feed on flowers, what happens to the flowers?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How do natural changes to an environment affect the organisms that live there?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 8.1: Coral Reef — Teacher Guide PDF page 165

Lesson 9: Humans Cause Ecosystem Change

THE BIG QUESTION

How do people change environments in ways that affect the organisms that live there?

Words to know

- **migrate** — to move from one place to another in different seasons

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 77–81: the steps, materials and timing for this lesson.

Read

Read Student Reader, Chapter 5: “Humans Cause Ecosystem Change”: PDF pages 30–35. Look at the pictures and maps together.

Talk it over

1. What ways have you seen that humans have changed an environment?
2. What are some things that can cause environments to change?
3. Which of those changes were caused by people?
4. What type of change do you think organisms are better able to survive, and why?
5. How can building a dam change the organisms that live in the environment?
6. Why do people build dams on rivers even though that can harm the organisms that live in the rivers?
7. Discuss how changes in the climate caused by human activities can change the environment. Ask: What effect does climate change have on organisms such as polar bears and seals in the Arctic?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How do people change environments in ways that affect the organisms that live there?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 9.1: Surviving Change in the Environment — Teacher Guide PDF page 166

Lesson 10: Living Things Respond to Change

THE BIG QUESTION

How do living things survive changes in their habitats?

Words to know

- **respond** — to react to a change by doing something

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 82–88: the steps, materials and timing for this lesson.

Read

Read Student Reader, Chapter 6: “Living Things Respond to Change”: PDF pages 36–39. Look at the pictures and maps together.

Talk it over

1. What are some natural hazards that can cause ecosystems to change?
2. What are some other natural ways that ecosystems change?
3. What are some human activities that can change ecosystems?
4. Why is the rate of change the most pressing issue affecting the animals in Antarctica?
5. How might the animals shown in the video need to adapt to the changes in Antarctica, such as melting sea ice and warmer weather?
6. Why is it important for salmon to be in cold water?
7. What do you think would happen if water temperatures in the rivers get warmer and warmer all year round?
8. Do you think the plant will be able to adapt quickly enough to survive the changes to its habitat?
9. Are there any ways for the plant to respond to the changes that might help it survive?
10. Is overpopulation the result of a natural or human-caused change to an ecosystem?
11. How does overpopulation negatively affect the ecosystem?
12. How can other organisms respond when their habitats are taken over by a particular species?
13. How are the examples similar?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How do living things survive changes in their habitats?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 10.1: Cause-and-Effect Diagram — Teacher Guide PDF page 167

Lesson 11: Ecosystem Problems and Solutions

THE BIG QUESTION

What are some solutions to problems in habitats and ecosystems?

Words to know

- **conservationist** — a person who works to protect plants, animals, habitats, and ecosystems
- **conservation** — the act of protection of a species, habitat, or resource
- **conserve** — to save or protect
- **restore** — to bring back something or to repair damage

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 89–94: the steps, materials and timing for this lesson.

Read

Read Student Reader, Chapter 7: “Ecosystem Problems and Solutions”: PDF pages 40–45. Look at the pictures and maps together.

Talk it over

1. What kind of person can be a conservationist?
2. What traits are important for a conservationist to have?
3. How does fewer sea turtle eggs hatching affect the ocean ecosystem?
4. How can conservationists know which solution to use to solve a problem?
5. How can conservationists know that the solution is making the problem better?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What are some solutions to problems in habitats and ecosystems?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 11.1: Problems-and-Solutions Table — Teacher Guide PDF page 168
- Activity Page 11.2: Thinking About What Makes Solutions Good — Teacher Guide PDF page 169

Lesson 12: Local Environmental Project

THE BIG QUESTION

How is my community helping solve problems of habitat change?

Words to know

- **ecosystem** — all the living and nonliving things in a place and their interactions
- **conservationist** — a person who works to protect plants, animals, habitats, and ecosystems
- **advantage** — a natural or learned condition that helps an organism adapt to a particular habitat
- **conserve** — to save or protect
- **disadvantage** — a condition or trait that is harmful or presents a challenge
- **disrupt** — to cause a disturbance or problem
- **ecosystem change** — a natural or human-caused influence in a habitat
- **environment** — the conditions or surroundings in which plants and animals live

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 95–102: the steps, materials and timing for this lesson.

Check for understanding

- Answer the Big Question in a sentence or two: How is my community helping solve problems of habitat change?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 12.1: Local Conservation Project — Teacher Guide PDF page 170
- Activity Page 12.2: Take-Home Letter — Teacher Guide PDF page 171

Lesson 13: Hidden Clues About Earth's Past

THE BIG QUESTION

What do age and layering of earth materials tell us about past habitats?

Words to know

- **fossil** — the remains of a living thing from long ago, usually formed in layers of rock
- **relative** — a comparison to identify similarities, such as comparisons of fossils and current species of plants or animals

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 105–111: the steps, materials and timing for this lesson.

Talk it over

1. Where did the boy find the dinosaur fossil?
2. What were the people in the video doing with the fossil?
3. Why do you think people have to be careful when they dig up fossils?
4. How does this provide clues about habitats in the past?
5. Do the fossils come from different times in Earth's history?
6. Which fossil was the oldest?
7. How can you tell?
8. Which fossil was the second oldest?
9. Which fossil was the youngest?
10. What does this tell you about habitats in the past?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What do age and layering of earth materials tell us about past habitats?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 13.1: Let's Dig! — Teacher Guide PDF page 172

Lesson 14: Fossils and How They Form

THE BIG QUESTION

What can fossils tell us about ancient habitats?

Words to know

- **fossil** — the remains of a living thing from long ago, usually formed in layers of rock
- **evidence** — proof of the past or of a fact, such as fossils that show imprints of animals that lived long ago
- **preserve** — to take care of something in order to keep it in its original form

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 112–116: the steps, materials and timing for this lesson.

Read

Read Student Reader, Chapter 8: “Fossils and How They Form”: PDF pages 46–51. Look at the pictures and maps together.

Talk it over

1. Page 42 What is the difference between a fossil and an organism that has died?
2. Which of these (the actual shell or the clay impression) looks more like the seashell fossil in the picture?
3. Explain that an impression is all that is left of seashells when they are fossilized. Ask the following: What does the clay represent?
4. Page 45 How are the fossils of the pine cone and the shell similar?
5. What happens to food you freeze in a home freezer?
6. Where does permafrost occur?
7. What is the difference between an organism that is preserved and one that is not preserved?
8. What happens to permafrost as the climate grows warmer?
9. Where can you find resin?
10. What sort of fossils would you be most likely to find in amber?
11. Is a tree a habitat?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What can fossils tell us about ancient habitats?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 14.1: Analyzing Fossils — Teacher Guide PDF page 173
- Activity Page 14.2: How a Fossil Is Made — Teacher Guide PDF page 174

Lesson 15: Fossil Clues About Changing Habitats

THE BIG QUESTION

What do fossils reveal about organisms, habitats, and change?

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 117–121: the steps, materials and timing for this lesson.

Read

Read Student Reader, Chapter 9: “Fossil Clues About Changing Habitats”: PDF pages 52–57. Look at the pictures and maps together.

Talk it over

1. What might the shape of the teeth of a fossil animal tell you about it?
2. How can you know how an animal moves from one place to another by looking at fossil remains?
3. What clues tell scientists about the type of habitat or how it may have changed?
4. Do you know of any animals that are extinct that once lived in the area where you live now?
5. Which layer of rock is the oldest layer?
6. How do the fossils in the oldest layers compare with fossils in newer ones?
7. When scientists find fossils of coral in places that are now cold, what does this tell them about how the environment has changed?
8. What do you know about coal?
9. What kind of fossil is coal?
10. What clues can people look for to know where to find coal?
11. What evidence has been found of dinosaurs living in the western United States?
12. What is the oldest layer of a glacier?
13. How are fossils preserved in glaciers and permafrost?
14. What are some clues other than bones that scientists can look for to know about past climates?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What do fossils reveal about organisms, habitats, and change?

Activity pages

- Activity Page 15.1: Rock Layers — Teacher Guide PDF page 175

Lesson 16: Solving a Fossil Mystery

THE BIG QUESTION

What do fossils reveal about organisms, habitats, and change?

Words to know

- **fossil** — the remains of a living thing from long ago, usually formed in layers of rock
- **extinct** — having no surviving members
- **evidence** — proof of the past or of a fact, such as fossils that show imprints of animals that lived long ago

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 122–126: the steps, materials and timing for this lesson.

Talk it over

1. What animal today does this dinosaur look like?
2. How is the dinosaur similar to a duck, besides its looks?
3. How do you think scientists were able to tell that the dinosaur lived in the water?
4. What is similar about the two layers where the fossils were found?
5. How can you tell?
6. What can this tell you about when the fossilized organisms existed?
7. Do you think all of the fossils are the same age?
8. What do you think the farmland was like when the brachiopod lived there?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What do fossils reveal about organisms, habitats, and change?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 16.1: A Fossil Mystery — Teacher Guide PDF page 176
- Activity Page 16.2: Solving a Fossil Mystery — Teacher Guide PDF page 177

Lesson 17: Habitat Changes and Extinction

THE BIG QUESTION

How do changes in habitats lead to the extinction of species?

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 127–132: the steps, materials and timing for this lesson.

Read

Read Student Reader, Chapter 10: “Habitat Changes and Extinction”: PDF pages 58–63. Look at the pictures and maps together.

Talk it over

1. Can you recall a species that is extinct?
2. What happens to living things when their habitat changes?
3. How do species become extinct?
4. What kinds of things can cause many individuals of a species to die?
5. What do the two ideas have in common?
6. If it became cold and dark, why would plants not be able to survive the change?
7. What ideas do scientists have to explain the mass extinction that happened 250 million years ago?
8. What evidence did scientists see that supports that a mass extinction happened?
9. Do all organisms on Earth die in a mass extinction?
10. What do the western black rhino and Steller's sea cow have in common?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How do changes in habitats lead to the extinction of species?

UNIT REVIEW

Unit review and assessment

- Unit Assessment (print for your student): Teacher Guide PDF pages 179–183
- How to mark it (for the teacher): Teacher Guide PDF pages 187–188
- Activity page answer key (for the teacher): Teacher Guide PDF pages 184–186
- Activity Page UR.1: When Living Things Cannot Survive Habitat Change — Teacher Guide PDF page 178

WORDS QUIZ

Habitats and Change

Name: _____ Date: _____

Circle the letter of the best answer.

- 1.** Which word means “a body part or behavior that helps a living thing survive”?
 - a) habitat
 - b) adaptation
 - c) conservationist
 - d) behavioral trait
- 2.** Which word means “the remains of a living thing from long ago, usually formed in layers of rock”?
 - a) endangered species
 - b) fossil
 - c) behavioral trait
 - d) habitat
- 3.** Which word means “a person who works to protect plants, animals, habitats, and ecosystems”?
 - a) migrate
 - b) conservationist
 - c) survive
 - d) endangered species
- 4.** Which word means “the natural place where an organism lives”?
 - a) invasive species
 - b) behavioral trait
 - c) habitat
 - d) ecosystem
- 5.** Which word means “all the living and nonliving things in a place and their interactions”?
 - a) climate
 - b) fossil
 - c) ecosystem
 - d) endangered species
- 6.** Which word means “to stay alive”?
 - a) survive
 - b) conservationist
 - c) ecosystem
 - d) climate

- 7.** Which word means “to move from one place to another in different seasons”?
- a) conservationist
 - b) behavioral trait
 - c) climate
 - d) migrate
- 8.** Which word means “an organism that causes harm in a place where it does not normally live”?
- a) invasive species
 - b) behavioral trait
 - c) migrate
 - d) extinct
- 9.** Which word means “a way an organism behaves, or acts”?
- a) migrate
 - b) adaptation
 - c) behavioral trait
 - d) survive
- 10.** Which word means “the pattern of weather over a long period of time”?
- a) habitat
 - b) migrate
 - c) climate
 - d) ecosystem
- 11.** Which word means “a species that is at risk of becoming extinct within a few years”?
- a) endangered species
 - b) behavioral trait
 - c) climate
 - d) conservationist
- 12.** Which word means “having no surviving members”?
- a) extinct
 - b) climate
 - c) migrate
 - d) conservationist

Answers

Lesson 1: Where Organisms Live

1. **What things do people get where they live that they need to stay alive?**

Food, water, shelter, and spaces to do things such as sleep and play games

2. **In what ways do organisms, such as alligators, bats, polar bears, and cacti, have “addresses,” too?**

Though they do not have houses with numbers and street names, they do have places where they live that meet their needs.

3. **Where might be a good place to design and make this habitat?**

Answers will vary depending on the school environment but may include a grassy playfield, a nearby park, or a vacant lot in the neighborhood.

4. **What changes in the habitat might need to happen to encourage a bluebird to stay a while?**

Accept all answers, but look for understanding of how effects are related to causes/actions.

5. **In what area near our school should the bluebird habitat be located?**

Sample answer: in the park where there are trees

6. **What will you do to meet the bluebirds’ needs for space?**

We can make sure the grassy areas are kept clean and mowed.

7. **What will you do to meet the bluebirds’ needs for water?**

We can add a birdbath and check it regularly for water and no dirt.

8. **What will you do to meet the bluebirds’ needs for food?**

We can plant some berries.

9. **What will you do to meet the bluebirds’ needs for shelter?**

We can make sure not to harm the trees or mess with the nests.

10. **What does your living place offer you that you need to survive?**

» What things do people get where they live that they need to stay alive? (food, water, shelter, and spaces to do things such as sleep and play games)

Lesson 2: Habitats

1. **What differences did these habitats have?**

Some were on land; others were in water. Some had trees; others did not. Some were in warm places; others were in cold places.

2. **What habitats are near our school?**

Answers will vary. If students cannot think of any, prompt them to think where they have seen animals, such as ants and spiders, and plants, such as grasses and trees, in the school neighborhood.

3. **How do you know that arctic hares get all the things they need from their habitat, the tundra?**

Because they would not be able to survive there if they did not

4. **There are not any large trees or bushes in the tundra, so what else might arctic hares eat in the tundra habitat?**

Tiny plants growing on the rocks and soil

5. **What do desert and tundra habitats have in common?**

They are both dry.

6. **How are deserts and tundra habitats different?**

Tundra are much colder than the typical desert.

7. **How do you know the tall saguaro cactus gets what it needs in the desert?**

If it didn't get what it needs, it could not survive.

8. **Why don't tall trees with many branches and leaves live in this habitat?**

There may not be enough water for them to survive in a desert.

9. **Would you expect to find kit foxes living in the ocean or tundra? What is your evidence?**

No, because they cannot get the things they need to survive in those habitats. I know this because the kit fox's features help it meet its needs in a dry, warm habitat.

10. **What do you notice with your eyes?**

Lots of shade

11. **How does the air feel on your skin?**

Cool and moist

12. **What animals do you see in this habitat?**

Answers will vary depending on the type of forest but may include perching birds in a tree, ants on the ground, and deer.

13. **What is one difference between pond and ocean habitats?**

Ponds have fresh water, and oceans have salt water.

14. **What if we were to set up an aquarium in our school? Why would we have to think about the kind of water we put in it?**

Because some animals and plants can only survive in salt water or fresh water

15. **What are the living and nonliving things in this photo?**

The bird, worm, and green leaves are living. The brown leaves are nonliving.

16. **How might they interact in this ecosystem?**

The worm that the bird is eating ate decaying material in the soil. The bird eats the worm.

17. **What other interacting parts of this ecosystem cannot be seen in the photo?**

Trees, other birds, soil and worms under leaves; animals that eat birds

18. **Collect the completed What Lives in a Grassland?**

AP 2.1

Lesson 3: Investigating Traits and Adaptations

1. **Distribute and review What Is the Advantage of the Adaptation Called Blubber?**

AP 3.1

Lesson 4: Adaptations in Living Things

1. **What evidence did you have that a layer of fat can keep an animal warm in cold water?**

We could hold a finger in ice water for a longer amount of time when it was covered in a layer of fat/shortening than without.

2. **What adaptation does a whale or walrus have that functions like the shortening?**

It has a layer of blubber under its skin.

3. **What other adaptations do animals have to stay warm when their environment is very cold?**

Thick fur, fluffy feathers, or locating shelter, such as a nest or cave

4. **What are two groups of adaptations described on this page?**

Adaptations that are body parts; adaptations that are ways an organism acts

5. **What other kinds of plants have spines for protection?**

Rose bushes, blackberry bushes

6. **What other kinds of animals use camouflage for protection?**

Insects, such as praying mantises and katydids, geckos, and arctic hares

7. **Direct students to the image of the capybara, and ask: What other kinds of animals protect themselves by swimming, running, or flying away from danger?**

Swimming: fish, frogs, dolphins; running: antelopes, wild horses, rabbits; flying: birds, butterflies, bats

8. **What happened to the water on the paper towel?**

It soaked into the paper and passed through to the other side.

9. **What happened to the water on the waxed paper?**

It sat on top of the waxed paper. Little to no water passed through.

10. **How are the results of your investigation evidence to explain how the outer layer of a cactus works?**

Water not passing through waxed paper is evidence that wax on plants may not let water pass through, either. The water stays inside and cannot escape from the plant.

11. **Collect the completed What's My Adaptation?**

AP 4.1

Lesson 5: Living Things in Groups

1. **Build on what students learned about adaptations in Lesson 4 and in Student Reader Chapter 2. Ask: What adaptations do animals have for getting food?**

Examples from the Student Reader include giraffes' long necks for reaching tree

leaves, the shape of the topi's snout for eating grasses, and an owl's large eyes for finding prey in the dark.

2. **Remind students that the ways organisms act can also be adaptations. Ask: How is the time of day an owl hunts for food an adaptation?**

It hunts at night because more prey are out then or because there are fewer predators hunting at night to compete with.

3. **Have students look at the image and caption on the page, and ask: What are some behavioral traits of wolves?**

They live in a family group; the whole group cares for the young.

4. **What other behavioral traits of wolves do you know about?**

Answers will depend on students' prior knowledge but may include that wolves howl loudly at night, that they hunt other animals for food, and that they run fast.

5. **Then, discuss the following question: Do you think it is dangerous to be the sentry who stands tall while the others in the group are low to the ground or inside their burrow? What evidence would support your answer?**

Students should acknowledge that strong evidence would come from observing meerkats in the wild. There, they would see that the sentry is the first member of the group to see a predator and also the first member to dive into a burrow for safety.

6. **Where is the calf in this photo? Allow students to share the location of the calf with a reading partner. Ask: Was the calf hard for you to see? How does hiding the calf in a group of larger elephants protect it?**

It makes the calf hard for a predator to see or to attack.

7. **Point out to students that they have just used evidence to support an argument. Ask: What was your argument to explain how the calf is protected?**

It is protected because predators cannot see it.

8. **Collect the completed How Big Are Animal Groups?**

AP 5.2

Lesson 6: Suited for Survival

1. **How would you describe this habitat?**

It is rocky and very close to the ocean, where waves and tides can cover the rocks.

2. **What are some adaptations you noticed?**

Answers will vary with the images and videos used but may include gills for breathing underwater and hard shells for protection from waves and predators.

Lesson 7: Beaver Dam Case Study

1. **internet access and the means to project video for whole-class viewing How Do Beavers Change the Environment?**

AP 7.2

2. **Where does the beaver build the dam?**

In the middle of a pond or stream

3. **How does the dam change the water flow?**

It changes the water level, its direction, and the speed at which it flows.

4. **Why might the beaver build the dam in the place where it does?**

Because it gives beavers protection from predators, and they move better in water than on land

Lesson 8: Nature and Changing Ecosystems

1. **What kind of impact could changes to coral reefs have on people?**

Sample answer: If animals in the ocean die from changes to coral reefs, people cannot consume those animals, and then people have fewer types of food to eat.

2. **There are many types of bugs that like to eat flowers. If there is a sudden increase in bugs that feed on flowers, what happens to the flowers?**

The flowers will die.

Lesson 9: Humans Cause Ecosystem Change

1. **What ways have you seen that humans have changed an environment?**

Building houses, planting a garden, widening a road

2. **What are some things that can cause environments to change?**

Too much or too little water, fires, trees being cut down, beaver dams, insect invasion

3. **Which of those changes were caused by people?**

Cutting down trees, using water, buildings

4. **What type of change do you think organisms are better able to survive, and why?**

A change that happens slowly, since they have more time to adapt to the change

5. **How can building a dam change the organisms that live in the environment?**

They may have less water to live in, drink, or find food in.

6. **Why do people build dams on rivers even though that can harm the organisms that live in the rivers?**

Because people need fresh water to drink

7. **Discuss how changes in the climate caused by human activities can change the environment. Ask: What effect does climate change have on organisms such as polar bears and seals in the Arctic?**

Animals that depend on very cold temperatures may have to move if their climate becomes too warm for them to survive.

Lesson 10: Living Things Respond to Change

1. **What are some natural hazards that can cause ecosystems to change?**

Earthquake, tornado, hurricane, fire, flood

2. **What are some other natural ways that ecosystems change?**

Overpopulation, invasive species

3. **What are some human activities that can change ecosystems?**

Pollution, overfishing, overhunting, deforestation, agriculture, resource

use/overpopulation

4. **Why is the rate of change the most pressing issue affecting the animals in Antarctica?**

Animals cannot adapt as quickly as the conditions are changing in their environment.

5. **How might the animals shown in the video need to adapt to the changes in Antarctica, such as melting sea ice and warmer weather?**

The animals may need to search in new places for food.

6. **Why is it important for salmon to be in cold water?**

It is better for their bodies, growth, and reproduction.

7. **What do you think would happen if water temperatures in the rivers get warmer and warmer all year round?**

The salmon might not be able to survive.

8. **Do you think the plant will be able to adapt quickly enough to survive the changes to its habitat?**

The plant will die in just a few days if the water is not drained at all.

9. **Are there any ways for the plant to respond to the changes that might help it survive?**

The plant roots might adapt by drinking more water than usual.

10. **Is overpopulation the result of a natural or human-caused change to an ecosystem?**

It could be either.

11. **How does overpopulation negatively affect the ecosystem?**

When too many organisms need food to survive, the ecosystem may run out of natural supplies and die.

12. **How can other organisms respond when their habitats are taken over by a particular species?**

They can fight for available food, try to kill the harmful organisms, or move away.

13. **How are the examples similar?**

» Did you read about any situations that are similar to that of the overpopulation of the organism? How are the situations similar?

Lesson 11: Ecosystem Problems and Solutions

1. **What kind of person can be a conservationist?**

Anyone who wants to help plants and animals meet their needs for survival

2. **What traits are important for a conservationist to have?**

Creativity to find solutions to problems

3. **How does fewer sea turtle eggs hatching affect the ocean ecosystem?**

There will be fewer adult sea turtles to eat animals such as jellyfish, and there will be less food for animals like sharks.

4. **How can conservationists know which solution to use to solve a problem?**

They have to figure out what would be helpful to the organism or habitat they want to

protect.

5. **How can conservationists know that the solution is making the problem better?**

They take measurements and observations and compare them.

Lesson 13: Hidden Clues About Earth's Past

1. **Where did the boy find the dinosaur fossil?**
In the ground; in rock; in earth
2. **What were the people in the video doing with the fossil?**
Getting it out of the ground to move it; brushing it off
3. **Why do you think people have to be careful when they dig up fossils?**
Because they can break
4. **How does this provide clues about habitats in the past?**
It can tell us what kinds of animals lived a long time ago.
5. **Do the fossils come from different times in Earth's history?**
Yes
6. **Which fossil was the oldest?**
Feathers
7. **How can you tell?**
It was buried the farthest down in the pan.
8. **Which fossil was the second oldest?**
Beads
9. **Which fossil was the youngest?**
Seashells
10. **What does this tell you about habitats in the past?**
Habitats must have changed over time.

Lesson 14: Fossils and How They Form

1. **Page 42 What is the difference between a fossil and an organism that has died?**
Fossils are the remains of organisms that lived long ago.
2. **Which of these (the actual shell or the clay impression) looks more like the seashell fossil in the picture?**
The clay
3. **Explain that an impression is all that is left of seashells when they are fossilized. Ask the following: What does the clay represent?**
Mud
4. **Page 45 How are the fossils of the pine cone and the shell similar?**
They were both pressed into a rock formation.
5. **What happens to food you freeze in a home freezer?**
It gets hard and does not decompose.

6. **Where does permafrost occur?**

At Earth's poles and tops of mountains where snow never melts

7. **What is the difference between an organism that is preserved and one that is not preserved?**

All parts of the fossil are there, including the soft parts, when it is preserved.

8. **What happens to permafrost as the climate grows warmer?**

It thaws, and scientists may find more fossils there.

9. **Where can you find resin?**

When you cut a pine tree, you can see it seeping from the wound.

10. **What sort of fossils would you be most likely to find in amber?**

Insects that were living in trees

11. **Is a tree a habitat?**

Yes

Lesson 15: Fossil Clues About Changing Habitats

1. **What might the shape of the teeth of a fossil animal tell you about it?**

The type of food it ate

2. **How can you know how an animal moves from one place to another by looking at fossil remains?**

You can see if it has wings, a tail, or limbs.

3. **What clues tell scientists about the type of habitat or how it may have changed?**

The type of animal or plant fossils that they find

4. **Do you know of any animals that are extinct that once lived in the area where you live now?**

Dinosaurs, ferns, coral

5. **Which layer of rock is the oldest layer?**

The lowest layers in the photo

6. **How do the fossils in the oldest layers compare with fossils in newer ones?**

The animals are simpler the older the rock layers are.

7. **When scientists find fossils of coral in places that are now cold, what does this tell them about how the environment has changed?**

The environment used to be a warm ocean but now is colder.

8. **What do you know about coal?**

It is mined in states such as West Virginia. It is burned to create electricity and heat.

9. **What kind of fossil is coal?**

Plants, including trees

10. **What clues can people look for to know where to find coal?**

They can find fossils of plants. They can look in places where tropical forests used to grow.

11. What evidence has been found of dinosaurs living in the western United States?

Fossil bones and footprints

12. What is the oldest layer of a glacier?

The bottom layer

13. How are fossils preserved in glaciers and permafrost?

They are frozen, so they do not decompose much.

14. What are some clues other than bones that scientists can look for to know about past climates?

Evidence of glaciers, the body covering or types of nests that animals built

Lesson 16: Solving a Fossil Mystery

1. What animal today does this dinosaur look like?

Duck

2. How is the dinosaur similar to a duck, besides its looks?

It lived in the water.

3. How do you think scientists were able to tell that the dinosaur lived in the water?

Based on where the fossil was found

4. What is similar about the two layers where the fossils were found?

They are both in the second layer.

5. How can you tell?

The fossils were found in the same layer.

6. What can this tell you about when the fossilized organisms existed?

The fossils came from the same time in Earth's history.

7. Do you think all of the fossils are the same age?

Yes

8. What do you think the farmland was like when the brachiopod lived there?

Aquatic, underwater

Lesson 17: Habitat Changes and Extinction

1. Can you recall a species that is extinct?

A dinosaur species

2. What happens to living things when their habitat changes?

Some of them survive, and some do not.

3. How do species become extinct?

When there are no more individuals left to reproduce because changes to the environment could not be overcome

4. What kinds of things can cause many individuals of a species to die?

The habitat changes, for example, with the introduction of a new predator, disease that kills a food source, or change in climate. Organisms that cannot move or adapt die.

5. **What do the two ideas have in common?**
That the sun was blocked and it became cold
6. **If it became cold and dark, why would plants not be able to survive the change?**
They need sunlight to make food.
7. **What ideas do scientists have to explain the mass extinction that happened 250 million years ago?**
An asteroid from space struck Earth.
8. **What evidence did scientists see that supports that a mass extinction happened?**
They found fossils of many different organisms in lower layers of rock, and then the layers on top of it were empty of those types of fossils.
9. **Do all organisms on Earth die in a mass extinction?**
No, only the ones that cannot respond to the changes by finding new shelter and food sources
10. **What do the western black rhino and Steller's sea cow have in common?**
They were not able to adapt when their habitat changed, and they became extinct.

Unit quiz key

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