ALL for Science™
Authentic Literacy and Language for Science

Baylor College of Medicine
CENTER FOR EDUCATIONAL OUTREACH

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 one of four representative plants: mosses, ferns, conifers, and flowering plants. These representative plants are members of the much broader groups of plants (nonvascular plants, vascular plants, gymnosperms, and angiosperms) that have existed on Earth. We selected these representative plants to highlight examples that children are likely to have encountered in their lives. For example, conifers are a large subgroup of gymnosperms that are common in South Texas and elsewhere in the United States.

The teacher will create the inquiry 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.

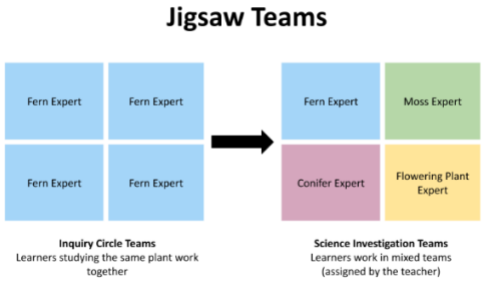
The teams will then explore texts and rank their top choices as a group. The teams will be assigned a plant to investigate based on their preferences (hopefully their first or second choice). The teacher will need to ensure that there is at least one team studying each different plant type.

The exploratory texts and media the teams use in the text inquiry (see **"Plant Resources" Spreadsheet** below) should guide learners toward acquiring and/or building on information that leads to thinking about and asking questions about the representative plants. Learners in each inquiry circle investigating a representative plant (e.g., an inquiry circle investigating ferns) will gain knowledge of the representative plant and serve as "experts" of the representative plant when the science investigation teams are formed.

In their inquiry circles and in their science investigations, children will encounter a lot of diversity among the representative plants they are learning about. To deal with this diversity, the children can record findings about their representative plant as a whole (e.g., conifers produce cones) as well as findings about a specific species of the representative plant (e.g., some conifers, including Loblolly pines, have scaly bark). The exception to this is "flowering plants," which includes all angiosperms.
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 representative plant they are investigating.

GUIDED SCIENCE INVESTIGATIONS

Guided science investigations are teacher-facilitated science explorations, with children working in collaborative teams. During the guided science investigations in this unit, children will be **assigned** to work in jigsaw teams. Each science team will be made up of one "expert" from each of the inquiry circle teams investigating the representative plants. Science teams will remain the same throughout the unit (see the graphic below).



The teacher must assign children to science teams before they begin the Day 1 lesson!

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

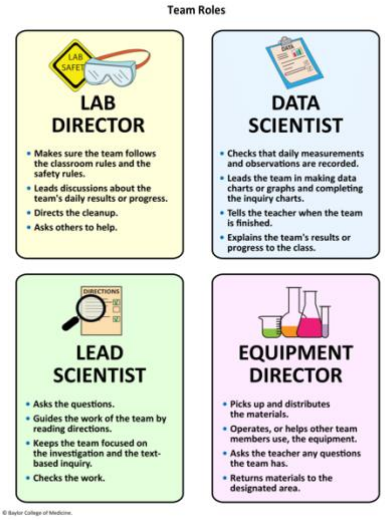
their grade level. Rather, it is intended to enhance the teacher's understanding of the daily topic or concept.

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 assign 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 folder 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 complete list of the science language used in this unit can be found in the "Before the Unit Begins" section.**

"PLANT RESOURCES" SPREADSHEET

The "Plant Resources" spreadsheet in the "Before the Unit Begins" folder 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** for that day's lesson.