DAY 1 I Am a Scientist		
Reading Strategy: Language of a Scientist and Introduction to Inquiry Circles		**Science Concept:** Scientists work collaboratively in teams to conduct scientific research and investigations.
Reading TEKS: 3.13	**ELPS:** Speaking K-12, 19 TAC 74.4(c)(3) D	**Science TEKS:** 3(b)2A, 3(b)3C
Materials for Reading Mini Lesson: Chart paper, markers, nonfiction freshwater pond text to model strategy		
Materials for Inquiry Circle Groups: A list of North American ecosystems for research (aquatic polar, desert, Tundra, ocean, temperate forest, Grassland) and a variety of nonfiction texts for each group (Go to project website for suggestions); Science Team Roles (one copy of each role to display as a reference for students or create the class's own anchor chart of team roles); fiction portal texts		
Materials for Science Whole Group Lesson: See lesson.		
Content Vocabulary: **Teamwork —** a collaborative effort to accomplish a goal or complete a task in the most effective or efficient way. **Collaboration-** 2 or more people working together **Scientist –** Person who is an expert in, or studies aspects of the natural or physical world.		
Science and Literacy Connection: Often, scientists work in teams to research a topic and perform investigations.		

For an expanded version of the Standards listed above, see page ____.

Daily sequence of instruction will be:
Reading Mini-lesson
Inquiry Circle groups
Science Whole-group Lesson.

You may space the three components throughout the day in the way that best fits your usual schedule.

Reading Mini-lesson — 15 minutes

OVERVIEW

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 you will lead a reading mini-lesson before having the students work in their inquiry circles. The mini-lesson is designed to help students become more strategic in their reading through intentional instruction.

Each inquiry circle of students will select a North American ecosytem to investigate throughout this unit using informational texts. A list of suggested ecosystems (aquatic polar, desert, Tundra, ocean, temperate forest, Grassland) and text resources is provided for you on the unit website. 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 (using the Pond Ecosystem), who will work together to collect data about the ecosystem they selected. You will recognize the instructional model of inquiry circles as being similar to that of literature circles.

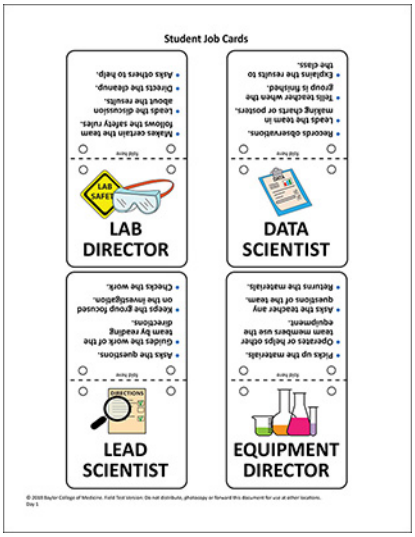
In addition to their English language arts activities, students will plan and conduct their own science investigations in separate lessons labeled as Science Whole Group Lesson. The Science Whole Group Lesson is a teacher-facilitated science exploration with students working in collaborative groups.

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

Students will be organized into teams of four 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.

Teachers may decide to have larger inquiry groups when researching the ecosystems or have multiple small groups researching the same ecosystem (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 as an anchor chart.



Lead Scientist

- Asks the questions
- Guides the work of the team by reading directions
- Keeps the group focused on the investigation
- Checks the work

Lab Director

- Makes certain the team follows the safety rules
- Leads the discussion about the daily results
- Directs the cleanup
- Asks others to help

Data Scientist

- Records observations
- Leads team in making charts or posters
- Tells the teacher when the group is finished
- Explains the team results to the class

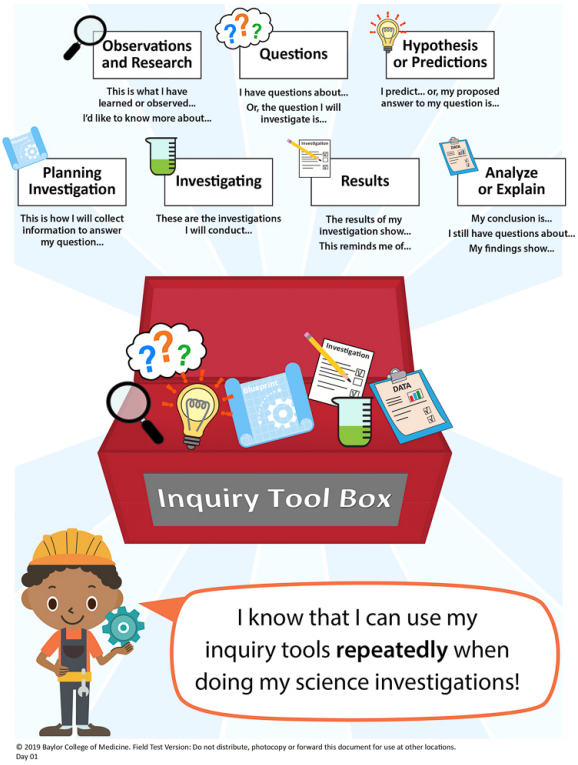
Equipment Director

- Picks up the materials
- Operates or helps other team members use the equipment
- Asks the teacher any questions of the team
- Returns the materials

PROCEDURE

Each day, for your Reading Mini-Lesson, instructions for the teacher will be provided as Declarative Knowledge (statement of what students will do or learn); Conditional Knowledge (context or background related to what students will learn); and Practical Knowledge (explicit instruction and practice).

- **Declarative Knowledge (what)**
  - Say something like, "Today, we will start a new unit in which we all will embody the role of a scientist. We'll be investigating different North American ecosystems."
- **Conditional Knowledge (when and why)**
  - Say something like, "When we conduct investigations and when we research ecosystems, 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 (how)**
  - 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 the "Language of a Scientist" 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."



Inquiry Circle Groups — 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 like a scientist, and writing like a scientist.

PROCEDURE

Before Inquiry Circle Groups — 5 minutes

- Say something like, "We will practice working with our inquiry circle groups."

- Remind students of the introductory mini-lesson and the "Inquiry Tool Box" anchor chart. Say something like, "When we research North American ecosytems, 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 science than to become a scientist!"

- 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 science investigation." (You may wish to use this time to assign roles to students and determine how roles will be rotated.)

- Say something like, "Remember when we are in our inquiry circles, we will help each other become scientists. Look at the "Inquiry Tool box" anchor chart to find sentence stems to assist you."

During Inquiry Circle Groups — 20 minutes

- Say something like, "Now each group will read a fiction portal text about the ecosystem you will research. When reading this text, think about what questions you may have about the ecosystem that can be researched. We will use nonfiction texts when we start our research tomorrow."

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

The portal texts are meant to grab the attention of the learners and get them interested in the topic. If you feel your students may have difficulty reading the portal texts independently, you may choose to read aloud the fiction portal texts to your students prior to starting this unit. That option still allows an opportunity for students to become interested when deciding which ecosystem to research.

After Inquiry Circle Groups — 5 minutes

Say something like, "The Data Scientist from each group will share with the class what your portal text was about. How did it grab your attention? What did the character do?" 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 Whole Group Lesson — 30-45 minutes

OVERVIEW
In this lesson, students will learn how to work as a team to complete a task together.

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

BACKGROUND INFORMATION
Over the course of the next four weeks, students will plan and conduct investigations as members of scientific research teams. Working within assigned roles, they will each contribute to the overall team process of scientific inquiry. Developing an understanding of how scientists work collaboratively towards a shared goal also enhances their understanding of the nature and methods of science.

For example, an oceanographic research expedition may include different scientists who focus on different aspects of the oceansuch as : the chemistry, plankton physiology, historical evidence from sediment cores, and microbial ecology. Looking through different perspectives helps scientists put together the big picture of what is happening in the part of the ocean they are studying.

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

MATERIALS
- Air dry clay
- Diatom jpeg.
- Adult size shoebox
- Xacto knife
- Dark felt or dark material
- Before the Unit Begins doc.

SET UP
- At least 3 days before the class, the teacher will create a 3D model of a diatom using an image and air -dry clay (see Before the Unit Begins doc.). *This should be done when there are no students in the classroom since the identification of the model will not be made until later in the unit!*
- Cut at least 5 small windows out of the shoe box. Placement of the windows is important so that students get different views of the diatom from different levels and positions- (see photos in Before the Unit Begins doc.)
- Before the first class, place model into box and secure with tape so that it cannot be opened.

Procedure
Engage

1. Ask students what they think of when they hear the word “teamwork”. Students may offer ideas and examples- accept all responses.
2. When all responses have been considered, ask them what the common factor was in their examples (teamwork involves more than one person working on something)
3. Tell the class that today they will work together in teams to complete a task.Their teams will be the same ones they worked in during literacy time.

Explore

4. Teacher will bring out the shoebox and place in a central location. Point out the location of the “windows”.
5. Tell the students that their task will be to recreate a clay model that is in the box. (do not reveal what the model is)
6. Explain that each team member has 3 seconds to pick a different window to look through to see what the model looks like. (Use timer, or count 1-1000, 2-1000, 3-1000)
7. After they look, they will construct the part they saw using clay. They can discuss what they saw with their team as they work.
8. When all the parts are complete, they will attach them together to form the model inside the box!
9. Tell them that they will have 10-15 minutes to complete the task.
10. Distribute the clay and begin allowing team members to look into the box. (Depending on the size of the class, you may have 2 students from different teams looking at the same time into different windows; or make 2 models.)
11. Let them know that you will be monitoring the time and observations while standing next to the boxes.

Explain

12. When time is up, have teams stop constructing regardless of progress.
13. Allow each team to explain what their strategy was and how successful they were.
14. Ask students to reflect on the activity. How did they solve any problems that came up? Did everyone participate in the decision making? How did they handle frustration? What motivated them? Were they successful?
15. Explain to the class that successfully completing the model was not the intended goal. Ask them if they can tell you what they think this challenge was all about. (effective teamwork: communication, collaboration, respect for each other’s ideas)
16. Before the structure inside the box is revealed, teams will share their constructions with each other to see how they compare, or to finish construction with help from other teams.
17. When all models have been shared and construction complete, you may open the box and reveal the model inside! If students want to know what it is, explain that it will be identified in a later lesson.
18. Tell them that the only clue you can offer them is that the actual size of the object in the box is MUCH smaller than the model.

Elaborate

19. Ask students to think about how this teamwork activity can be applied to scientists working as a team to plan investigations.
20. 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.
21. Each member of a scientific team organizes their information to make connections to the work of others, maximizing the effectiveness of their research and investigations.

Evaluate

22. Observe and note the strategies used by students as they worked to solve the problem.

Was everyone included in the planning? Did they develop feasible strategies? Were they successful?

23. Some teams may not work well together, and guidance or adjustments may become necessary.
24. Remember that the focus of this challenge was to learn how to work as a team to solve a problem together. The process of planning and sharing their strategies is more important than actually constructing the object!

Expanded Standards

Reading TEKS: 3.13 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.
ELPS: Student Expectations for Speaking K-12, 19 TAC 74.4(c)(3) The student is expected to: (D) speak using grade level content vocabulary in context to internalize new English words and build academic language proficiency (E)share information in cooperative learning interactions
Science TEKS: 3b2A: The student is expected to plan and implement descriptive investigations, including asking and answering questions, making inferences, and selecting and using equipment or technology needed, to solve a specific problem in the natural world. 3(b)3C: The student is expected to connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.

Image References