

Unit Overview for the Teacher

ORGANIZATION

Throughout this unit, learners will be organized into inquiry circles and science investigation teams that reflect the roles of practicing scientists. By taking on the roles of scientists as they engage in text-based and hands-on investigations, and by learning to read, write, speak, and listen like scientists, children develop deeper science learning and science-specific disciplinary literacies.

DAILY SCHEDULE

The sequence of instruction for the unit will be as follows (you may space the three components throughout the day in the way that best fits your usual schedule):

- mini-lesson on science-specific disciplinary literacy
- science inquiry circles
- guided science investigation

MINI-LESSON

Each day, the teacher will lead a mini-lesson on a science-based disciplinary literacy before the children work in their inquiry circles. The mini-lessons are taught as whole-class lessons in which the teacher models and explains a literacy strategy relevant for use with exploratory texts or media. Mini-lessons are organized around teaching children various literacy strategies associated with science and scientists. They are designed to help learners 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.**

Our goal in these lessons is 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.

SCIENCE INQUIRY CIRCLES

Throughout this unit, children will participate in inquiry circles—small teams that will work together to investigate plants in one of three Texas Ecoregions: the Piney Woods, the Trans-Pecos, and Blackland Prairie. An ecoregion is a large area of similar ecosystems. While there are many more ecoregions in Texas, we have selected these three because they are representative of three distinct ecosystems that can be found throughout North America: temperate forest, desert, and temperate grassland. You (the teacher) will use a fourth ecoregion—the Gulf Coast Marsh salt marsh—as a model.

It is important to note that the ecology of Texas is varied and complex. You should be prepared to help learners navigate some of these complexities. For example, tall pine forests in Texas are mostly found in the Piney Woods, but in Central Texas there are some pines called the Lost Pines for their unique location in an area otherwise considered a temperate grassland. This disjunct population of trees is related to the loblolly pines of the Piney Woods but are not considered part of the temperate forest. Additionally, there are varied ways of referring to Texas's ecoregions. Different resources might offer slight variations of the names of ecoregions. You may need to support children in cross-checking references and drawing conclusions about which ecoregion is being discussed. Finally, the majority of Texas is a temperate grassland. In the U.S., temperate grasslands might be referred to as "plains," "savannahs," or "prairies." All of these terms have been used to name various grassland ecoregions in Texas.

The informational texts and media teams will use in the text inquiry (see the "**Ecosystem Resources**" spreadsheet in the "Before the Unit Begins" section) should guide learners toward acquiring and/or building on information that leads to thinking about and asking questions about plants in the ecosystem they are studying. Learners in each inquiry circle investigating an ecosystem (e.g., an inquiry circle investigating the Trans-Pecos) will build their expertise on the plants in their chosen ecosystem. The "Ecosystem Resources" spreadsheet includes a small sampling of texts labeled "Exploratory Texts for Selecting Inquiry Topics" should be used on Day 1 when children or teams choose which ecosystem they will learn about.

The teacher will create the inquiry circle teams. **We suggest no more than four children per team**, although the number of inquiry circles you have will depend on the size of your class and other considerations. There will likely be multiple teams studying the same ecoregion.

Teachers have two options for creating teams:

Option 1: The teacher creates teams before the lesson begins. The teams then explore texts and rank their top ecosystem choices as a team. The teams will be assigned an ecosystem to investigate based on their preferences (hopefully their first or second choice).

Option 2: The children explore texts in existing table teams on Day 1 and rank their top choices individually. The teacher will then assign children to teams based on common interests, with everyone receiving (hopefully) their first or second choice. The teams would be revealed on Day 2.

These Texas ecoregions are representative of ecosystems found across North America. In their inquiry circles and in their science investigations, children will encounter information about plants and environmental conditions in their Texas ecoregion (e.g., Blackland Prairie) and about plants and environmental conditions in ecosystems like theirs (e.g., all North American temperate grasslands). To deal with this diversity, the children can record findings about their specific ecoregion (e.g., plants in the Blackland Prairie have long, deep roots) as well as general findings about the ecosystem (e.g., plants in temperate grasslands, like the Blackland prairie, have long, deep roots).

You will recognize that the instructional model for inquiry circles is similar to that of literature circles in which learners build skills and develop strategies in reading. You, the teacher, will model inquiry and literacy practices for learners, who will work together in their teams to collect data about the ecoregion they are investigating.

GUIDED SCIENCE INVESTIGATIONS

Guided science investigations are teacher-facilitated science explorations, with children working in collaborative teams. Children will work in the same teams for both inquiry circles and science investigations.

In this unit, children will explore observable inherited traits of plants in specific environments (desert, forest, etc.) and observable acquired traits that develop as a result of external factors or environmental change. Each team will plan and conduct an investigation using authentic monthly rainfall data for a given locale to investigate how the amount of rainfall (water) can impact plant growth and traits. Using Wisconsin Fast Plants as a model organism, learners will sprout seeds in a container where they can monitor growth/change.

Note: Background information relevant to each day's science lesson is included for the teacher. The information provided is not intended for the children, as it may contain terminology or concepts above their grade level. Rather, it is intended to enhance the teacher's understanding of the daily topic or concept.

TEAM ROLES

Team roles with jobs will guide the children's work both in the inquiry circles teams and in their science investigation teams. Typically, science teams have a leader, called the Lead Scientist, and various other science roles, such as Lab Director, Data Scientist, and Equipment Director.

You may use a variety of methods when assigning team roles or allow learners to choose their roles. To provide variety, learners should rotate positions in different activities, allowing each learner to try each role.

The "Team Roles" anchor chart PDF in the Day 1 section contains four 8.5" x 11" reproducible anchor charts that you will review with your learners and display as a reference. Team roles and their duties are given below:

Lead Scientist

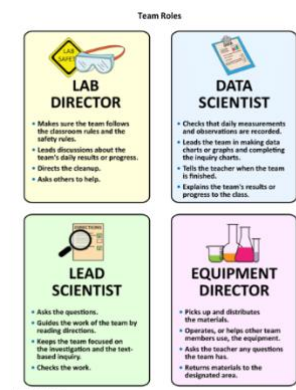
- Asks the questions.
- Guides the work of the team by reading directions.
- Keeps the team focused on the investigation and text-based inquiry.
- Checks the work.

Lab Director

- Makes sure the team follows the classroom rules and the safety rules.
- Leads the discussion about the daily results and progress.
- Directs the cleanup.
- Asks others to help.

Data Scientist

- Checks that daily measurements and observations are recorded.
- Leads the team in making data charts or graphs and completing the Inquiry Charts.



- Tells the teacher when the team is finished.
- Explains the team’s results or progress to the class.

Equipment Director

- Picks up and distributes the materials.
- Operates, or helps other team members operate, the equipment.
- Asks the teacher any questions the team has.
- Returns materials to the designated area.

SCIENCE LANGUAGE

The strategies related to science-specific reading and writing in the mini-lessons and inquiry circles enable deep science learning. Rather than simply memorizing *vocabulary words* without true understanding of their relationship to their scientific work, children develop fluency with the language of science **in context**, both in text-based inquiry and scientific inquiry. We encourage you to model using this language in context often to enhance children’s learning.

We have provided science language picture cards suitable for building reference-word walls for children. **The teacher will need to print color copies of the picture cards before Day 1. Each day’s science language is listed near the end of the lesson. The science language picture cards and a list of all the science language used can be found in the “Before the Unit Begins” section.**

“ECOSYSTEM RESOURCES” SPREADSHEET

The “Ecosystem Resources” spreadsheet in the “Before the Unit Begins” section provides a list of informational texts and media resources. **Please be sure to have texts and media resources prepared prior to beginning the unit.** Learners will need ready access to these resources when they begin their investigations in their inquiry circles.

SUPPORTING MATERIALS

The “Lessons at a Glance” document in the “Before the Unit Begins” section lists the materials needed for each day’s lesson. Any additional supporting documents referenced in a lesson (including anchor charts and printable or downloadable files) can be found in the “Supporting Files” section (on the righthand side of the webpage) for that day’s lesson.