

Day 2: Roly-polies!

-  **Mini-Lesson** Children develop questions to investigate about their chosen organism and are introduced to Inquiry Charts.
-  **Inquiry Circles** Children discuss what they already know about their chosen organisms and add it to their Inquiry charts.
-  **Guided Science Investigation** Children are introduced to a roly-poly habitat and discuss what they want to know about roly-polies.

Literacy Strategy: formulating research questions and recording with a visual format.	Reading TEKS ELA.1.13A, ELA.1.13B	CCSS SL.1.2
Science Concept: scientists investigate questions they develop from conducting research or making observations.	Science TEKS 2018–19: 1.2A, 1.4A 2024–25: 1.1A, 1.1D	NGSS 1-LS3-1
Science and Literacy Connection: formulating a question is an important first step in preparing for an investigation.		

Mini-Lesson (15 minutes)



OVERVIEW

Scientists always identify a question to investigate, and they record their data in an organized matter. While a true inquiry project would allow learners to develop their own questions, for this mini-lesson, the teacher will guide learners through open-ended questions that can be answered for each outdoor organism to be investigated during inquiry circles. Suggested questions are provided.

Each day in this unit, the teacher will model mini-lessons using roly-polies as the outdoor organism. During this time, the teacher

will work on the class Inquiry Chart about roly-polies (you may construct a larger version of the class Inquiry Chart below to post in the classroom or project the class Inquiry Chart on a large screen).

Additionally, each inquiry circle team will need an Inquiry Chart (**to be created by the teacher**) on a large piece of chart or butcher paper. Learners will record their findings on this team Inquiry Chart during inquiry circles. Be sure the size is large enough for the children to record on (but not so large that the charts cannot be laid out in the classroom for the teams to work on) and manageable for storage when teams are not working on them. A model for the team Inquiry Charts can be found in “Supporting Files” for Day 2.

MATERIALS

Teacher needs:

- chart paper
- marker(s)
- class Inquiry Chart about roly-polies (**note: teacher will refer to pill bugs as “roly-polies” until the guided science investigation on Day 3**)
- Inquiry Chart model

PROCEDURE

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

EXPLAIN THE STRATEGY

Tell what the strategy is (declarative knowledge)

1. *Yesterday, we voted on the outdoor 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 investigate. To investigate means that they make a careful search for facts or information that will help them answer their questions.*

Tell when and why to use the strategy (conditional knowledge)

1. *Let’s think about what we want to know about the outdoor organisms and make a list of questions.* (Encourage learners to think about their discussions yesterday when exploring all the texts. Record questions on a sheet of chart paper. You may need to guide learners to think about open-ended questions rather than yes/no questions.)

Tell how to use the strategy (procedural knowledge)

1. *Now that we have a list of things we want to know, we need to decide which are the most important questions to investigate about our outdoor organism.* (Look for and emphasize any questions offered about where the organisms live and what they eat. Explain that this is important information to know!)
2. (Post the class Inquiry Chart about roly-polies that you constructed or project it on a large screen.) *Like scientists, we will record answers to our questions in an organized manner using a chart like this one called an Inquiry Chart. I have picked roly-polies as my organism to model with.*

- Notice I have already written four questions that are important to know about roly-polies: *Where do they live? What do they eat? What other organisms live in the same place? What is the relationship between roly-polies and the other organisms the environment?* (Explicitly show children how the questions they came up with will be answered by the broad, open-ended questions in the chart. If they do not fit exactly, you can use the **“Other interesting facts”** column as the inquiry progresses.)

Roly-polies	Where do they live?	What do they eat?	What other organisms live in the place?	What is the relationship between our organisms and others in the environment?	Other interesting facts
What we know:					
Resource 1					
Resource 2					
Resource 3					
Resource 4					
Resource 5					

- Looking at the Inquiry Chart, I see that I will also need to record, or write down, my resources, such as the title and author of books or the videos I use. When we are ready, I will show you how to do that.
- Now, let’s practice completing the **“What we know”** section on our class Inquiry Chart about roly-polies. (Model how to record places where roly-polies live in the first column, what roly-polies eat in the second column, etc. as learners give their responses. Tell them it is okay if we do not know many things just yet.)
- During inquiry circle time today, your teams will begin by answering the **“What we know”** section about the outdoor organism you chose!

Note: On this first day of using the Inquiry Charts in their inquiry circles, learners will work together to complete only the “**What we know**” row. After this day, learners will use their team Inquiry Charts to record their research data while in inquiry circles. This is what an Inquiry Chart on roly-polies might look like. **For each team, the teacher will need to make an Inquiry Chart that lists the team’s chosen outdoor organism and the names of each team member.**

Science Inquiry Circles (30 minutes)

OVERVIEW

Scientists work in teams when conducting investigations and experiments. Each day of this unit, learners will work in inquiry circles while taking on the roles of scientists engaged in investigating texts. Specifically, learners will speak like a scientist, read like a scientist, and write like a scientist. Today children will consider what they already know about their assigned outdoor organism and record their ideas.

MATERIALS

Each team needs:

- pencils
- team Inquiry Chart

Teacher needs:

- class Inquiry Chart about roly-polies

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.* (If you have not already done so, inform each team which outdoor organism they will be exploring.)
2. (Ask Equipment Directors to gather pencils and their team’s Inquiry Chart. Make sure the class Inquiry Chart about roly-polies is visible to be used as a model.) *Notice that your Inquiry Chart looks just like the class chart we discussed during the mini-lesson. Today we are going to start a guided inquiry.* (Point out each of the questions to your learners and provide a brief explanation.)

During Inquiry Circles (20 minutes)

1. *Take a few moments to discuss what you already know about your outdoor organism. Perhaps you know something about the environment in which it lives. Think about some of the things we*

knew about roly-polies. Do you know similar things about your outdoor organism? The Lab Director will lead the discussion. Be sure that everyone has a chance to share. Do not write anything on your Inquiry Chart just yet. (While teams are working, walk around the room and assist learners as needed.)

2. Now, everyone should assist the Data Scientist in recording what you already know in the correct column. For example, if you already know something about where your outdoor organism lives, record it in the first column. If you know something about what it eats, record it in the second column. If you know something that doesn't fit into these questions, record it in the **"Other interesting facts"** column. (While teams are working, walk around the room and assist learners as needed.)

After Inquiry Circles (10 minutes)

1. As we conclude our inquiry circles for today, each team will have a chance to share what they already know about their outdoor organism, as well as what they accomplished and learned.
2. The Lab Director will lead the discussion with their inquiry circle team about today's results. For example, what did the team learn about its outdoor organism? What problems did the team members encounter as they worked? How did the team resolve those problems? (While teams are working, walk around the room and assist learners as needed.)
3. The Data Scientist will now share with the entire class either something the team learned about their outdoor organism or how the team solved a problem. (After all learners have shared, thank them for their hard work and point out any excellent behaviors that you observed. If you notice any problems in the teams during the lesson, take a moment to gently point them out and explain your expectations for all future inquiry circles. Collect all Inquiry Charts or have learners put them in the usual classroom place for ongoing work so they can easily access them.)

Guided Science Investigation (30–45 minutes)

OVERVIEW

Learners 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-polies? What do you want to know?

BACKGROUND INFORMATION FOR THE TEACHER

Scientific work involves a variety of approaches and processes, such as observation and research, asking questions, collecting and analyzing data, and explaining information.

Allowing learners 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 learners 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-polies should be reviewed and posted.

MATERIALS

Each team member needs:

- hand lens

Teacher needs:

- chart paper
- marker(s)
- class Inquiry Chart about roly-polies
- “Rules for Observing Roly-polies” document

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 the sheet of chart paper “**What we want to know about roly-polies.**” (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 the Class Inquiry Chart where all can see it.
- Have a copy of the “Rules for Observing Roly-polies” ready to post when it is time (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 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-polies yet.
4. Explain that you have created a habitat for small organisms that usually live outdoors. Inform learners, *A habitat is a place where organisms can live and grow.*

Explore

1. Explain that you will pass the habitat around for a closer look to discover what is inside.
2. Provide each child with a hand lens for observing and model the correct way to hold and use it. Caution them not to shake the habitat or open it up!
3. Let them know that they may look at the habitat until you count to 5, then they need to pass it on. As they do, someone will notice the roly-polies, if they have not already. You can allow the habitat to go around the circle twice.
4. After everyone has had a chance to view the habitat, ask, *What did you see?* (roly-polies, leaves, etc.) Accept all responses.
5. *Let's look at what you already know about roly-polies.* Refer to the class Inquiry Chart and read their statements out loud.
6. Then ask, *What else would you like to know about roly-polies?* Write their questions on the chart paper. **Note: It's important to record the learners' ideas in their own words, without offering any help or guidance or dismissing their ideas.**
7. Remind them that they are now scientists working in teams. *What do you think scientists would do if they wanted to know more about roly-polies?* 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

1. Point to the list of questions they have generated and remind them that they will be investigating similar questions about other outdoor organisms in their inquiry circles. However, to learn more about roly-polies, they are going to set up a science investigation!
2. Ask, *What do you think a science investigation is?* Accept all responses. After discussion, explain that an investigation is a plan for finding answers to questions and solving problems.
3. Tell learners that over the next few days, they will work in teams to plan and conduct their own investigations on roly-polies.

Elaborate

1. Let the class know that the habitat will be available for them to continue observing for the next day or two.
2. Explain that they will make their observations as a team and share with each other what they see.
3. To make careful and safe observations, teams will need to follow a few rules. Introduce and post the "Rules for Observing Roly-polies." Review the rules with the class:

- Be careful not lift, shake, or in any way move the habitat so that the roly-polies are not disturbed!
- Do not open the lid to the habitat.
- Do not pick up the roly-polies without permission from the teacher.
- Use the hand lenses for a closer look at the roly-poly habitat
- The teacher will monitor learners to make sure they follow the rules.

Evaluate

1. Did learners share information based on prior knowledge about roly-polies?
2. Did they develop questions based on their observations?
3. Did they include any new science language in their responses or explanations?

Science Language

- **Observation** is carefully looking at something or someone to gather information.
- A **scientist** is a person who is an expert in or who studies the natural or physical world.
- A **team**, or **teamwork**, is a group of people who work together to accomplish a goal or task.
- **Organisms** are living things that carry out the activities needed to live, grow, and survive.
- A **habitat** is a place where organisms live and grow.
- A **scientific investigation** is a plan for finding answers to questions and solving problems.

Expanded Standards

Reading TEKS

ELA.1.13A: generate questions for formal and informal inquiry with adult assistance. **ELA.1.13B:** 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.

Science TEKS

2018–19: 1.2A: ask questions about organisms, objects, and events observed in the natural world.

1.4A: 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 windsocks; and materials to support observations of habitats of organisms such as aquariums and terrarium.

2024–25: 1.1A: ask scientific questions and define engineering problems based on observations or information from text, phenomena, models, or investigations. **1.1D:** use tools, including hand lenses, goggles, heat-resistant gloves, trays, cups, bowls, beakers, sieves/sifters, tweezers, primary balance, notebooks, terrariums, aquariums, stream tables, soil samples (loam, sand, gravel, rocks, and clay), seeds, plants, windsock, pinwheel, student thermometer, demonstration thermometer, rain gauge, straws, ribbons, non-standard measuring items, flashlights, sandpaper, wax paper, items that are magnetic, non-magnetic items, a variety of magnets, hot plate, aluminum foil, Sun-Moon-Earth model, and plant and animal life cycle models to observe, measure, test, and compare.