DAY 6 Drawing Conclusions From Observations			
Reading Strategy: Drawing Conclusions Practice		**Science Concept:** Where are the Caterpillars? Students observe caterpillar growth and track their movement.	
Reading TEKS: 2.6F	**Figure 19:** Reading/ Comprehension Skills F	**ELPS:** Reading 2-12, 19 TAC 74.4(c)(4)	**Science TEKS:** 2.2(A, D); 2.10
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: Caterpillar Maps (each team will need one map for each day of observation); glue stick or tape, marker pens, and scissors. (See section for details.)			
Content Vocabulary: **Instar —** A growth stage between 2 periods of molting in the development of an insect larva or other invertebrate animal. **Molting —** The casting off of an outer layer or covering, and the formation of its replacement. **Tracking** — The process of following something or someone.			
Science and Literacy Connection: Scientists have to integrate information from various sources or "read between the lines" to develop explanations or reach conclusions. It can be useful to document the activity of organisms being studied in order to draw conclusions about what the organisms need and why they exhibit certain behaviors.			

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 below as follows.

- **Tell what the strategy is (declarative knowledge)**
  - Say something like, "Today we will continue to practice drawing conclusions while we read about the topic (butterflies). Remember, drawing conclusions is a type of inference and is sometimes called 'reading between the lines.'" 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 authors can't possibly give me all the information I need to know while I am reading. Their book (text) would simply be too large! So, authors don't always tell me everything I need to know. As a strategic reader, I have to 'read between the lines.'"
- **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 drawing conclusions. I was so impressed when they____." Teachers also are 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 the strategy again, say something like, "The first thing I will do is pay attention to the details the author does give me when reading, watching a video, or interviewing an expert."
  - Say something like, "Now, I will think about what I already know about this topic and the goals/intentions of the author."
  - Say something like, "Now, I will put these two things together to draw a conclusion."
  - Say something like, "As I read, I will continue to confirm or revise my conclusion."

Inquiry Circle Groups — 30 minutes

OVERVIEW

Scientists work in teams when conducting research and investigations. Each day of this unit, students will work within inquiry circle 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 different ways in which they observe the world, read scientific texts, and write about their findings. 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. Say something like, “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. Say something like, “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. Say something like, “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. Say something like, “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

Students learn to plot the approximate position of caterpillars in the growth chambers as they track their daily movement.

GUIDING QUESTIONS

Where do the larva spend their days in the growth habitats? Why do you think they choose those places?

BACKGROUND INFORMATION

It is difficult to track caterpillars in the natural world. Much of their lives are spent eating and looking for a better place to eat. Scientists have a tough job tracking their caterpillars because, within a species, they all look pretty much alike. The caterpillar they saw on a particular leaf yesterday, may be an entirely different caterpillar today. Yesterday’s caterpillar moved on and a new one took its place. The scientist studying them will likely not notice the switch.

Tracking is much easier with caterpillars contained within the plastic habitat. There is only so far that they can go or want to go for the food and moisture supply. Eating and growing is important to them so that they can form chrysalises, go through metamorphosis, and emerge as adult butterflies!

The caterpillar’s eating and growing process goes through four stages called instars. When larvae get too fat for their skin, it splits the skin so that it can continue growing. This happens four times during the growth process.

In nature, painted lady larvae will form silk nests under leaves. Nest formation doesn't usually happen inside the growth chambers because there aren't any leaves present. Larvae do form silk strands that can be seen with careful observation.

The purpose of the nests is to protect the larvae from predators. Eventually, the larvae will leave the nest and find a place to attach themselves in a downward hanging position. As they hang, they will resemble the letter "J." Their skin will split one more time, revealing the chrysalises inside.

SAFETY

Remind student teams each day to be gentle during handling or moving the habitats to prevent disturbing the larvae.

Please follow all district and school science laboratory safety procedures. It is good laboratory practice to have students wash hands before and after any laboratory activity. Clean work areas with disinfectant.

SETUP

Download and print the "Caterpillar Maps" page (06-Caterpillar Maps.pdf). Check the application print settings to ensure the file will print at the actual size of 100% on 8.5-in. x 11-in. standard copy machine paper *Do not fit, shrink or scale the page*.

MATERIALS

Per Student Team of 4

- Copy of "Caterpillar Maps" page (each team will need one map for each day of observation)
- Glue stick or tape
- Marker pens
- Scissors

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. Gather students around the growth chambers. Ask your student teams to describe what the larva are doing inside their habitat? Do larvae move about? How do you know? Why do they move around? Where do they go? How can you record larvae movements?

Explore

2. Tell students that they will use their observation skills to track the movement of caterpillars.

3. Distribute copies of the "Caterpillar Maps" page.

4. One copy of the maps is needed for a team of four students each day the larvae are going through their growth process.

As an alternative, trimmed copies of the maps can be given to each student for pasting in their notebooks. They will need about 8–10 maps to complete the movement observations. Each day, student teams will fill in one of the blank maps.

5. Have students separate the maps by cutting along the dashed lines.

6. Discuss the features of the maps. (To help students locate and mark where the larvae are located, the illustrations show the placement of the food cups, sponge, and hole for the micropipette.) Explain that each day until the chrysalis forms, they will use marker pens to place dots in the approximate locations of the larvae on that day. If two larvae are in the same place, place dots side by side.

7. Be sure that the students write down the date of the observations and the time. Students should also write descriptions of the larvae movements in their notebooks next to the daily maps.

8. Teacher should move between groups asking students to share their observations as they work.

Explain

9. When observations are complete and recorded, ask for reports from each group. Discuss their ideas about the movement and placement of the caterpillars. Did anyone notice any evidence of a nest?

10. Remind the class that they will track the movement of the caterpillars every day until the chyrsallis appears. If you have not already done so, this is a good time to explain about “instars” and what they can expect to see during these changes.

11. If they haven’t already done so, the completed maps should be mounted in their notebooks with glue or tape.

Elaborate

12. After several days of tracking and measuring, ask students if they can see any patterns to larvae movement in the growth chambers. Where do the larvae tend to hang out? Why do you think the larvae do that? (the more they move to find food, the bigger they become!)

13. Tell the class that eventually, the larvae will move to the upper parts of the chambers and remain there. This is a strong indication that chrysalis formation is about to begin!

EXPANDED STANDARDS

Reading TEKS: 2.6F 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: (F) make inferences and use evidence to support understanding.

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: (D) make inferences about text using textual evidence to support understanding.

ELPS: Student Expectations for Reading 2-12, 19 TAC 74.4(c)(4) The student is expected to: (J) demonstrate English comprehension and expand reading skills by employing inferential skills such as predicting, making connections between ideas, drawing inferences and conclusions from text and graphic sources, and finding supporting text evidence commensurate with content area needs.

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;

(D) record and organize data using pictures, numbers, and words

2.10 The student knows that organisms resemble their parents and have structures and processes that help them survive in their environments.