Day 4 What Do Pill Bugs Eat?			
Literacy Strategy: Fix-Up Strategies		**Science Concept:** Good science questions are testable and should be answered in a measurable way through investigations or experiments.	
Reading TEKS: (1)(b)(6)(I)	**CCSS:** RI.1.4, RI.1.5, RI.1.6	**NGSS:** 1-LS3-1	**Science TEKS:** 1(b)(2)(A), 1(b)(2)(B)
Materials for Mini-lessons on Science-based Disciplinary Literacies (referred to as Mini-lesson): Chart paper, markers, inquiry charts, text to model strategy			
Materials for Science Inquiry Circles: Team inquiry charts, pencils, nonfiction texts for each team, access to websites and online books			
Materials for Science Investigation: See Lesson			
VOCABULARY **Organisms** – living things that are able to carry on the functions (actions) needed to live, grow, and survive. **Needs-** the things essential for survival (water, energy source, air, a place to be)) **Energy** – required by organisms on Earth to move, grow, and sustain themselves. Food provides energy and other raw materials necessary for life. **Scientific investigations –** a planned design or approach to find an answer to a question			
Science and Literacy Connection: Scientists consider specific information when formulating testable questions as they plan to conduct research and investigations.			

Mini lesson — 15 minutes

OVERVIEW

Scientists are aware of their understanding of both observations they are making and texts they are reading while doing research. Sometimes they read an entire page and realize they have no idea what is said, and sometimes they get confused while doing an investigation. When that happens, a scientist will use a fix-up strategy to help them understand what they are reading and doing.

This Mini-Lesson teaches children how to "fix-up" their comprehension if it breaks down while they are reading.

EXPLAIN THE STRATEGY

Declarative Knowledge (Tell them what the strategy is that they are learning)

1. Say something like, "Today we will practice using comprehension fix-up strategies when we read. A comprehension fix-up strategy is a tool we use when we don't understand what we read."

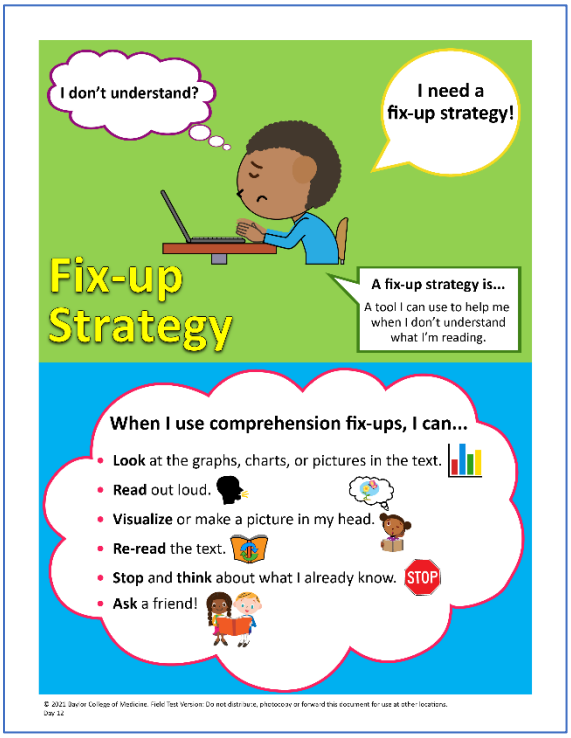
Conditional Knowledge (Tell them when and why you know to use the strategy)

2. Say something like, "I use a comprehension fix up strategy when I am reading and I encounter a problem that causes me to not understand what I read. Sometimes when I am reading, I forget what I just read.

Sometimes I am interrupted or distracted while reading. And, sometimes, the text is just too hard! When this happens, I use comprehension fix-up strategies because I am a strategic reader.

Tell how to employ the strategy (procedural knowledge)

3. "Yesterday we learned how to monitor our comprehension. Remember, I use metacognition to listen to myself and talk to myself as I read to be sure everything makes sense! (Refer to the "Monitoring Comprehension" anchor chart.)
4. "If I do not understand something that I read (because I was distracted or there was too much noise around me or something else went wrong), then I need to use a comprehension fix-up strategy."
5. "There are several comprehension fix-up strategies that I can use. But first I have to recognize that something has gone wrong in my reading. I know something has gone wrong when I read, and I think, 'What in the world did I just read?' Once I recognize that I'm not understanding, then there are a few things I can do to fix it.
   Some of them are:
   i. I can look at the graphs, charts, and pictures in the text.
   ii. I can read out loud.
   iii. I can visualize or create a picture in my head.
   iv. I can re-read the text.
   v. I can stop and think about what I already know.
   vi. I can ask someone in my inquiry circle.



Practice in text (print, video, or interview)

Post the "Fix Up Strategy" anchor chart in your classroom for easy reference. Remind the young scientists that they have a copy in their mini-lesson journals and encourage them to use the strategy in their Inquiry Circles.

Science Inquiry Circles — 30 minutes

OVERVIEW

Scientists work in teams when conducting research and investigations. Each day of this unit, students will work in 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 like a scientist, and writing like a scientist.

PROCEDURE

Before Inquiry Circle Groups — 5 minutes

You might want to say something like this to the readers:

1. It is time to get into our inquiry circle groups. You will be with the same research team as yesterday.
2. When we research our animals, 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
You might want to say something like this to the readers:

3. 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.)
4. 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.
5. 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.)

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

After Inquiry Circle Groups — 5 minutes
You might want to say something like this to the readers:

6. As we are concluding our inquiry circle groups for today, each group will have a chance to share what they accomplished and learned.
7. The Lab Director should lead the discussion with their inquiry circle group about today's results. For example, what did you learn about your animals? Which reading strategies did you use? What problems did you encounter? How did you resolve those problems?
8. The Data Scientist will now share with the entire class either something the group learned about their ecosystem, which reading strategy(ies) were used, or how the group solved a problem.

Science Investigation — 30 -45 minutes

OVERVIEW
The lesson begins with a review of the needs of living things. Then, the teacher will guide a discussion leading to a testable question that can be used for a science investigation.

GUIDING QUESTION
Why do organisms need energy? Where do organisms get energy from? What do pill bugs eat?

BACKGROUND INFORMATION
Pill bugs are detritivores, feeding on dead or decaying organic material which is called detritus. In the wild, they consume mainly plant detritus such as leaves and grass. They will also feed on damp vegetation, young plants, algae, fungi and rotting wood. Pill bugs are considered decomposers, as they

return important nutrients to the soil from their consumption of detritus. They also consume their own poop, a practice called coprophagy, as a source of copper, an important element it needs to live!

In habitats, pill bugs will eat, among other things, fruits and vegetables, oatmeal, and even fish food. **Remember not to reveal this information to the class- they should come up with their own answers about what pill bugs eat through their investigations!**

SAFETY

Remind students of Rules for Observing Roly-polys.

MATERIALS

- Class lists of "What we know…" and "Questions" about roly-polys generated on Day 2
- Pill bug habitat
- Needs of living things placards
- Post both class lists where all can see (either paper or on smartboards)
- Post a new sheet of chart paper titled "What do pill bugs eat?"

DAILY OBSERVATIONS

Students have the opportunity to observe the pill bug habitat as a team for general observations.

PROCEDURE

Engage

1. Gather the class in a circle and place the pill bug habitat in the middle of it.
2. Remind the class that yesterday they talked about what living things need to survive.
3. Hold up the placard for "A place to be". Ask, "What were your ideas yesterday about where pill bugs live?". Accept all responses (outside, under rocks, etc.). Explain that all living things need a place to be or live. Our classroom pill bugs live in their habitat. Ask, "Where do you live"?
4. Hold up the placard for "air". Ask, "Who remembers how pill bugs breathe?" (using gill-like structures instead of lungs). Remind them that all living things need air to breathe. Ask, "Is there air in the habitat?" (yes)
5. Next, hold up the placard for "water". Ask the class if anyone has noticed that there is not a water dish in the habitat? Why not? (pill bugs may drown). Tell them that spraying the habitat lightly with water keeps the habitat moist but not too wet. Remind them that pill bugs like a moist environment and can get their water from it. They take in water through their gill-like structures but can also drink it from the moist environment. Add that all living things on Earth need water to live.
6. Hold up the placard for "source of energy". Ask, "Who remembers where living things get their energy from?" (food) Point to the class inquiry chart and ask the scientist experts for this question to share some of the foods listed on their chart for the organism researched.
7. State that organisms need food for energy. "Why is energy important?" Accept all responses. (Because it helps us to do everything we need to grow and live!)

Explore

8. Ask the class, "Have you noticed any food in the pill bug habitat?" "What do you think pill bugs eat?". Accept all responses and write them on the new chart paper list. Listen for children sharing something they may have found during their research.

9. When the list is complete, you can add (if they have not already) that you would like to include plants, grasses, and/or vegetables as your suggestions.
   At this point do not reveal that they prefer detritus. It is hoped that children will learn this on their own as they proceed through the unit
10. Read over their list of possibilities together. Ask, "How can we figure out what pill bugs eat?" Listen to their ideas- someone may suggest doing an experiment or testing!
11. Explain that scientists always have questions about the world around us. The things we know and can explain about the natural world came through discoveries that were made in science investigations that began with a ***testable*** question.
12. Ask, "What do you think a "*testable*" question is?". Accept all responses.
13. Explain that testable questions are questions that **can be answered either through observations or investigations**. Scientists can conduct research in a lab, read about another scientists' work, or they can also go out and do field work to find answers (like going out to the ocean to study fish).
14. Explain to the students that they already have a question to work with: "What kind of food do pill bugs eat?".
15. Ask, "Is this a testable question?" Accept their responses; then confirm that they do indeed have a testable question. How do you think we will find the answer?"
16. Explain that, just like scientists, they will plan and conduct an investigation to find the answer!
17. First, each team will pick a food from the list of possibilities that they would like to use in their investigation. (If there are any food items that may be harmful to the pill bugs, take time to discuss and explain why.)
18. Ask them to huddle up together with their team to decide which food they want to test. Tell them that they have 3 minutes to decide. and each team will need to pick a different food from the list.

Explain

19. When time is up, ask each data scientist to report on which food their team would like to investigate. Ask, "Why did you choose that food?". Write their choices by team number on the food list. Be prepared to negotiate same choice foods!
20. When all teams have reported, read over their choices and discuss feasibility before agreeing to them.
21. When choices have been agreed upon, describe how they will set up investigations by placing the food they have chosen in a small habitat of their own, then observe every day to see if the pill bugs are eating it!
22. Explain that by observing them, they will collect information that will give them the answer to their question "What do pill bugs eat?".

Elaborate

23. Let the class know that they will set up their team habitats in the next class. Explain that as scientists, they will record what happens every day during the investigation in a journal - a special book where they will write and draw what they see.

Evaluate

24. Did students communicate understanding of the needs of living things?
25. Did students contribute reasonable ideas about the food choices pill bugs might like?
26. Was there evidence of working as a team to make decisions?
27. Are students using new science words in their communications?

Expanded Standards
Reading TEKS: (1)(b)(6)(I) 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: (I) monitor comprehension and make adjustments such as re-reading, using background knowledge, checking for visual cues, and asking questions when understanding breaks down.
CCSS: (RI.1.4) Ask and answer questions to help determine or clarify the meaning of words and phrases in a text. (RI.1.5) Know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text. (RI.1.6) Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.
NGSS: 1-LS3-1 Science & Engineering **-**Use information from observations (firsthand and from media) to construct an evidence-based account for natural phenomena. Connections to the Nature of Science - Science investigations begin with a question
Science TEKS: 1(b) (2) Scientific investigation and reasoning. The student develops abilities to ask questions and seek answers in classroom and outdoor investigations. The student is expected to: (A) ask questions about organisms, objects, and events observed in the natural world; (B) plan and conduct simple descriptive investigations such as ways objects move;