

Day 12			
What Information Can Fossils Give Us? (Part 2)			
Reading Strategy: practice making evidence-based claims orally and in writing.		Science Concept: fossils provide a record of how organisms changed over time in response to the changing environments they lived in.	
Reading TEKS: 3.7(C), 3.13(H)	CCSS: SL.3.2, W.3.7, W.3.8	NGSS: 3-LS4-1	Science TEKS: 3(b)3(C), 3(b)(2)(D,F)
Materials for Mini-lesson on Science-Based Disciplinary Literacies (referred to as Mini-lesson): chart paper, markers, sample inquiry chart.			
Materials for Inquiry Circles: team inquiry charts, pencils, variety of nonfiction texts for each group, access to websites and online books, access to all anchor charts introduced.			
Materials for Guided Science Investigation: see instructions beginning on page 3.			
Content Vocabulary: Claim —a statement that says something is true based on observations or an opinion. Evidence —data collected from an investigation that can be used to support explanations and answers. Data —facts or information collected during an investigation (e.g., images, measurements, or words). Reasoning —thinking about and explaining <i>how</i> the evidence supports a claim. Extant —refers to a species that is still living. Extinct —refers to a species that is no longer alive. Specie —a classification of organisms that share characteristics and are alike in some manner.			
Science and Literacy Connection: scientists formulate claims about their investigations, then use evidence acquired through their work to validate them.			

Mini-lesson—15 minutes

OVERVIEW

Today’s mini-lesson should be used as a time to review and practice the reading strategies introduced over the past two days: making evidence-based claims orally and in writing. Teachers are encouraged to use this time to best meet the needs of their learners.

Teachers can determine if the mini-lessons will be facilitated with the whole class or a particular inquiry circle team that needs additional support. If you are working with a specific team, we suggest your other learners spend additional time working in inquiry circles.

You may want to return to the information in the mini-lesson from Days 10 and 11 with some or all of your teams.

Science Inquiry Circles—30 minutes

OVERVIEW

Scientists often work in teams when conducting inquiry and investigations. Today, we will work in inquiry circles teams to investigate different questions about plant groups.

Prior to starting the inquiry circle work, be sure to have texts and technology available for your learners. You have been provided with a list of suggested books and websites titled Plant Resources in the Day 12 folder. These are suggestions, and you may use other resources. You may need to provide learners with specific instructions on how to access websites within your school district, or you may want to create a click sheet of approved websites for learners to be distributed in your learning management system (Google Classroom, Schoology, etc.). As teams begin working, you may have some groups working online while others are working with traditional texts. This will depend on your access to technology and texts.

PROCEDURE

Each statement in quotation marks below contains suggested wording the teacher may choose to use for the lesson; teacher actions are in parentheses.

Before Inquiry Circles

1. “It is time to get into our inquiry circle groups. You will be with the same team as yesterday, but we will rotate the scientific roles.” (Assign roles at your discretion and have the Equipment Directors gather the inquiry chart for their team).
2. “You are already familiar with the inquiry chart and the inquiry questions. Today we will continue to look for answers to all of your questions.”
3. “As you look for answers to your questions, you will practice your roles as scientists. You will do this because scientists have a special way of looking for answers. One way to look for answers is to do investigations. This means that they look at text (in books and on the computer) that might help them find information they can use.”

During Inquiry Circles—20 minutes

4. “Today you will continue to investigate your plant group by using preselected websites on the computer (or tablet) and preselected texts.” (The websites and texts are available in the Plant Resources document.)
5. “We have anchor charts to help guide your thinking. Do not forget to use them while working.” (Refer to all of the anchor charts already introduced. Remind learners that each day they will practice the literacy mini-lesson during this inquiry circle time. Once you have taught several mini-lessons, they can use any of the reading strategies taught, not just the one for that day.)
6. “The Lead Scientist will guide all inquiries for the day by picking which question(s) will be answered. The Data Scientist will record all source information and the answers to your inquiry questions on the inquiry chart. Remember, it is important to record in your inquiry chart where you found the information (source) so you do not plagiarize.” (Point out to learners where sources are located on the inquiry chart and how one source may answer various questions. Remind your learners to record the title and author for texts and the URL for websites.) “The Lab Director and the Equipment Director must help find the answers to the questions online and in texts.” (Be sure to model for learners where to record their source and where to record answers to specific questions. Explicitly show them how the inquiry chart will organize their progress.)
7. “My role is to help guide the inquiry circles, but I expect you to work as a scientific team to solve your problems together.” (While teams are working together, walk around the room to facilitate as needed.)

After Inquiry Circles—10 minutes

8. “As we conclude our inquiry circles for today, each team will have a chance to share the questions they answered, what they accomplished, and what literacy strategies they used. The Lab Director will lead the discussion about today’s results, and the Data Scientist will share your responses with the class. Discuss with your team, considering what you learned about your plant group. What problems did you encounter? How did you resolve those problems? Did you use a reading strategy? Which one, and how did it help you? What new questions do you have?” (After you have allowed the teams to gather their thoughts, have the Data Scientist share with the class.)
9. (After all learners have shared, thank them for their hard work, and point out any excellent behaviors you observed. If you saw an outstanding example of using a reading strategy or collaborative work, explicitly point it out. If you notice any problems in the teams during the lessons, take a moment to point them out, and explain your expectations for all future inquiry circles. Collect all inquiry charts or have learners put them in their normal classroom place for ongoing work so they can easily access them.)

Guided Science Investigation—45 minutes

OVERVIEW

Learners used all of their resources to make claims about the identity of fossils. Today each team will be given a few minutes to defend a claim for one fossil and explain how their evidence supports their claim.

When all teams have had a chance to defend their claim, the teacher will reveal the identity of the fossils using the [Plant Fossils Key](#) slideshow in the Day 12 folder.

GUIDING QUESTIONS

What claims have we made about the plant fossils? What information did we use to help us identify the plant fossils? How does that data provide the evidence to support our claim?

BACKGROUND INFORMATION

After an investigation, scientists make claims about their work based on their findings. They analyze and organize all of their information and look for patterns or connections that can provide the evidence they need to support their claims. The next step is to explain *how* the evidence supports their claim.

Often, new questions arise, and scientists have to go back and re-evaluate their claims and their evidence, which sometimes lead to a new direction for their investigation!

Teaching children how to organize their information logically as scientists do helps them understand how to support an explanation by using relevant data. Moreover, making the connections between their claims and evidence develops reasoning skills that lead to successful argumentation in science or any other core discipline.

SAFETY

There are no safety concerns.

MATERIALS

Each team member will need:

- a copy of their Paleobotanist Log
- science notebook

Each team will need:

- Plant Observations chart
- all bags of representative plant images
- Leaf Morphology chart
- access to inquiry charts

Teacher will need:

- Paleobotanist Log (paper copy or electronic version)
- Day 11 Plant Fossils Images PPT (if color copies not created yesterday)
- Day 12 Plant Fossils Key

SET UP

- Make plant fossil images available digitally (if color copies were not created yesterday).
- Be prepared to share the Day 11 Plant Fossils Images and the Day 12 Plant Fossils Key electronically for students.
- Make all charts, Paleobotanist Logs, and Making Connections documents accessible in a designated area.

DAILY OBSERVATIONS

Observations have ended.

PROCEDURE

Engage

1. Announce, *It's time for the big reveal! Today we will share your successes as paleobotanists in identifying fossils!*
2. Distribute the Paleobotanist Logs. Explain that you will project a fossil image and ask for a volunteer who identifies the fossil to share their claim and how the evidence they used supports their claim.
3. Tell them that after the volunteer has shared, you will give the others who identified the same fossil a chance to respond.
4. Then, after everyone has shared their findings, you will reveal the identities of the fossils!

Explore/Explain

5. Begin the Fossil Images PPT, projecting one image at a time. Allow time for the children to share and discuss their findings with each other. If needed, offer prompts to clarify what the children are saying, such as, *Can you tell me more about how _____ supports your claim?*
6. After all children have shared their findings, project the Fossil Images Key PPT. As you reveal the identity of each fossil, acknowledge the claims and evidence the children presented that were correct, or very close. It is important to validate their work!

Elaborate

7. After all of the images have been identified and discussed, ask the students to take a few minutes to reflect on their work. How did the new knowledge they have about plants help them identify the fossils? Have them turn to a partner and share their thoughts.
8. Remind them of the square and circle activity they did in on Day 10. Once again, have them turn to a partner and share their thoughts about what they had written in their circles. Ask them to consider if they are ready to move that information into a square. As partners share, walk among them and listen to their responses.
9. Commend the teams for their work, and point out any outstanding examples of teamwork you observed today.
10. Explain that they will spend the last three days of this unit working on and presenting a final product: a culminating project that will give them the opportunity to share their “expertise” on plants with others!

Evaluate

11. Was the evidence children used to support their claims reasonable?
12. Did learners apply prior or new knowledge in their written or verbal communications?
13. Was any information from the science inquiry circle work and/or their science notebooks included?
14. Are learners using science language in their communications, either written or verbal?

Expanded Standards

Reading TEKS: 3.7 Response skills: listening, speaking, reading, writing, and thinking using multiple texts. The learner responds to an increasingly challenging variety of sources that are read, heard, or viewed. The learner is expected to (C) use text evidence to support an appropriate response. 3.13 Inquiry and Research: listening, speaking, reading, writing, and thinking using multiple texts. The learner engages in both short-term and sustained recursive inquiry processes for a variety of purposes. The learner is expected to (H) use an appropriate mode of delivery, whether written, oral, or multimodal, to present results.

CCSS: SL.3.2 Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally. W.3.7 Conduct short research projects that build knowledge about a topic. W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

NGSS: 3-LS4-1 Some kinds of plants and animals that once lived on Earth are no longer found anywhere. Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments.

Science TEKS: 3(b)3 The learner knows that information, critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions. The learner is expected to (C) connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists. 3(b)2 The learner uses scientific practices during laboratory and outdoor investigations. The learner is expected to (D) analyze and interpret patterns in data to construct reasonable explanations based on evidence from investigations and (F) communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion.