

Lesson 11: Speaking, Reading, and Writing: Tools Paleontologists Use to Study Fossils



CCS Standards

- **RI.2.1:** Ask and answer such questions as *who*, *what*, *where*, *when*, *why*, and *how* to demonstrate understanding of key details in a text.
- **RI.2.4:** Determine the meaning of words and phrases in a text relevant to a *grade 2 topic or subject area*.
- **W.2.7:** Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).
- **L.2.6:** Use words and phrases acquired through conversations, reading and being read to, and responding to texts, including using adjectives and adverbs to describe (e.g., *When other kids are happy that makes me happy*).



Daily Learning Targets

- I can answer questions about a paleontologist's tools using key details in the text *Paleontology: The Study of Prehistoric Life*. (RI.2.1, RI.2.4, L.2.6)
- I can collaborate to write a paragraph about the tools paleontologists use to study fossils. (W.2.7)

Ongoing Assessment

- During Work Time A, listen for students to answer questions about a paleontologist's tools using key details in the text *Paleontology: The Study of Prehistoric Life*. (RI.2.1, RI.2.4, L.2.6)
- During Work Time B, notice whether students are able to collaborate in writing a focusing and concluding statement for the class paragraph about the tools paleontologists use to study fossils. (W.2.7)
- During Work Time B, circulate and observe as students record a detail about the tools paleontologists use to study fossils on page 2 of their paleontologist's notebook. (W.2.7)
- During the Closing, listen as students share their writing and reflect on perseverance. Notice whether they are able to speak clearly to share their work and articulate a growing awareness of how perseverance is demonstrated through daily work.

Agenda

1. Opening

- A. Engaging the Learner: Curiosities Museum (5 minutes)

2. Work Time

- A. Focused Read-aloud: *Paleontology: The Study of Prehistoric Life*, Pages 33–36 (20 minutes)
- B. Preparing for Independent Writing: Paleontologists Study Fossils (25 minutes)

3. Closing and Assessment

- A. Building Vocabulary: Fossils Word Wall (5 minutes)
- B. Pinky Partners: Reflecting on Perseverance (5 minutes)

Teaching Notes

Purpose of lesson and alignment to standards:

- As in Lesson 10, students continue to learn about paleontologists and the work they do. Students participate in a focused read-aloud of the text *Paleontology: The Study of Prehistoric Life* by Susan H. Gray during Work Time A. Students then continue to co-create the Tools Paleontologists Use anchor chart as a resource for their writing during Work Time B.
- Similar to Lesson 10, students collaborate to write a paragraph about the tools paleontologists use to study fossils during Work Time B.

How this lesson builds on previous work:

- In Lesson 8, students were provided with a highly scaffolded experience writing a paragraph. Today, students again write a paragraph, but with increased independence.
- Students continue to focus on perseverance in this lesson. Use the Working to Become Effective Learners anchor chart to reflect on how this habit of character is demonstrated through students' efforts to write during Work Time B.

Areas in which students may need additional support:

- The Tools Paleontologists Use anchor chart may visually overwhelm students. Consider covering the part that is not used during this lesson to help students focus only on the relevant content for this lesson.
- Copying from a model could be challenging. Change seating, if needed, to allow students who need additional support to be closer to the posted model. Also, focusing and concluding statements can be a challenge for students to synthesize. Provide examples as needed.
- Continue to use Goal 1 and 2 Conversation Cues to promote productive and equitable conversation.

Down the road:

- The Tools Paleontologists Use anchor chart provides a bank of tool names and descriptions to draw from when students discuss and write about paleontologists' work in later lessons.
- In Lesson 12, students will independently write a paragraph about a famous paleontologist.

In advance:

- Preview the focused read-aloud of an excerpt from *Paleontology: The Study of Prehistoric Life* during Work Time A to familiarize yourself with its content.
- Consider covering the top half of the Tools Paleontologists Use anchor chart (Tools Used to Discover Fossils) so that the chart doesn't appear visually overwhelming to students.
- Review the Pinky Partners protocol. (Refer to the Classroom Protocols document for the full version of the protocol.)
- Post: Learning targets and applicable anchor charts (see materials list).

Consider using an interactive white board or document camera to display lesson materials.

- Work Time A: Create the Tools Paleontologists Use anchor chart in an online format—for example, a Google Doc—for display and for families to access at home to reinforce learning.
- Work Time B: Students work collaboratively to complete part of page 2 of the paleontologist's notebook using a word-processing tool—for example, a Google Doc.
- Closing: Create the Fossils Word Wall in an online format—for example, Padlet (<https://padlet.com/>)—to share vocabulary words with families.

Supporting English Language Learners

Supports guided in part by CA ELD Standards 2.I.A.1, 2.I.A.2, 2.I.B.6, 2.I.B.8, and 2.I.C.10

Important points in the lesson itself

- The basic design of this lesson supports ELLs by providing the opportunity to hear an informational text about fossils and paleontologists read aloud, which builds on student learning from the narrative text in the first half of the unit. This lesson also supports ELLs by continuing the reading and writing routine established in the previous lesson, providing modeling and scaffolding for writing about paleontologists' tools, and allowing students to reflect on and celebrate the ways they showed perseverance.
- ELLs may find it challenging to write supporting details for their paragraphs in the time allotted. Work closely with and allow extra time for any students who need it. See “Levels of support” below and the Meeting Students' Needs column for additional suggestions.

Levels of support

For lighter support:

- During the Mini Language Dive, challenge students to generate questions about the sentence before asking the prepared questions. Example: “What questions can we ask about this sentence? Let's see if we can answer them together.”
- During Work Time B, challenge students to include adjectives in the supporting detail sentences they write in their paragraphs. (Example: Paleontologists use *small* pliers to remove fossils from *hardened* plaster.) Encourage them to select adjectives from the Adjective Construction board and to add new adjectives to the board.

For heavier support:

- During Work Time B, encourage students to refer to the model focusing statement and concluding statement on page 1 of their Paleontologist's notebook as they write their paragraphs.
- Write the name of each tool from the Tools Paleontologists Use anchor chart and how each tool is used to study fossils on separate large index cards. On a separate sentence strip, write the sentence frame “Paleontologists use ____ to _____.” Allow students to “build” a sentence by inserting the name of tools and their purpose into the sentence frame before

writing. Encourage students to read aloud each sentence as they build it, and then choose two to include in their paragraph.

Universal Design for Learning

- **Multiple Means of Representation (MMR):** In this lesson, students listen to a focused read-aloud of *Paleontology: The Study of Prehistoric Life*. Some may need support in identifying the key ideas and links between ideas, particularly as they relate to the first learning target. Provide differentiated scaffolds to support comprehension. For example, consider offering a graphic organizer or concept map with the key ideas for students.
- **Multiple Means of Action & Expression (MMAE):** In Work Times A and B, students respond to the text in verbal and written forms. Formative feedback during these learning activities supports students' capacity for monitoring their progress and knowledge of what to do differently. Provide explicit and timely feedback that students can use to guide their own learning. As students understand their progress, encourage them to ask for specific feedback that supports their learning through role-play and modeling.
- **Multiple Means of Engagement (MME):** During the lesson, support motivation and engagement by inviting students to regulate their emotions and motivation. Provide scaffolds and feedback for managing frustration and seeking support from others. Offer models for self-regulation and coping skills. (Example: "When I get stuck during my writing, I feel frustrated and don't want to finish it. I can stop for a minute and think of how I can handle it. I could take a break to organize my thoughts or give my writing hand a rest, or maybe I can ask someone for help.")

Vocabulary

Key:

(L): Lesson-Specific Vocabulary

(T): Text-Specific Vocabulary

(W): Vocabulary Used in Writing

New:

- prehistoric, laboratory, plaster, pliers, saws, jackhammers, picks, microscope (T)

Materials

- ✓ Curiosities Museum (begun in Lesson 3; added to during the Opening)
- ✓ Fossil photo #5 (one to display)
- ✓ Fossil photo #5 caption (blank; co-created with students during Work Time A)
- ✓ Unit 1 Guiding Questions anchor chart (from Lesson 1; one to display)
- ✓ *Paleontology: The Study of Prehistoric Life* (one to display; for teacher read-aloud)
- ✓ Tools Paleontologists Use anchor chart (begun in Lesson 10; added to during Work Time A)
- ✓ Tools Paleontologists Use for Study picture cards (new; added to the Tools Paleontologists Use anchor chart during Work Time A)
- ✓ Tools Paleontologists Use anchor chart (from Lesson 10; answers, for teacher reference)
- ✓ Paleontologist's notebook (from Lesson 10; page 2; one for teacher modeling and one per student)

- ✓ Pencils (one per student)
- ✓ Fossils Word Wall card (new; teacher-created; one)
- ✓ Fossils Word Wall (begun in Lesson 8; added to during the Closing)
- ✓ Pinky Partners Protocol anchor chart (begun in Module 1)
- ✓ Working to Become Effective Learners anchor chart (begun in Module 1)

Opening

A. Engaging the Learner: Curiosities Museum (5 minutes)

- Invite students to the whole group area.
- Share with students that they have another fossil to add to the **Curiosities Museum!**
- Display **fossil photo #5** and follow the same process from Lesson 3 to add it to the Curiosities Museum. Use the name and description of the photo of the fossil (“Levi Moxness is cleaning and identifying fossils in the field at Badlands National Park, South Dakota”) and the following sentence frame as needed for the **fossil photo #5 caption**:
“This is ____.” (This is Levi Moxness cleaning and identifying fossils in South Dakota.)
- Share that, as the class continues to collect curiosities, the museum will grow larger!

Meeting Students' Needs

- For students who may be uncomfortable sharing their own thinking with the entire class: Consider allowing them to share what their partner said so that they still have a chance to speak in front of the class. (MME)
- For ELLs: In addition to using the vocabulary on the Fossils Word Wall, encourage students to choose adjectives from the Adjective Construction board to describe what they notice in the photograph. Add any new adjectives to the board as students share.

Work Time

A. Focused Read-aloud: *Paleontology: The Study of Prehistoric Life*, Pages 33–36 (20 minutes)

- Direct students' attention to the posted learning targets and read the first one aloud:
*“I can answer questions about a paleontologist's tools using key details in the text **Paleontology: The Study of Prehistoric Life.**”*
- Invite students to turn and talk to an elbow partner:
*“What does this learning target mean?” (answer questions about a paleontologist's tool using important information in the book **Paleontology: The Study of Prehistoric Life**)*
- Invite a few students to share out.
- Refer to the posted **Unit 1 guiding question #1** and read it aloud:
“What do paleontologists do?”
- Remind students that in the last lesson, they learned about the work paleontologists do to discover fossils.

- Share that this text has a lot of information about paleontologists, and today the important information is about the tools they use to study fossils.
- Display the cover of *Paleontology: The Study of Prehistoric Life* and read the title aloud.
- Remind students that paleontologists are scientists who study fossils. The title also tells us that paleontologists study prehistoric life.
- Define *prehistoric* (belonging to a period of time before written history).
- Share that paleontologists study fossils because fossils help them to understand more about the earth in prehistoric times, times before people used writing to remember things.
- Direct students' attention to the **Tools Paleontologists Use anchor chart**.
- Remind students that in the last lesson, they recorded information about the *tools paleontologists use to discover fossils*.
- Briefly review the column titles on the anchor chart, emphasizing that today they will record information about tools used to study fossils.
- Share that as students hear the text read aloud, they will pause and record the names and use of some tools paleontologists use to study fossils. Prompt them to listen carefully for names and uses of specific tools.
- Display page 33 of the text and read the chapter title and first sentence aloud.
- Define *laboratory* (a place used for scientific experiments or studies).
- Share that paleontologists bring the fossils they discover back to a laboratory to study them.
- Draw students' attention back to the text and read the remainder of page 33 aloud.
- Using a total participation technique, invite responses from the group:
“What is this page about?” (Paleontologists do work in the field and at the laboratory; they use lots of tools to discover and study fossils.)
- Confirm that page 33 provides information about how paleontologists use many different tools in the field and laboratory.
- Draw students' attention back to the text and display pages 34–35. Prompt students to listen carefully for the names and uses of specific tools on these pages. Consider inviting them to show a silent signal (a quiet thumbs-up; touch forehead or nose) each time they hear the name of a paleontologist's tool.
- Read pages 34–35 aloud.
- Pause and invite students to turn and talk to an elbow partner:
“What is one tool that a paleontologist uses to study fossils?” (Responses will vary, but should include information from pages 34–35.)
- Invite a few students to share out. As students share out, record several tools from pages 34–35 and post the corresponding Tools Paleontologists Use for Study picture cards as you add the tools to the anchor chart. Refer to the **Tools Paleontologists Use anchor chart (answers, for teacher reference)** as necessary.
- Draw students' attention back to the text and read page 36 aloud.
- Share that, in the next lesson, students will learn more about famous paleontologists and the fossils they discovered and studied.

Meeting Students' Needs

- Before the focused read-aloud, provide white boards and white board markers as an option for students to record (drawing or writing) their ideas. This helps to scaffold active listening for key details. (MMR, MMAE)
- For ELLs: Invite students to recall and describe one way they worked toward a similar learning target in the previous lesson.
- For ELLs: Mini Language Dive. Ask students about the meaning of the sentence from page 35 of *Paleontology: The Study of Prehistoric Life*: "Once the fossils reach the laboratory, workers use pliers and saws to remove them from the plaster." Examples:

"What tools do we learn about in this sentence?" (pliers and saws)

"How do paleontologists use these tools?" (They use them to remove fossils from plaster.)

"When do paleontologists use these tools? How do you know?" (when the fossils are in the laboratory; I know because the beginning of the sentence tells us.)

"Plaster is a wet substance that hardens when it dries. Why do you think fossils have plaster on them when they arrive in the laboratory? What, in the text, makes you think so?" (Scientists wrap fossils in plaster to protect them when they get moved. The sentence before this one says that when the plaster dries, it is safe to transport them.)

"Can you say this sentence in your own words?" (Responses will vary, but may include: Paleontologists use saws and pliers to remove fossils from plaster.)

- For ELLs: For lighter support, consider discussing the meaning of the words *discover* and *study* in the middle column titles on the Tools Paleontologists Use anchor chart. Ask: "What does it mean to *discover* something?" (find something) "What does it mean to *study* something?" (to look at something very carefully; to learn a lot about it) "How are the tools that paleontologists use to *discover* fossils different from/the same as the tools they use to *study* fossils?" (Responses will vary.)
- For ELLs: Provide sentence frames for students to use when discussing what they learned about tools paleontologists use to study fossils. Examples:
 - "One tool paleontologists use to study fossils is ____."
 - "Paleontologists use ____ to ____."

Work Time

B. Preparing for Independent Writing: Paleontologists Study Fossils (20 minutes)

- Transition students back to their workspaces.
- Direct students' attention to the posted learning targets and read the second one aloud:

"I can collaborate to write a paragraph about the tools paleontologists use to study fossils."
- Remind students that, in the last lesson, they wrote a paragraph about the *tools paleontologists use to discover fossils*.

- Reread today’s learning target, emphasizing the following words: “I can collaborate to write a paragraph about the tools paleontologists use to study fossils.”
- Share that today students will work together to write a paragraph. This will require thinking, as the writers, about what information is most important to share with the reader.
- Display and invite students to open to page 2 of their **paleontologist’s notebook**.
- Read the title of page 2 aloud:
“Tools Paleontologists Use to Study Fossils.”
- Remind students that the first sentence in a paragraph is the focusing statement and tells the reader what the main topic is.
- Invite students to turn and talk with an elbow partner:
“What could the focusing statement of this paragraph say?” (Responses will vary, but should include some information about tools used to study fossils.)
- If productive, cue students to expand the conversation by saying more and to listen carefully and seek to understand:
“Can you say more about that?” (Responses will vary.)
“Who can tell us what your classmate said in your own words?” (Responses will vary.)
- Invite several students to share out. After hearing several ideas, record a focusing statement on the displayed version the paleontologist’s notebook. Invite students to record the same sentence at the top of the lined portion on page 2 of their notebook using a **pencil**.
- After 2–3 minutes, refocus students whole group.
- Point to the recorded focusing statement and invite students to read it aloud with you.
- Pointing to the blank lines in the middle, explain that here students will write several sentences that include supporting details about tools paleontologists use to study fossils. Refer to the posted Tools Paleontologists Use anchor chart.
- Model composing a sentence orally about a tool:
“Paleontologists use microscopes to view tiny fossils.”
- Invite students to turn and talk to an partner using the sentence frame:
“Paleontologists use ____ to ____.”
- Invite several students to share their sentences with the group.
- Focus students’ attention on page 2 of their paleontologist’s notebooks. Tell them they will now write two sentences with supporting details about the tools paleontologists use to study fossils. Share that they will also draw a picture to match the information in their sentences.
- Give students 4–5 minutes to work. As students work, circulate and provide support. As needed, re-model the sentence frame and refer students to the Tools Paleontologists Use anchor chart. Also, consider asking students to read their sentence aloud and/or describe the content in their drawings.
- Refocus students whole group.
- Remind students that the concluding statement tells the reader the main idea again.
- Invite students to turn and talk with an elbow partner:
“What could the concluding statement of this paragraph say?” (Responses will vary, but should include some information that restates the main idea.)

- If productive, cue students to expand the conversation by saying more and to listen carefully and seek to understand:
“Can you say more about that?” (Responses will vary.)
“Who can tell us what your classmate said in your own words?” (Responses will vary.)
- Invite several students to share out. After hearing several ideas, record a concluding statement on the displayed version of page 2 of the paleontologist’s notebook. Invite students to record the same sentence at the bottom of the lined portion on page 2 of their paleontologist’s notebook.
- After 2–3 minutes, refocus students whole group.
- Point to the recorded concluding statement and invite students to read it aloud with you.
- Provide brief directions for cleanup and invite students back to the whole group area.

Meeting Students' Needs

- For students who may need additional support with fine motor skills: Provide support with the physical act of writing during independent writing by offering a slanted board, pencil grips, or a scribe. (MMAE)
- For ELLs: Pair students with a partner of greater language proficiency. The partner with greater language can serve as a model in the group, initiating discussions and providing implicit sentence frames.
- For ELLs: During the turn and talk, write the suggested sentence frame on the board for students to refer to as they share. When students return to tables, encourage them to use the sentence frame to say their sentence aloud as many times as needed before writing.

Closing and Assessment

A. Building Vocabulary: Fossils Word Wall (5 minutes)

- Show students the **Fossils Word Wall card** for *laboratory* and follow the same routine established in Lesson 8: provide its definition, clap out its syllables, use it in a sentence, and place the card and its picture on the **Fossils Word Wall**.
- Remind students that today they learned about many tools that paleontologists use in laboratories.

Meeting Students' Needs

- To foster a sense of community and provide options for physical action after students have added to the Fossils Word Wall, invite the whole class to join you in a special applause (e.g., silent cheer, firecracker, hip-hip hooray). (MMAE, MME)
- For ELLs: Provide visual support next to the word *laboratory* on the Word Wall and invite students to share the translation of the word *laboratory* in their home languages. Invite all students to repeat the translation in a different home language.

Closing and Assessment

B. Pinky Partners: Reflecting on Perseverance (5 minutes)

- Tell students they are now going to use the Pinky Partners protocol to reflect on their ability to demonstrate perseverance when doing a task that is not easy. Remind them that they used this protocol in Module 1 and review as necessary using the **Pinky Partners Protocol anchor chart**. (Refer to the Classroom Protocols document for the full version of the protocol.)
- Direct students' attention to the **Working to Become Effective Learners anchor chart** and review the definition of perseverance as needed.
- Guide students through the Pinky Partners protocol using the following prompts:
 - “How did you show perseverance in your work today?” (Responses will vary.)*
 - “How did you notice a classmate showing perseverance in his or her work today?” (Responses will vary.)*
- Provide sentence frames if needed:
 - “I showed perseverance today when I ____.”
 - “____ showed perseverance today when he or she ____.”
- Refocus students whole group and invite several students to share out. Encourage them to cite specific examples of how they or other students demonstrated perseverance in their daily work.
- If productive, cue students to listen carefully and seek to understand:
 - “Who can tell us what your classmate said in your own words?” (Responses will vary.)*
- Preview the next lesson by telling students that they will read and write about famous paleontologists.

Meeting Students' Needs

- For students who may need additional support anticipating and managing frustration: Model what to do if they do not agree or understand what their Pinky Partner shares. (Example: “As I am listening to my partner share, I am not judging their reflection. I am listening respectfully as they share.”) (MME)
- For ELLs: Display, repeat, and rephrase the question:
 - “How did you show perseverance in your work today?”*
- Rephrase the question:
 - “What did you do to persevere when [sharing with your partner/writing] today?”*