



EXPEDITIONARY
LEARNING

Grade 4: Module 2B: Unit 1: Lesson 13

Science Talk: Synthesizing What We Know about Millipedes



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Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)

I can effectively engage in discussions with diverse partners about fourth-grade topics and texts. (SL.4.1)

- a. I can prepare myself to participate in discussions.
- a. I can draw on information to explore ideas in the discussion.
- b. I can follow our class norms when I participate in a conversation.
- c. I can ask questions that are on the topic being discussed.
- d. I can connect my questions and responses to what others say.

I can accurately synthesize information from two texts on the same topic. (RI 4.9)

Supporting Learning Targets

- I can effectively participate in a Science Talk about millipede defense mechanisms.
 - a. I can prepare for the Science Talk by using evidence from animal defense mechanism texts.
 - b. I can ask questions so I am clear about what is being discussed.
 - c. I can ask questions on the topic being discussed.
 - d. I can follow our class norms when I participate in a conversation.

Ongoing Assessment

- Preparing for a Science Talk note-catcher (page 22 Animal Defenses research journal)
- Observation of Science Talk



Agenda	Teaching Notes
1. Opening A. Engaging the Reader: Quiz-Quiz-Trade (10 minutes) B. Reviewing Learning Targets (5 minutes) 2. Work Time A. Preparing for a Science Talk (15 minutes) B. Conducting the Science Talk (15 minutes) C. KWL: Millipede (5 minutes) 3. Closing and Assessment A. Exit Ticket (10 minutes) 4. Homework A. Continue reading your independent reading book for this unit.	• This is the second of two Science Talks in this unit. This series of Science Talks helps students make progress toward SL4.1, which is formally assessed in Module 3. • When students prepare for the Science Talk during Work Time A, they use the teacher feedback from the Science Talk in Lesson 9. Be sure to give feedback and return to students by this lesson. • Part of the Science Talk preparation was assigned for homework after Lesson 12. Check that students have completed this; give time for them to complete it before this lesson if necessary. • The preparation for the Science Talk focuses on students making inferences and paraphrasing information researched in Lessons 10–12. This helps students make progress toward SL4.2, which is formally assessed in the end of unit assessment in Lesson 14. • The exit ticket is broken into two parts. The first part asks students to reflect on one of the guiding questions for the module. The second part asks students to rank the choices for expert group animals. Use these rankings to form the groups, which students begin working in during Lesson 1 of Unit 2. • In advance: Display the Science Talk Norms and Participating in a Science Talk anchor charts (from Lessons 8 and 9). • Review: Science Talk (see Appendix). • Post: Learning targets.



Lesson Vocabulary	Materials
goals, evidence, paraphrase	• Additional Vocabulary word cards (see Teaching Notes and supporting materials) • Vocabulary word cards (from Lesson 8) • Equity sticks • Science Talk Notes and Goal sheet (page 12 of Animal Defenses research journal; from Lesson 8; one per student) • Preparing for a Science Talk note-catcher (page 24 of Animal Defenses research journal; one per student and one to display) • Preparing for a Science Talk note-catcher (completed, for teacher reference) • <i>Venom</i> (book; one per student; page 15) • <i>Animal Behavior: Animal Defenses</i> (one per student; “Poisonous Prey,” pages 56–58) • Science Talk Norms anchor chart (teacher-created; from Lesson 8) • Participating in a Science Talk anchor chart (teacher-created; from Lesson 9) • Science Talk Criteria checklist (one for teacher) • Millipede Defense Mechanisms: KWL chart (page 13 Animal Defenses research journal; from Lesson 9; one per student) • Exit tickets (one per student)



Opening	Meeting Students' Needs
A. Engaging the Reader: Quiz-Quiz-Trade (10 minutes) • Tell students that today they will be discussing the question: “Which millipede defense mechanism is most important? Why?” Explain that now that they have read about millipede defense mechanisms, they should have new thoughts or ideas related to this question. Explain that today they will prepare for the Science Talk by reviewing the vocabulary that they have collected related to millipede defenses. Remind students that they have been recording vocabulary words into their Animal Defenses research journals and that the class has been building a Word Wall with these terms. • Explain that you would like them to do a short activity called Quiz-Quiz-Trade using words from the Word Wall to help build their understanding of these words. Post the following directions: Quiz-Quiz-Trade: 1. Find a partner. 2. Read definition—Read your word’s definition to your partner. Allow him or her to guess the word or ask for a hint. 3. Give a hint—If your partner needs a hint, say one thing that helps you remember the meaning of this word. Allow your partner to guess and share your word. 4. Switch—Have your partner read his or her definition and let you guess or receive a hint. 5. Trade cards and find a new partner. Repeat Steps 2–5. • Review the directions and clarify or model the process if necessary. Distribute the Additional Vocabulary word cards and the Vocabulary word cards (from Lesson 8). Explain that some they have played Quiz-Quiz Trade with some of these words, but that others are new from their recent reading about the millipede. • Point out to students that the word is on one side of the card and the definition is on the other. Tell them to be sure to cover the word so their partner cannot see it when trying to guess the word. • Give students 8 minutes to quiz and trade. • Collect the Vocabulary word cards.	• Guiding questions provide motivation for student engagement in the topic, and give a purpose for reading a text closely. • Discussing and clarifying the language of learning targets helps build academic vocabulary.



Opening (continued)	Meeting Students' Needs
B. Reviewing Learning Targets (5 minutes) • Use equity sticks to call on students to read the learning targets: – I can effectively participate in a Science Talk about millipede defense mechanisms. – I can prepare for the Science Talk by using evidence from animal defense mechanism texts. – I can ask questions so I am clear about what is being discussed. – I can ask questions on the topic being discussed. – I can follow our class norms when I participate in a conversation. • Invite students to turn to the Science Talk Notes and Goal sheet on page 12 in their Animal Defenses research journals and reread the feedback given by the teacher and the goal they set for themselves after the first Science Talk. • Use a Think-Pair-Share: * “What is the purpose of a Science Talk?” • Listen for responses like: “To discuss big ideas, which helps us to better understand a topic.”: * “What goals did you set for yourself after the last Science Talk?” • Listen for responses like: “I want to be sure to use evidence from my research to support what I say.” * “Based on the teacher feedback and your goal from last Science Talk, what is one thing you are going to try to do in today’s Science Talk?” • Listen for responses like: “The teacher suggested I should ask clarifying questions when I don’t understand what someone else is saying, so I’m going to be sure to ask a question like, ‘What did you mean when you said not all spiders are poisonous?’”	



Work Time	Meeting Students' Needs
A. Preparing for a Science Talk (15 minutes) - Invite students to open to the Preparing for a Science Talk note-catcher on page 24 of their Animal Defenses research journals. Post and remind students of the Science Talk question: * “Which millipede defense mechanism is most important? Why?” - Remind students that they prepared for the Science Talk on their own for homework after the last lesson by recording evidence that answers the Science Talk question in the first column of the note-catcher. - Explain to students that before they participate in the Science Talk, they will have a chance to add to their notes. - Tell them they will be adding notes into the right-hand column, “I think that the most important millipede defense mechanism is ... because ...” Explain that the notes will be information <i>paraphrased</i> from their research, as well as inferences made from their research. - Model paraphrasing and making an inference with the example evidence included on the note-catcher in the left-hand column: “They have a tough exoskeleton.” - Say something like: “This is an example piece of evidence someone would choose if they think the exoskeleton is the millipede’s most important defense mechanism. We want to paraphrase and make an inference about it when we write our notes in the right-hand column. We’ve been paraphrasing what we’ve listened to throughout this unit when we listen closely to texts read to us. Paraphrasing is when you say something you read or listened to in your own words. So if we want to paraphrase this evidence, we’d say millipedes have a hard shell. Now we need to make an inference about this piece of evidence; we’ll think about how the tough exoskeleton or hard shell helps the millipede survive. Since the shell is hard, I think the exoskeleton protects the millipede’s body from predators—it’s like an armor that a knight would wear. So I’ll write that in the box next to the evidence: ‘I think that the most important millipede defense mechanism is its hard shell because it’s hard and protects its body from predators.’ I combined the evidence I paraphrased with the inference I made to write my notes.” - Invite students to Think-Pair-Share, using the following steps to record inferences in the right-hand column: - Reread the evidence in the left-hand column. - Paraphrase the evidence. - Make an inference by asking yourself, “How does this help the millipede survive?” - Write your notes in the right-hand column.	- Graphic organizers and recording forms engage students more actively and provide the necessary scaffolding that is especially critical for students with lower levels of language proficiency and/or learning. For students needing additional support, you may want to provide a partially filled-in graphic organizer. - Step-by-step instructions help students complete independent activities.



Work Time (continued)	Meeting Students' Needs
• Be sure students have access to their texts: <i>Venom</i> (page 15) and <i>Animal Behavior: Animal Defenses</i> (pages 56–58) and the note-catchers used in Lessons 10–12, and remind students to refer to these resources if needed. Ask students to add to their note-catchers based on their conversations with their partners. Review the recording form briefly if needed. • Bring students back together. Tell students to think back to their goal they shared with a peer in the opening. Have them look over the evidence they recorded on their note-catchers for homework. Ask students to Think-Pair-Share: * “What is something new you now know about millipede defense mechanisms you might want to mention in today’s science talk?” * “Is there anything you can add to your note-catcher that will help you meet your goal?” • Circulate to confer as necessary, and remind students to use specific evidence from text to support their thinking.	
B. Conducting the Science Talk (15 minutes) • Post the Science Talk Norms anchor chart and review as a class. Ask each student to turn to a partner and point out one norm the class might need to focus on after their last Science Talk. Have pairs share and discuss or clarify norms as necessary. • Remind students that good discussions help you to think about topics in a new way. In order to help them expand their understanding of millipede defense mechanism, they will need to ask one another questions and build on one another’s ideas about which millipede defense mechanism is most important. • Write a few sentence stems to help students during the upcoming discussion—for example: – “I wonder if _____?” – “I wonder why _____?” – “I agree and I also think _____. I disagree because _____.” – “That’s a good question. I think _____.” • Gather students whole group in a circle. Remind them to bring their journals. Display the Participating in a Science Talk anchor chart for the class to see. Briefly review the anchor chart with students and answer any questions. Explain that for this Science Talk, they will all participate in one talk rather than having a Fishbowl and two rounds.	• Provide ELLs with additional sentence starters or frames to aid in language production. For example: “[Classmate’s name] said ... and this makes me think ...” or “I think the most important millipede defense mechanism is ... because ...”



Work Time (continued)	Meeting Students' Needs
• Direct students to begin the Science Talk. Use the Science Talk Criteria checklist or begin a new one with the new blank form in this lesson's supporting materials to monitor student progression toward the learning targets. Quickly redirect and support students as needed, but avoid leading the conversation. Remind students that their questions and comments should be directed to one another, not the teacher. • Ask students to return to their seats. Invite them to reread the goals they wrote on the bottom of page 11 in their Animal Defenses research journals. Have them reflect on the following questions with a partner: "What progress did you make on your Science Talk goal today? What can you continue to work on?" Encourage students to base their discussion on their written goals and this lesson's learning targets. Listen for students to state their goals and reference the learning targets as they share. • Collect students' Animal Defenses research journals. Use page 19 and the Science Talk Criteria checklist to assess individual students' progress toward SL.4.1 and record feedback in the appropriate spot on students' note-catchers.	
C. KWL: Millipede (5 minutes) • Invite students to turn to the Millipede Defense Mechanisms: KWL chart in their Animal Defenses research journals. Remind them that scientists always reflect on and record what they've learned. • Invite students to Think-Pair-Share. Ask: * "Were any of your questions about millipedes answered in the Science Talk today?" * "What new information did you learn from the Science Talk?" • Tell students to write the answers to any questions they had in the W column in the "I Learned" column, in the "Information" section. Invite students to add any new questions to the W column as well. • Tell students to write one new piece of information they learned in the "I Learned" column.	



Closing and Assessment	Meeting Students' Needs
A. Exit Ticket (10 minutes) • Distribute exit tickets to students. Explain that the first part asks students to answer one of the guiding questions for this module. • Explain to students that in Part 2, they will be ranking the four animal choices for the expert groups. Tell students that the animal they are assigned to research will be the animal they write their narratives about, so they should think carefully about how they rank their choices. • Circulate and support as needed. If necessary, prompt students by asking questions like: “Can you give an example of how an animal that we’ve read about uses defenses to survive?” Collect exit slips once students have completed them.	• Using entrance/exit tickets allows you to get a quick check for understanding of the learning target so that instruction can be adjusted or tailored to students’ needs during the lesson or before the next lesson. Pairing entrance tickets with exit tickets allows both teachers and students to track progress from the beginning to the end of the lesson.
Homework	Meeting Students' Needs
• Continue reading your independent reading book for this unit.	



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Supporting Materials



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Additional Vocabulary Word Cards (Front):
Animal Defense Words

Teacher Directions: Prepare a set of these additional cards and add these to the word cards from Lesson 8.

retch	entrap
affect	toxic
excrete	poisonous
injecting	seizes
unpleasant	frantically
living	quickly
warning	extract



Additional Vocabulary Word Cards (Back):
Animal Defense Word Definitions

throw up	causes something to be trapped
to change	deadly or poisonous
ooze, make	having poison
to put into something	grabs, take hold
not pleasing	out of control
alive	doing something fast
a sign of something bad coming	to pull out

**Animal Defenses Research Journal:
Preparing for a Science Talk**
(Completed, for Teacher Reference)

Question: Which millipede defense mechanism is most important? Why?

Preparation: Look back in your Animal Defenses research journal and texts about animal defense mechanisms to find evidence to help you answer the Science Talk question.

When I read or see that (evidence) ...	It makes me think that animals' bodies help them survive by ...
(Example) most spiders are venomous (<i>Venom</i> page 8)	(Example) I think that the venom paralyzes or kills the spider's prey and enemies.
the mimic octopus mimics other creatures to turn off predators ("Award-Winning Survival Skills: How Animals Elude Prey")	I think that since the mimic octopus can change to look like other dangerous animals, its enemies probably stay away from them because they think the octopus is dangerous and will poison or hurt them.
the three-banded armadillo rolls into a ball ("Award-Winning Survival Skills: How Animals Elude Prey")	I think that it rolls into a ball to protect the parts of its body that don't have a shell—its head, legs, and tail. By rolling into a ball, these parts are under its hard armor and protected from its enemies.
"bright colors can also be warning colors" (<i>Animal Behavior: Animal Defenses</i> page 58)	I think that the colors warn predators that the animal is dangerous, so they learn to stay away from it.



Animal Defenses Research Journal:
Science Talk Notes and Goals
(Completed for Teacher Reference)

My Science Talk Notes: Ideas and Questions

- **Do different kinds of millipedes emit different poisons?**
- **Is the poison dangerous to other millipedes, or just to predators?**

Now that I have heard everyone's reasons and their evidence, the millipede defense mechanism I think is most important is its poisonous gas because it is the most deadly and kills the

millipede's enemy the fastest.

My teacher's feedback:

My goals for the next Science Talk:

For the next Science Talk, I will try to build on my classmates' ideas more by saying things like, "To build on what so and so said ..." and "So and so said ... and that makes me think that ..."



Science Talk Criteria Checklist

I can effectively participate in a Science Talk about millipede defense mechanisms.

- a. I can prepare for the Science Talk by gathering evidence from scientific texts about simple machines.
- b. I can ask questions about the topic being discussed.
- c. I can build on other's ideas when responding to their statements and questions.
- d. I can follow our class norms when I participate in a conversation.

Student name	Prepares with evidence	Norms	Asks questions related to topic	Responds to and builds on others' ideas/questions	Teacher comments



Exit Ticket

Name: _____

Date: _____

Part 1:

How do animals' bodies and behaviors help them survive? Use evidence from your research and from today's Science Talk to support your answer.

Part 2:

Which animal would you like to research and write about for the performance task? Rank the following four choices, using a 1 for the animal you are most interested in researching and a 4 for the animal you are least interested in researching.

_____ Monarch butterfly

_____ Three-banded armadillo

_____ Mimic octopus

_____ Gazelle