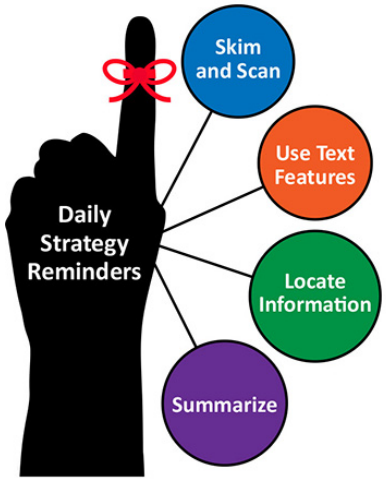
DAY 10 Be a Citizen Scientist			
Reading Strategy: Making Connections Practice		**Science Concept:** Citizens as Scientists	
Reading TEKS: 2.6E	**Figure 19:** Reading/ Comprehension Skills F	**ELPS:** Speaking K-12, 19 TAC 74.4(c)(4)	**Science TEKS:** 2.2(A); 2.3(C)
Materials for Reading Mini Lesson: chart paper, markers, butterfly inquiry chart, butterfly text to model strategy			
Materials for Inquiry Circle Groups: group inquiry charts, pencils, variety of nonfiction texts for each group, access to websites and online books			
Materials for Science Whole Group Lesson: See section for details.			
Content Vocabulary: **Citizen Scientists —** People who volunteer to help professional scientists study nature, conduct investigations, and work to protect and preserve the environment. **Collaboration —** Working as a team to accomplish a goal. **Data —** Information collected to answer a question. **Inspire—** To give someone the confidence, desire or enthusiasm to do something. **Migration —** The seasonal movement of animals from one region to another. **Scientific Proposal —** A document that gives specific information about research questions, importance of study, logistics, and budget. **Scientist —** Person who is an expert in or studying aspects of the natural or physical world. **Tagging —** To attach a label to identify or monitor. **Team —** Group of persons who work together to accomplish a goal.			
Science and Literacy Connection: Scientists make connections to the research of others before them. They can be inspired by something they've read, heard, or seen, and this may lead them to ask new questions.			

For an expanded version of the Standards listed above, see page 6.

Reading Mini-lesson — 15 minutes

OVERVIEW

Mini lesson practice 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 students. 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 group or a small group (i.e., a particular inquiry circle group) who needs additional support. If you are working with a small group, we suggest your other learners spend additional time within the inquiry circles.

Explain the strategy:

- **Tell what the strategy is (declarative knowledge)**
  - Say something like, "Today we will continue to practice accessing and making connections. It is thinking about the text and how it relates to myself, another text, or the world. I can also think about science and how it relates to myself, other sciences, and the world." Refer to the anchor chart previously made with the class.
- **Tell when and why to use the strategy (conditional knowledge)**
  - Say something like, "Yesterday, we talked about how I know to use this strategy (making connections) because the text or science investigation reminds me of something I already know. This strategy is important because my brain stores information in neat compartments (like drawers, or buckets). As I observe the world around me (or read), my brain is always trying to 'match' the new information with what I know. Some people call this schema. Making connections helps me organize my new information (or observation) so I can find/locate it later."
- **Tell how to employ the strategy (procedural knowledge)**
  - For this section in the mini-lesson, the teacher may choose to model the strategy again for the class. Be sure to use a different text or page in the text than what you modeled yesterday.
  - Teachers are encouraged to share examples of students using this strategy from the day before. Say something like, "Mohamed's group did a great job yesterday making connections. I was so impressed when they____." Teachers are also encouraged to invite the groups to share with their peers (you may need to scaffold this and prepare the students for sharing beforehand.)
  - If you choose to model this strategy again, say something like (while you model the strategy), "The first thing I do is recognize that I already know something about the topic. I can think about what aspects of the old information can help me understand the new information."
  - "I can ask myself literacy questions like 'How does this text relate to something I've already done before?' 'How does this text relate to something I have read before?' or 'How does this text relate to something that I've seen in a movie/song or that someone has told me about before?'"
  - "I can also ask myself science questions like 'Have I observed anything like this effect in my life?' 'Have I seen similar effects in other experiments?' or 'How might this effect interact with others in the real world?'"
  - "Now, I will use those connections that I've made to help me understand what I'm seeing (in science) or reading (in a text). Once I've made the connection, now what I know and think has been changed.

Practice in text (print, video, or interview)
Post the anchor chart in your classroom so students can refer to it while in their inquiry circles. Encourage scientists to use the strategy during in their Inquiry Circles.

Inquiry Circle Groups — 30 minutes

OVERVIEW

Scientists work in teams when conducting research and experiments. Each day of this unit, students will work in inquiry groups while embodying the role of a scientist. They will do so by taking on roles of scientists in research by speaking like a scientist, reading liking a scientist, and writing like a scientist.

PROCEDURE

Before Inquiry Circle Groups — 5 minutes

1. Say something like, "It is time to get into our inquiry circle groups. You will be with the same research team as yesterday."

2. Say something like, "When we research organisms, we will practice our roles as scientists. We will do this because scientists have a special way in which they observe the world, read scientific texts, and write reports. There is no better way to learn about science than to become a scientist!"

During Inquiry Circle Groups — 20 minutes

1. Say something like, "We have anchor charts to help guide your thinking. Do not forget to use them while in groups." Refer to the "Language of a Scientist" anchor chart and the daily anchor chart. Remind students that they can use all the reading strategies taught, not just the one for that day.

2. "My role is to help guide the inquiry circle groups, but I expect you to work as a scientific team to solve your problems together."

3. "Do not forget to answer your research questions and record it on the inquiry chart. It is important to record your sources on the inquiry chart as you complete it." Be sure to explicitly explain how students should use the chart.

4. While groups are working together, walk around the room to facilitate as needed.

After Inquiry Circle Groups — 5 minutes

1. Say something like, "As we are concluding our inquiry circle groups for today, each group will have a chance to share what they accomplished and learned."

2. "The Lab Director should lead the discussion with their inquiry circle group about today's results. For example, what did you learn about your organism? Which reading strategies did you use? What problems did you encounter? How did you resolve those problems?"

3. "The Data Scientist will now share with the entire class either something the group learned about their organism, which reading strategy(ies) where used, or how the group solved a problem."

Science Whole Group Lesson — 30 minutes

OVERVIEW

In this activity, students will gain a better understanding of how citizen science allows anyone to participate and collaborate in authentic science research.

GUIDING QUESTIONS

What are some things that citizen scientists do? How do they help scientists in their research and investigations?
Who can be a citizen scientist?

BACKGROUND INFORMATION

Anyone can become a citizen scientist. All it takes is a love of science and nature and a willingness to help in research and to work to protect and preserve living things and their environment. Monika Maeckle, featured in the slideshow, chose to study, protect, and educate others about butterflies. She created the Texas Butterfly Ranch in central Texas. The ranch provides a safe place for migrating butterflies; conducts research; and educates the public about butterflies and protecting them.

As a citizen scientist Ms. Maeckle began her studies by raising caterpillars in her yard. She followed with investigations and experiments to determine the best host plants for supporting butterflies within the local climate.

In her work, Ms. Maeckle follows the same procedures that scientists follow. She conducts research on migration patterns, population numbers and environmental factors that might affect the health of the migrating monarchs. In collaboration with scientists, she collects and shares data during the annual migration starting in spring in the mountains of Mexico, as the monarchs migrate north through the U.S. and back. Ms. Maeckle has assisted scientists in tracking monarch butterfly migration routes by catching and tagging butterflies and reporting tagging data.

The return migration south through the San Antonio, Texas, area peaks during the last two weeks in October. Using data collected during her investigations, Ms. Maeckle's work helps scientists predict how populations are reacting to environmental changes such as climate change.

SETUP

- Pre-cut student pages
- Prepare PowerPoint® file for presentation

MATERIALS

- "Be A Citizen Scientist" PowerPoint® file
- "I Am Citizen Scientist" student page (one per set)
- Projector/screen
- Chart paper or whiteboard
- Glue, scissors
- Pencils
- Science notebooks

DAILY OBSERVATIONS

Give students time to observe their organisms (whether they are in the larvae, pupa, or adult stage), take measurements of the larvae (if applicable), and record their observations in their science notebooks. Facilitate group discussions by asking questions like, "What did you notice?" "What has changed since the last time you observed your organisms?"

PROCEDURE

Engage

1. Ask students the following.
    a. How many of you are scientists? Accept all responses and allow time to explain their answers.
    b. What does a scientist do?

2. Record their answers on chart paper or the white board. You will add to this list after the slideshow.

3. Give students a short explanation of what they will be doing today. Say something like, "Today we will learn about a special kind of scientist – a citizen scientist. This citizen scientist works with monarch butterflies!"

Explore

4. Project the slideshow, reading for the students and answering any questions as they arise.

5. At the end, pause for turn and talk. Explain that the word "inspires" means that something excites you enough to want to lean more about it.

Explain

6. Revisit the questions asked before the slideshow began.

7. Guide your students to the understanding that they can ALL be scientists. Like Monika Maeckle, they need to find something that inspires them.

8. Ask "What inspires you?" List their answers on chart paper or on the board.

9. Ask students for their ideas about what they would like to do as a citizen scientist. List their ideas on chart paper or on the board.

Elaborate

10. Explain that scientists have to write proposals for the research they want to do. The proposal is a paper or document they use to explain what kind of research they are going to do (what question are they trying to find an answer for) and why is the research important.

11. Tell your students that they will write a short sentence or two explaining what they would like to do as a citizen scientist.

12. Hand out the "I Am A Citizen Scientist" page to each team of 4 students. Have teams cut the cards apart. Read over the sentence starters together and ask the class to finish the sentences.

13. When they are done, they will be glued into their science notebooks.

Evaluate

14. Have students share their proposals. Are they speaking like scientists?

Resources:

- Texas Butterfly Ranch: https://texasbutterflyranch.com/
- Monika Maeckle TEDx talk: Tales of a Butterfly Evangelist http://tedxsanantonio.com/2012-speakers/monika-maeckle/
- Monarch Butterfly Migration Google Earth Tour: https://www.youtube.com/watch?v=uqDwvuleRYc

Expanded Standards

Reading TEKS: 2.6E Comprehension skills: listening, speaking, reading, writing, and thinking using multiple texts. The student uses metacognitive skills to both develop and deepen comprehension of increasingly complex texts. The student is expected to: (E) make connections to personal experiences, ideas in other texts, and society.

Figure 19: Reading/Comprehension Skills. Students use a flexible range of metacognitive reading skills in both assigned and independent reading to understand an author's message. Students will continue to apply earlier standards with greater depth in increasingly more complex texts as they become self-directed, critical readers. The student is expected to: (F) make connections to own experiences, to ideas in other texts, and to the larger community and discuss textual evidence.

ELPS: Student Expectations for Speaking K-12, 19 TAC 74.4(c)(4) The student is expected to: (D) speak using grade-level content area vocabulary in context to internalize new English words and build academic language proficiency; (E) share information in cooperative learning interactions.

Science TEKS: 2.2: Scientific investigation and reasoning. The student develops abilities necessary to do scientific inquiry in classroom and outdoor investigations. The student is expected to:

(A) ask questions about organisms, objects, and events during observations and investigations

2.3: Scientific investigation and reasoning. The student knows that information and critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions. The student is expected to:

(C) Identify what a scientist is and explore what different scientists do.