

Lessons 13–15

Animal Groups

Prepare

In Lesson 13, students model group behaviors to investigate how living in a group can benefit animals. In Lesson 14, students deepen their understanding of animal groups by obtaining and combining information from texts to learn about the different purposes of living in groups and differences between groups. Students then construct an argument from evidence to explain how living in a group can benefit individual members. In Lesson 15, students model how animal groups cope with changes to the systems in which they live. Students also synthesize their learning by updating the anchor chart and completing a Conceptual Checkpoint.

Student Learning

Knowledge Statement

Patterns in behavior reveal that living in groups helps animals survive.

Objectives

- Lesson 13: Use evidence from models to explain that animals can benefit from living in a group.
- Lesson 14: Obtain, evaluate, and communicate information about why different animals live in groups.
- Lesson 15: Apply prior knowledge of systems to understand how animal groups cope with change.

Concept 2: Suitability to Environment

Focus Question

How do organisms get what they need to survive?

Phenomenon Question

Why do some animals live in groups?

Texas Essential Knowledge and Skills Addressed

- 3.2A **Plan and implement descriptive investigations, including asking and answering questions, making inferences, and selecting and using equipment or technology needed, to solve a specific problem in the natural world.** (Addressed)
- 3.2B **Collect and record data by observing and measuring** using the metric system and recognize differences between observed and measured data. (Addressed)
- 3.2C **Construct** maps, graphic organizers, **simple tables, charts,** and bar graphs **using tools** and current technology **to organize, examine,** and evaluate measured **data.** (Addressed)
- 3.2D **Analyze and interpret patterns in data to construct reasonable explanations based on evidence from investigations.** (Addressed)
- 3.2F **Communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion.** (Addressed)
- 3.3A **Analyze, evaluate, and critique scientific explanations by using evidence, logical reasoning, and experimental and observational testing.** (Addressed)
- 3.4 **Collect, record, and analyze information using tools, including** cameras, computers, hand lenses, metric rulers, Celsius thermometers, wind vanes, rain gauges, pan balances, graduated cylinders, beakers, spring scales, hot plates, meter sticks, magnets, collecting nets, **notebooks,** and Sun, Earth, and Moon system models; timing devices; and materials to support observation of habitats of organisms such as terrariums and aquariums. (Addressed)
- 3.9A **Observe and describe the physical characteristics of environments and how they support populations and communities of plants and animals within an ecosystem.** (Addressed)
- 3.9C **Describe environmental changes** such as floods and droughts **where some organisms thrive and others perish or move to new locations.** (Addressed)
- 3.10A **Explore how structures and functions of plants and animals allow them to survive in a particular environment.** (Addressed)

English Language Proficiency Standards Addressed

- 2F Listen to and derive meaning from a variety of media such as audio tape, video, DVD, and CD ROM to build and reinforce concept and language attainment.
- 3E Share information in cooperative learning interactions.
- 4F Use visual and contextual support and support from peers and teachers to read grade-appropriate content area text, enhance and confirm understanding, and develop vocabulary, grasp of language structures, and background knowledge needed to comprehend increasingly challenging language.

Materials

		Lesson 13	Lesson 14	Lesson 15
Student	Science Logbook (Lesson 13 Activity Guide)	●		
Teacher	Science Logbook (Lesson 14 Activity Guide)		●	
Student	Science Logbook (Lesson 15 Activity Guides A and B)			●
Teacher	Model Penguin Behavior: 8 test tubes, 8 cups of ice, 2 thermometers, clear plastic bin (13.5" × 8" × 4.5" or larger), rubber band, timer, Model Penguin Behavior Setup Instructions and Classroom Procedure (Lesson 13 Resource A)	●		
Teacher	Animal Group Photographs (Lesson 13 Resource C)	●		
Teacher	Leaf-Cutter Ant Station: 80 leaves, 1 pound of modeling clay, 2 scales, 4 desks, timer, craft sticks (1 per student in group), container for craft sticks, marker, scissors, station procedure sheet	●		
Teacher	Lions versus Wildebeests Station: 6-sided game die, Wildebeest Behavior Key, Lion Behavior Key, desk, craft sticks (1 per student in group), container for craft sticks, marker, scissors, station procedure sheet, masking tape (optional)	●		
Teacher	Musk Oxen versus Arctic Wolves Station: 27 adult musk oxen cutouts (per group), 9 baby musk oxen cutouts (per group), 3 sheets of notebook or printer paper (per group), 3 musk oxen scenario sheets, 3 glue sticks, desk, craft sticks (1 per student in group), container for craft sticks, marker, scissors, station procedure sheet	●		
Teacher	Driving question board	●		●
Teacher	Animal Groups Text Assignments (Lesson 14 Resource)		●	
Teacher	Anchor chart		●	●
Teacher	Anchor model		●	
Teacher	Classroom Change Scenarios (Lesson 15 Resource A)			●
Teacher	Meerkat Group Photograph (Lesson 15 Resource B)			●
Teacher	Model Meerkat Behavior: 5 plastic cones or paper plates, hand tissues (1 per student acting as forager), several small pieces of paper (or other small objects), timer, Model Meerkat Behavior Setup Instructions and Classroom Procedure (Lesson 15 Resource C)			●
Teacher	Coping with Change Scenarios (Lesson 15 Resource D)			●
Teacher	Conceptual Checkpoint Photograph (Lesson 15 Resource E)			●

		Lesson 13	Lesson 14	Lesson 15
Preparation	1 Day Before: Collect leaves for Leaf-Cutter Ant Station.	●		
	Prepare materials to model penguin behavior (see Lesson 13 Resource A).	●		
	Set up group behavior stations (see Lesson 13 Resource B).	●		
	Print a copy of Animal Group Photographs (Lesson 13 Resource C).	●		
	Cue penguin video: http://phdsci.link/1215 .	●		
	Print a copy of each animal groups text (see Lesson 14 Resource).		●	
	Cue leaf-cutter ant video, lion and wildebeest video, musk ox and Arctic wolf video (VID NOW 2017), and butterfly video: http://phdsci.link/1216 , http://phdsci.link/1217 , http://phdsci.link/1218 , and http://phdsci.link/1219 .		●	
	Prepare materials to model meerkat behavior (see Lesson 15 Resource C).			●
	Cue meerkat video, elephant video, and butterfly video from Lesson 14: http://phdsci.link/1220 , http://phdsci.link/1221 , and http://phdsci.link/1219 .			●

Lesson 14

Objective: Obtain, evaluate, and communicate information about why different animals live in groups.

Launch

5 minutes

Review the questions added to the driving question board at the end of the previous lesson. Then show students videos of the animal groups they modeled in the previous lesson one at a time with no sound: <http://phdsci.link/1216>, <http://phdsci.link/1217>, <http://phdsci.link/1218> (VID NOW 2017).

After each video, allow students to discuss what they observe and how it relates to what they modeled at each station.

► What is happening in the video?

- The ants are gathering leaf pieces.
- A group of lions is attacking a group of wildebeests. The wildebeests are trying to protect themselves from the lions.
- Arctic wolves are coming toward a group of musk oxen. The adult musk oxen form a wall between the wolves and the baby musk oxen to protect the babies.

► How did you model similar group behaviors in the previous lesson?

- We gathered leaves, tore them into pieces, and stored them in tunnels.
- We modeled how lions can work together to get food and how wildebeests can work together to protect themselves.
- We positioned adult musk oxen in different positions so that they could protect their babies from wolves.

Agenda

Launch (5 minutes)

Learn (35 minutes)

- Research Animal Groups (15 minutes)
- Compare Animal Groups (10 minutes)
- Make a Claim (10 minutes)

Land (5 minutes)

Tell students they will have the opportunity to learn more about animal groups in this lesson as they continue to explore the Phenomenon Question **Why do some animals live in groups?**

Learn 35 minutes

Research Animal Groups 15 minutes

Show students the animal groups texts (Lesson 14 Resource). Divide students into four groups, and assign each group one of the texts. The group that is assigned to read about lions and wildebeests should read both texts listed for the animals. Explain that later in the lesson, students will come back together and share their knowledge of the texts with the class in a Jigsaw discussion.

Each group should read their text (or set of texts) together and answer the following questions in their Science Logbooks (Lesson 14 Activity Guide). 

- ▶ Why do these animals live in groups?
- ▶ How big are the groups?
- ▶ Where do these animals live?

After groups have finished reading, students from each group should take turns sharing what they learned with the class. Students should include details about why the animals live in groups, the size of the groups, and where the animals live. As each group shares, record the information for each animal in a class chart.



Differentiation

The texts in this lesson are above grade level and may be challenging for students to comprehend. Consider using the following strategies to support students (4F).

- Provide definitions or a glossary for challenging words. Use a free resource such as Wordsmyth (<http://phdsci.link/1223>) to generate a glossary.
- Include at least one student reading above grade level (or an adult such as a classroom volunteer or collaborating teacher) in each Jigsaw group and ask them to read the text aloud to other students.
- Provide an audio recording of each text that students can listen to with their group.
- Pair striving readers with strong readers so that they can read the text together.

Sample class chart: 🌟

Animal	Why do these animals live in groups?	How big are the groups?	Where do these animals live?
Leaf-cutter ants	<i>They work together to gather food, care for their young, and keep their home clean.</i>	<i>Hundreds of thousands</i>	<i>In underground chambers</i>
Penguins	<i>They huddle in a group to stay warm during the winter.</i>	<i>A few hundred to several thousand</i>	<i>Antarctica</i>
Lions	<i>They work together to hunt food, raise their young, and protect one another.</i>	<i>15 to 40</i>	<i>African grasslands</i>
Wildebeests	<i>They work together to search for food. The females also all give birth at the same time to keep their young safe.</i>	<i>Thousands</i>	<i>African grasslands</i>
Musk oxen	<i>They work together to protect themselves and their young.</i>	<i>10 to 20</i>	<i>Arctic tundra</i>
Arctic wolves	<i>They work together to hunt and kill other animals for food.</i>	<i>2 to 36</i>	<i>Arctic tundra</i>



Spotlight on Knowledge and Skills

Students notice differences between groups of animals as they read the provided text excerpts and share what they have learned with their peers.

Compare Animal Groups 10 minutes

After the class chart is complete, ask students to return to their groups and discuss similarities and differences among the animal groups described in the chart. Students should record the similarities and differences they discuss in their Science Logbooks (Lesson 14 Activity Guide).



Check for Understanding

Circulate as students work in their groups. Listen for evidence that students have an accurate understanding of the animal groups described in the class chart.

Evidence

Listen for evidence that all students

- express accurate information about the animal groups (e.g., reason for grouping, group size), and
- identify similarities and differences among the animal groups.

Next Steps

If students struggle to express accurate information about the animal groups, then consider providing sentence frames such as these:

- The animal group we read about is _____.
▪ This animal lives in a group to _____.

Students will continue to discuss similarities and differences among animal groups in upcoming activities.



English Language Development

Understanding the terms *similarities* and *differences* is required to participate in this activity. Consider providing examples of objects that are the same and objects that are different to scaffold students' understanding of these words. Students may also benefit from using sentence frames such as the ones below.

- These groups are similar because _____.
▪ These groups are different because _____.

After groups have had time to discuss the class chart, invite students from each group to share their ideas with the class.

► What are some differences among the animal groups?

- *Animals live in groups for different reasons. Some animals help each other find food while other animals help protect one another.*
- *Animal groups live in different environments.*
- *Different animal groups can be very different in size. Wolf packs can have as few as two members, while ants can live in groups that have hundreds of thousands of members.*

► How are the animal groups similar?

- When an animal lives in a group, it does things to help the whole group.
- A lot of animal groups work together to protect their young.

Make a Claim | 10 minutes

Ask students to work individually to make a claim about animal groups in their Science Logbooks (Lesson 14 Activity Guide). Students should state their claim and provide evidence gathered from the texts or modeling activities from the previous lesson. For each piece of evidence, students should use reasoning to explain why that evidence supports their claim. 

► Make a claim about why some animals live in groups.

Sample student response:

Claim: *Living in a group helps individual animals in the group survive.*

Evidence	Reasoning
<i>Leaf-cutter ants work together to gather food and build a home.</i>	<i>Ants need food and shelter to survive.</i>
<i>Penguins huddle in a group to stay warm.</i>	<i>A penguin could not stay warm enough to survive on its own.</i>
<i>Lions work together to separate and capture wildebeests.</i>	<i>Lions need food to survive.</i>
<i>Wildebeests give birth at about the same time.</i>	<i>Protecting the babies allows the herd to get bigger and continue to survive.</i>

Display the anchor chart. Use equity sticks to call on a few students to share their claim, evidence, and reasoning. Summarize students' claims into a single claim that describes students' current understanding of why animals live in groups.



Content Area Connection: English

Students should recount key details they gained from the texts to support their claim.

Sample anchor chart:

Survival
<p>Fossil Evidence</p> <ul style="list-style-type: none">• Fossils provide evidence about the kinds of organisms that once lived and what their environments were like.• Some environments looked very different in the past from the way they look now.• The kinds of organisms that live in an area can change over time. Sometimes organisms live in new areas, and sometimes they no longer live anywhere on Earth.
<p>Suitability to Environment</p> <ul style="list-style-type: none">• A habitat contains everything a particular kind of organism needs to survive. Environments include multiple interconnected habitats.• For any particular environment, some kinds of organisms can survive well, some can survive less well, and some cannot survive at all.• Some animals live in groups that help members survive. Living in groups can help animals get food and defend themselves.

After updating the anchor chart, tell students that although not all animals live in groups, many others they have not yet investigated do. 

► **What other animals do you think might live in groups?**

- *Fish seem to live in big groups.*
- *I think a lot of animals that live around lions, like elephants and zebras, live in groups.*
- *I think monkeys live together.*



Teacher Note

Students may wonder why all animals do not live in groups. As needed, prompt students to consider this question on their own or with a partner. Lead a discussion to help students understand that while many animals benefit from living in groups, other animals survive well living on their own (3E).

Ask students to consider the following question.

► **Do you think butterflies live in groups or on their own?**

- *I think butterflies live on their own because I only ever see one at a time.*
- *I think maybe butterflies come together when they need protection.*
- *I think that some butterflies live in groups but that others might not.*

Land

5 minutes

Show students the video of clustering butterflies (<http://phdsci.link/1219>).

► **Why might butterflies be found in groups?**

- *Maybe they live in groups to stay warm like penguins.*
- *I wonder if they live in groups to stay safe.*
- *Maybe living together helps them gather and store food like ants.*

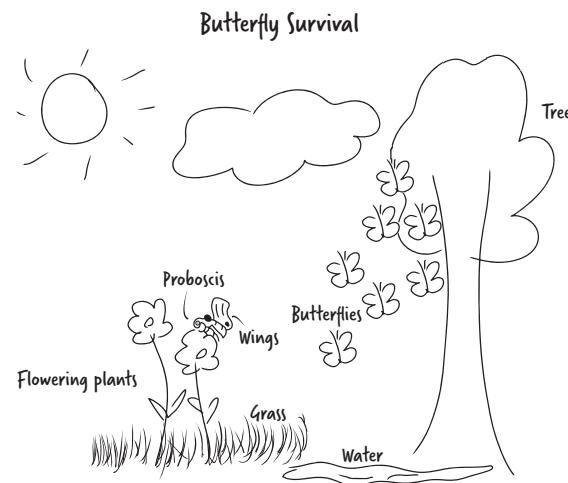
► **How could a scientist find out why butterflies group together?**

- *A scientist could observe butterflies living in groups and see what they do.*
- *Scientists could compare the behavior of these butterflies with other butterflies to see if they are similar or different.*
- *Scientists could observe patterns in how butterflies behave in different locations.*

Explain that while scientists know butterflies can be found in groups, they are not exactly sure why. Based on current research, scientists think that butterflies might sometimes form groups to protect themselves from the environment or predators.

Display the anchor model. Remind students of the Essential Question: **How do butterflies survive over time in a changing environment?** Ask students to generate ideas they now know about butterflies that could be added to the anchor model. Summarize students' responses, and add them to the anchor model.

Sample anchor model:



Butterflies live in environments that have water and plants such as flowering plants, grass, and trees. Butterflies get what they need to survive from their environment. Butterflies have characteristics that help them get what they need, such as a proboscis to get nectar and wings to fly. Like many other animals, butterflies can be found in groups. Butterflies have lived on Earth for millions of years, so we think they can survive in changing environments, but we're not sure how.

Optional Homework

Students think about a group they are part of (e.g., family, sports team, club). Students describe the group, explain the different roles people play in the group, and identify how being in a group benefits individual members of the group.