

Lesson 1: Building Background Knowledge: What Are Animal Defense Mechanisms?



CCS Standards

- **RI.4.1:** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
- **W.4.7:** Conduct short research projects that build knowledge through investigation of different aspects of a topic.
- **W.4.8:** Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.
- **SL.4.1:** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.4.1b:** Follow agreed-upon rules for discussions and carry out assigned roles.



Daily Learning Targets

- I can infer about animal defense mechanisms based on information in pictures and text. (RI.4.1)
- I can support my inferences with details and examples from pictures and texts. (RI.4.1)

Ongoing Assessment

- Observations during Poster Walk (SL.4.1)
- Participation during unpacking of guiding questions (SL.4.1)
- KWEL Chart: Animal Defense Mechanisms (RI.4.1)

Agenda

1. Opening

- A. Discovering Our Topic: Poster Walk (20 minutes)
- B. Reviewing Learning Targets (5 minutes)

2. Work Time

- A. Preparing to Research (10 minutes)
- B. KWEL Chart: Animal Defense Mechanisms (10 minutes)

3. Closing and Assessment

- A. Launching Independent Reading (15 minutes)

4. Homework

- A. Accountable Research Reading. Select a prompt to respond to in the front of your independent reading journal.

Teaching Notes

Purpose of lesson and alignment to standards:

- In this lesson, students participate in a Poster Walk to preview *Venom* and *Animal Behavior: Animal Defenses* as a way to build schema on the topic of animal defenses (RI.4.1, W.4.7, SL.4.1b).
- Then, students consider the module’s performance task prompt to help focus their work (W.4.7, W.4.8). To give yourself more context, preview the Performance Task Overview.
- The general name for students’ notebook is Animal Defenses research notebook. These notebooks contain note-catchers and graphic organizers tailored for research on animal defense mechanisms.
- Throughout the unit, the Materials list references the complete Animal Defenses research notebook, as well as the material(s) within the research notebook that students use in the lesson.
- After examining their research notebooks, students construct a KWEL chart (RI.4.1, W.4.7, W.4.8). Allow students to generate an initial list in the K, or knowledge, column. Students may make statements that you know to be untrue, but these should still be added to the chart. As the class continues to read and learn about animal defense mechanisms, these items can then be confirmed as true or untrue.
- Throughout Module 1, students were introduced to Goals 1 and 2 Conversation Cues to promote productive and equitable conversation. Continue using Goals 1 and 2 Conversation Cues in this way, considering suggestions within lessons. Refer to the Module 1 Appendix for additional information on Conversation Cues.
- The research reading students complete for homework will help to build both their vocabulary and knowledge pertaining to animals and specifically animal defense mechanisms. By participating in this volume of reading over a span of time, students will develop a wide base of knowledge about the world and the words that help to describe and make sense of it.
- In this lesson students also choose independent research reading books (RL.4.10, RI.4.10). See the Independent Reading: Sample Plans document for ideas on how to launch independent reading in your classroom. If you have your own routines for launching independent reading, in this lesson students will choose a research reading book.
- Each unit in this module is accompanied by a Recommended Texts list with a variety of reading levels. Students should use the classroom, school, or local library to obtain book(s) about the topics under study at their independent reading level. These books can be used in a variety of ways—as independent and partner reading in the classroom whenever time allows, as read-alouds by the teacher to entice students into new books, and as an ongoing homework expectation. In this lesson, students browse and select one of these texts for reading throughout the unit.
- In this lesson, students learn a cold call strategy called equity sticks. Equity sticks are Popsicle sticks with each student’s name that can be pulled randomly for students to respond to teacher prompts. Research indicates that cold calling improves student engagement and critical thinking. Prepare students for this strategy by discussing the purpose, giving appropriate think time, and indicating that this strategy will be used before students are asked questions. Feel free to use some other total participation technique instead; the goal is to ensure participation and accountability.

- In this module, the habit of character focus is working to contribute to a better world. Throughout the module, students will ‘collect’ characteristics of contributing to a better world on a Working To Contribute to a Better World anchor chart. The characteristic they collect in this lesson is: apply my learning when discussing the performance task.

How it builds on previous work:

- Students will continue to use their vocabulary log from Module 1 to collect new vocabulary in this module. As in Module 1, students will add new academic vocabulary to the front of the logbook and domain-specific vocabulary to the back of the book. You may wish to have students prepare the back of their books for the new module with a new section marked with flags or tabs.
- The Academic Word Wall will continue to be added to in this module. This is a permanent word wall that is added to across the year

Areas where students may need additional support:

- Since there are 10 posters to use during the Poster Walk, students likely will not visit each poster. Strategically group students and decide which posters they will visit. For example, consider placing ELLs in the same group and assigning them to examine posters 1-7, since they are not as text-heavy as posters 8-10.
- Consider inviting students who need additional fluency practice to chorally read the text on posters 8-10 during the Poster Walk.

Assessment Guidance:

- Consider using the Speaking and Listening Informal Assessment: Collaborative Discussion Checklist during students’ small group discussions. See Module 1 Appendix.
- Consider using the Reading: Foundational Skills Informal Assessment: Reading Fluency Checklist to gather baseline reading fluency data from students’ independent reading books in Closing and Assessment A. See Module 1 Appendix.
- Consider using the Reading: Foundational Skills Informal Assessment: Phonics and Word Recognition Checklist (Grade 4) to informally assess students during the independent reading launch in Closing and Assessment A. See Module 1 Appendix.

Down the road:

- In the next lesson, students discuss what it means to research a topic in more depth (for example, developing research questions and note-taking).

In advance:

- Prepare for the Poster Walk by reviewing the protocol in Opening A and preparing the Poster Walk posters (see preparation information in supporting materials). Note that this preparation will take time.
- Determine Poster Walk groups.
- Prepare the Animal Defenses research notebook. Consider stapling these notebooks into packets for students prior to this lesson. You may have each student create a research folder for storing their notebooks and other notes, texts, and writing throughout the module.
- Review the Independent Reading: Sample Plans in preparation for launching independent reading in this lesson. See Module 1 Appendix.
- Prepare an equity stick for each student.
- Post: Posters, learning targets.

- Opening A: Students view slideshows on technology (see posters in supporting materials).
- Opening A: Poster Walk artifacts set up on Google Docs in a folder. Students type their thinking into the Google Doc.
- Opening A: In Unit 2, students work in expert groups to study an animal and its defenses. They use web pages to research, and each web page has a slideshow option. Set up slideshows for each of the animals on technology around the classroom with an option for note-taking, or embed the links in a Google doc.
- Opening A: Set up these videos with a note-taking option as part of the Poster Walk:
 - Three-banded armadillo: ‘Part 1: Three-Banded Armadillo Keeper Chat at the Houston Zoo.’ Video. Houston Zoo. YouTube. 3 March, 2009. Web. 9 Apr, 2015. <https://www.youtube.com/watch?v=Ik1xfSDmfx>
 - Ostrich: ‘Ostrich.’ Video. Wildscreen Arkive. Web. 9 Apr, 2015. <http://www.arkive.org/ostrich/struthio-camelus/video-00.html>
 - Springbok: ‘Springbok.’ Video. Wildscreen Arkive. Web. 9 Apr, 2015. <http://www.arkive.org/springbok/antidorcas-marsupialis/video-00.html>
 - Monarch butterfly: ‘Monarch Butterfly.’ Video. Wildscreen Arkive. Web. 9 Apr, 2015. <http://www.arkive.org/monarch-butterfly/danaus-plexippus/video-00.html>
 - Pufferfish: ‘World’s Weirdest - Poisonous Pufferfish vs. Eel.’ Video. NatGeoWild. YouTube. 7 Nov, 2012. Web. 9 Apr, 2015. <https://youtu.be/dBXhZAcIT8Q>
- Work Time B: KWEL Chart: Animal Defense Mechanisms set up as a collaborative team document that all students in the team add to—for example, a Google Doc.

Supporting English Language Learners

Supports guided in part by CA ELD Standards 4.I.A.1, 4.I.A.3, 4.I.B.5, 4.I.B.6

Important points in the lesson itself

- The basic design of this lesson supports ELLs by emphasizing note-taking skills. Note-taking is an important activity that appears in multiple parts of this lesson. Note-taking is also required on the unit assessments and in life beyond the grade 4 classroom.
- ELLs may find note-taking challenging. Help ELLs develop note-taking skills by encouraging them to write down only key words (not sentences) as they engage with the posters. Help them develop categories under which to take notes, e.g., “body” or “behavior.” Encourage them to review their notes at the end of each activity.

Levels of support

For lighter support:

- Invite students to discuss various ways to politely but assertively gain and hold the floor in US conversations. Example: Wait for a stop or slight pause from the current speaker, then lean forward and say, “I really like that idea because _____, and I was thinking that _____.”

When you need to pause to find your words, say “Uh,” or “I have some additional thoughts I’d like to share.” or “Give me a second to gather my thoughts.”

For heavier support:

- The lesson introduces many possibly unfamiliar words, from *poster* to *source*. Continue to encourage ELLs to keep a vocabulary log of new words as they move through the unit, with translations and examples in context when they hear or see the new words. See other suggestions for working with new terms in the lesson. Offer a comforting smile and tell ELLs: “We will use a lot of new English words. Don’t worry. Don’t try to understand all the words today. It’s okay. Just try to do the most important things. You’re doing great!”
- Develop experience with question words by allowing students to role-play the topic of defense mechanisms. One student can be a scientist, and the other can be an animal. Offer question frames: “Millipede _____, are you so long?” “_____, you only had two legs?”

Universal Design for Learning

- **Multiple Means of Representation (MMR):** As you introduce each learning target, consider writing synonyms or sketching a visual above each key term to scaffold students’ understanding. Additionally, invite students to share ways in which they worked toward similar targets from previous modules.
- **Multiple Means of Action and Expression (MMAE):** This lesson offers several opportunities for students to engage in discussion with partners. For those who may need additional support with expressive language, facilitate communication by providing sentence frames to help them organize their thoughts. This way, all students can benefit from peer interaction.
- **Multiple Means of Engagement (MME):** Throughout this unit, sustained engagement and effort is essential for student achievement. Some students may need support to remember the goal for the work they are doing with this text. These students benefit from consistent reminders of learning goals and their value or relevance. Recall that students who may struggle with sustained effort and concentration are supported when these reminders are built into the learning environment.

Vocabulary

Key:

(L): Lesson-Specific Vocabulary

(T): Text-Specific Vocabulary

(W): Vocabulary used in writing

- infer, inference, defense, mechanism, support, document, inform, entertain, contributing to a better world, apply my learning (L)
- venom/venomous, poison/poisonous, self-defense, survive, toxic, predator, prey (T)

Materials

- ✓ Poster Walk posters and technology to play slideshows (new; teacher-created; see supporting materials)
- ✓ Directions for Poster Walk (one to display; see supporting materials)
- ✓ Markers (one different-colored marker per group)
- ✓ Equity sticks (one per student)
- ✓ Performance Task anchor chart (new; teacher-created; see Performance Task Overview)
- ✓ Working to Contribute to a Better World anchor chart (new; teacher-created and added to in Work Time A; see supporting materials)
- ✓ Working to Contribute to a Better World anchor chart (example, for teacher reference; see supporting materials)
- ✓ Animal Defenses research notebooks (one per student and one to display; see Teaching Notes)
 - KWEL Chart: Animal Defense Mechanisms (page 1 of Animal Defenses research notebook)
- ✓ Unit 1 recommended texts (see module overview documents)
- ✓ Independent Reading: Sample Plans (see Module 1 Appendix; for teacher reference)

Opening

A. Discovering Our Topic: Poster Walk (20 minutes)

- Build up excitement for this module and unit by explaining that today, students will begin learning about a new topic that they will study and write about over the next several weeks.
- Point out the **Poster Walk posters and the technology to display the slideshows** around the classroom.
- Display and review briefly the **directions for Poster Walk**, reminding students about expectations for group work and discussion.
- Explain that today, they will be in groups of three to four and rotate through the Poster Walk posters to discuss the following question:

“What can you infer about animal defenses from the pictures and/or text on this poster?”
- Circle the word *infer* and ask students to turn and talk to a partner, reviewing what it means to infer about something. (You use what you know and what the text says to figure out something the author doesn’t specifically say.)
- Clarify and provide an example as needed. Clarification: “To make an *inference*, a reader uses what he or she already knows about a topic and combines it with the text he or she read to figure out something that the author does not explicitly tell the reader. It is a guess based on evidence.” Example: “If someone is crying, you might infer that he or she is sad.”
- Group students and indicate where each group will start. (You may leave this open-ended and allow groups to visit as many charts as time allows or assign particular charts to each group.)
- Distribute **markers** and explain that there will be one recorder per group.

- Ask students to begin. Give them 3 minutes to work on each chart, and then rotate. As students are writing, monitor for text-based inferences. If necessary, gently point participants to interesting comments and inferences, pushing students to cite evidence for their inferences.
- At the end of 15 minutes, invite students to go back to the poster where they began and read through all of the inferences and comments on their assigned poster. Explain that they should be thinking about what they notice and wonder about what has been written on their poster.
- Ask, and then invite each group to share out round-robin style what they noticed and wondered until all posters have been shared:

“What patterns or themes did you notice in all of the Poster Walk posters?” (I noticed that many of the posters had animals on them, or I saw the word defenses repeated again and again.)

Meeting Students' Needs

- For ELLs: Consider partnering students who speak the same home language, since discussion of complex content is required. This allows students to have more meaningful discussions and clarify points in their native language. If such pairing isn't possible or fair, pair ELLs with a partner who has more advanced or native language proficiency.
- For ELLs: Provide students with a sentence starter or frame to aid in language production. For example: *In the photograph I see.... This makes me think that ...*
- For ELLs and students who may need additional support with comprehension: Repeat the question: “What can you infer about animal defenses from the pictures and/or text on this poster?” Rephrase the question: “Read this poster. Look at the pictures. Think about the words and the pictures for a minute. What do you think the animal does to be safe?” (MMR)

Opening

B. Reviewing Learning Targets (5 minutes)

- Read the first learning target aloud to students:
“I can infer about animal defense mechanisms based on information in pictures and text.”
- Tell them that today they will infer about animal defense mechanisms, the topic the class will be studying for the next few weeks. They will use pictures and text to do this.
 - Explain that the first word in the term *defense mechanism*, *defense*, means to protect yourself or keep something or someone from getting hurt.
 - The second word, *mechanism*, means natural reaction in response to something else. So the term *defense mechanism* means how animals react to protect themselves from harm.
- Ask for a student volunteer to read the second learning target:
“I can support my inferences with details and examples from pictures and texts.”
- Remind students that whenever they make an inference, they must support it with information from the text they are reading and thinking about.
- Have students give a quick thumbs-up, thumbs-down, or thumbs-sideways to indicate how well they understand today's learning targets.

Meeting Students' Needs

- For students who may need additional support with comprehension: Invite students to make a sketch that helps them define key vocabulary such as *infer*, *defense mechanism*, etc. For instance, students may draw a pair of eyes (to represent what they saw, the evidence) + a lightbulb (to represent what they already knew, their background knowledge) = *inference*. (MMR, MMAE)
- For ELLs: Mini Language Dive. Ask students about the meaning of the chunks of a key sentence from learning targets. Work on comprehension of these structures, for example, by eliciting paraphrases of these structures, modeling the target, and asking questions. Write and display student responses next to the chunks.
- NOTE: The “thumbs-up” and related signals may be offensive in some cultures. Explain to ELLs that these signals are okay in the United States, or ask the class to devise signals that are acceptable to all cultures.

Work Time

A. Preparing to Research (10 minutes)

- Introduce **equity sticks**. Tell students that the class will use these sticks as a way to call on students to participate during class. This will help you check their understanding during lessons. Tell them the reason they are called equity sticks is because everyone has one and will get a chance to think about questions asked in class and share their thinking.
- Remind students that all learners, including adults, must be willing to take risks to learn something new. They may not always be confident in their thinking, but sharing their thinking is important in learning new things.
- Discuss the importance of being respectful of everyone’s learning by asking:

“How can the class be respectful when others are sharing their thinking about questions?”
(We’ll actively listen to speakers by looking at them while they talk, or Only one person will speak at a time.)
- If productive, cue students to listen carefully:

“Who can repeat what your classmate said?” (Responses will vary.)
- Invite students to Think-Pair-Share the first question: “How do animals’ bodies and behaviors help them *survive*?”

“What does survive mean?” (It means to stay alive.)

“What do you think is meant by animals’ bodies and behaviors?” (Their bodies are how they physically look and are made, and their behaviors are how they act.)
- Explain to students that scientists call what animals do to protect themselves and survive *animal defense mechanisms*, and in this module, they will learn about defense mechanisms of all kinds of animals.
- Invite students to Think-Pair-Share the second question: “How can writers use knowledge from their research to *inform* and *entertain*?” Ask:

“What does it mean to inform?” (It means to teach someone about something.)

“What does it mean to entertain?” (It means to do something for someone to enjoy.)

“What does the word research mean?” (It means you learn about something by reading.)

- If necessary, give an example of something that informs (the nightly news) and something that entertains (a sitcom or movie), and something that does both (a nature show or a show about a period in history).
- Explain that students' written performance task for this module will have to inform and entertain their readers on the topic of animal defense mechanisms and that they will have an opportunity to learn about research during the study of this topic.
- Display the **Performance Task anchor chart**. Use equity sticks to call on a student to read the first three sentences of the prompt. Invite students to give a thumbs-up if they have read a choose-your-own-adventure-type book before or a thumbs-down if they have not.
- Explain that a choose-your-own-adventure is a story that has two possible endings and the reader decides what a character will do at certain points in the story. Tell students that they will learn more about this genre later in the module; for the time being, they just need to know they will research an animal and its defense mechanisms to write a narrative.
- Direct students' attention to the **Working to Contribute to a Better World anchor chart**. Emphasize the phrase *contributing to a better world* at the top of the anchor chart and inform students that this means putting learning to use to improve communities. Point out that it can be any community: for example, the classroom, school, or town.
- Read aloud the habit of character recorded.
- Invite students to tell an elbow partner what *applying my learning* means in their own words using the anchor chart as a guide.
- Invite students to discuss with an elbow partner and cold call students to share their responses with the whole group:
 - ***“What does applying your learning look like? What might you see when someone is applying what he or she has learned?” (see Working to Contribute to a Better World anchor chart (example, for teacher reference)).***
 - ***“What does applying your learning sound like? What might you hear when someone is applying what he or she has learned?” (see Working to Contribute to a Better World anchor chart (example, for teacher reference)).***
- Record student responses in the appropriate column on the Working to Contribute to a Better World anchor chart.
- Record contribute and apply learning on the academic word wall. Invite students to add translations of the words in their home languages in a different color next to the target vocabulary.
- Once again, remind students of the habit of character of focus: apply my learning. Explain that through the creation of their stories, they will be applying what they have learned about animal defense mechanisms.
- Distribute **Animal Defenses research notebooks**. Invite students to look through their notebooks and think about what they notice and wonder about them.
- Invite students to do a quick Go-'round in which each person shares in turn. Ask:
 - ***“What do you notice about the research notebook?”***
- Validate student responses and summarize what students noticed. This may sound something like: “Great observations! I heard several of you say that you noticed there were several graphic organizers repeated throughout the notebook.”

- Explain that students will use the research notebook during the first unit to collect and document research about animal defense mechanisms. Tell students they will work with a new research notebook in Unit 2, and then later to write their choose-your-own-adventure narratives in Units 2 and 3.
- Invite students to turn and talk, sharing what they wonder about the research notebook. Answer any clarifying questions and say that other things they are wondering about will be answered as they use the notebook.

Meeting Students' Needs

- For students who may need additional support with motivation: Guiding questions provide motivation for student engagement in the topic and give a purpose to reading a text closely. (MME)
- For ELLs: Be careful with equity sticks. Ensure that ELLs have plenty of time to think or take notes to process question language before they respond. Allow opportunities for them to verbalize an answer with a partner who has more advanced language proficiency before responding to questions in front of the class.
- For ELLs: Allow students to explore spelling and pronouncing aloud, synonyms, definitions, translations, collocations (words frequently used together), word clusters, and word maps to increase understanding of unfamiliar terms in this lesson, such as *be respectful*, *stay alive*, *performance task*, *adventure*, *narrative*, *notice*. Example: *be respectful*, *be good*, *be nice*, *be polite*, *have good manners*; *respetuoso* (Spanish)/*jonjung* (Korean)/*adara* (Arabic)/*respeitoso* (Portuguese); *highly respectful*, *perfectly respectful*; *We were perfectly respectful at the library*. *My grandmother says I need to be respectful*.

Work Time

B. KWEL Chart: Animal Defense Mechanisms (10 minutes)

- Invite students to open to page 1 in their research notebooks, the **KWEL Chart: Animal Defense Mechanisms**. Focus students on the questions at the top of the chart and read them aloud as they read silently in their heads:
“How do animals’ bodies and behaviors help them survive?”
- Explain the KWEL table as needed (K = what we know or think we know, prior knowledge about the topic; W = what we want to know, our questions; E = evidence; and L = what we learned, answers to our questions, or information that confirms/refutes our prior knowledge; in the Source column, write the source of the information recorded on the chart).
- Tell students that for the next several days, the class will record their knowledge, questions, and learning using this chart. Invite students to fill in the K column.
- Use equity sticks to cold call several students to share out. Record students’ comments (both accurate and inaccurate) in the K column. For example, a student may share correct information such as: “Venom is a defense mechanism of some snakes.” Or a student might inaccurately say: “Tigers use venom as a defense mechanism.”
- Tell students that during this unit, they will continue to learn about animal defense mechanisms and will be looking for evidence from various texts to either confirm or revise

their current knowledge. This chart will grow throughout the unit as a way to document class growth in their knowledge about animal defense mechanisms.

- Tell students that they will now think about what they are curious about regarding animal defense mechanisms. What do they want to learn about how animals protect themselves? Explain that this is questioning process that scientists go through as they research and discover new things. Without a deep sense of curiosity, scientists wouldn't have any motivation to conduct experiments or research a topic. Scientists often ask "Why?" or "How come?" or "What if?" Scientists always ask questions as part of scientific research.
- Invite students to independently record at least three questions about what they want to know about animal defense mechanisms in the middle W column. If students do not have much background knowledge about this topic, they may not have many questions at this time. This is okay, because the class will revisit and record more on this chart as they read other texts. Reiterate that they will be looking for answers to these questions as they continue learning about animal defense mechanisms during this unit.
- Focus students on the learning targets. Read each one aloud, pausing after each to use a checking for understanding protocol for students to reflect on their comfort level with or show how close they are to meeting each target. Make note of students who may need additional support with each of the learning targets moving forward.

Meeting Students' Needs

- For students who may need additional support with strategy development: Graphic organizers engage students more actively and provide the necessary scaffolding especially critical for learners with lower levels of language proficiency and/or learning. For students needing additional support, provide a partially filled-in graphic organizer. (MMAE)
- For ELLs: Before cold-calling ELLs or students who require additional think time, allow them to quickly verbalize, confirm, and clarify their responses with a partner first. This step will not only build confidence, but also is a critical part of processing and acquiring a new language.
- For ELLs: Check understanding: "What will we be doing in this unit?" (learning about what animals do to protect themselves and using evidence to help talk about what we learned)
- For ELLs and students who may need additional support with comprehension: Explain that "How come?" is similar to "Why?" Explain that "if" refers to a possible event. Model various questions scientists might ask using sentence frames.
- Example for students who need heavier support:
"Why does a monarch butterfly have ____ (orange and black colors/wings/a terrible flavor)?"
- Example for students who need lighter support:
"What if the ink of an octopus ____?" (MMR)

Closing and Assessment

A. Launching Independent Reading (15 minutes)

- Refer to the **Independent Reading: Sample Plans** to launch independent reading, or use your own routine. Tell students that you have gathered many books related to this topic for them to read independently throughout the module.
- Invite them to browse the **Unit 1 recommended texts**.

Homework

A. Accountable Research Reading. Select a prompt to respond to in the front of your independent reading journal.

Meeting Students' Needs

- For ELLs and students who may need additional support with writing: For all homework assignments in this unit, read the prompts aloud. Students can discuss and respond to prompts orally, either with you, a partner, family member, or student from Grades 1 or 2, or record an audio response. If students have trouble writing sentences, they can begin by writing words. Consider providing a sentence starter or inviting students who need lighter support to provide sentence starters. (MMAE)