Amplify CKLA
FLORIDA

Core Knowledge®

Knowledge 8

Teacher Guide | Grade 2

Insects

Grade 2 | Knowledge 8

Insects

Teacher Guide

Amplify Core Knowledge Language Arts

ISBN 978-1-68391-636-9

Printed in the USA
01 BR 2020

Grade 2 | Knowledge 8

Contents

INSECTS

Grade 2 | Knowledge 8

Introduction

This introduction includes the necessary background information to be used in teaching the *Insects* domain. The Teacher Guide for *Insects* contains eight daily lessons, each of which is composed of two distinct parts, so the lesson may be divided into smaller chunks of time and presented at different intervals during the day. The entire lesson will require a total of sixty minutes.

This domain includes a one-day Pausing Point following Lesson 5. At the end of the domain, a Domain Review, a Domain Assessment, and Culminating Activities are included to allow time to review, reinforce, assess, and remediate content knowledge. You should spend no more than twelve days total on this domain.

DOMAIN COMPONENTS

Along with this Teacher Guide, you will need:

- Flip Book for *Insects,* which can also be found on the CKLA Florida Teacher Resource site
- Activity Book
- Digital Components for *Insects,* which can be found on the CKLA Florida Teacher Resource site
- Image Cards for *Insects*

ADDITIONAL RESOURCES FOR THIS DOMAIN

Equity Guides

The Amplify CKLA Equity Guide offers an overview of the many ways that the Amplify CKLA program supports students' understanding of issues related to diversity, equity, inclusion, and social justice. The guide for each grade details how each domain of the Knowledge Strand (Grades K–2) or each unit (Grades 3–5) aligns to outcomes identified in the Teaching Tolerance Social Justice Standards. This tool enables teachers to understand how students work toward these outcomes through the Amplify CKLA program.

The guide also includes a DEI question for each domain or unit that teachers may use to further develop students' understanding of how the content area connects to these issues. The Equity Guide is located on the CKLA Florida Teacher Resource site.

Knowledge Builders

Knowledge Builders are animated videos designed to further student engagement and build students' background knowledge on Amplify CKLA topics. Each video has an accompanying guide that includes suggestions for follow-up extension activities. Knowledge Builders can be used as an introduction to the Knowledge unit or throughout the domain during Pausing Points, Culminating Activities, or Domain Reviews. The videos are located on the CKLA Florida Teacher Resource site.

ReadWorks Articles

Amplify CKLA and ReadWorks have partnered to deliver high-quality texts aligned to both the Amplify CKLA Knowledge Sequence and the Florida content topics in Social Studies, Science, and the Arts. These texts are accompanied by vocabulary supports and formative assessment opportunities aligned to the Florida B.E.S.T. standards. Teachers may monitor student progress using the ReadWorks reporting features.

These articles are designed for flexible use, including independently, in small groups, or in whole group instruction as desired. The ReadWorks icon appears in the sidebar of each lesson that has an accompanying ReadWorks article. To access all Amplify CKLA-aligned ReadWorks articles, see https://about.readworks.org/CKLA-FL.html.

Trade Book Guides

Each Knowledge Domain includes a high-quality, authentic text selected specifically to enhance the content of the domain. The book is intended for use as an introduction to the domain before diving into the deeper content of the domain Read-Alouds. The Trade Book Guide, found on the CKLA Florida Teacher Resource site, provides a summary of the book, text complexity information, an essential question, key vocabulary words, and activities to do after the Read-Aloud, including writing prompts. The book and Trade Book Guide activities can be used during Core Connections lessons as well as other points in the domain, such as Pausing Points and Culminating Activities.

RECOMMENDED RESOURCES

You should consider various times throughout the day when you might infuse the curriculum with authentic domain-related literature. If you are able to do so, you may recommend that students select books from the Recommended Resources list. In addition, if you recommend that families read aloud with their child each night, you may wish to suggest that they choose titles from this list to reinforce the concepts covered in this unit.

You might also consider creating a classroom lending library, allowing students to borrow domain-related books to read at home with their families. The Recommended Resources list, which also includes online resources, can be found on the CKLA Florida Teacher Resource site.

Core Knowledge Grade 2 Teacher Handbook, edited by E. D. Hirsch, Jr. and Souzanne A. Wright (Core Knowledge Foundation, 2005) ISBN 978-1890517748

WHY INSECTS ARE IMPORTANT

This domain will introduce students to the largest group of animals on Earth. Students will learn the characteristics of insects, the life cycles of insects, how insects can be categorized as solitary or social, and how insects are viewed as both helpful and harmful. For example, students will learn how insects are important to the process of pollination and in the production of honey, some cosmetics,

and even medicines. This domain will lay the foundation for review and further study of the life cycles, habitats, and classifications of insects and other animals.

Note: Each of the read-alouds in this domain is narrated by a different character. Lessons 1 through 7 are narrated by an insect character, and Lesson 8 is narrated by an entomologist.

WHAT STUDENTS HAVE ALREADY LEARNED

The following domains, and the specific core content that was targeted in those domains, are particularly relevant to the read-alouds students will hear in *Insects*. This background knowledge will greatly enhance students' understanding of the read-alouds they are about to enjoy.

Kindergarten *Plants*

Grade 1 *Animals and Habitats*

Grade 2 *Cycles in Nature*

CORE VOCABULARY FOR INSECTS

The following list contains all of the core vocabulary words in *Insects* in the forms in which they appear in the read-alouds or, in some instances, in the "Introducing the Read- Aloud" section at the beginning of the lesson. Boldfaced words in the list have an associated Word Work activity. The inclusion of the words on this list does not mean that students are immediately expected to be able to use all of these words on their own. However, through repeated exposure throughout the lessons, they should acquire a good understanding of most of these words and begin to use some of them in conversation.

Lesson 1 **habitats** insects social solitary	**Lesson 4** colonies **cooperate** drones pollen	**Lesson 7** adapt armor beetles **mimicry**
Lesson 2 abdomen antennae exoskeletons **microscopic** thorax	**Lesson 5** aggressive chambers **destructive** emit nurseries	**Lesson 8** entomologist extinction **foe** pesticides pollinators
Lesson 3 larva molt nymph **progression** pupa	**Lesson 6** bioluminescence **communicate** lanterns	

CORE CONTENT OBJECTIVES ADDRESSED IN THIS DOMAIN

Students will:

- Explain that insects are the largest group of animals on Earth
- Explain that there are many different types of insects
- Explain the behaviors of solitary and social insects
- Classify insects based on their defining characteristics
- Identify and describe the three main body parts of insects: head, thorax, and abdomen
- Describe an insect's exoskeleton
- Explain why spiders are not insects
- Describe insect life cycles and the stages of complete and incomplete metamorphosis
- Describe various social insect colonies including the jobs performed in the colony
- Describe the many ways insects communicate with one another
- Identify ways in which insects can be helpful to humans
- Identify ways in which insects can be harmful to humans
- Identify ways in which humans can be harmful to insects

WRITING

In this domain students will practice collecting and synthesizing information by recording information in journals. Students will also work independently to write an informational narrative in the style of the read-alouds in this domain. They will build upon their learning from Domains 3 and 4 by including a character, and a plot with a beginning, middle, and end. During this project they will use the writing process to plan, draft, and edit their informational narrative.

Writing Portfolio

The following activities may be added to students' writing portfolios:

- Insects Journal (Lessons 1–4)
- Plan an Informational Narrative (Activity Page 5.1)
- Draft an Informational Narrative (Activity Page 6.1)
- Edit an Informational Narrative (Activity Page 8.1)

LESSON

1

INSECTS

Insects Everywhere!

PRIMARY FOCUS OF LESSON

Speaking and Listening

Students will describe insects and their habitats.

ELA.K12.EE.4.1

Reading

Students will describe insects and their habitats.

ELA.2.R.2.2

Language

Students will demonstrate an understanding of the Tier 3 word *habitats.*

ELA.2.V.1.1

Writing

In a journal, students will write about a past experience with an insect.

ELA.2.C.1.4

FORMATIVE ASSESSMENT

Insects Journal

Narrative Students will write about a past experience with an insect in their journals.

ELA.2.C.1.4

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud			
Core Connections	Whole Group	10 min	❑ Domain 6 Flip Book
Domain Introduction			
Read-Aloud			
Purpose for Listening	Whole Group	30 min	
"Insects Everywhere!"			
Comprehension Questions			
Word Work: *Habitats*			
This is a good opportunity to take a break.			
Application			
Sayings and Phrases: Eaten Out of House and Home	Whole Group Independent	20 min	❑ paper ❑ stapler ❑ writing and drawing tools
Insects Journal: Narrative			
Take-Home Material			
Family Letter			❑ Activity Page 1.1

ADVANCE PREPARATION

Application

- Prepare a booklet with at least ten pages for each student in the class to serve as an insect journal throughout this domain. Make sure the pages are large enough that students can easily draw and write on them. You may wish to ask the art teacher to help students construct their own blank booklets in art class and decorate the covers.

Note to Teacher

The read-alouds in this domain ask students rhetorical questions. If you think students may know the answer, you may wish to pause and have them answer. It is not expected that students know the answers to these questions. If students do not know the answer, or you do not wish to pause, simply continue reading, as the text will provide the answer.

Many scientific terms, such as *host, solitary,* and *social,* have broader meanings in everyday speech, and more specific denotations in science. When possible, help students understand both the broad meaning of the word (e.g., *solitary* means alone) and the more narrow scientific meaning within the context of the domain (e.g., solitary insects are insects that survive by living alone or in pairs). By understanding both meanings, students begin to understand how to use words appropriately in both domain-specific and general conversation and begin to understand that words can have many connotations and uses.

Proverbs are short, traditional sayings that have been passed along orally from generation to generation. These sayings usually express general truths based on experiences and observations of everyday life. Although some proverbs do have literal meanings—that is, they mean exactly what they say—many proverbs have a richer meaning beyond the literal level. It is important to help students understand the difference between the literal meanings of the words and the implied or figurative meanings.

Universal Access

- Find images depicting different habitats, including the habitat in which you live, to show students during the Introducing the Read-Aloud activity.
- Find images depicting insects local to your area to share with students.

CORE VOCABULARY

habitats, n. the specific environments in which plants and animals live and thrive
Example: Desert habitats are home to plants and animals that can survive without regular rainfall.
Variation(s): habitat

insects, n. small animals with six legs and three main body parts
Example: Mackenzie likes all kinds of insects, especially butterflies.
Variation(s): insect

social, adj. living together in organized communities
Example: The social honeybees worked hard to take care of the queen bee.
Variation(s): none

solitary, adj. living alone or in pairs
Example: The solitary fly circled the food-covered table alone before landing on my ham sandwich.
Variation(s): none

Vocabulary Chart for "Insects Everywhere!"

Type	**Tier 3 Domain-Specific Words**	**Tier 2 General Academic Words**	**Tier 1 Everyday Speech Words**
Vocabulary	habitats *(hábitats)*		insects *(insectos)*
Multiple Meaning	social *(social)* solitary *(solitario/a)*		
Sayings and Phrases	teeming with life host plant all at once in the meantime		

Lesson 1: Insects Everywhere!

Introducing the Read-Aloud

10M

Speaking and Listening: Students will describe insects and their habitats.

ELA.K12.EE.4.1

CORE CONNECTIONS (5 MIN)

Life Cycle of a Butterfly

Note: Students learned about the life cycle of a butterfly in Domain 6: *Cycles in Nature.*

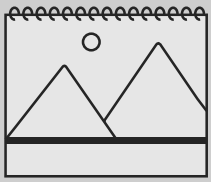
- Ask students to share what they have already learned about the life cycle of a butterfly.
- Prompt students to remember that a butterfly starts as an egg laid by an adult butterfly, then is a caterpillar or larva, then creates a chrysalis, then emerges as a butterfly and lays more eggs or fertilizes female eggs.
- Prompt students to remember that the process of changing from larva to butterfly is called metamorphosis.
- Tell students they will be learning about other animals that go through metamorphosis in this domain.

What Do We Already Know about Habitats?

Note: Students who participated in the Core Knowledge Language Arts program in Grade 1 will have heard about habitats in the *Animals and Habitats* domain. You may wish to solicit their knowledge of this topic to share with the class.

- Ask students to share what they know about habitats.
- Tell students habitats are the specific environments, or places, in which plants and animals live and thrive.
- Discuss your local habitat with students and ask them if they know of any other habitats (e.g., deserts, forests, mountains, grasslands, tundra, etc.).

Domain 6
Flip Book Poster 6



ENGLISH LANGUAGE LEARNERS

Speaking and Listening

Exchanging Information and Ideas

Entering/Emerging
Elicit short answers from students (e.g., "Name a stage in the life cycle of a butterfly.").

Transitioning/Expanding
Elicit more details in students' answers (e.g., "What happens during the first stage of a butterfly's life cycle?").

Bridging
Elicit higher-level insights and comparisons (e.g., "Why do we call this a life cycle?").

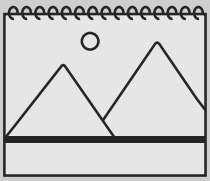
Support

Show students images depicting different habitats, including your own.

Challenge

Have students write a list of every insect they can think of and share it with a peer.

Flip Book 1A-1



Knowledge Builders

Trade Book Guides

DOMAIN INTRODUCTION (5 MIN)

What Do We Already Know About Insects?

- Ask students the following:
  - What is the smallest animal you have ever seen?
  - Do you know of any small animals that have six legs?
- Have students think about the times they have interacted personally with insects. Ask them to think about what the insect looked like, where they saw the insect, and how the insect interacted with them.
- Point to the collage on image 1A-1 and tell students that these are all insects. Tell students all of the insects pictured in this domain are shown bigger than life size so students can see them better.
- Use the following questions to prompt a discussion about the insects in the collage.
  - Do you recognize any of the insects pictured in this image?
  - Do any of these insects live in the area in which you live?
  - What do you know about the insects in the picture?
- You may want to record student responses on chart paper, a chalkboard, or a whiteboard to review during the course of the domain.
- Reiterate that, even though these are different animals, they all belong to a group of animals called insects.
- Tell students that for the next several days, they will be learning about small, six-legged animals called insects.
- Explain the following facts about insects to students:
  - Insects are the largest group of animals on the earth.
  - There are many different types of insects.
  - Insects are a category of animals that is defined by certain characteristics that they will learn about later in the domain.

- Tell students that they will learn the following about insects:
  - facts about many different types of insects
  - what characterizes an animal as an insect
  - the life cycles of insects
  - how insects may be helpful and/or harmful
- Tell students they are going to be introduced to a variety of insects with homes all over the planet. Tell them that today's read-aloud is called "Insects Everywhere!" because insects live in nearly every habitat on Earth.

Lesson 1: Insects Everywhere!

Read-Aloud

30M

Reading: Students will describe insects and their habitats. ELA.2.R.2.2

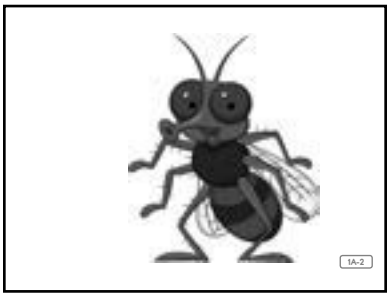
Language: Students will demonstrate an understanding of the Tier 3 word *habitats.* ELA.2.V.1.1

PURPOSE FOR LISTENING

- Tell students to listen carefully to find out about insects that live all over the world.

"INSECTS EVERYWHERE!" (15 MIN)

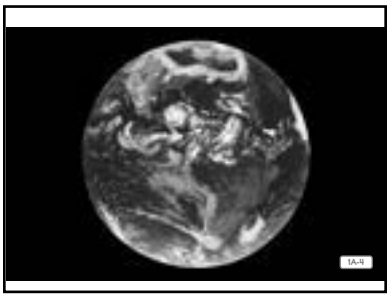
Note: The read-alouds in this domain ask students rhetorical questions. If you think your students may know the answer, you may wish to pause and have them answer. It is not expected that students know the answers to these rhetorical questions. If students do not know the answer, or you do not wish to pause, simply continue reading.



Show image 1A-2: Common housefly
Hello, boys and girls. I've been invited to join you today to talk about a very important subject—me. Who knows what type of animal I am? Right. I'm a fly. I'll bet most of you have seen lots and lots of flies, haven't you? I'm told that you find us flies rather annoying, so I'm guessing that you've swatted at one of my billions of cousins at least once in your life!

Show image 1A-3: Different types of flies
I'm wondering just how much you really know about us. For example, did you know that I could walk straight up a wall? I'll bet you can't do that, can you? I have thousands of tiny hairs on my feet that act like suckers. *These hairs attach to the wall, acting like suction cups. [Demonstrate with your hand the difference between vertical and horizontal. You may wish to show how a*

suction cup works.] I am a housefly, the most common type, but there are many other fly species on Earth. A species is a group of plants or animals that are alike in important ways. Horseflies, robber flies, fruit flies, gnats, and mosquitoes have many different species that all belong to the same group.



Show image 1A-4: Planet Earth

Scientists group animals into different categories. What different kinds of animals can you name? Yes—fish, reptiles, amphibians, birds, and **insects** are just a few of the animal groups you know. Flies, like me, belong to the largest group of animals on Earth. Who knows which group is the largest? Insects! *For every ten animal species in the world, about eight of them are insects! And scientists continue to discover more.* Insects are small animals with six legs and three main body parts. We flies are insects, and we share the planet with millions of other insects in many different **habitats**.

Habitats are the natural homes of plants and animals. Can you name a few? Great—deserts, forests, mountains, grasslands, and tundra are some you may know about. During the next few lessons, some of my fellow insect friends are going to teach you lots of interesting facts about insects that live in different kinds of habitats.

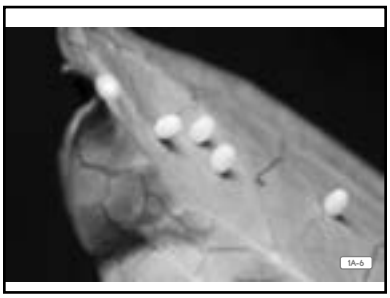
We insects live all over the earth—everywhere except the ocean. Insects can even live in some very cold or very hot areas of the earth!

Show image 1A-5: Alfalfa field in bloom

We'll start today by looking at meadow grasslands. Look at this field of alfalfa. Do you see any animals in the picture? It just looks like an ordinary field without much going on, doesn't it? But, don't be fooled; this field is teeming with life *or full of life*! If you sat down in the middle of this meadow and closed your eyes, you would likely hear birds singing, but you might be completely unaware of the often silent, hidden world of insects all around you.

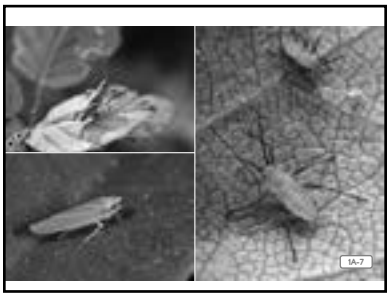
Support

Host can also mean a person who is having a party.



Show image 1A-6: Insect eggs on leaf

Many insects depend on plants to live. Many insects eat plants and some lay their eggs on plants. The plant on which an insect lays its eggs, and which provides food for its young, acts as a host and is called a host plant. *A host is a plant or animal on which, or in which, another thing lives.* Each host plant attracts different types of insects. Many insects have developed very specific diets and would die without their host plants.



Show image 1A-7: Grasshopper, leafhopper, aphids

Many meadow plants attract grasshoppers. *[Point to the insect in the top left corner.]* Grasshoppers feed on the leaves and stems of the alfalfa plant. Harder to spot is the tiny leafhopper, *[Point to the insect in the bottom left corner.]* but this wedge-shaped insect can slow down the host plant's growth, turning the plant brown as it sucks nutrition from it.

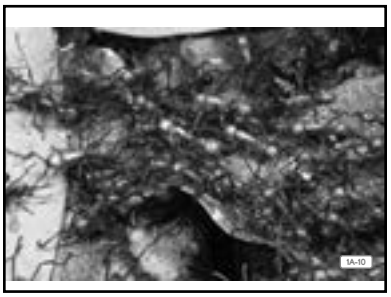
Many insects, such as these tiny aphids, [/ae*fədz/] *[Point to the insects on the right side.]* can damage entire meadows. Grasshoppers, leafhoppers, and aphids are all pests. Farmers are never happy when they discover them on their plants because they can destroy their crops. But not all insects are pests.

Show image 1A-8: Ladybug, lacewing, ambush bug

Who knows what this insect is called? *[Point to the insect on the left side.]* That's right. It's a ladybug. Did you know that ladybugs are some of the most helpful insects on Earth? They feed on aphids and the eggs of moths and beetles that destroy crops. Lacewings and ambush bugs also eat aphids, so farmers are happy when they see these insects on their plants.

From grasslands, let's move to a forest habitat. Both cone-bearing evergreens and deciduous trees live in this forest. *[Prompt students to remember that evergreens have green needles all year round and deciduous trees drop their leaves each year.]*

Show image 1A-9: Pine trees and bark beetle
Many trees, like these pine trees, are hosts to a variety of bark beetles. These tiny insects can kill huge trees! How can that be possible? Bark beetles burrow, or dig, under a tree's bark, creating a series of tunnels in which they lay their eggs. Well, let's think about this . . . what does a tree need to live? *A tree needs water, nutrients, and sunlight to live.* By burrowing into the layer of wood beneath the bark, these beetles stop the flow of nutrients, or food, and water, throughout the tree and often kill the tree.



Show image 1A-10: Swarm of army ants
Lots of insects live high up in the treetops of the forest and many insects also live on the forest floor. Can you think of any? Ants are one of the most common insects on Earth, and many live in the forest. Unlike many of us **solitary** insects that live on our own, ants are **social** insects that live in colonies, or groups. *How are social insects and solitary insects different from one another?* Let's look at an especially interesting social ant that lives in the rainforest.

Show image 1A-11: Army ant
This is an army ant. Army ants travel in big cooperative raiding parties to hunt prey. *Prey are animals that are hunted and eaten by other animals.* They resemble, or look like, an army of soldiers as they move across the ground together. These ants are known for swarming their prey all at once. You'll learn more about ants another day, so let's take a quick peek at one more forest insect.

ReadWorks Articles

"What Lives in a Rain Forest?"

Challenge

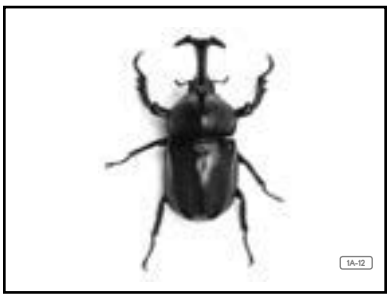
Social and *solitary* are also words that we use to describe people. What do *social* and *solitary* mean in terms of people?

Support

Solitary can also mean alone, without any other people. When we talk about animals such as insects being solitary, it has a slightly different meaning; it refers to animals that do not live in large groups, but live alone or with one other animal. Solitary animals are the opposite of social animals.

Support

Social can also describe being with a group of people. When we talk about animals such as insects being social, it has a slightly different meaning; it refers to animals that survive by living in large groups. Social animals are the opposite of solitary animals.



Show image 1A-12: Rhinoceros beetle

This beetle is named for the long, large horn at the front of its head. Does its horn look like that of any other animal that you already know? I'm thinking of a much larger animal. Yes, a rhinoceros! The rhinoceros beetle uses its horn for digging places to hide and for finding food. Male rhinoceros beetles use their horns for wrestling with other males in an effort to attract a female beetle. The winner gets the girl.

Show image 1A-13: Tundra and crane fly

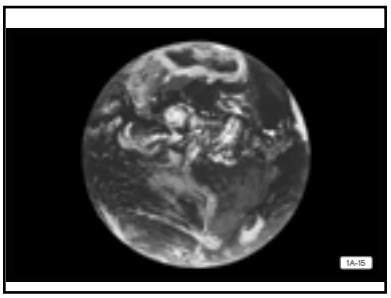
What habitat is shown in this image? What kinds of insects do you think live in the coldest habitats? There are many types of flies on the cold tundra, including houseflies like me.

This Arctic crane fly has amazingly long legs. And, guess what? Adult crane flies have no mouths—so they never eat! These mouthless creatures only live for a few days. *Why do you think they live only for a few days?*

Show image 1A-14: Dragonfly hovering above water

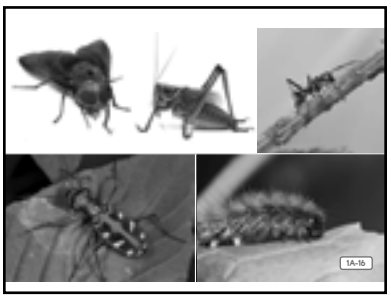
Some insects are aquatic, meaning that they live in or near water. Here's one that you may have seen in rivers, ponds, or streams. This insect is a dragonfly!

A few minutes ago, however, I told you that there is one large water habitat that does not support the life of insects. Do you remember what that habitat is? *[Pause for students' responses.]* The ocean!



Show image 1A-15: Planet Earth

Let's look at Earth again. Is Earth covered by more land or more water? Right—nearly two-thirds of Earth is covered by water and most of that water is in our oceans. Think about it. Oceans are the world's biggest habitat, yet no insects live there. But insects, found on only one-third of the earth's surface, are still the largest group of animals on Earth!



Show image 1A-16: Insect collage

[Point to each insect as you read its name.] Flies. Grasshoppers. Ants. Caterpillars. Beetles. These are all insects, yet they look quite different from one another—different shapes, sizes, and colors. So, what makes an insect an insect? You'll find out next time. In the meantime, be thinking about how a fly is like a grasshopper, or a beetle is like an ant. *Even though they look different, what are some things these insects might have in common with each other?*

COMPREHENSION QUESTIONS (10 MIN)

1. **Literal** What is the largest group or category of animals on Earth? *(insects)*
2. **Literal** In what large water habitat are insects unable to survive? *(ocean)*
3. **Inferential** Many insects depend upon host plants to stay alive. In what ways do these host plants help the insects? *(provide food and a place to lay eggs)*
4. **Inferential** If you were a farmer, which would you rather see on your crops: a ladybug or a grasshopper? Why? *(A ladybug, because grasshoppers eat and kill some plants.)*

Check for Understanding

Think Pair Share: Name an insect and the habitat it lives in. Then, describe how the insect lives in that habitat. *(Answers may vary. One example of a possible answer is: Grasshoppers and leafhoppers live in meadows and feed on the leaves and stems of alfalfa.)*

ENGLISH LANGUAGE LEARNERS

Speaking and Listening

Listening Actively

Entering/Emerging
Ask students simple *yes/no* questions (e.g., "Can insects survive in the ocean habitat?").

Transitioning/Expanding
Provide students with a specific sentence frame (e.g., "Insects cannot survive in . . .").

Bridging
Encourage students to use content-related words in complete sentences (e.g., "Insects cannot survive in the largest habitat on earth, the ocean.").

WORD WORK: HABITATS (5 MIN)

1. In the read-aloud you heard, "We flies are insects, and we share the planet with millions of other insects in many different habitats."
2. Say the word *habitats* with me.
3. Habitats are the specific environments in which plants and animals live and thrive.
4. Houseflies can live in various habitats, including the cold tundra.
5. Think of some other animals that you have learned about. What are the types of habitats in which those animals live? Use the word *habitats* when you talk about them. [Ask two or three students. If necessary, guide and/or rephrase the students' responses: "_____ live in habitats called . . ."]
6. What's the word we've been talking about?

Use a Making Choices activity for follow-up. I am going to name some habitats. If what I name is a habitat where insects live, say, "That is an insect habitat." If what I describe is not a habitat where insects live, say, "That is not an insect habitat."

- desert *(That is an insect habitat.)*
- rainforest *(That is an insect habitat.)*
- tundra *(That is an insect habitat.)*
- ocean *(That is not an insect habitat.)*
- grassland *(That is an insect habitat.)*

Lesson 1: Insects Everywhere!

Application

20M

Writing: In a journal, students will write about a past experience with an insect.
ELA.2.C.1.4

SAYINGS AND PHRASES (5 MIN)

Eaten Out of House and Home

- Ask students if they have ever heard anyone say they were "eaten out of house and home."
- Have students repeat the proverb.
- Explain that this proverb is another way of saying that someone (or something) has eaten all of the food in your house. Tell students that instead of saying, "When my friends came over, they ate all the food in the house," you could say, "When my friends came over, we were eaten out of house and home."
- Remind students that they heard about a few insects today that live on, and eat, different types of plants and trees. For example, grasshoppers, leafhoppers, and aphids feed off various types of plants and can even eat enough to destroy entire meadows. These insects, which also live on these host plants, can be said to have "eaten [themselves] out of house and home."
- Look for opportunities to use the saying "eaten out of house and home" in your classroom, and encourage students to use the saying throughout the day.

INSECTS JOURNAL: NARRATIVE (15 MIN)

- Tell students they are going to create an Insects Journal to record the information they are learning about insects. Give students the following multi-step directions:

1. Write your name on the cover as the author and illustrator of the journal.
2. Give your journal a title.
3. On the first page, write down any questions you have about insects after hearing today's read-aloud.

ENGLISH LANGUAGE LEARNERS

Writing

Writing

Entering/Emerging
Have students dictate facts using familiar vocabulary to a teacher to be recorded.

Transitioning/Expanding
Have students dictate facts using familiar vocabulary to a peer to be recorded.

Bridging
Have students write facts using familiar vocabulary independently.

4. Think about a time you have interacted personally with insects and write a story about it on the second page of your journal. Write at least three sentences about it in your journal. Think about all of the following things as you write:
    - How did the insect look?
    - Where did you see the insect?
    - What did you do? What did the insect do?
5. If you have extra time, you may also wish to draw a picture to illustrate your story.

Check for Understanding

Circulate and Ask: Circulate and guide students as they write their narratives by asking them questions such as "What kind of insect did you see?"

Challenge

For any students who are ready to do so, they may extend this activity by using the trade books and other resources to gather more information about the insect they wrote about.

- Ask students to share their drawings, sentences, and questions with the class. As students share, expand upon their vocabulary using richer and more complex language, including, if possible, any read-aloud vocabulary. Tell students to keep in mind any unanswered questions to see if they are answered in the following days.
- Collect students' Insects Journals to check that they have recorded any questions about insects and have drawn and written about an insect. Be prepared to return these to students for the next lesson.

End of Lesson

Lesson 1: Insects Everywhere!

Take-Home Material

FAMILY LETTER

- Send home Activity Page 1.1.

Activity Page 1.1

LESSON

2

INSECTS

What Makes an Insect an Insect?

PRIMARY FOCUS OF LESSON

Speaking and Listening

Students will review how insects interact with their habitats.

ELA.2.R.3.2b

Reading

Students will identify the common characteristics of insects.

ELA.2.R.2.2

Language

Students will demonstrate an understanding of the Tier 3 word *microscopic.*

ELA.2.V.1.3

Writing

Students will write an explanation of why certain animals are or are not insects.

ELA.2.C.1.4

FORMATIVE ASSESSMENT

Insects Journal

Is It an Insect? Students will write an explanation of why certain animals are or are not insects.

ELA.2.C.1.4

Writing Studio

If you are using Writing Studio, you may begin Unit 4 Lesson 1 after completing this Knowledge lesson. If you have not done so already, you may wish to review the Writing Studio materials and their connections to this domain.

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud			
What Have We Already Learned?	Whole Group	10 min	
Read-Aloud			
Purpose for Listening	Whole Group	30 min	❏ Image Card 1 ❏ chart paper, whiteboard, or blackboard
"What Makes an Insect an Insect?"			
Comprehension Questions			
Word Work: *Microscopic*			
This is a good opportunity to take a break.			
Application			
Am I an Insect?	Whole Group Independent	20 min	❏ Image Cards 2–5 ❏ Insects Journal (created in Lesson 1) ❏ books about insects ❏ writing and drawing tools
Insects Journal: Is It an Insect?			

ADVANCE PREPARATION

Application

- Prepare a classroom library filled with at least twenty books about insects. You may also have students visit the school library to search for books about insects. Note that all of these books do not necessarily need to match students' reading level. Students are not expected to be able to decode all of these books as they are only being used as a reference. It may even be beneficial to include field guides and other adult books that contain highly detailed and informative illustrations, and to model their use for students.
- Maintain this library throughout the domain as students will use these books for reference throughout the Insects Journal activity.

CORE VOCABULARY

abdomen, n. the end part of an insect's body that contains the digestive and reproductive structures
Example: The abdomen is the largest body part of most insects.
Variation(s): abdomens

antennae, n. feelers on the heads of insects
Example: The mosquito's feathery antennae provide it with a highly developed sense of smell.
Variation(s): antenna

exoskeletons, n. the hard body coverings of insects
Example: The thick exoskeletons on beetles protect them from being squashed by larger animals.
Variation(s): exoskeleton

microscopic, adj. very small
Example: Microscopic bugs live in the pond behind my house, and I use a magnifying glass to watch them.
Variation(s): none

thorax, n. the middle part of an insect's body between the head and the abdomen that contains the heart and the leg attachments
Example: Demarco's favorite dragonflies have a bright, green thorax.
Variation(s): thoraxes, thoraces

Vocabulary Chart for "What Makes an Insect an Insect?"

Type	Tier 3 Domain-Specific Words	Tier 2 General Academic Words	Tier 1 Everyday Speech Words
Vocabulary	abdomen *(abdomen)* antennae *(antenas)* exoskeletons microsopic *(microscópico/a)* thorax *(tórax)*		
Multiple Meaning			
Sayings and Phrases	to be exact for one thing sense organs		

Start Lesson

Lesson 2: What Makes an Insect an Insect?

Introducing the Read-Aloud

10M

Speaking and Listening: Students will review how insects interact with their habitats.

ELA.2.R.3.2b

WHAT HAVE WE ALREADY LEARNED? (10 MIN)

- Ask students in what large water habitat insects are unable to survive. *(oceans)*

Check for Understanding

Turn and Talk: Review what students learned in the previous read-aloud by asking them to name an insect and describe how it lives in its habitat. You may wish to show Flip Book images 1A-7–1A-14 to help students remember.

- Remind students that insects find many ways to adapt to and survive in their habitats. This makes the many kinds of insects very different from one another.

Show image 1A-16: Insect collage

- Ask students to look at the collage of insects once more and name some ways in which these insects are different from one another. Then ask students to name several ways in which the insects are similar to one another. Tell them that today they are going to learn what all insects have in common.

ENGLISH LANGUAGE LEARNERS

Speaking and Listening

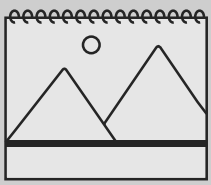
Listening Actively

Entering/Emerging
Ask students simple *yes/no* questions (e.g., "Can insects survive in the ocean habitat?").

Transitioning/Expanding
Provide students with a specific sentence frame (e.g., "Insects cannot survive in . . .").

Bridging
Encourage students to use content-related words in complete sentences (e.g., "Insects cannot survive in the largest habitat on earth, the ocean.").

Flip Book 1A-16



Challenge

Ask students to describe an insect local to your area and explain how it survives in your local habitat.

Lesson 2: What Makes an Insect an Insect?

Read-Aloud

30M

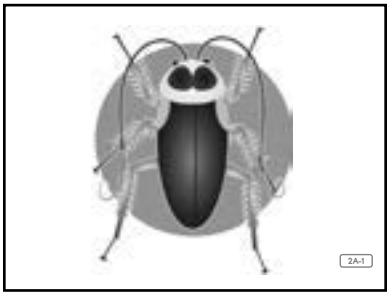
Reading: Students will identify the common characteristics of insects.
ELA.2.R.2.2

Language: Students will demonstrate an understanding of the Tier 3 word *microscopic.*
ELA.2.V.1.3

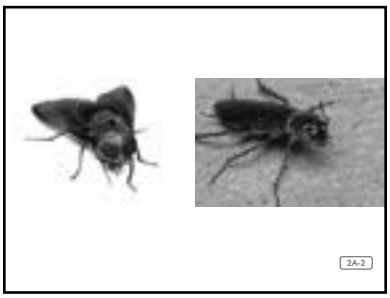
PURPOSE FOR LISTENING

- Tell students to listen carefully for the things all insects have in common to find out what makes an insect an insect.

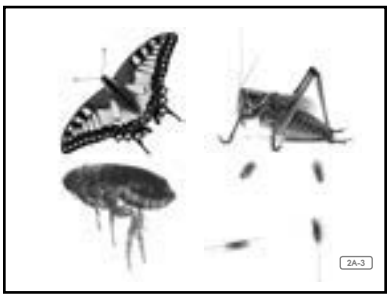
"WHAT MAKES AN INSECT AN INSECT?" (15 MIN)



Show image 2A-1: Cockroach
Hello, boys and girls. The last time you gathered to learn about insects you were joined by a fly, an insect with whom you are surely familiar. I am also a very common insect that loves to live in bathtubs or underneath kitchen sinks. My cousins and I often hide during the day so you may not notice us. Does anyone know what type of insect I am? I am a cockroach. Do you think I look anything like a fly?



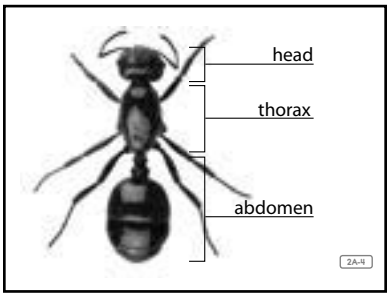
Show image 2A-2: Fly and cockroach
There are millions of insects on Earth. At first glance, we may look very different from one another. What are some of those differences? *[Pause for students' responses.]* What are some ways we are the same? *How are the fly and cockroach the same?*



Show image 2A-3: Butterfly, grasshopper, lice, and fleas (clockwise)

Some insects, like butterflies and grasshoppers, have wings, whereas others, like fleas and **microscopic** lice, don't. Microscopic *means very, very small, something that can only be seen with a microscope.* Some eat plants and others eat animals, but all insects have certain features in common. I am here to talk about what makes an insect an insect.

Our name should give you a clue. *[Say the word* insect *followed by the word* section.*] What part of both these words sounds similar?* (*sect*, meaning part) An insect's body is built in sections, or parts—three parts to be exact. We'll use one of my friends, the ant, as an example.

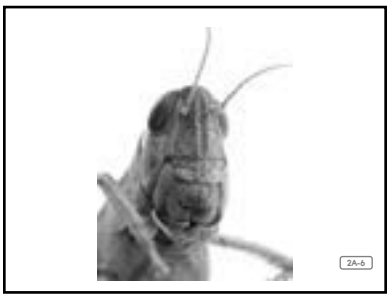


Show image 2A-4: Ant with three sections labeled

[Point to the body parts in the image as you read about them.] All insects have a head, a **thorax,** and an **abdomen.** The head is the center of an insect's senses, but different kinds of insects can have very different-looking heads. The thorax is the middle part of the insect's body. The abdomen is the end of the insect's body, farthest away from the head.

Show image 2A-5: Insect heads

What do you notice about the heads of these common insects? Do they look anything like yours? Do they have eyes? Yes, they do, but they are different from your eyes. For one thing, many insects have more than two eyes.



Show image 2A-6: Cricket's head

Most insects, like this cricket, have big eyes located on the side of the head. Many insects also have smaller, simple eyes on the tops of their heads. Look closely at this cricket's head. Can you see its eyes? Although some insects see better than others, most insects also use other senses to get information about their environments.

Show image 2A-7: Bush cricket's head with focus on its mouth

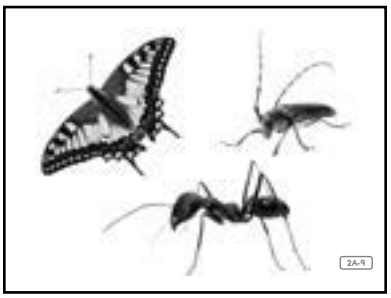
Look at this bush cricket. Does it have a mouth? Yes, its mouth is a small hole at the front of its head, surrounded by mouthparts. You and the cricket both use your mouths to taste and eat. *What are the parts of your mouth called?* (tongue, teeth, taste buds, lips)

Show image 2A-8: Cockroach, aphids, mosquito, and bee (clockwise)

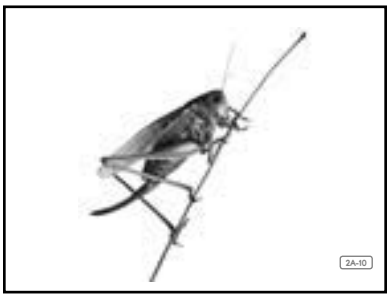
[Point to the image as you read about the specific insect.] Look at the variety of insect mouthparts. Some look like sponges; others look like scissors or needles. An insect's mouth is carefully designed for eating certain types of foods. Some insects bite and chew solid foods; others suck liquids; still others pierce their foods.

For example, cockroaches like me eat just about anything we can find. We have two pairs of jaws for biting, cutting, and chewing food well. Other insects, like the tiny aphids that destroy farmers' crops, have mouthparts that look more like drinking straws. They feed by sucking sap from plant leaves and stems through these tubes.

Look how long and sharp this mosquito's mouthpart is—perfect for piercing the skin of its prey and sucking its blood. Have you ever been bitten by a mosquito? They love to feed on people, as well as other animals like horses and birds. Butterflies and bees have long mouthparts for sucking nectar from flowers. *[Show Image Card 1 (Butterfly).] Look closely. Can you see this Monarch butterfly's mouthparts working like a straw to suck nectar from this flower?*



Show image 2A-9: Variety of insect antennae
So, now you've seen insect eyes and mouths. What else do you see on the head of these insects? Ah, yes, those long feelers! Those are the insects' **antennae** [/an*ten*ee/], their most important sense organs. Insect antennae come in a variety of shapes and sizes and help insects learn more about their surroundings.

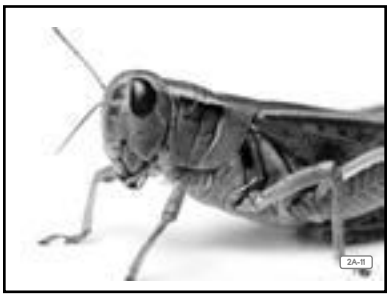


Show image 2A-10: Cricket antennae
These jointed feelers, such as those on this cricket, are often covered with tiny bristles and pegs, and some are even quite feathery. Antennae are primarily used for smell and touch, although some can pick up sounds or detect movements in the air. Do you see a nose on this cricket? No, at least nothing that looks like your nose. Instead of a nose, the cricket uses its antennae to smell.

Eyes. Mouth. Antennae. What else might you expect to find on an insect's head? What other sensory organs do you have on the side of your head? Right—ears! Do you see any ears on this cricket? No. The cricket's ears are located on its legs, attached to the middle section of the cricket's body. *What is the middle section of an insect's body called?*

The middle section of an insect's body is called the thorax. The thorax has three pairs of jointed legs and usually, but not always, two pairs of wings. Notice I said pairs. A pair is two of a specific item. If there are three pairs of legs, how many legs does an insect have altogether? Yes, all insects have six legs.

Let's take a look at the cricket's thorax and see if we can spot its ears.



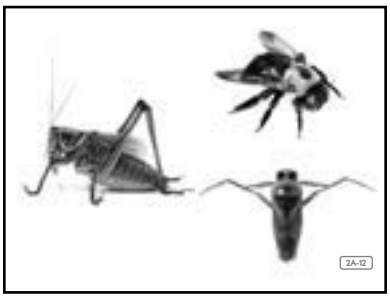
Show image 2A-11: Cricket's thorax and front legs
Look just below its knee joint on the front leg. Do you see a smooth patch of skin? That is the cricket's eardrum, which is very important for it communicates with other crickets through sound. The cricket's eardrum bends in and out to catch sound waves so it can communicate with other crickets.

Support

What are the body parts humans use to sense things, or to learn more about our surroundings? *(eyes, ears, nose, mouth, skin)*

Support

Here the word *patch* means a piece of skin covering an opening. The word *patch* can also mean a small area of land where a particular plant grows, like a pumpkin patch.



Show image 2A-12: Grasshopper, bee, and backswimmer beetle

Insect legs vary according to an insect's lifestyle. How do you think the long, muscular, back legs of a grasshopper might help it? That's right—its legs are designed for jumping to quickly escape danger. Have you ever seen the fuzzy legs of a honeybee covered with yellow clumps of pollen that it carries back to its hive? And how do you think the backswimmer beetle's pair of long legs help it in its water habitat? Notice the oar-like shape of the legs that it uses for paddling.

Show image 2A-13: Caterpillar with focus on true legs and prolegs

Caterpillars have three pairs of true legs on the front part of their bodies, but their long bodies need extra support so they also have several pairs of stubby legs in back to help them cling to stems and leaves. These false legs are called prolegs. Caterpillars loop along, grasping stems with their front legs, or true legs, before drawing their bodies up into a loop to hold on with their hind legs, or prolegs. *So do caterpillars have six true legs like all other insects?* (yes)

Show image 2A-14: Dragonfly wings

Only adult insects have wings, and some insects don't have any wings at all. If an insect does have wings, they are located on the insect's middle section, or thorax. Wings allow insects to move quickly from place to place, and they are surely one reason insects have survived in such large numbers for so many years. Insect wings may look very different from one another, but a network of veins supports each wing. *[You may wish to show the veins in your hand or the veins in a leaf.] Veins carry needed materials to different parts of the body.*

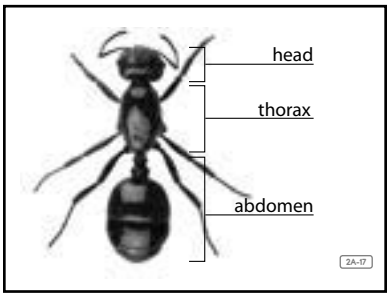
Show image 2A-15: Cricket wing

When it's quiet at night, especially in the summertime, you may hear an interesting chirping noise coming from insects outside. That sound may be a cricket! Crickets' wings have veins. The veins of a male cricket's wings are thicker and shaped differently from many other insects. You'll learn more another day about how a cricket uses its wings to make its unique chirping sounds.

Show image 2A-16: Cricket's abdomen with spiracles

So far, we've looked at an insect's head and its thorax. Every insect body is made up of three sections. What is the name of the third section? *[Pause for students' responses.]* The third and largest section is called the abdomen. Do you have an abdomen? Yes, you do. Your abdomen is your belly. Like an insect, your abdomen is where you digest your food, or break it down so your body can use it to grow and stay healthy. An insect's abdomen is also the part of its body where the female produces eggs. The abdomen is also where insects breathe. Like you, insects need oxygen from the air to live, but they do not have lungs, and they do not take in air through their noses or mouths.

Instead, if you look closely at this cricket's abdomen, you will see a line of tiny holes along its side. That is where insects take in air, containing oxygen, to breathe.

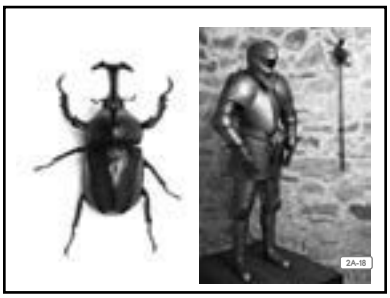


Show image 2A-17: Ant with three sections labeled

So, what makes an insect an insect? Well, it has three body parts—head, thorax, and abdomen. It also has six legs, and most insects have wings. But that's not all. All insects are invertebrates, meaning that they have no backbones. Instead of having skeletons inside their bodies like you, insects wear their skeletons on the outside.

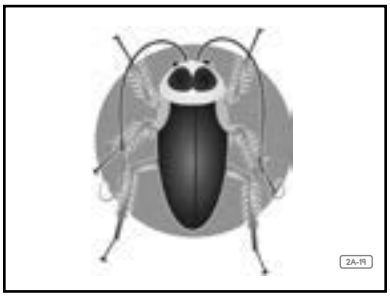
Challenge

Ask students to explain which insect part they would most like to have and why.



Show image 2A-18: Insect's exoskeleton and suit of armor

These waterproof **exoskeletons**, made of a tough, flexible material called chitin [/kie*tən/], protect the insect's soft insides like a suit of armor. Just like your backbone and bones, an insect's exoskeleton is the thing to which the insect's muscles attach.



Show image 2A-19: Cockroach

Here is a picture of another one of my cousins. We cockroaches were around long before the dinosaurs. I think our thick exoskeletons may have something to do with our long survival, don't you? *Why would the cockroach's hard exoskeleton help it to survive for so long?*

Next time the narrator of the read-aloud will be an insect that holds its front legs together in a prayer position. What do you think that might be? She'll tell you how insects grow from tiny eggs into adults. Be prepared to be amazed!

COMPREHENSION QUESTIONS (10 MIN)

1. **Inferential** In this read-aloud you heard about and saw pictures of many different insects. Based on what you heard and the pictures you saw, what do you think the author was trying to explain in this read-aloud? *(The author was trying to explain what makes an insect an insect and that, although there are many different types of insects, they all have certain characteristics.)*

Check for Understanding

Make a List: Let's make a list as a group. What do all insects have, or what makes an insect an insect? *(All insects have three body parts: head, thorax, abdomen; six legs; and are invertebrates. Note that this read-aloud also talks about features some insects have, such as wings. You may add these to the list, but make sure students know an insect does not have to have wings to be an insect.)*

- Record students' answers on a piece of chart paper, a whiteboard, or a blackboard.

2. **Evaluative** In what ways is an insect's skeleton different from yours? *(It is on the outside of the body and is called the exoskeleton; it is hard like armor.)* In what ways is it the same? *(They serve the same purpose—protection and support; both are flexible; and both have muscles attached.)*

Show image 2A-13: Caterpillar with focus on true legs and prolegs

3. **Inferential** How many legs do insects have? *(six)* This caterpillar has many more legs than that. Is it an insect? Why or why not? *(Yes; it has six true legs and the rest are prolegs, or false legs.)*

4. **Evaluative** *Think Pair Share:* If you could choose any insect feature (antennae, special mouth parts, more legs, wings, etc.) to add to your own body, what would it be? How would it help you? *(Answers may vary, but students should describe the feature and its function accurately.)*

ENGLISH LANGUAGE LEARNERS

Reading

Reading/Viewing Closely

Entering/Emerging
Prompt and support students to recall words and phrases that relate to the key characteristics of insects.

Transitioning/Expanding
Provide moderate support in eliciting phrases and ideas with greater detail that relate to the key characteristics of insects.

Bridging
Provide minimal support in eliciting key details relating to the key characteristics of insects.

WORD WORK: MICROSCOPIC (5 MIN)

1. In the read-aloud you heard, "Some insects, like butterflies and grasshoppers, have wings whereas others, like fleas and microscopic lice, don't."
2. Say the word *microscopic* with me.
3. If something is microscopic, it is very, very small, so small that you would need a special tool like a microscope to see it.
4. The germs that cause many diseases are microscopic, so they can't be seen with just your eyes.
5. What are some other things that are microscopic? [Ask two or three students. If necessary, guide and/or rephrase the students' responses: "Something that is microscopic is . . ."]
6. What's the word we've been talking about?

Use an Antonyms activity for follow-up. The opposite, or antonym, of the word *microscopic* is the word *gigantic*. If *microscopic* means very, very small, what do you think *gigantic* means? *Gigantic* means very, very large. I am going to name some things. If what I name is very, very small, say, "That is microscopic." If what I name is very, very large, say, "That is gigantic."

- a building that is forty stories tall *(That is gigantic.)*
- an insect that is so small we can't see it with just our eyes *(That is microscopic.)*
- the sun *(That is gigantic.)*
- the Pacific Ocean *(That is gigantic.)*

Lesson 2: What Makes an Insect an Insect?

Application

20M

Writing: Students will write an explanation of why certain animals are or are not insects.

ELA.2.C.1.4

AM I AN INSECT? (5 MIN)

Show image 2A-4: Ant with three sections labeled

- Have students identify the three body parts of all insects: head, thorax, and abdomen.

Show image 2A-5: Insect heads

- Have students identify parts of insect heads, including antennae (used for touch and smell) and any mouthparts with specially developed uses.

Show image 2A-11: Cricket's thorax and front legs

- Ask students to identify the part of the insect's body visible in this image where legs and wings are attached. *(thorax)*
- Ask students to identify the part of the body not visible in this image that is responsible for digestion, egg production, and breathing. *(abdomen)*

Show Image Cards 2 (cockroach), 3 (dragonfly), 4 (beetle), and 5 (spider)

- Ask students to identify and then compare and contrast the four animals in the images.
  - What body parts do each of these animals have? How are they similar? How are they different?
  - How is the animal in Image Card 5 different from the animals in the other images? *(It has eight legs.)*
  - So, is a spider an insect? *(no)* How can you tell? *(Insects have six, not eight legs; insects have three main body parts, this spider only has two.)*

Flip Book
2A-4, 2A-5, 2A-11

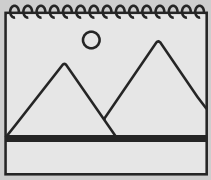
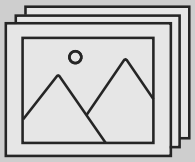


Image Cards 2–5



INSECTS JOURNAL: IS IT AN INSECT? (15 MIN)

- Tell students that they are going to create another entry in their Insects Journal. Give students the following directions:

1. On the first page, write down any questions you have about insects after hearing today's read-aloud.
2. Next, look in the library for an interesting book about insects. You need to find one insect to draw in your journal.
3. On the third page in your journal, draw the animal that is *not* an insect. You might draw your favorite noninsect animal, or a pet. Write one to three sentences below the drawing explaining why it is *not* an insect (e.g., "Cheetahs do not have exoskeletons and only have four legs, so they are not insects.")
4. On the fourth page in your journal draw the animal that *is* an insect, using your book to help you. Label the parts of your drawing that show it *is* an insect (e.g., three body parts, antennae, six legs, exoskeleton, etc.). Write one to three sentences below the drawing explaining why it is an insect.

Check for Understanding

Check In: As students are looking through trade books, and drawing and writing, circulate and ask them if the animal they are drawing/writing about is or is not an insect and how they can tell.

- Ask students to share their drawings, sentences, and questions with the class. As students share, expand upon their vocabulary using richer and more complex language, including, if possible, any read-aloud vocabulary. Tell students to keep in mind any unanswered questions to see if they are answered in the following days.
- Collect students' Insects Journals to check that they understand how to identify whether an animal is an insect. Be prepared to return these to students for the next lesson.

End of Lesson

ENGLISH LANGUAGE LEARNERS

Reading

Reading/Viewing Closely

Entering/Emerging
Prompt students to use words, phrases, and images from the read-aloud.

Transitioning/Expanding
Prompt students to use words, phrases, and images from a select trade book.

Bridging
Prompt students to use words, phrases, and images from multiple trade books.

Support

Rather than using trade books independently as resources, allow students to use sources they are more familiar with (e.g., show students Flip Book images and Image Cards as you reread parts of the read-aloud).

Challenge

You may wish to extend this research beyond the classroom library to include online resources and/or library resources, having students work in pairs or small groups to conduct their research.

LESSON

3

INSECTS

Life Cycles of Insects

PRIMARY FOCUS OF LESSON

Speaking and Listening

Students will review the life cycle of a butterfly.

ELA.2.R.3.2b

Reading

Students will describe the life cycles of insects.

ELA.2.R.2.2

Language

Students will demonstrate an understanding of the Tier 2 word *progression.*

ELA.2.F.1.3d; ELA.2.V.1.1

Writing

Students will use trade books to research insects and record information about insects in their journals.

ELA.2.C.4.1

FORMATIVE ASSESSMENT

Insects Journal

Use a Reference Students will use trade books to research insects and record information about insects in their journals.

ELA.2.C.4.1

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud			
What Have We Already Learned?	Whole Group	10 min	❑ Domain 6: Image Cards 17–20
Essential Background Information or Terms			
Read-Aloud			
Purpose for Listening	Whole Group	30 min	❑ Image Cards 6, 7
"Life Cycles of Insects"			
Comprehension Questions			
Word Work: *Progression*			
This is a good opportunity to take a break.			
Application			
Insects Journal: Use a Reference	Independent	20 min	❑ Insects Journal ❑ writing and drawing tools

ADVANCE PREPARATION

Note to Teacher

The Insects Journal activity may take some students longer to complete. You may wish to plan to give students additional time to complete their entries before sharing them with the class.

Universal Access

- The content of this lesson contains several domain-specific vocabulary words that are interdependent of one another. You may wish to create a bulletin board with labels for the stages of complete and incomplete metamorphosis, or keep Image Cards 6 and 7 displayed throughout this lesson.

- Be prepared to help students conduct research during the Insects Journal activity. This may include curating books from which students may find information, or reading portions of a book or field guide aloud to a student or group of students.

CORE VOCABULARY

larva, n. the immature stage of an insect's complete metamorphosis, between egg and pupa, not resembling the adult insect
Example: A butterfly egg turns into a larva known as a caterpillar.
Variation(s): larvae

molt, v. to shed old feathers, hair, skin, or shells, making way for new growth
Example: As it grows, a snake will molt, leaving behind the skin it sheds.
Variation(s): molts, molted, molting

nymph, n. the immature stage of an insect that does not undergo a complete metamorphosis, between egg and adult, resembling the adult insect
Example: The nymph stage of a cicada can last for years before the cicada emerges as a fully-developed, winged adult.
Variation(s): nymphs

progression, n. a connected series of events
Example: The progression of the phases of the moon from new moon to full moon and back to new moon again follows a predictable pattern.
Variation(s): progressions

pupa, n. the inactive, immature stage of an insect, between larva and adult
Example: The moth larva spun its cocoon, a safe place to stay during its transformative pupa stage.
Variation(s): pupae

Vocabulary Chart for "Life Cycles of Insects"

Type	Tier 3 Domain-Specific Words	Tier 2 General Academic Words	Tier 1 Everyday Speech Words
Vocabulary	larva *(larva)* molt pupa	progression *(progresión)*	
Multiple Meaning	nymph *(ninfa)*		
Sayings and Phrases	complete metamorphosis incomplete metamorphosis		

Lesson 3: Life Cycles of Insects

Introducing the Read-Aloud

10M

Speaking and Listening: Students will review the life cycle of a butterfly.

ELA.2.R.3.2b

WHAT HAVE WE ALREADY LEARNED? (5 MIN)

Insect Characteristics

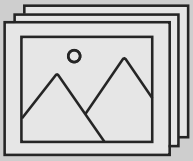
- Display the list of insect characteristics you created yesterday after the read-aloud. Ask students how you can tell an animal is an insect.
- Review the defining characteristics (*three body parts: head, thorax, abdomen; six legs; exoskeletons; are invertebrates; some have wings)* and any additional characteristics you listed.

Life Cycle

Note: Students learned about life cycles in Domain 6: *Cycles in Nature*.

- Tell students that today they will learn about the stages in the life cycle of an insect.
- Ask students what a life cycle is and remind students that all living things are born, and all living things die, but that different types of animals experience different stages of development in between.
- Ask students to name the stages of a human being's life cycle. *(infant, child, adolescent, adult)*

Domain 6
Image Cards 17–20



Show Image Cards 17–20 from Domain 6: *Cycles in Nature*

- Ask students what they remember from Domain 6: *Cycles in Nature* about the life cycle of a butterfly. *(Egg, larva, chrysalis, butterfly; a butterfly goes through metamorphosis, which is a total change in form, as it becomes an adult.)*

Check for Understanding

Turn and Talk: Explain the metamorphosis of a butterfly.

ESSENTIAL BACKGROUND INFORMATION OR TERMS (5 MIN)

- Tell students some insects go through changes similar to a butterfly, and this is called complete metamorphosis.
- Tell students other insects don't change as completely as a butterfly, and they go through stages called incomplete (or *not* complete) metamorphosis.

Challenge

Ask students what the prefix *in–* might mean if *incomplete* means not complete. *(not)*

Lesson 3: Life Cycles of Insects

Read-Aloud

30M

Reading: Students will describe the life cycles of insects.

ELA.2.R.2.2

Language: Students will demonstrate an understanding of the Tier 2 word *progression.*

ELA.2.F.1.3d; ELA.2.V.1.1

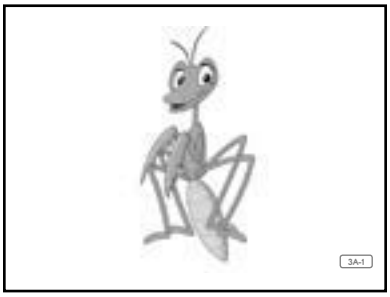
PURPOSE FOR LISTENING

- Tell students to listen carefully to learn about the stages of incomplete metamorphosis and to find out more about the stages of complete metamorphosis.

"LIFE CYCLES OF INSECTS" (15 MIN)

Support

Show students a video depicting a praying mantis hunting for food.



Show image 3A-1: Praying mantis

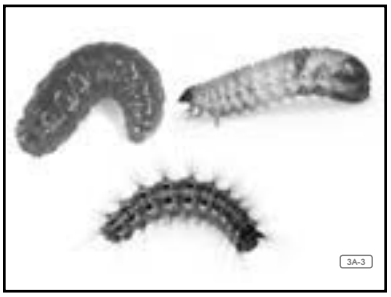
Hi, boys and girls. It's time to meet one of the most fascinating insects on the planet. That's me. I'm a praying mantis, named for the way I hold my two front legs together as though I am praying. I might look like I am praying, but my incredibly fast front legs are designed to grab my food in the blink of an eye!

I'm here to talk to you about the life stages of insects—how insects develop from birth to adult. Many insects undergo a complete change in shape and appearance. I'm sure that you are already familiar with how a caterpillar changes into a butterfly. The name of the process in which a caterpillar changes, or morphs, into a butterfly is called metamorphosis.

Show image 3A-2: Life cycle of a butterfly

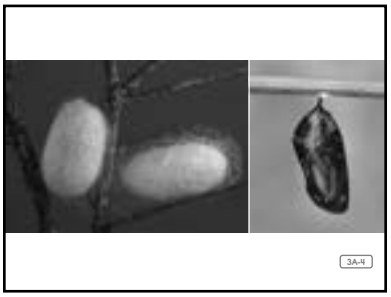
[Point to each stage of the life cycle as you read about it.] Some insects, like the butterfly, pass through four stages in their life cycles: egg, **larva** [/lar*və/], **pupa**, and adult. Each stage looks completely different from the next. The young never resemble, or look like,

their parents and almost always eat something entirely different. The female insect lays her eggs on a host plant. *or plant on which another organism lives* When the eggs hatch, the larvae [/lar*vee/] that emerge look like worms. *The word* larva *is singular, and the word* larvae *is plural.* Different names are given to different insects in this worm-like stage, and for the butterfly, the larva state is called a caterpillar.



Show image 3A-3: Insect larvae: maggot, grub, and caterpillar

Fly larvae are called maggots; *[Point to the insect on the top left part of the image.]* beetle larvae are called grubs; *[Point to the insect on the top right part of the image.]* and the larvae of butterflies and moths, as you just heard, are called caterpillars. *[Point to the insect on the bottom part of the image.]* Larvae feed and grow as quickly as they can. They also **molt**, or shed their hard exoskeletons, many times as they grow, because the exoskeletons don't grow with them. *Based on this sentence, what does the word* molt *mean?* (to shed or get rid of) In this way, insect larvae grow larger each time they molt, until they are ready to change into adult insects.



Show image 3A-4: Cocoon (soft silk) and chrysalis (hard case)

Once the larvae have eaten all that they can eat, they take a break. Sometimes people call this next stage a resting stage, but the larvae are hardly resting. A larva often spins a cocoon *[Point to the image on the left.]* to protect itself during the pupa stage when it will remain quite still for several weeks. Inside this shell-like covering, the pupa transforms, or changes, into something that looks altogether different than before. Some insects have a soft cocoon for the pupa stage, and some, like the butterfly, have a harder case called a chrysalis. *[Point to the image on the right.]*

Support

What happens when you outgrow your clothing? *(You get new clothing.)* This is similar to molting.

Show image 3A-5: Butterfly emerging from chrysalis

If you have ever seen a butterfly emerge from its chrysalis, you know how extraordinary it is to watch the first flutter of its fully developed butterfly wings. Its wings were completely invisible before it disappeared into its seemingly magical chrysalis. It looks nothing like it did at any of its earlier stages. Scientists call this **progression**, through four separate stages, a complete metamorphosis. *A progression is a connected series of events. So, a complete metamorphosis is a progression of events.* I can't argue with that, can you? The change is indeed complete. Butterflies, moths, beetles, and flies all undergo a complete metamorphosis.

Show image 3A-6: Life cycle of praying mantis: egg case, nymphs emerging, older nymph, adult

Not all insects change so completely. Some insects' young, like mine, are miniature, or very small, models of their parents after hatching. They do change, so they do experience a metamorphosis, but because it is not a complete change, scientists call it an incomplete metamorphosis.

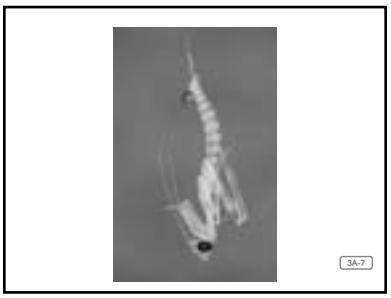
Challenge

Why do you think it is called incomplete metamorphosis?

Just like you, the young start off as a smaller version of what they will end up being. Just as you started off as a baby person and are slowly growing into an adult person, some young insects slowly grow and change into an adult.

A praying mantis goes through three life stages: egg, **nymph** [/nimf/], and adult. *[Point to each stage of the life cycle as you read about it.]* In autumn, the female mantis lays as many as 400 eggs inside an egg case, attached to a plant. In spring, the eggs hatch. The tiny praying mantis babies emerge from the egg case. These brand-new hatchlings, or nymphs, don't quite look like me, do they? A little later, the nymph resembles me more—the only thing it is missing is its wings. Even though you can't see them yet, there are tiny developing wing buds. These nymphs eat the same sorts of food as I do as an adult praying mantis—flies, aphids, moths, and other insects—just smaller.

Let's take a close look at one of these nymphs.



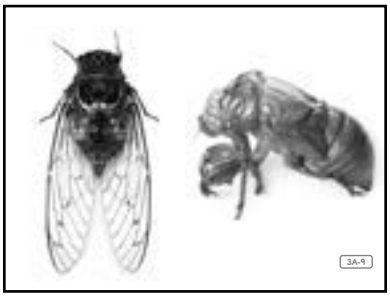
Show image 3A-7: Praying mantis nymph
Can you tell at this stage that it is an insect? Can you find its head? How many legs are on its thorax? (six) Can you see how many pairs of wings it has? *There are two tiny wing buds, but they are hard to see.* Is there a third section as well? What's that called? (abdomen)

What is the outside skeleton of an insect called? *[Pause for student answers.]* Right—an exoskeleton. The baby insect, or nymph, is born with an exoskeleton, but these hard, nonliving coverings do not grow with the growing praying mantis nymph. As a nymph grows, its exoskeleton splits open.

Show image 3A-8: Praying mantis nymph, molting
The nymph wriggles out to reveal softer skin that can stretch and expand before it hardens. It molts its exoskeleton again and again, growing a new one as many as ten times before it reaches adulthood. *What does* molt *mean?* The nymph stage often lasts all summer long. After its final molt, each surviving praying mantis has a fully developed exoskeleton and full-grown wings like mine. Grasshoppers, crickets, and cockroaches belong to the group of insects that experience an incomplete metamorphosis similar to this one.

An insect's life cycle is quite short compared to yours. In some cases, it takes only a few weeks. Scientists believe that this is one reason there are so many insects on the planet. They are forever breeding and need to reproduce rapidly because they have so many enemies.

Not all insects, however, have short life cycles.



Show image 3A-9: Cicada and molted skin
The cicada [/sə*kae*də/] looks a little like a grasshopper and is thought to have the longest life cycle of any insect, ranging from two to seventeen years. The adult cicada lays her eggs on twigs. When the eggs hatch, the nymphs fall to the ground and burrow into the soil, searching for tree roots. They feed on the tree's sweet root sap. Cicadas undergo incomplete metamorphosis, so there is no pupal stage. The nymphs remain hidden beneath the ground, continuing to shed their exoskeletons. *[Point to the empty exoskeleton on the right side of the image.] What is the word that means to shed its exoskeleton?* (*molt*) Once they are fully grown, they make their way to the surface again, shed their skin one last time, and emerge as winged adults. For some reason, all of the cicadas in an area emerge at once either every thirteen years or every seventeen years.

Support

Show students a video or audio recording of cicadas so students can hear how they sound.

Show image 3A-10: Swarm of cicadas
When the cicadas all emerge, they fly everywhere, and their calls are very loud. When hundreds of flying insects swarm through the air, their loud buzzing noises and the snapping of their wings make quite a loud noise!

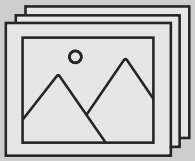
Next time, you will meet some other flying insects that may also travel in swarms. Can anyone guess what insects they might be? I'll give you a clue: Bzzzzzzz . . .

COMPREHENSION QUESTIONS (10 MIN)

1. **Literal** What word is used to describe the progression of events, or change, that occurs in an insect's development? *(*metamorphosis*)* What are the two types of metamorphosis? *(complete and incomplete)*

Show Image Cards 6 (Complete Metamorphosis) and 7 (Incomplete Metamorphosis).

Image Cards 6, 7



Check for Understanding

Turn and Talk: Ask paired students to take turns answering these questions:

- **Partner 1:** Turn to your partner and describe the stages of complete metamorphosis.
- **Partner 2:** Now turn to your partner and describe the stages of incomplete metamorphosis.
- **Partner 1:** What stages are the same in both complete and incomplete metamorphoses? *(egg, adult)*
- **Partner 2:** What stages are different? *(Nymph is different from larva and pupa.)*

2. **Inferential** Why do insects molt, or shed their exoskeletons? *(to make way for new growth)*
3. **Inferential** In which season(s) of the year would you expect to see the most insects? Why? *(Answers may vary, but should include the fact that many insect eggs hatch in spring.)*
4. **Inferential** *Think Pair Share:* Is the change that takes place in the growth of human beings more like that of complete or incomplete metamorphosis? Why? *(Incomplete; like insect nymphs, human infants resemble their adult parents from birth.)*

ENGLISH LANGUAGE LEARNERS

Reading

Listening Actively

Entering/Emerging
Ask students simple *yes/no* questions (e.g., "Is egg the first stage of complete metamorphosis?").

Transitioning/Expanding
Provide students with a specific sentence frame (e.g., "_____ is the first stage of complete metamorphosis.").

Bridging
Encourage students to use content-related words in complete sentences (e.g., "Egg is the first stage of both complete and incomplete metamorphosis.").

Challenge

In today's read-aloud, you heard that beetle larvae are called grubs. From that information alone, can you tell whether beetles undergo complete or incomplete metamorphosis? How? *(Yes, they go through a complete metamorphosis because the terms* larva *and* larvae*, although similar to the nymph stage of incomplete metamorphosis, are only used to describe those insects that have young that do not resemble the adult insect and that undergo a complete change to become an adult.)*

WORD WORK: PROGRESSION (5 MIN)

1. In the read-aloud you heard, "Scientists call this progression, through four separate stages, a complete metamorphosis."
2. Say the word *progression* with me.
3. A progression is a connected series of actions or events.
4. The progression of the seasons from winter to spring to summer to fall and then back to winter again happens in a regular pattern.
5. What other things go through a progression? Try to use the word *progression* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students' responses: "_____ is a progression of . . ."]
6. What's the word we've been talking about?

Use a Discussion activity for follow-up. Turn to a partner and describe the progression of a butterfly from egg to adult butterfly. Or, you may describe the progression of a praying mantis from egg to nymph to adult. Use the word *progression* as many times as you can in your description (e.g., "In the progression of a butterfly, it starts out as an egg. Next in the progression, it hatches as a caterpillar.")

Lesson 3: Life Cycles of Insects

Application

20M

Writing: Students will use trade books to research insects and record information about insects in their journals. ELA.2.C.4.1

INSECTS JOURNAL: USE A REFERENCE

- Tell students that they are going to add to their Insects Journals today by referencing a trade book about insects. Give students the following directions:

1. On the first page, write down any additional questions you have about insects after hearing today's read-aloud.
2. Next, look in the library for an interesting book or books about insects. Choose a picture of an insect you would like to draw and write about in your journal.
3. On the fifth page of your journal, draw a picture of the insect.
4. Then, write a description of the insect using complete sentences below your drawing. Include as many new words from the read-alouds as possible (such as *complete or incomplete metamorphosis, exoskeleton, thorax*, etc.).

- You may wish to supply students with a word bank from which they can use words.

Check for Understanding

Share: Ask students to share their drawings, sentences, and questions with the class. As students share, expand upon their vocabulary using richer and more complex language, including, if possible, any read-aloud vocabulary. Tell students to keep in mind any unanswered questions to see if they are answered in the following days.

- Collect students' Insects Journals to check that they have recorded questions about insects, and have drawn and written about an insect. Be prepared to return these to students for the next lesson.

End of Lesson

ENGLISH LANGUAGE LEARNERS

Reading

Reading/Viewing Closely

Entering/Emerging
Prompt students to use words, phrases, and images from the read-aloud.

Transitioning/Expanding
Prompt students to use words, phrases, and images from a select trade book.

Bridging
Prompt students to use words, phrases, and images from multiple trade books.

Support

Rather than using a trade book independently as a resource, allow students to use sources they are more familiar with, such as Flip Book images, as you reread parts of the read-aloud.

Challenge

You may wish to extend this research beyond the classroom library to include online resources and/or library resources, having students work in pairs or small groups to conduct their research.

LESSON

4

INSECTS

Social Insects: Bees and Wasps

PRIMARY FOCUS OF LESSON

Language

Students will review the meaning of the words *social* and *solitary* as they apply to insects.

ELA.2.V.1.3

Reading

Students will explain how honeybees and paper wasps are social insects.

ELA.2.R.2.2

Language

Students will demonstrate an understanding of the Tier 2 word *cooperate.*

ELA.2.V.1.1

Students will demonstrate an understanding of the multiple meaning word *comb.*

ELA.2.V.1.1

Writing

Students will draw and write about social insects.

ELA.2.C.1.4

FORMATIVE ASSESSMENT

Insects Journal

Social Insects Students will draw and write about social insects.

ELA.2.C.1.4

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud			
What Have We Already Learned?	Whole Group	10 min	
What Do We Know?			
Read-Aloud			
Purpose for Listening	Whole Group	30 min	
"Social Insects: Bees and Wasps"			
Comprehension Questions			
Word Work: *Cooperate*			
This is a good opportunity to take a break.			
Application			
Multiple Meaning Word: *Comb*	Whole Group Independent	20 min	❑ Poster 2M ❑ Insects Journal ❑ books about social insects ❑ writing and drawing tools
Insects Journal: Social Insects			

ADVANCE PREPARATION

Application

- Ensure that your class library contains several books depicting social insects such as honeybees and paper wasps. You may also wish to print out images and/or articles from the Internet, or allow students to use computers to further research social insects. Students will use these resources when writing in their journals.

Note to Teacher

Be sensitive to the fact that some students in your class may have allergic reactions to bee and/or wasp stings. Allow students to discuss this with their peers as a means of educating students on outdoor safety.

Universal Access

- Acquire an old paper wasp nest or honeybee comb to show students. You may also find images and videos depicting active nests and combs to show students.
- Bring in honeybee honey for students to taste.

Note: Be sure to follow your school's policy regarding food distribution and allergies.

CORE VOCABULARY

colonies, n. communities of animals living close together, often sharing a shelter, such as a beehive
Example: Scientists are concerned over the disappearance of some bee colonies.
Variation(s): colony

cooperate, v. to work together for the good of everyone
Example: Students cooperate with their teachers and their classmates so everyone can learn.
Variation(s): cooperates, cooperated, cooperating

drones, n. male bees in social bee colonies whose job is to fertilize the queen's eggs
Example: The queen bee left her hive to mate with the drones before returning to the hive to lay her eggs.
Variation(s): drone

pollen, n. a powder produced by flowers that must be transported from flower to flower for new flower seeds to grow
Example: Many fruit trees depend upon the honeybee to transport pollen to the tree so it will produce fruit.
Variation(s): none

Vocabulary Chart for "Social Insects: Bees and Wasps"

Type	Tier 3 Domain-Specific Words	Tier 2 General Academic Words	Tier 1 Everyday Speech Words
Vocabulary	pollen *(polen)*	cooperate *(cooperar)*	
Multiple Meaning	colonies *(colonias)* drones		
Sayings and Phrases	everyday world solitary lives no bigger than a pinhead		

Lesson 4: Social Insects: Bees and Wasps

Introducing the Read-Aloud

10M

Language: Students will review the meaning of the words *social* and *solitary* as they apply to insects.

ELA.2.V.1.3

WHAT HAVE WE ALREADY LEARNED? (5 MIN)

- Refer students to the title of the read-aloud—"Social Insects: Bees and Wasps." Remind them of two vocabulary words they learned in the first lesson of this domain, *social* and *solitary*, and ask volunteers to explain the difference between the two.

Check for Understanding

Making Choices: Tell me if what I'm describing is social or solitary behavior.

- A butterfly living its life alone. *(That is solitary.)*
- An army ant working with other army ants to bring food back to the group. *(That is social.)*

- Tell students that social insects must work together to survive.
- Tell students that not all bees and wasps are social insects; some are solitary. Today they will learn about the habits of the honeybee and the paper wasp, both very important social insects.

ENGLISH LANGUAGE LEARNERS

Speaking and Listening

Exchanging Information and Ideas

Entering/Emerging
Ask students *yes/no* questions about the meaning of *solitary* and *social* and encourage them to ask their own questions about the meaning of *solitary* and *social.*

Transitioning/Expanding
Encourage students to build on what the previous student has said about the meaning of *solitary* and *social.*

Bridging
Challenge students to say something more about what the previous student has said about the meaning of *solitary* and *social.*

WHAT DO WE KNOW? (5 MIN)

- Ask students if they know where honeybees and paper wasps live. *(honeybees in beehives, paper wasps in nests)*
- Ask students to share whatever else they know about honeybees. *(Students might share that they sting; they help pollinate flowers; they collect flower nectar and produce honey.)*
- Ask students to share what they know about paper wasps. *(Students might share that they sting; they help pollinate flowers.)*

Support

Allow students to taste honeybee honey. Tell students they will learn about the social insects that work together to make this sweet food. Be sure to follow your school's policy regarding food distribution and allergies.

Lesson 4: Social Insects: Bees and Wasps

Read-Aloud

30M

Reading: Students will explain how honeybees and paper wasps are social insects.
ELA.2.R.2.2

Language: Students will demonstrate an understanding of the Tier 2 word *cooperate*.
ELA.2.V.1.1

PURPOSE FOR LISTENING

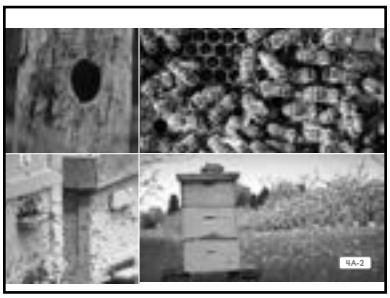
- Tell students to listen closely to learn about the jobs honeybees and paper wasps must perform in order to survive as social insects.

"SOCIAL INSECTS: BEES AND WASPS" (15 MIN)

Show image 4A-1: Honeybee
Buzzzzz Bzzzzz Oh! You startled me! I am so busy that I nearly forgot where I was. I'm a honeybee, and I'm delighted to be here to tell you a little bit about my everyday world.

Honeybees are quite social. *What does* social *mean?* Humans are social, too, which means that they live together in communities, or groups, instead of living alone. Social insects live in communities, too.

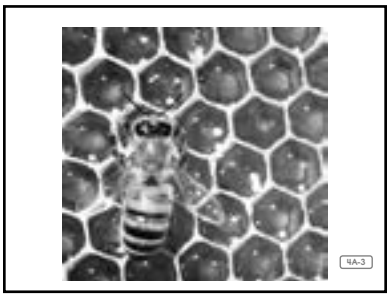
Most insects are solitary, living alone their entire lives. They are alone when they hatch from their eggs; they search for food alone; and they find their own shelter. There are thousands of different kinds of bees on the planet, and most of them live solitary lives. But honeybees are different. We live together in organized communities and depend upon one another to live, solving problems as a team. We gather and share food, build nests together, **cooperate** *or work together* to raise our young, and help protect one another from enemies.



Show image 4A-2: A natural hive in a tree; bees on a honeycomb; a commercial beehive box; bees swarming a hive box

Honeybee communities are called **colonies**. Our colonies are made up of twenty thousand or more bees. We like to make our nests, or beehives, in dark places. That's why you often see pictures of us buzzing about in the trunks of hollow trees.

People use beehive boxes to raise honeybees for honey. Perhaps you've seen these boxes in a field, orchard, or backyard. *[Point to the boxes in the image.]*



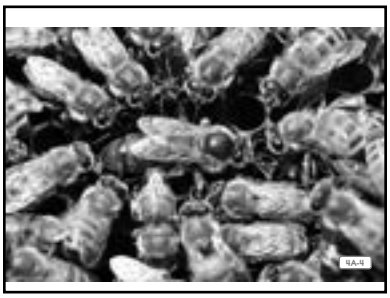
Show image 4A-3: Honeycomb

Wherever we nest, we build honeycombs. This amazing structure of layered cells is made from a waxy substance that we produce in our abdomens. Can you spot a pattern among the cells in this honeycomb? *[Pause for students' responses.]* They are all six-sided.

What purpose do all of these cells serve? These cells are very important to our lives. Listen carefully and I'll tell you how they are important to the many jobs we perform. Remember, I told you we are very social insects—and very busy. There is lots of work to be done, and each bee in the colony has its own job to do.

Challenge

Has anyone ever told you that you are "as busy as a bee"? What do you think this saying means now that you know more about bees?



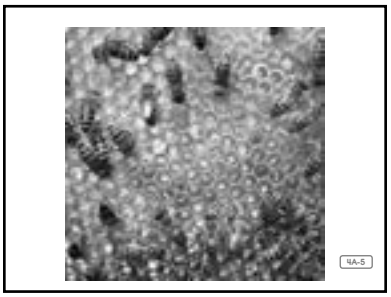
Show image 4A-4: Queen bee surrounded by other bees

Every honeybee colony has a mother called the queen bee. The queen is always the largest bee in the hive, and she has only one job to do. She must lay eggs, lots and lots of eggs. She must produce more queens for other hives and make sure there are enough worker bees to do the work in her own hive.

The queen bee flies from the nest to mate with male bees called **drones**. Once a drone has mated with the queen bee, it has done its job and it dies. Drones cannot sting because they don't have stingers.

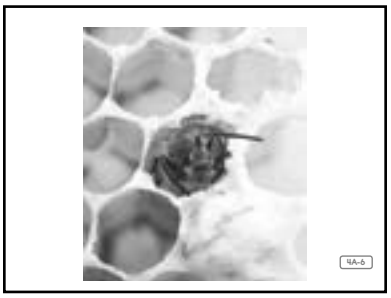
When the queen returns, she lays her eggs, sometimes more than one thousand eggs a day. Where do you think the queen bee lays all these eggs? *[Pause for students' responses.]* Right! She returns to the comb to lay them there in the cells.

The queen then pushes tiny eggs, no bigger than a pinhead, from her abdomen into the waxy cells of the honeycomb, one egg to each cell. *Which part of the insect's body is the abdomen?* (the section at the end, farthest away from the head)



Show image 4A-5: Worker bees on honeycomb

In just a few days the eggs hatch. The larvae get fed **pollen** by one of the hive's female worker bees. *Pollen is a powder produced by flowers that helps them reproduce.* The larvae grow and eventually spin silky cocoons.



Show image 4A-6: Bee emerging from cocoon

Worker bees quickly seal over the small waxy cells of the honeycomb, protecting the developing pupa inside each cocoon. Does this process sound familiar? It should. The bees are undergoing a change. *In the previous read-aloud, you heard a word that means the changes an insect goes through during its life cycle. What is the word that refers to that change? (metamorphosis*) When they emerge from their cocoons, they will chew their way out of the cells, emerging as full-grown adults. *Do honeybees undergo complete or incomplete metamorphosis?* (complete metamorphosis)

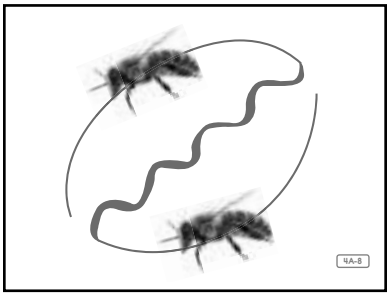
Most of the new adults are female worker bees. They only live for a few months, and they spend their whole lives working hard to keep the hive running well. They keep the hive clean. They serve as nurse bees, tending to the larvae. They make new cells and repair old ones, and they store nectar and pollen that others bring back to the hive. After several weeks working inside the hive, these hard-working females go outside to serve as guards, protecting the hive from enemies and bees from other hives. Each hive has its own special chemical scent, or smell, so it is easy to tell who doesn't belong in the hive. *What jobs do the female worker honeybees do?*

Support

The word *comb* here refers to the structure in which bees live and that contains six-sided cells. The word *comb* can also refer to the device that a person uses to make his or her hair neat and untangled.

Show image 4A-7: Worker bee collecting nectar and close-up of bee's mouthpart

Near the end of her life, a worker bee becomes a forager bee, collecting a sweet juice from flowers. *A forager is an animal that wanders over an area in search of food.* This juice, or nectar, is used to make honey. Foraging worker bees have keen *or sharp* senses of smell and sight and very good memories. They may visit thousands of flowers each day to find the best nectar.



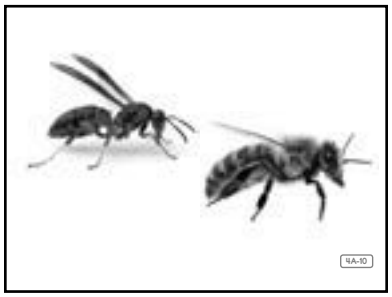
Show image 4A-8: Honeybee and figure-eight dance pattern

When a bee discovers a particularly good source of nectar, it returns to the hive to share its information with other foragers. First, it lets the other foragers smell the pollen so they can identify the type of flower. Then, it performs a complicated and special waggle dance. As it circles about in a pattern like a figure eight, it wags its abdomen as it moves through the middle of its dance. *[Trace the figure eight in the image several times.]* The bee's repeated movements, circling and waggling its abdomen, tell the others exactly how far away and in which direction from the sun the flowers are located. A bee that thinks she has found a really good flower patch does the waggle dance with lots of energy. *Why might it be helpful to the other bees to know how good the source of nectar is?* Where do you suppose the bees put the nectar when they return to the hive? They make the nectar into honey and store it in honey cells—the cells that are not being used for developing bees. The honey is an important food source for the bees. *What jobs do the forager honeybees do?*

Show image 4A-9: Bee covered with pollen

While moving from flower to flower, worker bees rub up against a yellow powder called pollen. Honeybees will pack the pollen into baskets of hairs on their hind legs, and then they carry it with them. Pollen is used to feed the larvae, but this pollen is important stuff for another reason. Plants need pollen from other plants in order to make new seeds. This

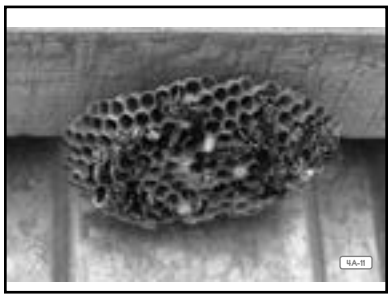
is called pollination. Honeybees are important because they carry the pollen between flowers of the same species, or kind.



Show image 4A-10: Paper wasp and honeybee

I'd like to introduce you to a relative of mine. This is a paper wasp. *[Point to the image on the left.]* Look closely at its body next to mine. What do we have in common? We each have a head. We each have a thorax with six legs, an abdomen, an exoskeleton, and wings. And, this particular wasp, the paper wasp, is a social insect, just like me. Some wasps are solitary, but the black and gold ones nearly always live in societies *or groups*.

Like honeybees, wasps live in large groups. What are these groups called? Yes, wasps live in colonies. Each colony has a leader, a female wasp who is bigger than all the other wasps and who spends most of her time laying eggs. Sound familiar? What is she called? Yes, the queen.



Show image 4A-11: Paper wasp nest

Like honeybees, wasps build nests. They build them in many different places, usually in hidden, difficult-to-see places that are protected from rain and bad weather, such as under the eaves of houses or in protected areas on trees. *The eave of a house is a protected place where the roof and the outside wall come together, so wasps like to build their nests there.* Wasp nests have a very different look from beehives on the outside, but their paper-like structures are similar to ours on the inside.

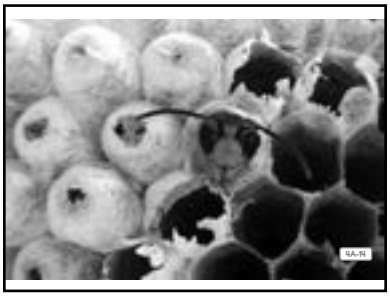
Show image 4A-12: Wasp queen forming nest

We'll take a look at how paper wasps build their nests. The process begins with the queen. She finds plant fibers—dry grasses, old boards, fence posts—and pulls them apart with her strong jaws. She softens the splintery pieces with saliva inside her mouth and chews

them into a paste that looks and feels a little like paper. Then she sticks a dab of this paste to whatever surface she has chosen for her nest. The queen adds a tough stem to support the whole nest and begins attaching cone-like chambers to it. These clusters of six-sided chambers open downward to keep the rain out.

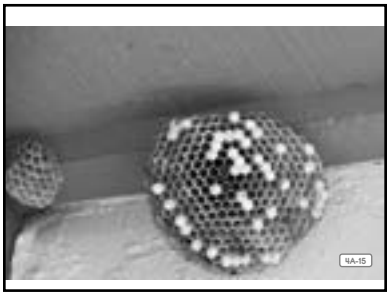
Show image 4A-13: Queen wasp placing eggs in nest

As the queen forms each chamber, she deposits an egg in each one. The eggs develop into larvae. The queen wasp takes care of the first larvae herself. She leaves the nest to find food, capturing and chewing other insects into mush to feed her young. About two weeks after hatching, the larvae enter the pupa stage, spinning cocoons inside each cell and covering the cells with silk. *What jobs does the queen paper wasp do?*



Show image 4A-14: Adult wasp emerging from cell

These sealed cells break open a few weeks later and out come adult wasps with long legs, strong wings, and large eyes. Most of these newly hatched wasps are female workers who begin to take over the queen's work right away. They hunt for food and feed the larvae, clean and repair the cells, and guard the nest. Others fan the nest with beating wings, and some even spread water over the combs to keep the nests cool. While the workers enlarge the nest for more and more wasps, the queen goes back to laying eggs. *What jobs do the female worker wasps do?*



Show image 4A-15: Large paper wasp nest

By summer's end, many of the workers have died. There are often 250 or more cells inside the wasp's papery nest. The wasps that do emerge at the end of summer are no longer female worker wasps. Instead, they are new queens and males. The new queens find shelter in protected places—in attic walls, inside logs, under bushes—where they

hibernate all winter. When spring comes, the new queens come out from hiding and begin building nests for new colonies of wasps.

All wasps abandon their nests in fall, using them for one season only. When fall comes and the leaves drop from the trees, look up and see if you can spot one of their papery apartment houses dangling from under a roof or partially hidden behind a wall.

Next time you'll find out how some other social insects build their nests. Until then, be thinking about who they might be.

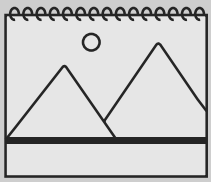
COMPREHENSION QUESTIONS (10 MIN)

Check for Understanding

Turn and Talk: Are honeybees and paper wasps social or solitary insects? *(social)* How do you know they are social? *(Both live in communities, or groups, and work together to find food and raise young bees and wasps.)*

1. **Literal** If honeybees and paper wasps have a larva and pupa stage, do they go through complete or incomplete metamorphosis? *(complete metamorphosis)*

Flip Book 4A-4, 4A-7, 4A-8, 4A-11



Show image 4A-4: Queen bee surrounded by other bees

2. **Literal** The queen honeybee performs a very important job that keeps the life cycle of the bee going. What is it? *(She lays eggs.)*

Show image 4A-7: Worker bee collecting nectar and close-up of bee's mouthpart

3. **Inferential** What other jobs do honeybees have to help keep the colony alive? *(Queen bees lay eggs; drones mate with the queen bee; worker bees build honeycombs, protect the larvae, store nectar and pollen, guard the hive; forager bees used to be worker bees and they go out in search for the sweetest nectar.)*

Show image 4A-8: Honeybee and figure-eight dance pattern

4. **Inferential** Why do honeybees perform the waggle dance? *(It is a way to communicate with their fellow foragers, telling them where the best flower nectar can be found.)*

Show image 4A-11: Paper wasp nest

5. **Evaluative** Why do you think these wasps are called paper wasps? *(Answers may vary, but may include that their nests look like they are made of paper)* How do paper wasps build their nests? *(They scavenge for building materials and chew them up to make a paste.)*

6. **Evaluative** *Think Pair Share:* Which member(s) of the hive do you think are most important to the hive's survival? Use evidence from the read-aloud to support your answer. *(Answers may vary. Be sure to discuss the cooperative nature of the hive—all roles are necessary and equally important but emphasize that all members of the colony come from the one queen.)*

WORD WORK: COOPERATE (5 MIN)

1. In the read-aloud you heard, "We gather and share food, build nests together, cooperate to raise our young, and help protect one another from enemies."
2. Say the word *cooperate* with me.
3. *Cooperate* means to work together for the good of everyone involved.
4. My family and I all cooperate with each other to prepare our evening meal.
5. Tell me about a time you and your classmates had to cooperate with one another to accomplish something. Try to use the word *cooperate* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "One time my classmates and I had to cooperate was when . . ."]
6. What's the word we've been talking about?

Use a Discussion activity for follow-up. Using the word *cooperate,* turn and describe how honeybees or paper wasps are social insects.

ENGLISH LANGUAGE LEARNERS

Speaking and Listening

Selecting Language Resources

Entering/Emerging
Have students verbally share key words from the read-aloud.

Transitioning/Expanding
Have students verbally craft a complete sentence based on the read-aloud.

Bridging
Have students verbally craft a detailed sentence based on the read-aloud.

Lesson 4: Social Insects: Bees and Wasps

Application

20M

Language: Students will demonstrate an understanding of the multiple meaning word *comb.*

ELA.2.V.1.1

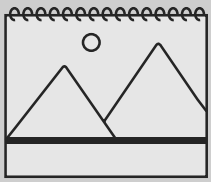
Writing: Students will draw and write about social insects.

ELA.2.C.1.4

MULTIPLE MEANING WORD: COMB (5 MIN)

Show Poster 2M (*Comb*)

Flip Book Poster 2M



- Review the meaning of *comb* from the read-aloud.
  - In the read-aloud you heard, "She returns to the comb to lay [the eggs] there in the cells." Here *comb* means a group of wax cells, each of which has six sides, that is built by honeybees.
- Have a student point to the part of the poster that shows this meaning.
- Review the other meanings of *comb.*
  - *Comb* can also mean a flat piece of plastic or metal with a row of thin teeth used for making hair neat.
- Have a student point to the part of the poster that shows this meaning.
  - Another meaning of *comb* refers to the soft part on top of the head of some birds, like this rooster.
- Have a student point to the part of the poster that shows this meaning.
- Have students work with partners to create sentences using the three meanings of *comb* and allowing their partner to guess the meaning they are using in the sentence.
  - Now with your neighbor, make a sentence for each meaning of *comb* and your neighbor can choose the correct picture on the poster. Remember to use complete sentences. For example, you could say, "I use this comb to keep my hair from being tangled." And your neighbor should respond, "That's '2'." I will call on some of you to share your sentences.
- Call on a few students to share their sentences.

ENGLISH LANGUAGE LEARNERS

Writing

Writing

Entering/Emerging
Have students dictate facts using familiar vocabulary to a teacher to be recorded.

Transitioning/Expanding
Have students dictate facts using familiar vocabulary to a peer to be recorded.

Bridging
Have students write facts using familiar vocabulary independently.

Challenge

Have students conduct additional research on paper wasps or honeybees using books from the class library or on the computer. Encourage students to incorporate this information in their journal entries.

INSECTS JOURNAL: SOCIAL INSECTS (15 MIN)

- Tell students that they are going to add to their Insects Journal today by drawing and writing about a social insect. Give students the following directions:

1. On the first page, write down any questions you have about social insects after hearing today's read-aloud.
2. Next, decide whether you want to draw and write about paper wasps or honeybees. Write *Honeybees* or *Paper Wasps* at the top of the page as the title for your journal entry.
3. On the next page of your journal, draw a picture of honeybees or paper wasps showing how they work together as a colony (e.g., show the honeycomb or nest, and the various jobs of different bees or wasps). Encourage students to label their drawings (e.g., honeycomb, queen bee, nest, etc.).
4. Then, write a description of your drawing using complete sentences below your drawing. In your description, explain how the insects are social and how the insect colony works together.

Check for Understanding

Check In: As students begin to draw, circulate and ask students how the insect or group of insects is social and to encourage students to add labels to their drawings.

- Tell students they will share their drawings, sentences, and questions with a partner in the next lesson.
- Collect students' Insects Journals to check that they have recorded questions about insects, and have drawn and written about a social insect and explained how it is social. Be prepared to return these to students for the next lesson.

End of Lesson

LESSON

5

INSECTS

Social Insects: Ants and Termites

PRIMARY FOCUS OF LESSON

Speaking and Listening

Students will present their journal entries explaining how honeybees and paper wasps are social insects.

ELA.2.C.2.1

Reading

Students will explain how ants and termites are social insects.

ELA.2.R.2.2

Language

Students will demonstrate an understanding of the Tier 2 word *destructive.*

ELA.2.V.1.1

Writing

Students will plan an informational narrative.

ELA.2.C.1.2

FORMATIVE ASSESSMENT

Activity Page 5.1

Plan an Informational Narrative Students will plan an informational narrative.

ELA.2.C.1.2

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud			
Insects Journal: Social Insects	Whole Group	10 min	❑ Insects Journal
Read-Aloud			
Purpose for Listening	Whole Group	30 min	❑ Image Card 14 ❑ chart paper, chalkboard, or whiteboard
"Social Insects: Ants and Termites"			
Comprehension Questions			
Word Work: *Destructive*			
This is a good opportunity to take a break.			
Application			
Plan an Informational Narrative	Independent	20 min	❑ Activity Page 5.1
Take-Home Material			
Family Letter			❑ Activity Page 5.2

CORE VOCABULARY

aggressive, adj. forceful or ready to attack
Example: The mother bear became aggressive when she thought her cubs might be in danger.
Variation(s): none

chambers, n. empty, enclosed spaces; rooms
Example: Bees develop in separate chambers in a hive.
Variation(s): chamber

destructive, adj. causing a large amount of damage or harm
Example: The destructive puppy chewed a hole in the new sofa.
Variation(s): none

emit, v. to send out or give off
Example: Fire alarms emit a very loud noise so people will hear them easily.
Variation(s): emits, emitted, emitting

nurseries, n. places to breed and care for young animals or plants
Example: Worker ants feed baby ants in separate chambers, or nurseries.
Variation(s): nursery

Vocabulary Chart for "Social Insects: Ants and Termites"

Type	Tier 3 Domain-Specific Words	Tier 2 General Academic Words	Tier 1 Everyday Speech Words
Vocabulary	chambers nurseries	aggressive *(agresivo/a)* destructive *(destructivo/a)* emit	
Multiple Meaning			
Sayings and Phrases	take a close look storage bin social insects just in case		

Lesson 5: Social Insects: Ants and Termites

Introducing the Read-Aloud

10M

Speaking and Listening: Students will present their journal entries explaining how honeybees and paper wasps are social insects. ELA.2.C.2.1

INSECTS JOURNAL: SOCIAL INSECTS (10 MIN)

Review Social Insects

- Remind students that they learned about the habits of honeybees and paper wasps in the previous read-aloud and ask them to describe a job of honeybees and/or paper wasps.
- Tell students some of these are characteristics of all social insects:
  - live together in organized communities called colonies
  - depend upon and cooperate with one another: gathering food, caring for young, caring for queen
  - have very specialized jobs.

Share Insects Journal Entry

- Have students share their journal entry on honeybees or paper wasps with a partner, describing their drawing and reading aloud the description below the drawing.
- As each student shares, encourage the listening partner to ask questions about the sharing partner's drawing and writing.
- Circulate as these conversations are happening, eliciting observations about the language students used to describe social insects.
- If there is time, have students add to or revise their drawing and writing based on their partner's feedback.

ENGLISH LANGUAGE LEARNERS

Language

Evaluating Language Choices

Entering/Emerging
With prompting and support, describe the language your partner used to describe social insects.

Transitioning/Expanding
With prompting and moderate support, describe the language your partner used to describe social insects.

Bridging
Independently describe the language your partner used to describe social insects.

Lesson 5: Social Insects: Ants and Termites

Read-Aloud

30M

Reading: Students will explain how ants and termites are social insects. ELA.2.R.2.2
Language: Students will demonstrate an understanding of the Tier 2 word *destructive.* ELA.2.V.1.1

PURPOSE FOR LISTENING

- Tell students they are going to learn about two more social insects today: ants and termites. Tell students to listen carefully to learn about the jobs ants and termites must perform in order to survive.

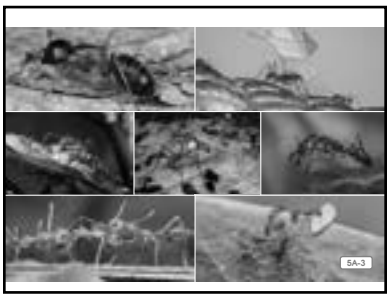
"SOCIAL INSECTS: ANTS AND TERMITES" (15 MIN)

Show image 5A-1: Black garden ant
Hi there, everybody. Because I'm one of the most common insects on the planet, I'm sure you know that I'm an ant. But, did you realize how much my cousins and I look like a wasp? Take a close look.

Show image 5A-2: Ant and wasp
See how slender, or thin, our waists are? Mine is unusually flexible, making it easy to bend and twist. Count my body parts. You'll see that I have three, just like all other insects—my head with its long antennae, my thorax, and my abdomen. *[Have student volunteers point to those parts of the insect in the image.]*

Here's something you might not know: I have two stomachs! Both are located in my abdomen, but one is for my own digestion and the other, called the crop, is just a storage bin where I keep food for other ants.

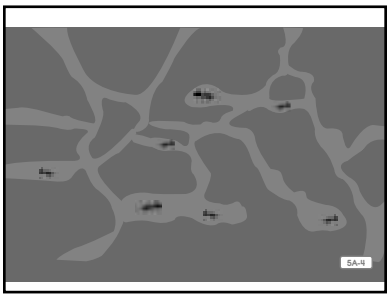
The fact that I store food for other ants should tell you something about me. *What does this tell you about ants?* Ants are social insects. We raise and care for our young in ant colonies. There are many different kinds of ants with many different ways of life.



Show image 5A-3: Collage of ants

[Point to each ant as you read about it, going from left to right on each line, top to bottom.] Carpenter ants build their nests in wood. Leafcutter ants grow fungus on the leaves they cut in vast, or very large, underground gardens. *A fungus is a type of living organism—not a plant or animal. Mold is of one kind of fungus.* The **aggressive** weaver ants live in leaves they bind together in trees. Aggressive *means forceful or ready to attack.* The huge colonies of army ants travel in groups, eating everything in sight. Trap-jaw ants can jump distances of more than twelve inches! *[Demonstrate the width of twelve inches with your hands.]* Harvester ants build huge nest mounds where they store seeds. Beware of the red fire ants—they sting!

I am a black garden ant, the type that you may see most often, so that is the kind of ant I am going to tell you about today. Like many other ants, we live in underground tunnels, or passageways.

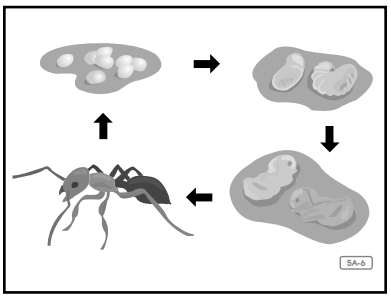


Show image 5A-4: Underground ant tunnels with chambers

Bees have honeycombs, paper wasps have paper nests, and we have tunnels—miles and miles of tunnels, full of little **chambers**, or rooms—hundreds of very dark chambers. A colony may have as few as twelve ants or as many as a million or more. The center of an ant colony's life is this nest of tunnels.

Show image 5A-5: Winged queen ant

An ant colony begins with the queen. A young queen is born in one colony but leaves that colony to start her own. Her wings carry her into the air to find a mate. Once she mates, she sheds her wings and immediately finds a nesting place underground. There she builds a chamber and seals herself inside to lay her eggs.



Show image 5A-6: Stages of development: egg, larva, pupa, adult
When ant larvae hatch, the queen cares for the first brood herself, feeding them with her own saliva as they change from wormlike larvae into pupae and, finally, adults. The queen does not leave the nest this whole time, getting nutrition from her now-useless wing muscles in order to survive.

Ants undergo a complete metamorphosis. *What is a metamorphosis?* (a change) *What are the four stages in complete metamorphosis?* (egg, larva, pupa, adult) Most of the eggs eventually develop into small female worker ants that begin their lifetime of hard work by gathering food for the queen, making sure she is well fed. The queen will never leave the nest again, living there for ten to twenty years, perhaps even longer. As the mother of the colony, she has her own special chamber. Her only job from this point on is to lay eggs.

Show image 5A-7: Worker ants feeding larvae
The worker ants carry the eggs from the queen's chamber into **nurseries** where they keep the eggs clean and moist by licking them until they hatch. *Nurseries are places to breed and care for young animals or plants.* Then they carry the larvae into separate chambers to feed them.

Black ants eat other insects, any crumbs that we can find, and the honeydew of aphids. *[Show Image Card 14 (ants tending aphids).] Honeydew is a sugary liquid made by the aphids. The ants collect the honeydew and protect the aphids from predators.* We chew the food up well and put it in a pouch in our mouths where the liquid is squeezed out of it. We spit out the solid parts and swallow the liquid. Remember, we have two stomachs, one being a crop for storing food, so worker ants come back to the nest with crops full of food for the young.

Show image 5A-8: Ant pupae

As they grow, the larvae molt a few times and after a few weeks they spin cocoons. *What does it mean when insects molt?* (They shed their skins to grow.) The worker ants move these newly formed pupae into much drier chambers where they rest until they are ready to gnaw their way out into the world.

Support

Ask students to think of examples of ways your class cooperates to get things done.

As social insects, ants cooperate in many ways. *What does* cooperate *mean?* (work together) When these new workers emerge, some will help care for the queen and larvae, and some will build and repair the tunnels, while others will guard the nest.

Show image 5A-9: Soldier ant guarding a nest

These guards, called soldier ants, have larger heads and jaws than the other ants, and they place their bodies across the entrance to the nest to defend the colony. All ants, including soldier ants, **emit** *or give off* chemical signals that other ants smell with their antennae. Soldier ants use these signals to warn the colony of danger. This is one way that ants communicate, or share information.

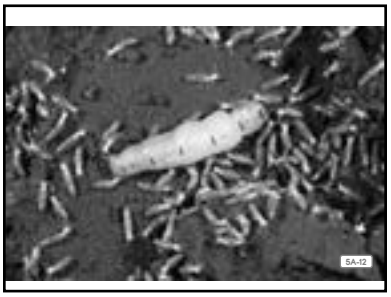
Show image 5A-10: Ants communicating

Another way ants communicate is through touch. If an ant is hungry, it taps a food gatherer lightly with its antennae to let it know that it would like to eat.

They exchange the food mouth-to-mouth in what looks like little kisses. When food is shared, the ants also share and pass along some chemical information important for the entire colony. If one of us ants gets trapped when the soil around us caves in, we produce a squeaky sound by rubbing joints together and other ants "hear" the cry for help through their legs.

Show image 5A-11: Termites and cockroach
Before I leave, I want to introduce you to another social insect that some people mistakenly call white ants. Do you think these look like ants? They're not. They are termites. Termites are more closely related to cockroaches and yet they do not have hard exoskeletons. They are soft-bodied and nearly blind. They would not survive as solitary insects on their own, but they are very successful social insects.

There are several differences between termites and the other social insects you have learned about—honeybees, paper wasps, and ants. Termites do not go through as many stages of development. They skip the pupa stage so their metamorphosis is incomplete.



Show image 5A-12: Termite queen
Termite society is a bit different as well. Both a king and a queen rule termite colonies. They start a colony together. The queen is the most important member of the colony, sometimes laying six or seven thousand eggs a day. She is so well protected by the countless numbers of worker termites that it is almost impossible to find her within the colony. Just in case something should happen to the royal couple, termite colonies include substitute kings and queens as well.

Show image 5A-13: Termite soldiers
Termite workers perform jobs similar to the worker ants' jobs, but the job of guarding the colony rests with a small number of soldiers, equipped with strong legs and long powerful jaws. Unlike honeybees, paper wasps, and ants, where all the workers are female, in termite colonies, both male and female workers are important members of society.

Show image 5A-14: Termites chewing on wood

Termites' favorite food is wood. They can be very **destructive** if they choose to eat through the walls of a house! Destructive *means they cause a lot of damage or harm.* Depending on where they live, some termite species eat insects, waste materials, and fungus. They build their temperature-controlled nests underground, inside fallen trees, in timber, and in tree branches.

Show image 5A-15: Termite nest in a tree and termite mound

[Point to the image on the left.] Does this nest look a bit like a wasp nest? I think so. It's made of chewed wood and saliva like a wasp nest, but with added mud and soil.

Some termites build mounds above ground to house their colonies. *[Point to the image on the right.]* These towering mud structures are hard as rock and some are as tall as a two-story house. Lots of teamwork goes into building these mounds with incredible air-conditioning systems to keep the chambers cool in very hot climates.

Next time you'll hear from an insect that glows in the dark. Until then, be thinking about who that might be.

COMPREHENSION QUESTIONS (10 MIN)

1. **Inferential** The author of this read-aloud made the statement that ants are social insects. What reasons, or facts, did the author give to support this statement? *(Ants live and work together cooperatively in colonies with specialized jobs.)*

Check for Understanding

Make a List: Let's make a list as a group. What jobs do ants and/or termites have that contribute to the colony? *(The queen builds tunnels and lays eggs; workers feed the young and repair tunnels; soldiers guard the nest.)*

- Record students' answers on a piece of chart paper, a chalkboard, or a whiteboard.
- Ask students how those jobs make ants and/or termites social. *(They have to work together for the good of the community.)*

2. **Evaluative** How are termites and ants different? *(Termites have incomplete metamorphosis, whereas ants have complete metamorphosis; termites have multiple kings and queens, whereas ants have only one queen; male termites serve the colony in many ways, whereas the only role of a male ant is to mate with the queen.)*
3. **Evaluative** *Think Pair Share:* Many people stack firewood on their wooden porches so it is handy to transport into the house to make fires when it is cold outside. Given what you know about the termite's eating habits, do you think that is a good idea? Why or why not? *(Answers may vary, but should reference the fact that termites eat wood and might begin harming the porch or the house if they are close to it.)*

Challenge

Compare and contrast honeybees and wasps with ants and termites.

ENGLISH LANGUAGE LEARNERS

Speaking and Listening

Listening Actively

Entering/Emerging
Ask students simple *yes/no* questions (e.g., "Is the queen ant's job to lay eggs?").

Transitioning/Expanding
Provide students with a specific sentence frame (e.g., "The queen ant's job is to . . .").

Bridging
Encourage students to use content-related words in complete sentences (e.g., "The queen ant's job is to lay eggs, just like the queen honeybee.").

Challenge

Have students conduct additional research on ants or termites using books from the class library or on the computer. Encourage students to write a journal entry detailing this new information.

WORD WORK: DESTRUCTIVE (5 MIN)

1. In the read-aloud you heard, "[Termites] can be very destructive if they choose to eat through the walls of a house!"
2. Say the word *destructive* with me.
3. If something is destructive, it causes great damage or harm.
4. Hurricanes can be very destructive storms.
5. Can you think of something that is destructive? Try to use the word *destructive* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students' responses: "_____ is destructive."]
6. What's the word we've been talking about?

Use a Making Choices activity for follow-up. A word that is an antonym, or has the opposite meaning, of *destructive*, is the word *constructive. Constructive* means helpful or making something better. I am going to describe some scenarios. If what I describe is an example of something that is destructive, or causes harm, say, "That is destructive." If what I describe is an example of something that is constructive, or that is helpful, say, "That is constructive."

- The engineers built a new bridge over the river. *(That is constructive.)*
- I helped my little sister learn to tie her shoe. *(That is constructive.)*
- The puppy chewed through my mother's new shoes. *(That is destructive.)*
- The ocean wave destroyed the sand castle I built on the beach. *(That is destructive.)*
- We helped plant flowers in the garden. *(That is constructive.)*

Lesson 5: Social Insects: Ants and Termites

Application

20M

Writing: Students will plan an informational narrative.

ELA.2.C.1.2

PLAN AN INFORMATIONAL NARRATIVE (20 MIN)

- Tell students they are going to write an informational narrative, or story, from the perspective of an insect. This narrative, or story, will be narrated by an insect, like the read-alouds have been, and it will contain accurate information about the insects in the story.
- Using their journals, have students review the insects they have learned about so far. You may also wish to have them review some of the trade books from the classroom library.
- Give each student Activity Page 5.1. Tell students that they are going to use this activity page to plan their informational narrative.
- Remind students that when they studied *The Ancient Greek Civilization* domain, they experienced the writing process of planning, drafting, and editing as they wrote a fictional narrative.
- After reviewing their journals, have students choose one type of insect and write it on the first blank in the "Character(s)" box. Then have them think of a name for their insect and write it on the second blank in the "Character(s)" box.
- Ask students the following questions to encourage the brainstorming process:
  - Is your insect a solitary insect or a social insect?
  - Does your insect go through incomplete metamorphosis or complete metamorphosis?
  - Does your insect have wings?
  - What type of mouth does your insect have?

Activity Page 5.1

ENGLISH LANGUAGE LEARNERS

Writing

Writing

Entering/Emerging
Have students dictate facts using familiar vocabulary to a teacher to be recorded.

Transitioning/Expanding
Have students write phrases using familiar vocabulary to a peer to be recorded.

Bridging
Have students write facts using familiar vocabulary independently.

Support

Model the brainstorming stage of writing by choosing your own title and writing down your ideas on chart paper, a chalkboard, or a whiteboard.

- You may wish to ask the following questions to help students organize their story:
  - What is the setting of your story?
  - Who are the characters?
  - What is the plot? (What do you want to happen?)
  - What happens first (in the beginning)?
  - What happens next (in the middle)?
  - What happens last (at the end)?
- You may wish to have students work together in groups to allow them to give and receive feedback.
- Tell students that they will continue their writing with the draft step the next time you meet.

Check for Understanding

Circulate and Ask: As students begin to plan, circulate and ask them questions to help them identify a character, setting, beginning, middle, and end.

- Collect students' informational narrative plan to check that they have identified a character and setting, and planned a beginning, middle, and end for their stories. You may wish to provide oral feedback and guidance prior to beginning Lesson 6.
- If students need extra time, allow them to complete the journal entry during the Pausing Point.

End of Lesson

Lesson 5: Social Insects: Ants and Termites

Take-Home Material

FAMILY LETTER

- Send home Activity Page 5.2.

Activity Page 5.2

Grade 2 | Knowledge 8

Pausing Point

NOTE TO TEACHER

You should pause here and spend one day reviewing, reinforcing, or extending the material taught thus far.

You may have students do any combination of the activities listed below, but it is highly recommended you use the Mid-Domain Assessment to assess students' knowledge of insects. The other activities may be done in any order. You may also choose to do an activity with the whole class or with a small group of students who would benefit from a particular activity.

CORE CONTENT OBJECTIVES UP TO THIS PAUSING POINT

Students will:

- Explain that insects are the largest group of animals on Earth
- Explain that there are many different types of insects
- Explain the behaviors of solitary and social insects
- Classify insects based on their defining characteristics
- Identify and describe the three main body parts of insects: head, thorax, and abdomen
- Describe an insect's exoskeleton
- Explain why spiders are not insects
- Describe insect life cycles and the stages of complete and incomplete metamorphosis
- Describe various social insect colonies including the jobs performed in the colony

Activity Page PP.1

MID-DOMAIN ASSESSMENT: PARTS OF AN INSECT

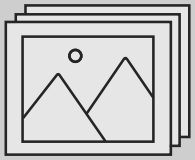
Materials: Activity Page PP.1

- Read students the following directions:
  - Look at this drawing of an insect. Using the word bank provided, label five parts of an insect: the abdomen, antenna, head, leg, and thorax.

ACTIVITIES

Act It Out (10 min)

Image Cards 1, 2, 8–13



Materials: Image Cards 1, 2, 8–13

- Show students Image Cards 2 (cockroach), 8 (praying mantis), 9 (grasshopper), and 10 (cricket).
- Tell students that they will have the opportunity to act out the stages of metamorphosis today.
- Tell students that each of the insects pictured in this group of images undergoes incomplete metamorphosis. Review the three stages of incomplete metamorphosis: egg, nymph, and adult.
- Show students Image Cards 1 (Butterfly), 11 (Moth), 12 (Fly), and 13 (Ant).
- Tell students that each of the insects pictured in this group of images undergoes complete metamorphosis. Review the four stages of complete metamorphosis: egg, larva, pupa, adult.
- Divide students into groups of three or four. Give each group an Image Card depicting one of the insects.
- Tell students to work cooperatively with their group members and have each student represent a different stage of development for their given insect. Have students practice in their small groups.
- Next, tell students each group will perform for the class. Have students regroup according to the part they played in the development of the insects (all eggs will be together, all nymphs, all larvae, etc.). Tell them that you are going to describe each developmental stage in one sentence (i.e., first you will describe the egg stage, second you will describe the nymph stage, etc.).
  - I am the first stage of development in all insects. I am laid by an adult and remain rather helpless, unable to move until I change forms. *(egg, both complete and incomplete metamorphosis)*
  - I am the second stage of development, following the egg, and resemble, or look like, my parent. *(nymph, incomplete metamorphosis)*
  - I am the second stage of development, following the egg, and do not look at all like my parent. Rather, I am wormlike in appearance. *(larva, complete metamorphosis)*
  - I am the third and final stage of development, following the nymph stage. *(adult, incomplete metamorphosis)*

- I am the third, seemingly quiet, stage of development, following the larval stage. *(pupa, complete metamorphosis)*
- I am the fourth and final stage of development, following the pupal stage. *(adult, complete metamorphosis)*

Insect Research

Materials: Insects Journals; trade books; other resources as needed

- Have students check their Insects Journals to see if there are any questions they have about insects that have not been answered.
- Allow them to search through the trade books in the classroom library to look for answers.
- You may also wish to allow them to research using the Internet, library, and other available resources.
- Have students write in their journals any information that either answers a question or that they find interesting. As time allows, have students share what they find with the class.

Riddles for Core Content

- Ask the students riddles such as the following to review core content:
  - Most insects begin their life cycle inside of me. What am I? *(an egg)*
  - We help most insects to smell and feel. What are we? *(antennae)*
  - We help most insects to fly, escape from predators, and look for food. What are we? *(wings)*
  - All insects have six of us. What are we? *(legs)*
  - I am the hard outer skeleton of all insects. What am I? *(an exoskeleton)*
  - We are the three main body parts of insects. What are we? *(head, thorax, and abdomen)*
  - We work and live together in communities with other insects. What are we? *(social insects)*
  - We do things on our own and do not live and work in communities. What are we? *(solitary insects)*
- You may wish to have students create their own riddles about insects to pose to the class, based on what they have learned thus far.

Drawing Insects

Materials: Drawing paper, drawing tools

- Have students draw their favorite insect. Tell them to be sure to label the six legs and the three body parts: head, thorax, and abdomen.
- Allow students to share their drawings with the class.
- You may also ask students why a spider is not considered an insect, and why they would not draw a spider for this activity. *(Spiders have eight legs, rather than six like insects have.)*

Keeping Insects in the Classroom

Materials: Insects, their homes,and their food (will vary)

Note: Many insect species are available through science catalogues such as Carolina Biological Supply. Before deciding to keep or raise non-native species of insects, you may wish to consider that it is important they not be released into the environment, as they can disrupt the local ecosystem. You may wish to donate them to another classroom or to a local science museum.

- You may wish to keep insects in the classroom for students to observe and care for. Many insects are interesting and will enhance the themes of this domain.
- Giant peppered roaches (*Archimandrita tesselata*) can be kept successfully for long periods of time. These are attractive, large (2" to 3"), and long-lived insects. They are not smelly, can be fed on apples and cat chow, and are easily handled by students.
- Walking sticks can be raised on oak leaves, roses, or romaine lettuce.
- Praying mantises are less hardy and, because they are predators, require more attention to keep them fed.
- Mealworms can be raised in small containers and their life cycle observed. They are easy to feed on oats and potato slices, though the oat substrate and the potatoes need to be replaced periodically to prevent mold.
- You may be able to find Monarch butterfly caterpillars and watch the amazing and beautiful progression as each forms its chrysalis and then emerges as an adult Monarch.
- There are many enjoyable insects for students to observe. You may wish to do more research on keeping these insects or others in your classroom.

Note: You may wish to extend this exercise by having students write and share a brief report about a specific insect.

Key Vocabulary Brainstorming

Materials: Chart paper, chalkboard, or whiteboard

- Give students a key domain concept or vocabulary word such as *exoskeleton.* Have them brainstorm everything that comes to mind when they hear the word, such as *external skeleton, protective covering, waterproof,* etc.
- Record their responses on chart paper, a chalkboard, or a whiteboard for reference.

Insect Videos

- You may wish to search the Internet, or purchase or rent videos about insects. Show portions of videos to support the concepts in this domain.

Insect Habitats

- Have students discuss all of the different types of habitats where insects live. Emphasize that because there are so many different types of insects, they live in all kinds of places.
- Allow students to share stories of places where they have seen insects. Remind them that there are more insects than any other animal on Earth.

On Stage

- Have students act out particular insects, and have the rest of the students guess which insect it is.
- You may wish to allow the student to give clues such as, "I'm a solitary insect," or "I'm a very harmful insect," etc.

Writing Prompts

- Students may be given an additional writing prompt such as the following:
  - My favorite insect is . . .
  - One thing I don't like about insects is . . .
  - Some ways that insects are helpful are . . .
  - Some ways that insects are harmful are . . .

Insect Hunt

- Take the class outside to see how many insects they can find.
- Have students observe the insects and draw and/or write notes in their Insects Journals.
- You may also choose to bring insects into the classroom to observe, perhaps under a microscope.

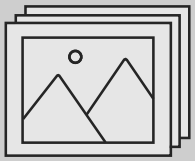
Image Review

- Show the Flip Book images from any read-aloud again, and have students retell information from the read-aloud using the images.

Image Card Review

Materials: Image Cards 1–13

Image Cards 1–13



- In your hand, hold Image Cards 1–13 fanned out like a deck of cards. Ask a student to choose a card but to not show it to anyone else in the class.
- The student must then perform an action or give a clue about the picture s/he is holding. For example, for a card with a butterfly, the student could flap his or her arms and pretend to "fly" around the room.
- The rest of the class will guess what is being described.
- Proceed to another card when the correct answer has been given.
- Be sure to "wrap the language" around this activity, reminding students of key domain-related vocabulary they have learned.

Domain-Related Trade Book or Student Choice

Materials: Trade book

- Read a trade book to review a particular insect or concept about insects; refer to the books listed in the Recommended Resources in the digital components for this domain.
- You may also choose to have the students select a read-aloud to be heard again.

Class Book

Materials: Drawing paper, drawing tools

- Tell the class or a group of students that they are going to make a class book to help them remember what they have learned about insects thus far in this domain.
- Have students brainstorm important information about the different types, characteristics, and life cycles of insects, and which insects are solitary or social.
- Have each student choose one idea to draw a picture about, and ask him or her to write a caption for the picture.
- Bind the pages to make a class book to put in the class library for students to read again and again.

LESSON

6

INSECTS

Insects that Glow and Sing

PRIMARY FOCUS OF LESSON

Reading

Students will explain how different insects communicate with one another.
ELA.2.R.2.2

Language

Students will demonstrate an understanding of the Tier 2 word *communicate.*
ELA.2.V.1.1

Writing

Students will draft an informational narrative.
ELA.2.C.1.2

FORMATIVE ASSESSMENT

Activity Page 6.1

Draft an Informational Narrative Students will draft an informational narrative from the point of view of an insect about which they have learned.
ELA.2.C.1.2

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud			
What Have We Already Learned?	Whole Group	10 min	
Read-Aloud			
Purpose for Listening	Whole Group	30 min	
"Insects that Glow and Sing"			
Comprehension Questions			
Word Work: *Communicate*			
This is a good opportunity to take a break.			
Application			
Syntactic Awareness Activity: Adverbs	Independent	20 min	❑ Activity Pages 5.1, 6.1
Draft an Informational Narrative			

ADVANCE PREPARATION

Note to Teacher

The purpose of syntactic activities is to help students understand the direct connection between grammatical structures and the meaning of text. These syntactic activities should be used in conjunction with the complex text presented in the read-alouds.

Universal Access

- Acquire a stiff comb to demonstrate the sound a grasshopper makes according to the descriptive text that accompanies image 6A-9 during the read-aloud.

CORE VOCABULARY

bioluminescence, n. light given off by some plants and animals, such as fireflies, caused by a biochemical reaction
Example: The night sky was filled with the bioluminescence of dancing fireflies.
Variation(s): none

communicate, v. to share or exchange information
Example: Humans use their mouths to communicate with one another by speaking.
Variation(s): communicates, communicating, communicated

lanterns, n. the part of a firefly's abdomen that produces light
Example: The fireflies' lanterns looked like flying stars in the summer night.
Variation(s): lantern

Vocabulary Chart for "Insects that Glow and Sing"

Type	Tier 3 Domain-Specific Words	Tier 2 General Academic Words	Tier 1 Everyday Speech Words
Vocabulary	bioluminescence	communicate *(communicar)*	
Multiple Meaning	lanterns		
Sayings and Phrases	find their way chemical reactions flipped a light switch call us by another name of course		

Lesson 6: Insects that Glow and Sing

Introducing the Read-Aloud

10M

Reading: Students will explain how different insects communicate with one another. ELA.2.R.2.2

WHAT HAVE WE ALREADY LEARNED? (10 MIN)

- Ask students to name the common characteristics of all insects. (six legs; three body parts: head, thorax, and abdomen; an exoskeleton; two antennae; and sometimes wings)
- Ask students how the insects they have learned about so far (specifically crickets, honeybees, and ants) communicate or exchange information with one another. You may wish to reread the following passages from previous read-alouds to help students remember.

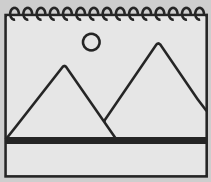
Show image 2A-11: Cricket's thorax and front legs

Look just below its knee joint on the front leg. Do you see a smooth patch of skin? That is the cricket's eardrum, which is very important as it communicates with other crickets through sound. The cricket's eardrum bends in and out to catch the sound waves so it can communicate with other crickets.

Show image 4A-8: Honeybee and figure-eight dance pattern

When a bee discovers a particularly good source of nectar, it returns to the hive to share its information with other foragers. First, it lets the other foragers smell the pollen so they can identify the type of flower. Then, it performs a complicated and special waggle dance. As it circles about in a pattern like a figure eight, it wags its abdomen as it moves through the middle of its dance. The bee's repeated movements, circling and waggling its abdomen, tell the others exactly how far away and in which direction from the sun the flowers are located. A bee that thinks she has found a really good flower patch does the waggle dance with lots of energy.

Flip book 2A-11, 4A-8, 5A-9, 5A-10



Challenge

Prior to rereading parts of the read-alouds or showing the Flip Book, ask students how insects communicate.

Support

Make a list of the various ways humans communicate, or exchange information (speaking, writing, facial expressions, body movements).

Show image 5A-9: Soldier ant guarding a nest

All ants, including soldier ants, emit chemical signals that other ants smell with their antennae. Soldier ants use these signals to warn the colony of danger. This is one way that ants communicate, or share information.

Show image 5A-10: Ants communicating

Another way ants communicate is through touch. If an ant is hungry, it taps a food gatherer lightly with its antennae to let it know that it would like to eat.

They exchange the food mouth-to-mouth in what looks like little kisses. When food is shared, the ants also share and pass along some chemical information important for the entire colony. If one of us ants gets trapped when the soil around us caves in, we produce a squeaky sound by rubbing joints together and other ants "hear" the cry for help through their legs.

- Tell students they are going to learn how some other insects communicate.
- Tell students that today's read-aloud is called "Insects that Glow and Sing." The insects they will learn about today communicate by glowing in the dark and singing to one another.

Lesson 6: Insects that Glow and Sing

Read-Aloud

30M

Reading: Students will explain how different insects communicate with one another. ELA.2.R.2.2

Language: Students will demonstrate an understanding of the Tier 2 word *communicate.* ELA.2.V.1.1

PURPOSE FOR LISTENING

- Tell students that they are going to learn about fireflies, grasshoppers, and crickets.
- Tell students to listen carefully to find out how these insects communicate with one another using light or sound.

"INSECTS THAT GLOW AND SING" (15 MIN)

Show image 6A-1: Firefly with well-illuminated light

Can you blink, boys and girls? So can I. Does your abdomen light up when you blink? No? Are you sure? How can you tell? If you're blinking, perhaps you just can't see. Turn to your neighbor and ask him or her to watch your abdomen while you blink. Did it glow? No? Well, I'm not really surprised. If humans were able to produce their own light, they might never have invented the electric light bulb. We fireflies have been around long before electricity or even candles. Our light organs, called **lanterns**, are located in our transparent, or see-through, abdomens. On fireflies, lanterns are the body part that produces light.

Show image 6A-2: Fireflies lighting up a forest

When humans first discovered us lighting up the forests, they were amazed by how much light we produced. In ancient China and Japan, people collected us in transparent jars and used us as lanterns to find their way in the

Support

Lanterns are also lights that have a covering over the light bulb or candle and are used to light up a room or path.

dark. *What does* transparent *mean?* (see-through) They named us fireflies. But we are not flies at all, and our light—unlike a fire—is cold.

"Cold light" is the way your ancestors explained our beautiful, magical light. Scientists now know that chemical reactions create the light, and they describe this process with a much bigger word. They call it **bioluminescence** [/bie*oe*l<u>oo</u>*mə*nes*ənz/]. Can you say that? *Bio* means living and *lumin* means light. I think that's a good name for it, don't you? We are living lights!

Challenge

Why is bioluminescence a good name for fireflies' ability? *(Because the roots of the word mean living and light, and a firefly is a living thing that produces light.)*

Show image 6A-3: Bioluminescence in the ocean

Other animals and plants glow, or light up like tiny electric bulbs, but most of them live in the ocean. Certain types of squid, jellyfish, corals, and even sharks glow beneath the water. Plants such as algae in the ocean can also glow on the surface of the water. At times, this bioluminescence is so bright that it looks as if someone flipped a light switch beneath the water.

It's less common to find land animals that glow, or give off light. I've told you that we are called fireflies, but do any of you call us by another name? We're also called lightning bugs. But we are neither flies nor bugs. We are beetles—another group of insects. Take a close look and see.

Show image 6A-4: Lightning bug

Like all insects, we have three body parts (head, thorax, and abdomen); six legs; two antennae; an exoskeleton; and, like most insects, two pairs of wings. *[Have student volunteers point to these body parts in the image.]*

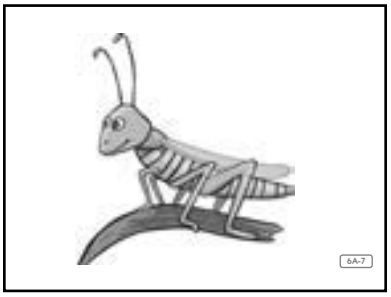
Show image 6A-5: Firefly larvae

We undergo a complete metamorphosis—changing from egg to larva to pupa to adult. *What is a complete metamorphosis?* (A change that is so big that the insect looks completely different after.) Some of our eggs and larvae even glow! Have you ever heard of

a glowworm? Glowworms are also misnamed. They are not worms at all. *At what stage do insects look like worms?* (as larvae) The larvae of fireflies and other insects are often called glowworms because they live on the ground like worms do, and they glow in the dark.

Show image 6A-6: Firefly bioluminescence
In order for any animals to survive, they must reproduce, or have babies. That means we must all work hard to attract mates. Fireflies glow when they are seeking mates. The males fly through the dark, flashing very specific signals to females who sit patiently and wait for them. Our yellowish-green lights stand out against the night sky as we signal one another with special codes. When a female recognizes a male's code as being from the same species, *or type* she flashes the same code back to him and the male lands beside her.

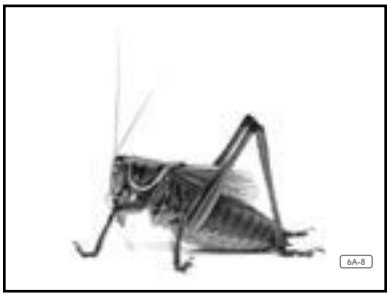
Have you ever noticed how some fireflies flash close to the ground with one pattern, but others seem to be higher in the air with a different flash pattern at a slightly later time of night? These are males of different species attracting their own females. Watch us next summer and you will see what I mean.



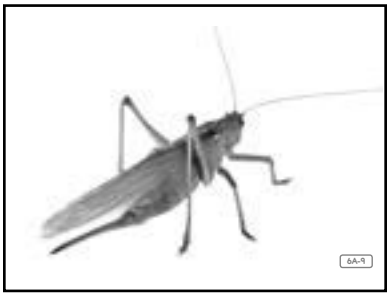
Show image 6A-7: Grasshopper
Who has been narrating the read-aloud up to this point? (a firefly) *Based on the image, who do you think will be narrating now?* Hi there. I bet you're surprised to see me today. I'm not bioluminescent. I don't glow, but I do sing. That's what I want to talk to you about today—other ways that insects **communicate**, or share information.

Fireflies are silent communicators, flashing their glowing lights back and forth. *What is the firefly's light organ called?* (a lantern) How do you communicate with one another? You talk, don't you? And what do you use to talk? Your mouths, of course! Although we insects use mouths for eating, just like you, we have no vocal cords, or voice boxes, so we don't use them for talking and singing. Even so, we grasshoppers can be a noisy bunch. Have you ever heard grasshoppers sing on a summer day? You won't hear any

words, but you will definitely hear a chorus of sounds. Just like birds, each type of grasshopper produces a different song. If you listen closely, you can tell what type of grasshopper is singing by its song.



Show image 6A-8: Grasshopper's tympanum
Nearly all grasshoppers have two pairs of wings, but we seldom use them for flying because we spend so much of our lives low to the ground. Male grasshoppers use their wings for communicating with one another. Female grasshoppers do not sing, but they listen very carefully. They hear our sounds with tympanum, eardrums on the sides of their abdomens. *[Point to the abdomen in the image. The tympanum is located near where the thorax and abdomen come together, close to where the muscular hind legs attach to the thorax.]*

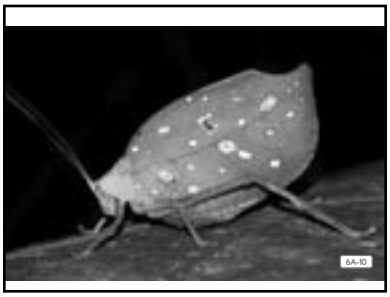


Show image 6A-9: Grasshopper's wings
Grasshoppers, locusts, and crickets all make sounds by rubbing body parts together, sometimes two wings and sometimes a leg and a wing.

To make sounds, I lift my wings and rub the front wings together. *[Point to the wings as you read this paragraph.]* The vein, composed of many tiny teeth, on the bottom of one wing rubs against the sharp edge, or scraper, on the top of the other wing. It is a little like rubbing your fingers along the teeth of a comb. As the two parts rub together, the wings vibrate, moving back and forth rapidly to produce the sounds that you hear.

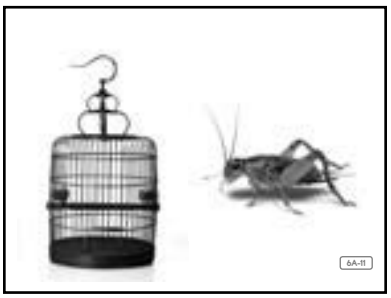
Support

Demonstrate this effect using a stiff comb.



Show image 6A-10: Katydid
You may be familiar with my cousin, the katydid. Katydids have long antennae, just like me. As they rub their front wings together, it sounds like they are calling out "Katy did, Katy did." Their high-pitched calls become faster and faster as the outside temperature rises. Some people even say that you can tell how hot it is by the number of times per second a

katydid chirps. If katydids live in your part of the world and you are patient enough, you may want to try counting the number of chirps you hear every five seconds. Add thirty-nine to that number and you may have an accurate reading of the temperature, depending on the species of katydid you are hearing.



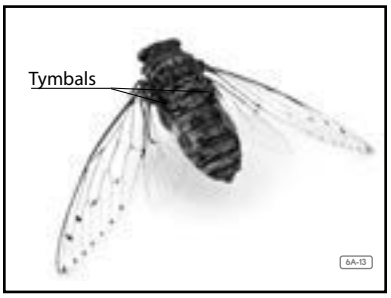
Show image 6A-11: Cricket cage and cricket

In some Asian countries, in a tradition that has been practiced for thousands of years, male crickets have been kept in cages as singing pets. Do you know where the ears of a cricket are located? You may remember that female grasshoppers hear with special parts on their abdomens, but crickets have "ears" on their forelegs. *The front legs of animals are called forelegs.* Both places must seem a little strange to you since your ears are on the sides of your head.

Before I leave today, I want to introduce you to another singing insect. These insects are often mistaken for grasshoppers and crickets because they look a lot like us.

Show image 6A-12: Cicada

Does anyone remember what this insect is called? This is a cicada [/sə*kae*də/]. Cicadas are related to aphids, leafhoppers, and spittlebugs. Unlike grasshoppers and crickets, many cicadas have strong wings and are fast fliers. Male cicadas produce incredibly loud songs, but they do not use their legs and wings to make those sounds.



Show image 6A-13: Cicada with tymbals labeled

Look closely at the abdomen of a cicada. On its underside, close to the thorax, a cicada has a pair of sound-producing organs called tymbals [/tim*bəlz/]. These ribbed membranes are a little like the skin of a drum. The cicada uses its muscles to vibrate these drum-like organs.

Vibrate *means to move back and forth very fast.* The tymbals pop and click as they move in and out. Their sound is amplified, or made louder, inside the mostly hollow abdomen, acting like a drum and creating a loud buzzing song. The shrill sound of hundreds or thousands of cicadas singing together on a warm summer evening may be very, very loud.

Grasshoppers, crickets, and cicadas all use sound to communicate in much the same way that fireflies use their lights. Males attract females for the purpose of mating, making sure that these winged insects will continue to survive.

Next time you gather to discuss insects, you will learn about the largest group of insects on Earth. Can anyone guess what that might be?

ENGLISH LANGUAGE LEARNERS

Reading

Listening Actively

Entering/Emerging
Ask students simple *yes/no* questions (e.g., "Do fireflies use their wings to make sounds to communicate?").

Transitioning/Expanding
Provide students with a specific sentence frame (e.g., "To communicate, fireflies . . .").

Bridging
Encourage students to use content-related words in complete sentences (e.g., "To communicate, male fireflies use their lanterns to flash signals to females.").

COMPREHENSION QUESTIONS (10 MIN)

Check for Understanding

Turn and Talk: Name an insect and describe how that insect communicates. You may wish to prompt students by giving them a list of insects from which to choose:

- firefly *(uses lanterns)*
- grasshopper *(sings by rubbing wings or wings and legs together and listens using tympanum)*
- katydid *(sings by rubbing front legs together)*
- cricket *(sings and listens with forelegs)*
- cicada *(vibrates tymbals to make a loud noise)*

1. **Inferential** The female grasshoppers use their tympanum, or eardrums on the sides of their abdomens, to listen to the male grasshoppers. Why do the males sing to the females? *(They are communicating that they want to mate with them.)*
2. **Inferential** You heard in the read-aloud about a tradition in some Asian countries where crickets are kept in cages. Is it males or females that are caged? Why are they caged? *(Males; so people can hear them sing.)*
3. **Inferential** Do grasshoppers, crickets, and fireflies all have exoskeletons? How do you know? *(Yes, they are all insects and all insects have exoskeletons.)*

WORD WORK: COMMUNICATE (5 MIN)

1. In the read-aloud you heard, "That's what I want to talk to you about today—other ways that insects communicate, or share information."
2. Say the word *communicate* with me.
3. *Communicate* means to share or exchange information.
4. It is important to communicate with your teacher when you need something.
5. Tell me about a time when you have had to communicate with a person. Use the word *communicate* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students' responses: "I have had to communicate with _____ because . . . "]
6. What's the word we've been talking about?

Use a Brainstorming activity for follow-up. Let's think of all the different ways humans communicate with one another. Then, think of other animals and how they communicate with one another. Tell students to discuss with their partner. Call on a few sets of partners to share.

Support

Describe how an insect communicates and then ask the student to name the insect you are describing [e.g., "What insect communicates by flashing its lantern?" *(firefly)*].

Lesson 6: Insects that Glow and Sing

Application

20M

Writing: Students will draft an informational narrative. ELA.2.C.1.2

SYNTACTIC AWARENESS ACTIVITY (5 MIN)

Adverbs

Note: There may be variations in the sentences created by your class. Allow for these variations, and restate students' sentences so that they are grammatical.

Show image 6A-9: Grasshopper's wings

- Explain what adverbs are, using an example from the read-aloud.
  - We know that many verbs are action words. Today we will practice using adverbs, which are words that are used to describe verbs.
  - Grasshoppers sing. *Sing* is an action word. What words could we use to describe how grasshoppers sing? (*loudly, softly, etc.)* For example, we could say, "Grasshoppers sing loudly or grasshoppers sing softly."
  - The words that describe how grasshoppers sing are called adverbs. Adverbs are words that describe verbs, or action words.
- Have students identify an adverb in a sentence from the read-aloud.
  - In the read-aloud you heard that grasshoppers' wings move rapidly to make sounds.
  - What do grasshoppers' wings do? *(move)* What word is used to describe how the wings move in this sentence? *(rapidly, which means quickly) Rapidly* is the adverb that is used to describe how grasshoppers' wings move.
- Have students repeat clapping motions after you as they describe the clapping using adverbs, such as *clap quickly, clap slowly, clap loudly,* etc.
  - We can use adverbs to describe how we move, too. Listen to how I clap, and repeat it after me. What words, or adverbs, could we use to describe how we are clapping?

ENGLISH LANGUAGE LEARNERS

Language

Modifying to Add Details

Entering/Emerging
With teacher support, have students think of an adverb to describe an action verb.

Transitioning/Expanding
With peer support, have students think of an adverb to describe an action verb.

Bridging
Have students verbally craft a detailed sentence using at least one adverb to describe an action verb.

- Have students work with a partner to take turns doing an action or describing the action using adverbs.
  - Now you try! First, one partner should move a certain way so the other partner can repeat it. Then, work together to describe the movement.

Check for Understanding

One-Word Answer: What are these describing words called? *(adverbs)* What is an example of an adverb? *(Answers may vary.)*

DRAFT AN INFORMATIONAL NARRATIVE (15 MIN)

Activity Pages 5.1, 6.1

- Return Activity Page 5.1, and tell students they are going to begin writing an informational narrative, or story, about the insect they have chosen.
- Have students review their titles and brainstorming activity pages to see if there is anything they would like to add or change. You may wish to have students work together in groups to allow them to give and receive feedback.
- Once students have decided on a title and basic story, have them write at least five sentences in the rectangles on Activity Page 6.1. Remind students that the first sentence should be an introductory sentence. Remind students that the last sentence should be a concluding sentence. Also, remind students to use capital letters at the beginning of their sentences and correct punctuation at the end of each sentence.
- Encourage students to use as many words from the read-alouds as they can (e.g., *communicate, honeycomb, burrow,* etc.). You may even provide students with a bank of words they may wish to include.
- Tell students they are not expected to finish writing today and that they will continue to write their narratives the next time you meet.
- Collect students' drafts to check that they have begun to write an informational narrative containing accurate information about the insect they chose.

End of Lesson

LESSON

7

INSECTS

Armored Tanks of the Insect World

PRIMARY FOCUS OF LESSON

Speaking and Listening

Students will review the key characteristics of insects and make a list of insects they know.

ELA.2.R.3.2b

Reading

Students will identify key characteristics of beetles, the largest group of insects.

ELA.2.R.2.2

Language

Students will demonstrate an understanding of the Tier 3 word *mimicry.*

ELA.2.V.1.1

Writing

Students will draft an informational narrative.

ELA.2.C.1.2

FORMATIVE ASSESSMENT

Activity Page 6.1

Draft an Informational Narrative Students will draft an informational narrative from the point of view of an insect about which they have learned.

ELA.2.C.1.2

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud			
What Have We Already Learned?	Whole Group	10 min	❑ chart paper, chalkboard, or whiteboard ❑ Image Card 15
What Do We Know?			
Read-Aloud			
Purpose for Listening	Whole Group	30 min	❑ pie chart of two-thirds (see Advance Preparation) ❑ drawing paper ❑ drawing tools
"Armored Tanks of the Insect World"			
Comprehension Questions			
Word Work: *Mimicry*			
This is a good opportunity to take a break.			
Application			
Draft an Informational Narrative	Independent	20 min	❑ Activity Pages 5.1, 6.1 ❑ writing tools

ADVANCE PREPARATION

Read-Aloud

- Draw a simple pie chart on chart paper, a chalkboard, or a whiteboard to illustrate the concept of two-thirds.

Application

- Having read over the incomplete drafts of students' informational narratives, be prepared to provide feedback and scaffolding based on your evaluation of students' work so far.

Universal Access

- Bring in two golf balls so students can feel how much the largest insect weighs.
- Prepare images of a large variety of animals that practice mimicry beyond just beetles. (e.g., snakes, frogs, sea creatures, etc.)

CORE VOCABULARY

adapt, v. change in order to survive in new conditions
Example: Animals in the Arctic habitat grow thick, warm fur to adapt to the cold winter temperatures.
Variation(s): adapts, adapted, adapting

armor, n. protective layer or shell
Example: A turtle's protective shell provides heavy armor against its predators.
Variation(s): none

beetles, n. insects with tough outer coverings and hard forewings
Example: Beetles have the ability to adapt to nearly every environment on Earth, both land and water.
Variation(s): beetle

mimicry, n. the close resemblance of one plant or animal to another
Example: A wasp beetle's mimicry, which makes it look like a stinging wasp, keeps its predators away.
Variation(s): none

Vocabulary Chart for "Armored Tanks of the Insect World"

Type	Tier 3 Domain-Specific Words	Tier 2 General Academic Words	Tier 1 Everyday Speech Words
Vocabulary	beetles mimicry	adapt *(adaptar)* armor	
Multiple Meaning			
Sayings and Phrases	make up set us apart means of protection still others with ease everyday lives		

Start Lesson

Lesson 7: Armored Tanks of the Insect World

Introducing the Read-Aloud

10M

Speaking and Listening: Students will review the key characteristics of insects and make a list of insects they know.

ELA.2.R.3.2b

WHAT HAVE WE ALREADY LEARNED? (5 MIN)

- Ask students to name the common characteristics of all insects. *(three body parts; six legs; antennae; exoskeleton; and some have wings)*

Check for Understanding

Make a List: Ask students to name as many insects as they can. Record students' answers on a piece of chart paper, a chalkboard, or a whiteboard. *(cockroach, fly, butterfly, moth, mosquito, grasshopper, cricket, praying mantis, cicada, honeybee, paper wasp, ant, termite, firefly, etc.)*

WHAT DO WE KNOW? (5 MIN)

- Tell students that the insects they will learn about today are part of the largest group of insects on Earth.

Show image 7A-1: Collage of beetles

- Refer students to both the name of the read-aloud ("Armored Tanks of the Insect World") and the pictures of beetles. Tell students that these insects are all beetles.
- Ask students to guess what these insects have in common with one another, besides being insects.

Show Image Card 15 (armored tank)

- Ask them how the beetles in the image are similar to the armored tank.

Flip Book 7A-1

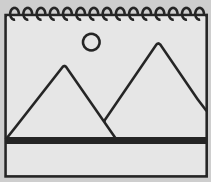
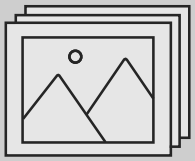


Image Card 15



Lesson 7: Armored Tanks of the Insect World

Read-Aloud

30M

Reading: Students will identify key characteristics of beetles, the largest group of insects.

ELA.2.R.2.2

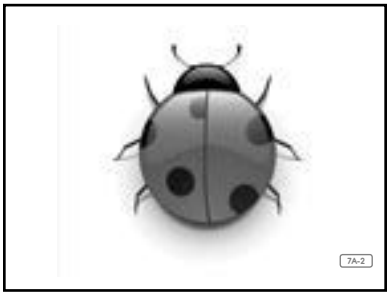
Language: Students will demonstrate an understanding of the Tier 3 word *mimicry.*

ELA.2.V.1.1

PURPOSE FOR LISTENING

- Tell students to listen carefully to find out more about beetles, the largest group of insects on earth.

"ARMORED TANKS OF THE INSECT WORLD" (15 MIN)



Show image 7A-2: Ladybug

My grasshopper friend tells me that he asked you to guess the largest group of insects on Earth. Did anyone guess flies? Perhaps you guessed ants. Both ants and flies are good guesses. You may notice flies and ants more often than you do the enormous group of insects to which I belong. Do you remember seeing a picture of me in the first lesson about insects? Who remembers my name? Yes, I'm a ladybug. But did you know that ladybugs are **beetles**?

Show image 7A-3: Firefly, weevil, whirligig, and rhinoceros beetle (clockwise)

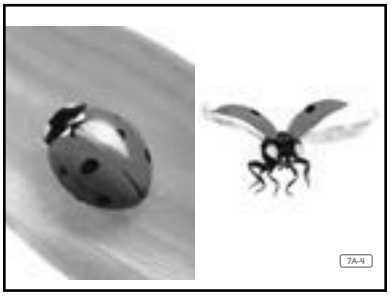
Fireflies are beetles, too. Beetles make up about two-thirds of all insects on our planet. *[Refer to the pie chart you drew in advance.]* There are over four hundred thousand kinds of beetles.

By the end of today, you will know a lot about these amazingly diverse insects. Diverse *means having many different things.* They come in all shapes, sizes, and colors.

[Point to each image as you read the next sentence.] Beetles include fireflies, weevils, whirligigs, and rhinoceros beetles. You already know what makes an insect an insect. *What makes an insect an insect?* (All have a head, thorax, abdomen, antennae, six legs, a hard exoskeleton, and many have wings.) So what makes a beetle a beetle?

First of all, because beetles are insects, we share the same characteristics as all insects. We have a head, a thorax, and an abdomen. We have antennae, six legs, a hard exoskeleton, and wings. Most beetles undergo a complete metamorphosis. *What is a complete metamorphosis?*

What else do all beetles have in common? Beetles stand out in the insect world because of our heavy **armor**, or protective covering. In addition to our exoskeletons, our wings provide protection. Most beetles have two pairs of wings, but our front wings are not really wings at all. These thick, hard protective coverings are called elytra [el*i*trə].



Show image 7A-4: Ladybug at rest and ladybug in flight

When we're resting, we tuck our delicate back wings under our elytra, or front wings, so that you cannot see them at all. Then, when we are ready to fly, we unlock our elytra and unfold our long, thin back wings. Our elytra provide lift like the wings of an airplane, but they remain quite still as our back wings beat up and down in flight.

Scientists believe one reason insects have survived, or continued to live, in such huge numbers on Earth is because many of us can fly, but beetles are not the fastest fliers in the insect world. In fact, some ground beetles do not fly at all. Surely one big reason for our survival is the hard, outer wing cases that set us apart from other insects. Being tough, we're able to burrow down under stones and logs into very narrow places where we remain hidden, protected from predators. *or animals that hunt and eat other animals* It's hard to crush or bite a beetle.

Challenge

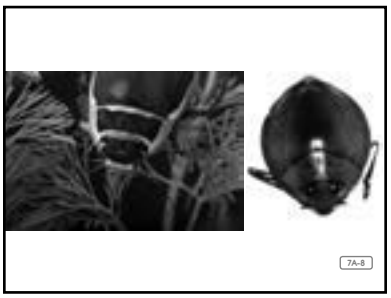
How is a beetle's survival different from that of other insects? *(Beetles have been able to survive because of their tough bodies, whereas other insects have been able to survive largely because they can fly.)*

Show image 7A-5: Bombardier beetle
We clever beetles have many means of protection. For instance, look at the bombardier beetle. This ground-living beetle produces chemicals in its abdomen. *What part of an insect is the abdomen?* (the section at the end, farthest away from the head) When attacked by a predator, the chemicals combine to form a bad-smelling, boiling liquid. The bombardier beetle makes a loud popping noise as it sprays its enemies with the chemicals, sometimes burning other insects, or even people.

Show image 7A-6: Wasp beetle
Mimicry, or animal look-alikes, is another way beetles protect themselves. Look at this beetle. What does it look like? It is called a wasp beetle because its long yellow and black body mimics, or copies, that of a wasp. How do you think this keeps predators away from the wasp beetle? Of course, they are afraid of being stung.

Show image 7A-7: Namibian desert beetles
Another reason for the large numbers of beetles is the fact that different species **adapt**, or change over very long periods of time, *like hundreds and thousands and millions of years* to suit their environments. Beetles live in some of the most difficult places to live on Earth, some surviving in the intense heat of the desert and others in underwater habitats where they have to develop ways of breathing underwater.

Many desert beetles are wingless and live beneath the sand where it is cooler and less dry. Some, like these Namibian [/nə*mib*ee*ən/] desert beetles, have stilt-like legs, allowing them to rise above the hot sand. Still others have developed arched elytra, creating tiny air pockets to help protect them from the heat. *What are elytra?* (thick, hard, protective front wing covers)



Show image 7A-8: Diving beetle and whirligig beetle

Because insects need air to live, water beetles must come to the surface to get the oxygen they need to breathe. Some water beetles, like this diving beetle, *[Point to the image on the left.]* have developed a trick of carrying oxygen bubbles underwater, trapped just beneath their elytra. This whirligig beetle *[Point to the image on the right.]* solves the oxygen problem by staying mostly on the surface of ponds and streams, using its paddle-shaped legs to spin and turn. Its eyes, divided into two parts, can see above and below the surface of the water at the same time.

Show image 7A-9: Boll weevil

Beetles have adapted over the years to eating a variety of plant and animal foods. With their strong, chewing mouthparts, nearly every possible food source is used by some kind of beetle. Weevils, like this boll weevil, are thought to be some of the peskiest of all beetles. Their long snouts enable them to bore down into the seedpods of plants, called bolls. Boll weevils have destroyed many fields of cotton, laying eggs in the holes they make. When the eggs hatch, the larvae eat the plants from the inside out.

Some beetles feed on grains and seeds. Others chomp on apples, cherries, and other fruits. Still others live on wood and decaying plant life. Carrion beetles and their larvae feed on dead animals.

Show image 7A-10: Dung beetle rolling ball of dung

Dung beetles are named for the food that they eat. Dung is manure, the solid waste of animals. Dung is very rich in nutrients and an ideal food for young dung beetles. Adult dung beetles compete to get some of the dung. They roll the dung into balls and push them away from the other beetles. They bury the balls in the ground and lay eggs in them. When the eggs hatch, the larvae feed on the dung.

Show image 7A-11: Tiger beetle
Tiger beetles are fierce predators, chasing down almost any prey they can find, including other insects. Prey *refers to the animal that is hunted and eaten. What does* predator *mean?* Their fast legs and strong jaws make their job easy. Tiger beetles are the fastest runners in the insect world. Even the larvae of tiger beetles are predators who eat other insects. The larvae hide in burrows, popping partway out and snatching passing insects with their jaws.

Show image 7A-12: Stag beetle
This stag beetle, with horns like the antlers of a stag (or male deer), looks rather fierce, but it is among the most harmless of all insects and eats mostly tree sap and other liquids. Its horns are actually its jaws. Male stag beetles use these jaws to wrestle with each other for females.

Show image 7A-13: Rhinoceros beetle
Horned beetles, like this rhinoceros beetle, include some of the largest beetles in the world. Some of these beetles are also called Hercules beetles due to their great strength. *[You may wish to ask students what they remember about Hercules's strength from the* Greek Myths *domain.]* The males use their horns to drive other males away from a female when it is time to mate. Many of them live in hot, wet, tropical areas.

Show image 7A-14: Goliath beetle
One of the largest and heaviest of all insects is the male goliath beetle of Africa. Goliaths can grow to be more than five inches long and weigh about as much as two golf balls. Their heavy bodies make them poor fliers, but they are able to climb trees with ease, using their strong legs and good claws.

Support

Pass around two golf balls and remind students that a single goliath beetle could weigh as much as both golf balls together.

Aren't we beetles amazing? All insects—from those with eardrums on their abdomens, to those that make their own honey, to those that glow in the dark—are truly amazing. Many insects are so small you may forget they are living all around you—in the trees, underground, even in your houses! It's true that some insects can become a real nuisance, but many insects, like me, are extremely helpful. Next time, you will learn how important insects are to your everyday lives.

COMPREHENSION QUESTIONS (10 MIN)

Show image 7A-3: Firefly, weevil, whirligig, and rhinoceros beetle (clockwise)

Check for Understanding

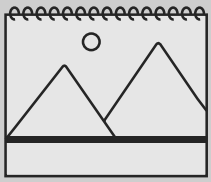
Turn and Talk: What do all beetles have in common? *(They have exoskeletons that are hard, called armor; most have two pairs of wings and the front pair, called elytra, is hard and protective.)* Why is it important for beetles to have two sets of wings? *(One set is for protection and one is for flying.)*

1. **Inferential** According to the author, what is one big reason that beetles have survived so long and are so numerous? *(They have hard protective exoskeletons.)*
2. **Inferential** How do beetles protect themselves? *(They have hard exoskeletons, they can burrow in the ground, they use mimicry, some have horns and claws to protect themselves, they eat a variety of foods, etc.)*

Show image 7A-10 Dung beetle rolling ball of dung

3. **Literal** What do dung beetles do with the dung that they collect? *(They lay their eggs in it, providing a nutritious and readily available meal for their young when they hatch.)*
4. **Evaluative** *Think Pair Share:* Which of the beetles that you heard about today is your favorite? Why? Be sure to tell your partner one fact about it. *(Answers may vary.)*

Flip Book 7A-3, 7A-10



ENGLISH LANGUAGE LEARNERS

Reading

Exchanging Information and Ideas

Entering/Emerging
Reframe questions as simple choice questions (e.g., "Are all beetles skilled fliers or do all beetles have strong exoskeletons?").

Transitioning/Expanding
Provide students with a specific sentence frame (e.g., "All beetles are/have . . .").

Bridging
Encourage students to use key details in complete sentences (e.g., "All beetles have a strong exoskeleton and hard wings, that is why they have survived for so long.").

Challenge

The author of today's read-aloud gave several reasons why there are more beetles in the insect group than any other insect. What are some of those reasons and which do you think is the best reason? Why?

Support

Show students images of a large variety of animals that practice mimicry (beyond just beetles).

WORD WORK: MIMICRY (5 MIN)

1. In the read-aloud you heard, "Mimicry, or animal look-alikes, is another way beetles protect themselves."
2. Say the word *mimicry* with me.
3. Mimicry is when a plant or animal looks like another plant or animal, often so it can protect itself from a predator.
4. A wasp beetle's mimicry of a wasp protects it from predators who fear that, like a wasp, it will sting them.
5. What insect in today's read-aloud uses mimicry to protect itself? *(wasp beetle)* Try to use the word *mimicry* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "_____ used mimicry to protect itself from predators."]
6. What's the word we've been talking about?

Use a Drawing activity for follow-up. If you were able to create an insect that used mimicry to protect itself from predators, what animal would your insect mimic, or copy? Draw a picture of your insect and write a short sentence explaining how your insect uses mimicry to protect itself.

Have students share their drawings and writing with classmates, and encourage them to use the word *mimicry* when describing their insect.

Lesson 7: Armored Tanks of the Insect World

Application

20M

Writing: Students will draft an informational narrative.

ELA.2.C.1.2

DRAFT AN INFORMATIONAL NARRATIVE

- Return Activity Page 6.1, and tell students they are going to continue writing their informational narratives about the insect they have chosen.
- Remind students that they should write at least five sentences in the rectangles on Activity Page 6.1. Remind students that the first sentence should be an introductory sentence and the last sentence should be a concluding sentence. Also, remind students to use capital letters at the beginning of their sentences and correct punctuation at the end of each sentence.
- Encourage students to continue to use as many words from the read-alouds as they can (e.g., *communicate, honeycomb, burrow,* etc.). You may even provide students with a bank of words they may wish to include.

Check for Understanding

Check In: As students write, circulate and ask students to share what they have written, and encourage students to add details and domain-related vocabulary to their writing.

- If students finish writing early, they may illustrate their stories on a separate sheet of paper. Encourage students to label their illustration with domain-related vocabulary.
- Collect students' drafts to check that they have written an informational narrative containing accurate information about the insect they chose.

End of Lesson

Activity Pages
5.1, 6.1

ENGLISH LANGUAGE LEARNERS

Writing

Writing

Entering/Emerging
Have students dictate their stories using familiar vocabulary to a teacher to be recorded.

Transitioning/Expanding
Have students dictate their stories using familiar vocabulary to a peer to be recorded.

Bridging
Have students write their stories using familiar vocabulary independently.

LESSON

8

INSECTS

Friend or Foe?

PRIMARY FOCUS OF LESSON

Reading

Students will explain why humans and insects can be both helpful and harmful to each other.

ELA.2.R.2.2; ELA.2.R.3.2b

Language

Students will demonstrate an understanding of the Tier 2 word *foe.*

ELA.2.V.1.3

Writing

Students will edit an informational narrative that they wrote.

ELA.2.C.1.2; ELA.2.C.1.5

FORMATIVE ASSESSMENT

Activity Pages 6.1, 8.1

Edit an Informational Narrative Students will edit an informational narrative that they wrote.

ELA.2.C.1.2; ELA.2.C.1.5

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud			
What Have We Already Learned?	Whole Group	10 min	
Making Predictions			
Read-Aloud			
Purpose for Listening	Whole Group	30 min	❑ Image Cards 16–19
"Friend or Foe?"			
Comprehension Questions			
Word Work: *Foe*			
This is a good opportunity to take a break.			
Application			
Edit an Informational Narrative	Whole Group Independent	20 min	❑ Activity Pages 5.1, 6,1, 8.1 ❑ paper and writing tools

ADVANCE PREPARATION

Universal Access

- Create an example of an edited informational narrative by writing a story with mistakes and marking it with edits according to the editing checklist on Activity Page 8.1.

CORE VOCABULARY

entomologist, n. a person who studies insects
Example: The entomologist traveled to rainforests worldwide to compare the kinds of insects living in each one.
Variation(s): entomologists

extinction, n. the dying out of a species until it no longer exists
Example: Scientists believe that the extinction of the dinosaurs occurred many millions of years ago.
Variation(s): none

foe, n. enemy or opponent
Example: The Athenians and Spartans of ancient Greece fought together against their foe, the Persian Empire.
Variation(s): foes

pesticides, n. substances used to destroy insects that threaten the life or health of plants and animals
Example: Some people prefer to eat organic plants, because they are not sprayed with chemical pesticides.
Variation(s): pesticide

pollinators, n. insects that carry pollen from one plant to another
Example: Bees and butterflies are both important pollinators, collecting pollen from one plant and depositing it on another.
Variation(s): pollinator

Vocabulary Chart for "Friend or Foe?"

Type	Tier 3 Domain-Specific Words	Tier 2 General Academic Words	Tier 1 Everyday Speech Words
Vocabulary	entomologist extinction *(extinción)* pesticides *(pesticidas)* pollinators	foe	
Multiple Meaning			
Sayings and Phrases	food source think twice hiding in plain sight		

Lesson 8: Friend or Foe?

Introducing the Read-Aloud

10M

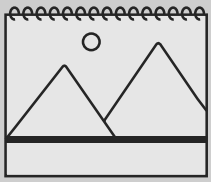
Reading: Students will explain why humans and insects can be both helpful and harmful to each other.

ELA.2.R.3.2b

WHAT HAVE WE ALREADY LEARNED? (5 MIN)

- Ask students to think all the way back to the first read-aloud you read. Remind students that they heard that some insects can be pests and are harmful to other living things and some insects are helpful to other living things.
- Reread the following key passages from the read-aloud "Insects Everywhere!"

Flip Book 1A-7–1A-9



Show image 1A-7: Grasshopper, leafhopper, aphids

*Many insects, such as these tiny aphids, [/ae*fədz/] can damage entire meadows. Grasshoppers, leafhoppers, and aphids are all pests. Farmers are never happy when they discover them on their plants because they can destroy their crops. But not all insects are pests.*

Show image 1A-8: Ladybug, lacewing, ambush bug

Who knows what this insect is called? That's right. It's a ladybug. Did you know that ladybugs are some of the most helpful insects on Earth? They feed on aphids and the eggs of moths and beetles that destroy crops. Lacewings and ambush bugs also eat aphids, so farmers are happy when they see these insects on their plants.

Show image 1A-9: Pine trees and bark beetle

Pine trees are hosts to a variety of bark beetles. These tiny insects can kill huge trees! How can that be possible? Bark beetles burrow, or dig, under a tree's bark, creating a series of tunnels in which they lay their eggs. Well, let's think about this . . . what does a tree need to live? By burrowing into the layer of wood beneath the bark, these beetles stop the flow of nutrients, or food, and water, throughout the tree and often kill the tree.

Check for Understanding

Turn and Talk: Name one way insects are harmful to other plants and animals, and name one way insects can be helpful to other living things.

MAKING PREDICTIONS (5 MIN)

- Tell students that the title of today's read-aloud is "Friend or Foe?"
- Tell students that the word *foe* means enemy or opponent.
- Then ask what students think the title of the read-aloud means and what they think will be the main topic of the read-aloud. Ask students who the friends and who the foes might be.
- Tell students that insects may be both friends and foes to humans, but that humans also play a big role in the world of insects.
- Tell students that today they will hear about one of the insect world's biggest foes, or enemies. Ask students who they think this might be. Tell students humans are insects' greatest foe.

Lesson 8: Friend or Foe?

Read-Aloud

30M

Reading: Students will explain why humans and insects can be both helpful and harmful to each other.

ELA.2.R.2.2

Language: Students will demonstrate an understanding of the Tier 2 word *foe.*

ELA.2.V.1.3

PURPOSE FOR LISTENING

- Tell students to listen carefully to find out how humans and insects can be both friends and foes.

"FRIEND OR FOE?" (15 MIN)

Show image 8A-1: Entomologist

Hi, boys and girls. Surprised to see me? I'll bet you were expecting another fabulous insect. Disappointed to see a fellow human being? I have been fascinated with insects since I was in second grade, so I wanted to let you know that if you are like me, you might be lucky enough to keep learning about insects your whole life. I am an **entomologist**, and studying insects is my job.

Some people call me the bug lady, but I study much more than bugs. When I was your age, I called everything that creeps and crawls or buzzes and flies a bug. Do you do that sometimes, too? Lots of people do, but did you know that a bug and an insect are not the same thing? A bug is an insect, but not all insects are bugs. Confusing, isn't it?

Show image 8A-2: Shield bug sucking sap from plant

Scientists identify true bugs as insects with beak-like mouths. These piercing, sucking mouthparts allow the insect to pierce the leaf or stem of a plant and suck out the plant juices inside.

Support

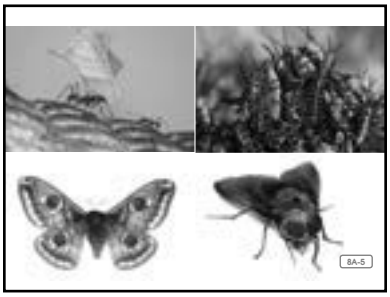
Here the word *bug* means a small insect that has a beak-like mouth with sucking mouthparts. The word *bug* can also mean to annoy someone.

Show image 8A-3: Stinkbug, bedbug, and cicada

Let's look at a few bugs. This is a stinkbug. *[Point to the image on the left.]* This is a bedbug. *[Point to the image on the right.]* Treehoppers and aphids are bugs, too. Here's one you should recognize: a cicada. *[Point to the image in the center.]* Look closely if you see one of these bugs outside and you may see its long, piercing mouthparts.

Show image 8A-4: Close-up of ladybug

This is another familiar insect. What is it called? Right, a ladybug! It's called a bug, but is it? Does it have a beak-like mouth with a long, piercing tube? No. Fascinating, isn't it—a ladybug isn't a bug at all!



Show image 8A-5: Leafcutter ant, locusts, fly, and moth (clockwise)

I thought you should know about bugs, but the real reason I'm here today is to talk to you about helpful and harmful insects. I'll start with the bad news. You already know that some plant-eating insects cause major crop damage. Leafcutter ants can strip the leaves from an orange grove in one night. A swarm of locusts, or large grasshoppers, can strip large areas of grassland in just a few hours. Fruit flies are orchard pests as well. The larvae of many moths, flies, bugs, beetles, and weevils are pests. The Colorado potato beetle is another example of an insect that damages crops. *[Show Image Cards 16 (potatoes) and 17 (potato beetles).] Adults and larvae eat the leaves of the potato plant. Damaged plants can't produce as many potatoes.*

Challenge

What is the word used to describe something that causes major damage or harm? *(destructive)*

Show image 8A-6: Spraying crops with pesticides, honeybee, and bird

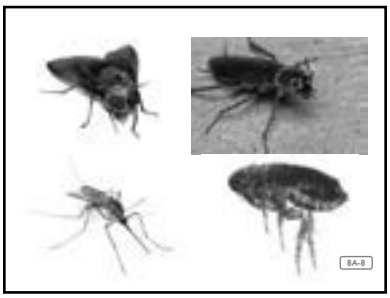
So, what's the solution? Humans thought they had a great idea. They created **pesticides**, poisons that could kill all of the insect pests on the whole field so the crops could grow without being eaten.

But there was a problem with that. Do you think the pests were the only animals living in the field? *[Pause for students to share.]*

It turns out that pesticides can be just as big of a problem as the pests themselves. Pesticides can destroy both harmful *and* helpful insects. Frogs and birds may eat the poisoned insects and become sick, too. They may even die. Pesticides have killed **pollinators** like the honeybee. *Pollinators are insects that carry pollen from one plant to another to enable plants to grow and produce flowers or fruit.* Without pollinators, plants cannot make seeds to grow new plants or produce fruits. With fewer plants, fewer insects are able to survive. So, you see, the human use of pesticides changes the environment for everybody—and not always in a good way. Because of this, you can see how a person can be a **foe**, or enemy, of insects.

Show image 8A-7: Natural insect predators: lacewing and ladybug

One alternative that is being used by many farmers today, is to keep plant pests under control by introducing their natural enemies, one insect against the other. Ladybugs and lacewings are predators that catch and eat aphids. Wasps and ants eat insects harmful to crops as well.



Show image 8A-8: Fly, cockroach, flea, and mosquito (clockwise)

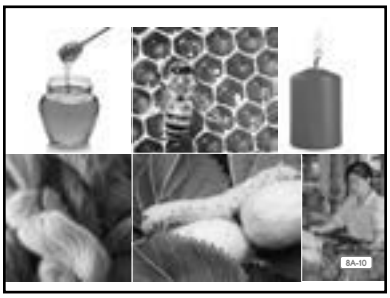
I do have a little bit more bad news for you before I get to the good news. Some insects can be dirty. They can spread germs. When flies, ants, and cockroaches walk across our kitchen countertops with the same feet they use to crawl through dirt and rotting plants, they can poison our food and make us sick.

Some insects, such as mosquitoes, fleas, bedbugs, and lice, live off host animals. *You heard about host plants. What is a host animal?* These types of insects can be very harmful to people. The Anopheles [/ə*nof*ə*leez/] mosquito carries malaria, a deadly disease. Hundreds of years ago, fleas that carried deadly bacteria spread the plague, a disease that killed millions of people—or almost one-third of Europe. Today, fleas are more irritating than deadly.

Show image 8A-9: Honeybee and dung beetle

That's enough bad news. Are you ready for some good news? There's lots of it! You already know how important honeybees and other plant pollinators are to the survival of the planet. Without pollinators, there would be no beautiful flowers or sweet fruit, because the crops would not be pollinated, and crops need to be pollinated in order to grow.

Scavenger insects, like the dung beetle, are important, too. By feeding on dead plants and animals and their waste products, scavengers break up dead material and return rich nutrients to the soil.



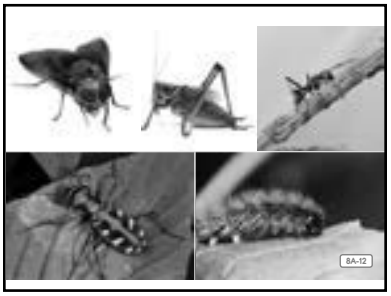
Show image 8A-10: Honey, honeybee, candle; silk thread, silkworm and cocoons, woman weaving silk cloth

Insects are also responsible for many products that humans use. What product does the honeybee give us? Yes, honey! They also give us beeswax, used to make wood polishes and candles, and even lipsticks! And did you know

that the spider is not the only creature that spins silk? Many other insects produce silk as well. The silk moth lays its eggs on the leaves of mulberry trees. Their larvae, silk caterpillars, spin cocoons out of a single strand of silk. The silk from their cocoons is gathered and unwound to produce beautiful silk thread used to make cloth.

Show image 8A-11: Bowl of crickets, roasted grasshoppers, roasted termites/ants

You know that insects are a food source for other insects and animals, but did you know that many people eat insects as well? Lightly salted crickets are eaten as snacks in many parts of Asia. Roasted grasshoppers with chili and lime are popular in Mexico. Roasted termites are a part of the regular diet of many Africans. Some Australians feast on beetle larvae, and some Europeans enjoy the sweet crunch of chocolate-covered ants.



Show image 8A-12: Collage of insects

You know that insects make up the largest group of animals on Earth. Their ability to adapt over time to nearly every environment has made them terrifically successful survivors on the planet. *What does the word* adapt *mean?* Whereas we think that humans have been around for about forty thousand years, some scientists believe that insects have lived on Earth for about four-hundred million years! They are the most varied of all animals, coming in all shapes, colors, and sizes. Scientists guess that there are over one million species, but it's hard to know for sure because it is impossible to count them all as they crawl, fly, swim, and hide all around the world.

Show image 8A-13: Rainforest clearance and desert homes

Even with all of these millions and billions and trillions of insects, some are in danger of **extinction**, or disappearing from the earth. How can that be? It happens when many insects are killed at the same time. We humans

ReadWorks Articles

"Animals of the Rain Forest"

are insects' worst enemies because we often destroy their native habitats. *What is the word you heard a few minutes ago that means an enemy?* For example, huge areas of the rainforests have been cleared. *[Point to the image on the left.]* When trees are cut down for wood, all of the plants are removed and the insects that lived on the plants are destroyed. Insects and other animals that feed on those insects are affected when they can no longer find enough food. Also, people build homes in the desert *[Point to the image on the right.]* and not only destroy animal habitats, but also very quickly use up all the water that the desert insects need to survive.

ReadWorks Articles

"Protecting the Wetlands"s

Show image 8A-14: Grassland and wetland

Grasslands are often cleared for planting crops. When the grassland host plants disappear, their visiting insects cannot survive. Water is often drained from wetlands to build farms, homes, and roads. When this happens, fertilizers from the farmers' fields often run into the wetlands and encourage plants there to grow out of control. They soak up all the water and the wetland dries up.

Show image 8A-15: Honeybee

So, why do you think it matters whether insects become extinct? Isn't it good to kill those often pesky, sometimes deadly, critters? I don't think so. Think about the honeybee. It may sting you, but a moment's pain is nothing compared to all the benefits it provides by helping to pollinate plants and produce fruits or other foods that you need to survive. We still have a lot to learn about the insect world, but we do know that everything in our world is connected, and that plants and animals depend upon one another for survival. We do not want to upset the balance of nature.

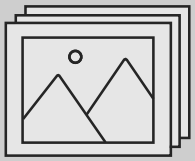
Show image 8A-16: Looking at trees and looking at flowers

Now that you know how important insects are to our world, I hope that you will think twice before squashing a bug beneath your feet. I encourage you to use your own schoolyard to look for insects and spiders. Where might you look? Lots of places—under a rock, in the grass, on bushes and trees, on flowers, and in the soil. Remember, many insects are very good at camouflage, so don't give up. They may be hiding in plain sight.

COMPREHENSION QUESTIONS (10 MIN)

Show Image Cards 18 (cicada) and 19 (ladybug)

Image Cards 18, 19



1. **Inferential** Which one of these two insects is also a bug? *(cicada)* How do you know? *(It has a beak-like mouth and piercing mouthparts, which are the traits that define a bug.)*
2. **Inferential** You heard that insects can be friends to humans. How do insects help humans? *(used as pest control on crops; used in products such as honey; beeswax for candles, wood polish, lipsticks; silk)*
    - **Literal** Name one of the many useful products that are produced by insects. *(honey; beeswax for candles, wood polish, lipsticks; silk)*
3. **Inferential** You heard in the read-aloud that insects can be foes, or enemies, to people. How? *(Answers may vary, but may include the fact that they can destroy crops, they carry diseases, and they can cause injury.)*
4. **Inferential** You heard that humans can be foes to insects? How? *(spraying crops with pesticides to kill insects; destroying their natural environments)*

ENGLISH LANGUAGE LEARNERS

Reading

Offering Opinions

Entering/Emerging
Provide students sentence frames using a small set of learned phrases (e.g., "I think insects and humans are foes/friends because . . .").

Transitioning/Expanding
Provide students sentence frames using an expanded set of learned phrases (e.g., "I think insects, such as aphids/ladybugs, and humans are foes/friends because . . .").

Bridging
Provide minimal support and guidance for open responses.

Check for Understanding

Think Pair Share: If you had to choose one word to describe the relationship between insects and humans, would you say they are foes or they are friends? Why? Support your answer with evidence from the text.

WORD WORK: FOE (5 MIN)

1. In the read-aloud you heard, "Because of this, you can see how a person can be a foe, or enemy, of insects."
2. Say the word *foe* with me.
3. *Foe* means enemy or opponent.
4. When a person tries to kill insects, he becomes the insects' foe.
5. What are some of the ways an insect can become a foe to people? [Ask two or three students. If necessary, guide and/or rephrase the students' responses: "An insect can become a foe to people by . . . "]
6. What's the word we've been talking about?

Use an Antonyms activity for follow-up. The antonym, or word with the opposite meaning, of *foe* is *friend*. I am going to describe some interactions between people or between animals. If the person or animal acts like an enemy or opponent, say, "That person/animal is a foe." If the person or animal acts like a friend, say, "That person/animal is a friend."

- The tiger attacked the antelope. *(The tiger is a foe.)*
- The mother cuddled her newborn baby. *(The mother is a friend.)*
- The boys and girls played on the playground together. *(The boys and girls are friends.)*
- The Persians battled the Spartans in ancient Greece. *(They are foes.)*
- Sallie gave Issac a balloon on his birthday. *(Sallie is a friend.)*

Lesson 8: Friend or Foe?

Application

20M

Writing: Students will edit an informational narrative they wrote.

ELA.2.C.1.2; ELA.2.C.1.5

EDIT AN INFORMATIONAL NARRATIVE (20 MIN)

- Remind students that they have planned and drafted their informational narratives.
- Remind students that editing is the next step in the writing process.
- Tell students they are going to edit the narratives using Activity Page 8.1. Explain that this means they are going to read the story to check for any mistakes, and to make sure they have said everything they wanted or needed to say.
- Review what each item on the checklist represents. Students should be familiar with this checklist after using a similar one in previous domains.

Item from Student Checklist	What It Means
. ? !	punctuation at the end of each sentence
T he cat ran.	capital letter at the beginning of each sentence
	story has a character with a name
	story includes a beginning, middle, and end
[teacher's choice]	[teacher's choice]
[teacher's choice]	[teacher's choice]

Activity Pages
5.1, 6.1, 8.1

ENGLISH LANGUAGE LEARNERS

Writing

Writing

Entering/Emerging
Have students dictate their edits to a teacher to be recorded.

Transitioning/Expanding
Have students dictate their edits to a peer to be recorded.

Bridging
Have students make edits independently.

- The checklist includes additional lines on which you may also include specific writing concepts students are currently learning such as plot/events or writing a title, introduction, or conclusion.

Check for Understanding

According to the editing checklist, what are you going to look for in your stories? *(punctuation, capitalization; a character with a name; a beginning, middle, and end)*

Challenge

Have students work with a partner to share and edit their stories. Allow students to share any mistakes they see, what they like about what has been written, and what changes they may suggest.

- Tell students to read their stories, checking for each item on the list. If students find something they want to add or edit in their stories, have them mark it in a different color/type of writing utensil in their stories.
- Remind students they can reference Activity Page 5.1 with their original plans to help them add to and edit their stories.
- If students finish early, have them copy their edited story onto a clean sheet of paper or use a word processor to publish it.

End of Lesson

Grade 2 | Knowledge 8

Domain Review

NOTE TO TEACHER

You should spend one day reviewing and reinforcing the material in this domain. You may have students do any combination of the activities provided, in either whole-group or small-group settings.

CORE CONTENT OBJECTIVES ADDRESSED IN THIS DOMAIN

Students will:

- Explain that insects are the largest group of animals on Earth
- Explain that there are many different types of insects
- Explain the behaviors of solitary and social insects
- Classify insects based on their defining characteristics
- Identify and describe the three main body parts of insects: head, thorax, and abdomen
- Describe an insect's exoskeleton
- Explain why spiders are not insects
- Describe insect life cycles and the stages of complete and incomplete metamorphosis
- Describe various social insect colonies including the jobs performed in the colony
- Describe the many ways insects communicate with one another
- Identify ways in which insects can be helpful to humans
- Identify ways in which insects can be harmful to humans
- Identify ways in which humans can be harmful to insects

Flip Book

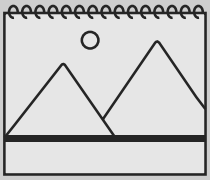
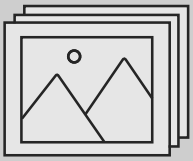


Image Cards 1–19



REVIEW ACTIVITIES

Image Review

- Show the Flip Book images from any read-aloud, and have students retell the information from the read-aloud using the images.

Image Card Review

Materials: Image Cards 1–19

- In your hand, hold Image Cards 1–19 fanned out like a deck of cards.
- Ask a student to choose a card but to not show it to anyone else in the class. The student must then perform an action or give a clue about the picture s/he is holding. For example, for the ladybug, a student may pretend to eat other insects or act out flying around with two pairs of wings.
- The rest of the class will guess what is being described.
- Proceed to another card when the correct answer has been given.

Key Vocabulary Brainstorming

Materials: Chart paper, chalkboard, or whiteboard

- Give students a key domain concept or vocabulary word such as *colonies.* Have them brainstorm everything that comes to mind when they hear the word, such as social, ants, honeybees, etc.
- Record their responses on chart paper, a chalkboard, or a whiteboard for reference.

Riddles for Core Content

- Ask students riddles such as the following to review core content:
  - I am the process by which most insect eggs change into their adult forms. What am I called? *(metamorphosis)*
  - We are the two types of metamorphosis. What are we? *(complete and incomplete metamorphosis)*
  - I am the name for the caterpillar stage in the process of complete metamorphosis. What am I? *(larva)*
  - I am the name for the chrysalis or cocoon stage in the process of complete metamorphosis. What am I? *(pupa)*
  - We are the four stages in the life cycle of an insect that undergoes complete metamorphosis. What are we? *(egg, larva, pupa, adult)*

- I am the female that produces all of the eggs for a social colony, allowing the colony to survive. What am I? *(the queen)*
- We are the male bees that live in a honeybee colony. What are we? *(the drones)*

- You may wish to have students create their own riddles about insects to pose to the class, based on what they have learned.

Class Book

Materials: Drawing paper, drawing tools

- Tell the class or a group of students that they are going to add to the class book they started previously to help them remember what they have learned about insects in this domain.
- Have students brainstorm important information about the characteristics and life cycles of insects, including complete and incomplete metamorphosis, which insects are solitary and which are social, and how insects are helpful and/or harmful.
- Have each student choose one idea to draw a picture of, and ask him or her to write a caption for the picture.
- Bind the pages to make a class book to put in the class library for students to read again and again.

Compare/Contrast

Materials: Chart paper, chalkboard, or whiteboard

- Tell students that there are many things to compare and contrast in the read-alouds they have heard.
- Remind students that *compare* means to tell how things are similar and *contrast* means to tell how things are different.
- Have students choose a topic from the following list to compare/contrast using a Venn diagram or three-column chart.
  - complete and incomplete metamorphosis
  - ants and bees
  - honeybee hives and paper wasp nests
- You may have students do this individually or you may conduct this activity as a class. You may wish to extend this activity by using the chart as a prewriting tool and having students write two sentences, one describing similarities and the other describing differences.

Grade 2 | Knowledge 8

Domain Assessment

This domain assessment evaluates each student's retention of domain and academic vocabulary words and the core content targeted in *Insects.* The results should guide review and remediation the following day.

There are two parts to this assessment. You may choose to do the parts in more than one sitting if you feel this is more appropriate for your students. Part I (vocabulary assessment) is divided into two sections: the first assesses domain-related vocabulary, and the second assesses academic vocabulary. Part II of the assessment addresses the core content targeted in *Insects.*

PART I

ELA.2.V.1.1

Activity Page DA.1

- Read the following directions aloud:
  - I am going to ask you a *yes* or *no* question using a word you have heard in the read-alouds. First I will say the word, and then I will ask the *yes* or *no* question. If the answer is "yes," circle the thumbs up. If the answer is "no," circle the thumbs down. I will say each question two times. Let's do number one together.
- Read the word, and then read the sentence. Pause for students to record their answers.

1. **Host:** Is a host an animal or a plant on which or in which another living thing lives? *(thumbs up)*
2. **Social:** Do social insects live by themselves? *(thumbs down)*
3. **Solitary:** Do solitary insects live by themselves? *(thumbs up)*
4. **Antennae:** Are an insect's antennae located on its head and used to get information about its surroundings? *(thumbs up)*
5. **Exoskeletons:** Are insects' exoskeletons located on the inside of their bodies, just like a person's skeleton? *(thumbs down)*
6. **Metamorphosis:** Is metamorphosis the change an insect goes through from egg, to larva, to pupa, to adult? *(thumbs up)*
7. **Molt:** Do insects molt so they can grow? *(thumbs up)*
8. **Pollen:** Is pollen the part of the insect's body that is farthest from its head? *(thumbs down)*

9. **Bioluminescence:** Do fireflies communicate with one another using bioluminescence? *(thumbs up)*
10. **Entomologist:** Is an entomologist a type of bug? *(thumbs down)*

- Read the following directions to aloud:
  - Now I am going to read more questions using other words you have heard and practiced. If the answer is "yes," circle the thumbs up. If the answer is "no," circle the thumbs down. I will say each question two times.

11. **Microscopic:** If something is microscopic is it very, very large? *(thumbs down)*
12. **Cooperate:** If people cooperate, do they work together to accomplish something? *(thumbs up)*
13. **Destructive:** If something is destructive, does that mean it is helpful and tries to make things better? *(thumbs down)*
14. **Transparent:** If a window is transparent, does that mean you can see through it? *(thumbs up)*
15. **Foe:** Is a foe an enemy? *(thumbs up)*

Activity Page DA.2

PART II ELA.2.R.2.2

- Read the following directions aloud:
  - I am going to ask you a *yes* or *no* question about information from the read-alouds. If the answer is "yes," circle the thumbs up. If the answer is "no," circle the thumbs down. I will say each question two times. Let's do number one together.
- Read the sentence and pause as students record their answers. You may want to read the questions twice.

1. Do insects live in every habitat on Earth, except in the ocean? *(thumbs up)*
2. Do insects have eight legs and five main body parts? *(thumbs down)*
3. Do insects have skeletons on the inside of their bodies like we do? *(thumbs down)*
4. Are honeybees and paper wasps solitary insects? *(thumbs down)*
5. Do some social insect colonies have queens that lay eggs? *(thumbs up)*
6. Are spiders are insects? *(thumbs down)*
7. Do insects use their antennae to smell and feel? *(thumbs up)*
8. Does complete metamorphosis have four stages: egg, larva, pupa, and adult insect? *(thumbs up)*
9. When people spray pesticides or cut down insects' habitats, are they helping insects? *(thumbs down)*
10. Do crickets communicate with one another by the blinking lights called lanterns on their abdomens? *(thumbs down)*

Grade 2 | Knowledge 8

Culminating Activities

NOTE TO TEACHER

Please use the final day to address class results of the Domain Assessment. We suggest you begin with the whole-class Read-Aloud activity to reinforce domain content. Based on the results of the Domain Assessment and students' formative assessments, you may wish to use the remaining time to provide remediation opportunities that target specific areas of weakness for individual students, small groups, or the whole class.

Alternatively, you may also choose to use this class time to extend or enrich students' experience with domain knowledge. A number of enrichment activities are provided in order to provide students with opportunities to enliven their experiences with domain concepts.

READ-ALOUD

- Ask students to summarize what they have learned about bees. *(Answers may vary, but students should recall that bees are social insects. They may also remember that honeybees dance in a figure-eight pattern. They do this to share information about food sources with other bees.)*
- Explain that today students will hear another book about bees. They should listen carefully to determine the author's purpose, or what the author wants readers to believe or do after reading the book.
- Read the trade book *Give Bees a Chance* by Bethany Barton.

1. Display several pages from the book and ask students to identify text features on those pages. Have them describe how those text features help them understand the book's information. *(Answers may vary, but students should discuss features found on the displayed pages. For example, they may discuss how the author draws different bee species, uses labels to identify each one, and often adds information about the species in parentheses. This helps readers understand how many different kinds of bees exist.)*
2. According to the book, how many different kinds of bees are there? *(25,000)*
3. How does Edgar feel about bees at the start of the book? *(He does not like them.)*

4. How does the speaker try to change Edgar's feelings about bees? *(She points out that there are many different kinds of bees "to love," explains what is "weird and cool" about the bodies of honeybees, explains how bees produce honey, and describes how bees are threatened.)*
5. Think of the book's title, *Give Bees a Chance*. Based on the title and the contents of the book, why do you think the author wrote this book? What do you think she would like readers to do or feel about bees? *(She wants readers and people like Edgar to learn about bees so that they will understand them better and maybe even come to like them.)*

REMEDIATION

You may choose to regroup students according to particular areas of weakness, as indicated by Formative and Domain Assessment results.

Remediation opportunities include:

- targeting Review Activities
- revisiting lesson Applications
- rereading and discussing select read-alouds
- using corresponding activities in the Language Studio

ENRICHMENT

Domain-Related Trade Book or Student Choice

Materials: Trade book

- Read a trade book to review a particular insect or concept about insects; refer to the books listed in the Recommended Resources list in the digital components for this domain.
- You may also choose to have students select a read-aloud to be heard again.

Drawing Insects

Materials: Drawing paper, drawing tools

- Have students draw their favorite insect. Tell them to be sure to draw six legs and label the three body parts: head, thorax, and abdomen. Allow students to share their drawings with the class.

Insect Research

Materials: Insects Journals, trade books, other resources as needed

- Have students check their Insects Journals to see if there are any questions they have about insects that have not been answered.
- Allow them to search through the trade books in the classroom library to look for answers. You may also wish to allow them to research using online and/or library resources.
- Have students write in their journals any information that either answers a question or that they find interesting.
- As time allows, have students share what they find with the class.

On Stage

- Have students pretend to be particular insects, and have the rest of the class guess which insect is being portrayed.
- You may wish to allow the student to give clues such as, "I'm a social insect," or "I'm a very helpful insect," etc.

Listen to Music

Materials: Recordings of music and sound effects

- Have students listen to "Flight of the Bumblebee," by Nikolai Rimsky-Korsakov, and ask them why they think this song has this title.
- Sing "The Ants Go Marching" and other fun songs about insects.
- You may also wish to play recordings of chirping crickets and other insect sounds.

Writing Prompts

- Students may be given an additional writing prompt such as the following:
  - My favorite read-aloud about insects is . . .
  - Some social insects that I know of are . . .
  - Some solitary insects that I know of are . . .
  - The difference between complete and incomplete metamorphosis is . . .

Challenge

Have students write and share a brief report about a specific insect.

How Insects Help Us

Materials: Silk; honey; beeswax candle; foods from plants pollinated by bees

Note: Be sure to follow your school's policy regarding food distribution and allergies

- Bring in some silk fabric, honey, or a beeswax candle to show students products that are made possible because of insects.
- You may also wish to bring in samples of apples, pears, tomatoes, cucumbers, almonds, and chocolate to show students the variety of plant products pollinated by bees.

Observing Metamorphosis

Materials: Butterfly kit

- Allow students to observe the four stages of a butterfly's metamorphosis: egg, caterpillar, chrysalis, and adult.
- Have students draw and/or write notes in their journals about the experience.

Observing Social Insects

- Take your class on a trip to visit a museum that has a beehive, or set up an ant colony in your classroom.
- Have students observe the insects' social behavior and draw and/or write notes in their journals.

Insect Hunt

- Take your class outside to see how many insects they can find.
- Have students observe the insects and draw and/or write notes in their journals.
- You may also choose to bring insects into the classroom to observe, perhaps under a microscope.

Teacher Resources

Grade 2	Knowledge 8

Teacher Guide

Grade 2 | Knowledge 8

Teacher Resources

In this section you will find:

- Activity Book Answer Key

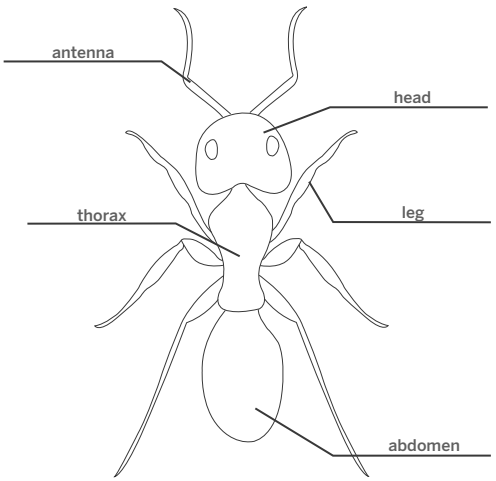
ACTIVITY BOOK ANSWER KEY

NAME: _____

DATE: _____

PP.1 **Assessment**

Abdomen	Antenna	Head	Leg	Thorax



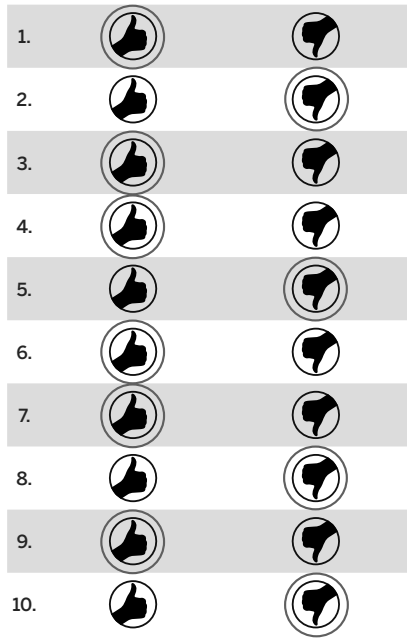
Directions: Label the parts of this ant using the word bank provided.

Knowledge 8

NAME: _____

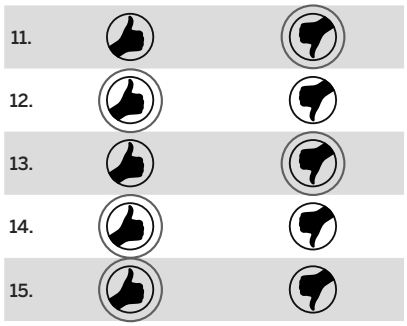
DATE: _____

DA.1 **Assessment**



Directions: Listen to your teacher's instructions.

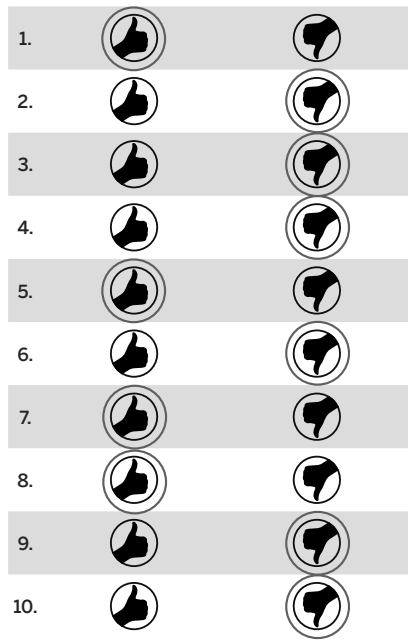
Knowledge 8



NAME: _____

DATE: _____

DA.2 **Assessment**



Directions: Listen to your teacher's instructions.

Knowledge 8

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Acknowledgments

These materials are the result of the work, advice, and encouragement of numerous individuals over many years. Some of those singled out here already know the depth of our gratitude; others may be surprised to find themselves thanked publicly for help they gave quietly and generously for the sake of the enterprise alone. To helpers named and unnamed we are deeply grateful.

Contributors to Earlier Versions of These Materials

Susan B. Albaugh, Kazuko Ashizawa, Kim Berrall, Ang Blanchette, Nancy Braier, Maggie Buchanan, Paula Coyner, Kathryn M. Cummings, Michelle De Groot, Michael Donegan, Diana Espinal, Mary E. Forbes, Michael L. Ford, Sue Fulton, Carolyn Gosse, Dorrit Green, Liza Greene, Ted Hirsch, Danielle Knecht, James K. Lee, Matt Leech, Diane Henry Leipzig, Robin Luecke, Martha G. Mack, Liana Mahoney, Isabel McLean, Steve Morrison, Juliane K. Munson, Elizabeth B. Rasmussen, Ellen Sadler, Rachael L. Shaw, Sivan B. Sherman, Diane Auger Smith, Laura Tortorelli, Khara Turnbull, Miriam E. Vidaver, Michelle L. Warner, Catherine S. Whittington, Jeannette A. Williams.

We would like to extend special recognition to Program Directors Matthew Davis and Souzanne Wright, who were instrumental in the early development of this program.

Schools

We are truly grateful to the teachers, students, and administrators of the following schools for their willingness to field-test these materials and for their invaluable advice: Capitol View Elementary, Challenge Foundation Academy (IN), Community Academy Public Charter School, Lake Lure Classical Academy, Lepanto Elementary School, New Holland Core Knowledge Academy, Paramount School of Excellence, Pioneer Challenge Foundation Academy, PS 26R (the Carteret School), PS 30X (Wilton School), PS 50X (Clara Barton School), PS 96Q, PS 102X (Joseph O. Loretan), PS 104Q (the Bays Water), PS 214K (Michael Friedsam), PS 223Q (Lyndon B. Johnson School), PS 308K (Clara Cardwell), PS 333Q (Goldie Maple Academy), Sequoyah Elementary School, South Shore Charter Public School, Spartanburg Charter School, Steed Elementary School, Thomas Jefferson Classical Academy, Three Oaks Elementary, West Manor Elementary.

And a special thanks to the CKLA Pilot Coordinators, Anita Henderson, Yasmin Lugo-Hernandez, and Susan Smith, whose suggestions and day-to-day support to teachers using these materials in their classrooms were critical.

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ISBN 9781683916369

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