DAY 1 I Am a Scientist			
Literacy Strategy: Introduction to team roles, research, and Science Inquiry Circles		**Science Concept:** Scientists ask questions before they begin gathering information from text and the natural world, and benefit from working in teams.	
Reading TEKS: (1)(b)(6)(A)	**CCSS:** RI.1.10	**NGSS:** K-2 ETS1-1, ETS1.A	**Science TEKS:** 1(b)(3)(A)
Materials for Mini-lessons on Science-based Disciplinary Literacies (referred to as Mini-lesson): Chart paper, markers, Team Roles Anchor Chart; portal text			
Materials for Science Inquiry Circles: List of backyard organisms, chart paper, marker, non-fiction texts (go to project website)			
Materials for Science Investigation: See lesson.			
Content Vocabulary: **Team** – Group of people who work together to accomplish a goal. **Scientist –** A person who is an expert in, or studies the natural or physical world **Collaboration -** Two or more people working together to accomplish a goal or task. **Organism** - living things that are able to carry on the functions (actions) needed to live, grow, and survive. **Research**- a careful search for facts or information			
Science and Literacy Connection: Scientists use different ways to observe the world including reading scientific texts, conducting investigations, and writing reports while working collaboratively with others in the cycle of inquiry.			

Mini-lesson - 15 minutes

OVERVIEW (See section *3. Reading and Writing Strategies to Support Science Inquiry* in the **Overview Guide** for more information)

Throughout this unit, students will be organized as scientific research teams. The teams will work collaboratively in small groups called “inquiry circles” to conduct research using informational texts. Each day, prior to their work in their inquiry circle, the children will work with you on a Reading Mini-Lesson The Mini-lesson is designed to help students become more strategic in their reading through intentional instruction; the strategies children learn in the mini-lessons are practiced with texts during the inquiry circles.

The Mini-lessons are based on Science-based Disciplinary Literacies (referred to as Mini-lessons). These are taught as whole group lessons in which the teacher models and explains a literacy strategy relevant for use with informational (expository) texts or media. Mini-Lessons are organized around teaching children various literacy strategies associated with science and scientists. It is our goal in these lessons to give you (the teacher) suggested language to use when teaching these strategies and a set of materials that will support you in explaining those strategies to children. We have not scripted the lessons for you. Rather, we hope you take

these suggestions as the starting points for working with children on constructing an understanding of what it is we do when we read and write like a scientist.

<u>This Mini-Lesson teaches children how to begin to use language that is used by scientists.</u>

PROCEDURE

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

- Say something like, "Today, we will start a new unit in which we all will embody the role of a scientist. We will become scientists! We will be using texts to help us learn more about our organisms."

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

- Say something like, "When we investigate living 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 reports. There is no better way to learn about the world around us than to become a scientist!" (Scientists often observe, work with a team, ask questions, make a plan, record information, organize data, make predictions, etc.)

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

- Say something like, "While in inquiry circle groups and your science groups, you will take on different team roles." Refer to the roles above and describe the duties to students. You may wish to refer to the anchor chart with descriptions of all four jobs.
- Say something like, "When working in our inquiry circle groups, we also want to practice speaking like a scientist. In order to do this, we have an anchor chart to help us remember what kind of language to use." Create an "Inquiry Tool Box" anchor chart with the students and give examples of when to use the stems. (A model of this anchor chart is provided for you.)
- Say something like, "Every day we will have a Mini-lesson that helps us know how to read like a scientist and we will record our information like a scientist. We will talk about that more tomorrow."

Science Inquiry Circles — 30 minutes

OVERVIEW

Scientists frequently work in teams when conducting investigations or carrying out routine tasks. 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.

Each inquiry circle of students will select an organism to investigate throughout this unit using informational texts. A list of suggested organisms and text resources is provided for you. Please be certain to gather or obtain access to these resources prior to beginning the unit. You, the teacher, will model research and literacy practices for students, who will work together to collect data about the organisms they selected. You will recognize the instructional model of inquiry circles as being similar to that of literature circles.

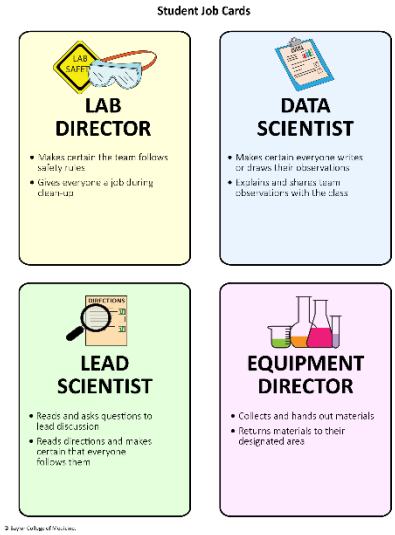
You may use a variety of methods when assigning groups. We recommend forming heterogenous groups, while providing learners with the opportunity to choose their animal of interest. Be sure to form, or enable students to form, the groups prior to beginning the first Reading Mini-lesson.

We have selected fiction portal text for each inquiry group topic. This text is designed to spark interest and help students to decide which animal they would like to explore further in the inquiry circles. ***We suggest that the teacher read aloud these to texts to the whole group to initiate conversations prior to starting the inquiry circle groups.***

Students will be organized in teams that reflect the roles of practicing scientists. Typically, such teams have a leader, called the Lead Scientist, and various other scientists, such as Lab Director, Data Scientist, and Equipment Director. To provide variety, students should rotate positions in different activities, allowing each student to try each job.

While working with the animals, students will be in groups of four. Teachers may decide to have larger inquiry groups when researching the organisms or have multiple small groups researching the same organism (the decision may be dependent on class size).

Team Roles are given below. These roles also are outlined on four separate 8.5-in. x 11-in. reproducible pages, which you may want to display as a reference for students.



Lead Scientist

- Reads/asks questions to lead discussion
- Reads directions and makes certain that everyone follows them.

Lab Director

- Makes certain the team follows safety rules
- Gives everyone a job during clean-up

Data Scientist

- Makes certain everyone writes /draws their observations
- Explains/shares team observations with the class

Equipment director

- Collects and hands out materials
- Returns materials to designated area

PROCEDURE

Before Inquiry Circle Groups — 5 minutes

1. Say something like, “We will practice working with our inquiry circle groups.”

2. Remind students of the introductory Mini-lesson and the “Inquiry Tool Box” anchor chart. Say something like, “When we research organisms, we will practice being scientists. We will do this because scientists use different ways to observe the world, read scientific texts, and write reports. There is no better way to learn about science than to become a scientist!”

3. Say something like, “While in inquiry groups, you will take on different scientific roles. These roles are the same as the roles we have during the butterfly investigation.” (You may wish to use this time to assign roles to students and determine how roles will be rotated.)

4. Say something like, “Remember when we are in our inquiry circles, we will help each other become scientists. Look at the ‘Language of a Scientist’ anchor chart to find sentence stems to assist you.”

During Inquiry Circle Groups — 20 minutes

1. Say something like, "We have read fiction portal texts about the animals you will research. When reading these texts, we thought about what questions you may have about your animal that can be researched. Today you will decide which inquiry group you want to participate in. We will look at the nonfiction books about your topic to get some ideas about what we will learn. We will use the nonfiction texts when we start our research tomorrow."

   Use this time to put students into the groups based on interests. It is suggested that you use this time to review group norms, procedures, etc. Encourage the students to look at the nonfiction texts and portal texts to spark conversations about what they may learn. What do they see in the pictures? How is the fiction portal text similar or different to the nonfiction text? What questions do they have?

2. Say something like, "While each group is exploring the texts, I will be listening for all the scientific language and teamwork in the classroom." Allow class time to read while you facilitate when necessary.

After Inquiry Circle Groups — 5 minutes

Say something like, "The Data Scientist from each group will share with the class what anything interesting you discovered today. What grabbed your attention?" *Be sure all members of the scientific inquiry team assist the Data Scientist, so she/he is prepared to speak. Allow inquiry circle groups to share.*

Science Investigation — 30-45 minutes

OVERVIEW

In this lesson, students will work together as a team to design a solution for a defined problem.

GUIDING QUESTIONS

Why do scientists work in teams? What is the value of teamwork?

BACKGROUND INFORMATION

Over the course of the next 3 weeks, students will plan and conduct investigations as members of scientific research teams. Typically, science teams have a leader, called the Lead Scientist, and various other positions, such as Lab Director, Data Scientist, and Equipment Director. (To provide variety for students, the positions can be rotated among students, allowing each student to try each job).

In practice, members of each student team will participate in all tasks the team performs during the investigation. For example, measuring, making observations, etc.

To practice working as a team, students will use consumable materials to "rescue" a snail trapped on a wire hanging from the ceiling!

MATERIALS

- 1 pkg of playdoh
- Fishing line or string
- tape
- Instructions video for making snails
- Dark plastic grocery bag
- Index cards
- Straws
- Large paper plates

SET UP

- Before the class, the teacher will construct **1 snail per team** out of playdoh.
- It will be attached by string or fishing line to the ceiling and should hang approximately 3 ft. above a teams' table or workspace. (Needs to be high enough for a challenge but not impossible.)
- Cover the snails loosely with a dark plastic bag so that the class can't see it before you are ready to unveil it.
- Place 20 index cards, 20 straws, and tape in a Ziploc bag, **one bag per team**.
- Decide on a designated area to setup materials for distribution throughout the unit. Place bags and paper plates there for today's lesson.

PROCEDURE

Engage

1. Ask, "What do you think of when you hear the word "teamwork?" Students may offer ideas and examples- accept all responses.
2. When all responses have been considered, ask "What is something that many of you mentioned that is similar?" (teamwork involves more than one person working on something).
3. Tell the class that today they will work together in teams to complete a rescue mission!

Explore

4. Teacher unveils the "object" hanging from the ceiling.
5. Explain to the students that the snail got stuck on a thin wire and needs a way to climb down!
6. Tell the students that their task will be to build something that will reach the snail so that it can crawl down safely.
7. Point out the materials they can use to construct with: index cards, straws, and tape.
8. Explain that first, each team member should share an idea for a plan on how to do that. Encourage them to draw their ideas. Teacher should walk around and listen to their ideas.
9. Then, after everyone has shared, tell them to decide as a team which idea they will try.
10. When ready, ask the Equipment Director of the team to come to the designated area to collect the bags of materials and one paper plate for their team.
11. Explain that they will build on the plates at their tables to make it safer to move if needed.
12. Tell them that they only have 15 minutes to complete the task. (Teacher can set a timer if needed. As students work, walk among the teams to listen to their ideas and offer guidance as needed.)

Explain

13. When time is up, have teams stop constructing regardless of progress. The teams should position their finished constructions carefully under the snail to see if it reaches!

14. One at a time, ask the teams "What was your idea or plan? Did you reach the snail? If not, what would you need to change in your construction to make it work? (Allow time for students to respond.)
15. Allow teams who didn't finish to describe what their construction was going to be and/or ask them to report on any problems they had. Let them know that it is OK if their constructions did not work. Ask "What could you have done differently?"
16. Ask the class to reflect on the activity. "What do you think was the hardest part of this construction? "Do you think you worked successfully as a team? What did you do well together? What did not work well?" (Allow time for discussion.)
17. Explain to the class that successfully completing the "escape route" for the snail was not necessary. Tell them that communication (talking to each other respectfully), collaboration (working as a team), and respect for each other's ideas- these were the important things!

Elaborate

18. Ask students to think about how scientists work as a team. (They talk to other scientists about their ideas, share information they might have, etc.) Accept all responses.
19. Explain that scientists often collaborate with each other to share the results of their research and investigations to put the pieces of a bigger picture together, and that each has a specific role in the scientific team.
20. Let them know that scientists are not always successful in their work either, but they learn from each other and find new ways to do things better.

Evaluate

21. Did students communicate reasonable ideas about what "teamwork" is?
22. Did students work together to solve the problem? Was everyone included in the planning?
23. Some teams may not work well together, and guidance or adjustments may become necessary. Remember that the focus of this challenge was to learn how to work as a team to solve a problem together. The process of collaborative work is more important than actually constructing the object!

Expanded Standards

Reading TEKS: (6) 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: (A) establish purpose for reading assigned and self-selected texts with adult assistance.
CCSS: RI.1.10 With prompting and support, read informational texts appropriately complex for grade 1.
NGSS: K-2 ETS1-1 Science and Engineering Practices – Asking Questions and Defining Problems - Define a simple problem that can be solved through the development of a new or improved object or tool. ETS1.A Defining and Delimiting Engineering Problems – A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have acceptable solutions
Science TEKS: 1(b)(3)(A) Scientific investigation and reasoning. The student knows that information and critical thinking are used in scientific problem solving. The student is expected to: (A) identify and explain a problem such as finding a home for a classroom pet and propose a solution in his/her own words