DAY 2							
Roly-polys!							
Literacy Strategy: Formulating Research		Science Concept: Scientists investigate questions					
Questions and recording with a visual format		they develop from conducting research or					
		making observations.					
Reading TEKS:	CCSS:	NGSS:	Science TEKS:				
1.13 A &B	SL.1.2	1-LS3-1	1(b)(2)(A), 1(b)(4)(A)				
Materials for Mini-lessons on Science-based Disciplinary Literacies (referred to as Mini-lesson): Chart							
paper, markers, Inquiry charts; pencils, text to model strategy							
Materials for Science Inquiry Circles: Inquiry charts; pencils, non-fiction (informational) texts							
Materials for Science Whole Group Lesson: See Lesson							
Content Vocabulary:							
Observation – the action or process of observing or viewing something or someone carefully to							
gather information.							
Scientist – Person who is an expert in, or studies aspects (parts) of the natural or physical world.							
Team – Group of persons who work together to accomplish a goal.							
Organism - living things that are able to carry on the functions (actions) needed to live, grow, and							
survive.							
Habitat – a place where many organisms can live and grow.							
Research- a careful search for facts or information							
Scientific investigation – a planned design or approach to find an answer to a question							
Science and Literacy Connection: An important first step in research is preparation, which may be							
formulating your research question or preparing for your investigation.							

Mini lesson — 15 minutes

OVERVIEW

Scientists always identify a question to research and record their data in an organized matter. While a true inquiry project would allow students to develop their own research questions, for this guided inquiry, we will provide questions that can be answered for each organism to be researched. Students will record their findings in an inquiry chart. The teacher will model mini lessons each day using the animal studied in the whole group Science Investigations and will complete a class inquiry chart about pill bugs during the modeling.

For each inquiry circle, each group will need an inquiry chart to be created (by the teacher) on a large piece of chart or butcher paper. Be sure the size is manageable for storage when groups are not working together and will be easy for students to record on (big enough for recording space, but not so large that it cannot be laid out in the classroom for the group to work). A model for an inquiry chart is provided in the Day 2 folder for you.

This Mini-Lesson teaches children how to locate specific information in their texts and how to record that information on their inquiry charts.

PROCEDURE

Each statement below contains suggested wording for the lesson in quotations and teacher actions in parenthesis:

EXPLAIN THE STRATEGY

Tell what the strategy is (declarative knowledge)

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

 Say something like, "Yesterday we voted on the organisms we wanted to learn more about. Today, we will decide what we want to know about them. When scientists want to learn more about an organism, they come up with questions that they can research. Research means that they make a careful search for facts or information that will help them answer their questions."

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

2. Say something like, "Let's think about what we want to know about the organisms and make a list of questions".

Procedural Knowledge (Tell them the steps to using the strategy)

- 3. Say something like, "Now that we have a list of what we want to know, we need to decide which are the most important questions we need to research about our organism". (Look for and emphasize any questions offered about where the organisms live and what they eat. Explain that is important information to know!)
- 4. (Post the large Inquiry chart you have constructed, or project on a large screen.) "Like scientists, we will record answers to our questions in an organized manner using this chart called an inquiry chart."
- 5. "Notice, I have already written four questions that are important about our organism: What do we know already? Where do they live? What do they eat? What other organisms live in the same place? What is the relationship between our animal and the others in the environment?"
- 6. "Looking at the inquiry chart, I see that I will also need to record, or write down, my resources: the title and author of books or the videos I use. When we are ready, I will show you how to do that."
- 7. During inquiry circle time today, you will begin by answering your first question."

Note: For this first day of using the Inquiry Chart while in inquiry circles, students will work together to only complete the "what we know" section. After this day, students will use the inquiry chart to record their research data while in inquiry circles. This is what an Inquiry Chart on pill bugs might look like. Each group needs their own with their chosen animal listed on it.

Pill Bugs	Where does our animal live?	What does our animal eat?	What other organisms live in the same area as our animal?	What is the relationship between our animal and the others in the environment?
What do we				
already know				
about our				
animal?				
Resource 1				
Resource 2				
Resource 3				
Resource 4				
Resource 5				

Science Inquiry Circles — 30 minutes

OVERVIEW

Scientists work in teams when conducting research and experiments. 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 liking a scientist, and writing like a scientist.

PROCEDURE

Before Inquiry Circle Groups — 2–5 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 use different ways to observe the world, read scientific texts, and write about what they have studied. There is no better way to learn about science than to become a scientist!"
- 3. (Distribute one inquiry chart per team.) "Notice that the inquiry chart looks just like the class chart we discussed during the mini-lesson. Also, if you look at the top of the chart (point it out), you will see I have written a team number on it. This will be the team number you will use for all of your work in this unit."

During Inquiry Circle Groups — 30 minutes

- Say something like, "We have anchor charts to help guide your thinking. Do not forget to use them while in groups." Refer to the "Inquiry Tool Box" anchor chart and the inquiry chart discussed today. Starting on Day 3, 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 accomplish your work together."
- 4. Say something like, "Do not forget to answer your research questions and record your ideas on the inquiry chart. Do not worry about your spelling and you can always draw a picture on the chart when needed. It is important to record your sources on the inquiry chart as you complete it."
- 5. While groups are working together, walk around the room to facilitate as needed.

After Inquiry Circles (10 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) were used, or how the group solved a problem. "

Science Investigation — 30 - 45 minutes

OVERVIEW

Students are introduced to a roly-poly habitat the teacher has brought into the classroom for observations and discussion.

GUIDING QUESTIONS

What do you see? What do you know about roly-polys? What do you want to know?

BACKGROUND INFORMATION

Scientific work involves a variety of approaches and processes that include observations and research, asking questions, collecting and analyzing data, and explaining information.

Allowing students to carry out investigations they design teaches them about the processes that scientists use in their work. Learning to generate their own questions based on their observations gives them ownership in the scientific process.

SAFETY

The teacher should advise the students not to open the container as they pass it around to observe. The correct use of the hand lenses should be modeled by the teacher. Safety rules for observing the roly-polys should be reviewed and posted.

MATERIALS

- 2 sheets of Chart paper/marker
- Hand lenses
- Rules for Observing Roly-polys doc.

SETUP

Before the class:

- The class habitat should be already set up by today!
- NOTE: It is important to conceal the habitat from the class until you are ready to introduce it in this lesson!
- Label one sheet of chart paper with "What we know about roly-polys". Label the other with "What we want to know about roly-polys" (Alternate Option: Prepare a Smartboard Document with these questions)

On the day of the class:

- The teacher will plan a central location for accessible observation. (Sitting in a circle on the floor? Gathering around a table?)
- Remember: Keep the habitat concealed until you are ready to share!
- Post the chart paper where you can easily write on it
- Post a copy of the Rules for Observing Roly-polys (Teacher may choose to make a larger copy on chart paper)

DAILY OBSERVATIONS

None at this time

PROCEDURE

Engage

- 1. Invite the class to sit in a circle on the floor. If this is not possible, they can gather around a table.
- 2. Tell them that you have something special to share that they will be studying in science for the next couple of weeks.
- 3. Unveil the habitat. Ask, "Can you describe what you see? What do you think is inside?" Accept and discuss all responses. (They may or may not notice the roly-polys yet.) Explain that you have created a habitat for small organisms that usually live outdoors. Share, "A habitat is a place where many organisms can live and grow."

Explore

- 4. Provide a hand lens for observing and model the correct way to hold and use it.
- 5. Explain that you will pass the habitat around for a closer look to discover what is inside. Caution them not to shake it or open it up!
- 6. Let them know that they may look at it until they count to 5, then they need to pass it on. (As they do, someone will notice the roly-polys if they have not already.) You can allow the habitat to go around the circle twice.
- 7. After everyone has had a chance to view the habitat, ask students to share their observations.
- Next, ask students to think about everything they already know about roly-polys. Accept all responses and record their information on chart paper.
 Note: It's important to record the students' ideas in their own words, without offering any help or guidance nor dismissing their ideas.
- 9. Then ask, "What would you like to know about roly-polys?". Write their responses on the chart paper.
- 10. Remind them that they are now scientists working in teams. Ask, "What would scientists do if they wanted to know more about roly-polys?". Accept all responses and use prompts as needed. (Read about them? Make observations? Ask questions?) Explain that they would probably do all of these.

Explain

- 11. Point to the list of questions they have generated and remind them that they will be researching similar questions about other backyard organisms in their inquiry circles. However, to learn more about pill bugs, they are going to set up a science investigation!
- 12. "What do you think a science investigation is?" Accept all responses. After discussion, explain that it's another way that scientists use to find answers to their questions.
- 13. Tell the students that in the next few days they will work in teams to plan and conduct their own investigations on roly-polys.

Elaborate

- 14. Let the class know that the habitat will be available for them to continue observing for the next day or two.
- 15. Explain they will go as a team to make their observations and share what they see with each other.
- 16. Introduce and post the "Rules for Observing Roly-polys". Review the rules with the class:
 - Be careful not lift, shake or in any way move the habitat so that the roly-polys are not disturbed!
 - Do not open the lid to the habitat
 - Do not pick up the roly-polys without permission from the teacher.
 - Use the hand lenses for a closer look at the roly-poly's habitat
 - The teacher will monitor you to make sure you follow the rules.

Evaluate

- 17. Did students share information based on prior knowledge about roly-polys?
- 18. Did they develop questions based on their observations?
- 19. Did students include any new science vocabulary in their responses or explanations?

Expanded Standards

Reading TEKS: 1.13 A &B Inquiry and research: listening, speaking, reading, writing, and thinking using multiple texts. The student engages in both short-term and sustained recursive inquiry processes for a variety of purposes. The student is expected to: (A) generate questions for formal and informal inquiry with adult assistance; (B) develop and follow a research plan with adult assistance;

CCSS: SL.1.2: Ask and answer questions about key details in a text read aloud or information presented orally or through other media.

NGSS: 1-LS3-1 Science & engineering Practices- Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. Crosscutting Concepts- Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.

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; 1(b) (4) Scientific investigation and reasoning. The student uses age-appropriate tools and models to investigate the atural world. The student is expected to: (A) collect, record, and compare information using tools, including computers, hand lenses, primary balances, cups, bowls, magnets, collecting nets, notebooks, and safety goggles; timing devices, including clocks and timers; non-standard measuring items such as paper clips and clothespins; weather instruments such as classroom demonstration thermometers and wind socks; and materials to support observations of habitats of organisms such as aquariums and terrariums;