

Day 12: What Is Scientific Evidence?

- 
Mini-Lesson Today is a time to practice previously taught reading strategies as needed.
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Inquiry Circles Today is the last day for completing the Inquiry Charts before work begins on the culminating project.
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Guided Science Investigation Children learn how to develop claims about their findings then use evidence from their investigations to support the claims.

Literacy Strategy: practice making connections.	Reading TEKS ELA.1.6E	CCSS RI.1.3
Science Concept: Scientists rely on evidence to support claims and to explain things. Scientific evidence comes from the information and data collected during an investigation.	Science TEKS 2018–19: 1.2E 2024–25: 1.3A, 1.3B	NGSS 1-LS3-1
Science and Literacy Connection: scientists and strategic readers make connections between what they already know and new information that they collect through observations, investigations, and reading.		

Mini-Lesson (15 minutes)



OVERVIEW

Today's mini-lesson should be used as a time to practice the reading strategies previously taught in this unit. Teachers are encouraged to use this time to best meet the needs of their learners. Perhaps your class needs more time with the mini-lesson from the day before, or you may choose to circle back to mini-lessons from a week ago. The choice is yours; we just ask that you use this time to practice!

Teachers should determine if this mini-lesson will be facilitated with the whole team or a small team (i.e., a particular inquiry circle team) that needs additional support. If you are working with a small team, we suggest that your other learners spend additional time within the inquiry circles.

Science Inquiry Circles (30 minutes)

OVERVIEW

Today is the last day for completing the Inquiry Charts before work begins on the culminating project. Children will finish work on unanswered questions or look for additional information from different resources.

MATERIALS

Each team needs:

- pencils
- team Inquiry Chart
- exploratory texts/media (or a Nearpod or similar tool created by the teacher; see the “Exploratory Texts and Media” spreadsheet for ideas)
- access to pill bug Inquiry Chart and all mini-lesson anchor charts used to date

Teacher needs:

- class Inquiry Chart about pill bugs

PROCEDURE

Each *italicized statement* below contains suggested wording the teacher may use for the lesson; additional teacher actions or considerations are in parentheses.

Before Inquiry Circles

1. *It is time to get into our inquiry circles. You will be with the same team as yesterday.*
2. *We have answered most (or all) of our Inquiry Chart questions. We will use our Inquiry Chart today to determine what questions still need to be answered or to add information from a different book, website, or eBook. **Tomorrow we will start on our culminating project, so we need to be sure to complete the Inquiry Chart today.***
3. *Now, teams will work together on their Inquiry Charts.* (Be sure to display the class Inquiry Chart as a model.)

During Inquiry Circles (20 minutes)

1. *As you continue to look for information, do not forget that it is important to record your resources on the Inquiry Chart as you complete it.* (Remind learners that the class Inquiry Chart about pill bugs is visible as a guide. Also, you may choose to be more explicit for your class and only allow them to answer one question at a time daily. Use your judgement on the level of guidance.)
2. *Remember, we have anchor charts to help guide your thinking. Do not forget to use them while working.* (Refer to the “Inquiry Toolbox” anchor chart and all of the mini-lesson anchor charts. Remind learners that they can use any of the reading strategies during inquiry circles.)
3. *My role is to help guide the inquiry circles, but I expect you to work as a team to solve your problems together.* (While teams are working together, walk around the room to facilitate as needed.)

After Inquiry Circles (10 minutes)

1. *As we conclude our inquiry circles for today, each team will have a chance to share the questions they answered, as well as what they accomplished and what reading strategies they used. The Lab Director will lead the discussion about today's results. Discuss what the team learned about its outdoor organism. Which reading strategy did the team use? How did it help the team? Did the team have any problems? How did the team resolve those problems? (While teams are working together, walk around the room to facilitate as needed.)*
2. *The Data Scientist will now share with the entire class either something the team learned about their outdoor organism, a reading strategy, or how the team solved a problem. (Try to encourage teams to share a variety of things—you do not want just facts about outdoor organisms, just mini-lesson reading strategies, or just cooperative learning strategies. If you saw a great example in action, encourage that team to share with the entire class.)*

Guided Science Investigation (30–45 minutes)

OVERVIEW

Children learn how to develop claims then use evidence from their investigations to support them.

GUIDING QUESTIONS

What is a claim? What is evidence? What information or data from my investigation can I use as evidence?

BACKGROUND INFORMATION FOR THE TEACHER

Scientific evidence is data used to support answers to questions or claims generated by investigations. Evidence can come from your own investigation, the investigations of others, and from reasoning. Using a **claim, evidence, and reasoning (CER)** approach teaches children how to organize information logically, the way scientists do.

It also helps them understand how to support an explanation by using relevant data. **At this early age, they learn to “back up” what they say with tangible evidence, in this case, what they “see.”** Moreover, making the connections between their claims and evidence begins to develop reasoning skills applicable to any other core discipline.

SAFETY

There are no safety issues.

MATERIALS

Each team member needs:

- “Pill Bug Investigation” journal
- 1 copy of the “Team CER Chart” (on 8½” x 11” paper)
- pencil

Each team needs:

- photos of the team’s chosen food item taken by the teacher before and at the end of the investigation

Teacher needs:

- 2 sheets of chart paper
- copy of the “Practice CER Chart” page

SETUP

Before the class:

- Label one sheet of chart paper “Practice CER Chart.”
- Label another sheet of chart paper “Team CER Chart.”
- Using the “Practice CER Chart” document, write the following statements **on both sheets of chart paper**:
 - Our prediction was, **We think pill bugs will eat**_____.
 - (Claim) **We can now say that pill bugs (do or do not eat)** _____.
 - (Evidence) **We know because**_____.
 - (Reasoning) **We think** _____.
- Place both sheets of chart paper where they can be seen by the class.
- The teacher will make copies of the “Team CER Chart” on 8½” x 11” paper (1 per learner).

DAILY OBSERVATIONS

Pill bug observations have ended.

PROCEDURE

Engage

1. Ask learners, *What do we now know about pill bugs?* Accept responses. Listen for connections to the other organisms (decomposers) they have been researching. Use the class Inquiry Chart about pill bugs to prompt them, if needed.
2. Remind the class, *Last week you set up investigations to see what food pill bugs liked best to eat. And every day you observed them to see what they were doing and what was happening to their food.*
3. *You made predictions about what food pill bugs would eat. Now it’s time to see if your predictions were correct!*

Explore/Explain

1. Ask the Equipment Directors to hand out the “Pill Bug Investigation” journals and copies of the “Team CER Chart” on 8½” x 11” paper (1 copy per learner).
2. Explain: *After scientists finish an investigation, they make a **claim**, or say what they think is true about their work. However, they cannot simply say “it’s true”; they have to **back it up** with information, or **evidence**, from their investigation.*
3. *This is similar to being a detective and looking for clues to solve a crime! Before the detective can “claim” or say that someone is guilty of a crime, the detective has to have evidence (clues) to back up the claim.*
4. *Today, I will show you how to make a **claim** about an investigation and how to **back it up** with information. We will use this CER chart to organize our information. Point to the chart paper labeled “Practice CER Chart” and tell learners that the C stands for claim, the E for evidence, and the R for reasoning. First, I will show you how to complete a CER chart; then we will work together to complete one for your team!*
5. *Let’s pretend I just finished a science investigation with a team, and we are ready to make a “claim.” Remember, a claim is a statement of what we think is true. First, we need to share the prediction we made.*

On the chart paper labeled “Practice CER Chart,” point to and read aloud the prediction stem sentence **“We think pill bugs will eat ____.”** Remind them that this is just an example, so you will write in a food. (**Note:** select a food that no team has picked and add it to the statement as children watch.) For example, **“We think pill bugs will eat green beans.”**

6. Tell learners, *My team’s prediction may or may not have been correct, but either is okay. The important thing is what we can now say. Scientists call this making a claim.*
7. Point to and read the next stem sentence on the chart: **“We can now say that pill bugs ____.”** As the children watch, write in **“do not eat green beans.”** Explain that this is your team’s claim, or what your team thinks is true.
8. Ask, *But how do we know that the pill bugs don’t eat green beans?* Point to the prompt **“We know because ____.”** Ask for their ideas about how to answer this: *What would be a clue that the pill bugs didn’t like the green beans?* Accept responses.
Then share that your team thinks the pill bugs didn’t like the green beans because all the green beans are still there—the pill bugs didn’t eat any! Finish the statement by writing **“all the green beans are still there.”** Explain that this is the **evidence** your team has that will **back up** or prove its claim.
9. Next, point to the prompt **“We think ____.”** Explain that this is where they will write **what the evidence is telling your team. This is the “reasoning” part of the chart.**
Ask, If all the green beans are still there, what does that tell us? Accept responses. (Maybe they didn’t like the taste, or maybe they started to rot?)
10. *So, we can write in our answer for “We think ____”* (write in **“they didn’t like the taste”** or the **evidence suggested by learners**).
11. Tell learners, *We now have a complete CER chart with our claim (or prediction), the evidence that backs up our claim, and the reasoning, or what the evidence tells us!*

Elaborate

1. *Now, let’s begin working on your team CER charts.* Point to the chart paper labeled “Team CER Chart” and explain: *You will write in your team information in the same way we did for the practice CER chart, as I guide you through the steps.*
2. *Each team member will complete his or her own chart, but you will work as a team to discuss and help each other with your answers.*
3. Hand out the labeled food photos. Remind the teams that they also have the pictures you took of the food in the mini-habitats and the drawings they made in their journals. This is more evidence they can use to support their claim!
4. Remind learners, *Each team picked a different food to place in their habitat.* Point to the chart paper labeled “Team CER Chart” and read, “Our prediction was, **We think pill bugs will eat ____.**” *On your charts, write the name of your team’s food choice here.* Allow time for them to write.
5. *Next, you will write your claim, or what you think is true.* Point to the chart paper labeled “Team CER Chart” and read, **“We can now say that pill bugs (do/do not eat) ____”** (claim). *Think, did your pill bugs eat your food or not?* Point to the chart paper labeled “Practice CER Chart” to remind learners of how you wrote in your answer. Allow time for them to write.
6. *Now, how do you know they did or did not eat that food? What is your evidence or clue?* Point to the chart paper labeled “Team CER Chart” and read, **“We know because ____”** (evidence). Refer back to the chart paper labeled “Practice CER Chart” and read what you wrote. Ask, *What will you write here?* and point to the same area of the chart paper labeled “Team CER Chart.” Provide guidance as needed.

7. Tell learners, *The last thing you need to write about is what the evidence is telling you.* Point to the chart paper labeled “Team CER Chart” and read, “**We think _____**” (reasoning). Again, refer back to the chart paper labeled “Practice CER Chart” and read what you wrote. Ask, *What will you write here?* and point to the same area on the chart paper labeled “Team CER Chart.” Move between the teams and provide help as needed.
8. When all the work is completed, collect each learner’s team CER chart for review.
9. Congratulate your teams! *You have conducted your own investigations in teams just like scientists do, with each of you having a special role. And you gathered and recorded your own information in your journals with drawings and words. Scientists call that “authentic data,” information that comes from your own work! Tomorrow you will begin to work on a special project to share the work you have done and what you have learned.*

Evaluate

1. Did learners communicate a reasonable understanding of how to make a claim?
2. Did they communicate an understanding of how to “back up” their claim with evidence?
3. Are learners using science language in their communications (verbal or written)?

Science Language

- A **claim** is a statement of what you think is true based on observation and evidence.
- **Evidence** is data collected from the investigation that supports (backs up) explanations and answers.
- **Data** are facts and information (such as images, words, and measurements) collected during an investigation.
- **Reasoning** means thinking about and explaining how the evidence supports a claim.

Expanded Standards

Reading TEKS

ELA.1.6E: make connections to personal experiences, ideas in other texts, and society with adult assistance.

CCSS

RI.1.3: describe the connection between two individuals, events, ideas, or pieces of information in a text.

NGSS

1-LS3-1: Science & Engineering Practices: make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.

Science TEKS

2018–19: 1.2E: communicate observations and provide reasons for explanations using student-generated data from simple descriptive investigations.

2024–25: 1.3A: develop explanations and propose solutions supported by data and models. **1.3B:** communicate explanations and solutions individually and collaboratively in a variety of settings and formats.