DAY 7 What Tools do Scientists Use ?		
Reading Strategy: Main Idea		**Science Concept:** Science requires appropriate tools for conducting investigations.
Reading TEKS: 3.6G	**ELPS:** Reading 2-12, 19 TAC 74.4(c)(4)	**Science TEKS:** 3b2A , 3b4
Materials for Reading Mini Lesson: Chart paper, markers, pond ecosystem inquiry chart, pond text to model strategy		
Materials for Inquiry Circle Groups: Group inquiry charts, pencils, variety of nonfiction texts for each group, access to websites and online books		
Materials for Science Whole Group Lesson: See lesson		
Content Vocabulary: **microscope**- a magnifying tool that bounces light off objects that are too small to see with our eyes **digital microscope –** a microscope that uses a digital camera to allow us to see an image on computer **Loupe-** a small magnifier used to see details more closely; used by jewelers		
Science and Literacy Connection: Scientists consider the details of their investigation along with their prior knowledge of tools to choose the correct equipment to use.		

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

Reading Mini-lesson — 15 minutes

OVERVIEW

When scientists are researching a topic, they must decide what is the most important part of what they read. When we do this, we are determining the main idea.

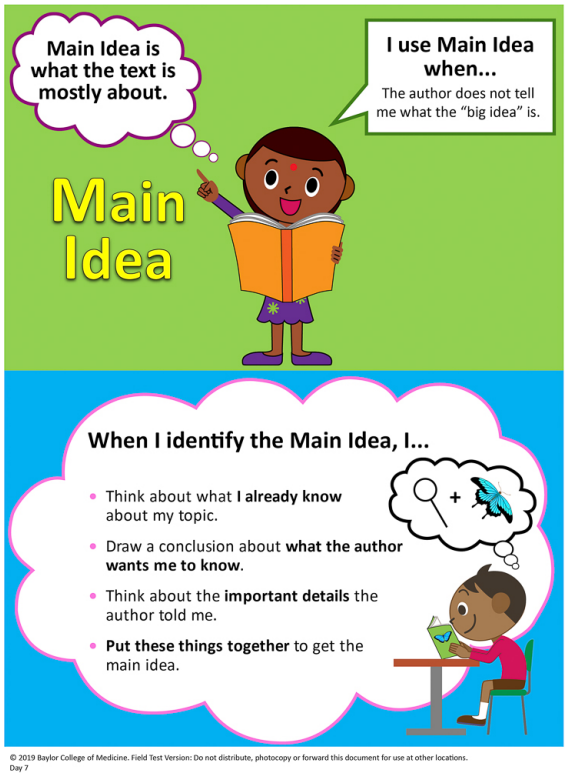
Explain the strategy below as follows.

- **Tell what the strategy is (declarative knowledge)**
  - Say something like, "Today we will practice determining the main idea of a section as we read about pond ecosystems. The main idea is the most important thing the author wants us to know about their topic. Getting the main idea is sometimes called 'getting the gist' of a piece."
- **Tell when and why to use the strategy (conditional knowledge)**
  - Say something like, "Sometimes authors tell us the main idea. Usually they do that in the first or last sentence of a section. But, they don't always do that. Sometimes, they leave out the main idea and make us (as readers) work to extract it. As a strategic reader, I will do this after each paragraph or section in the text I am reading. I do this because it makes my reading clear and helps me remember what I read."

- **Tell how to employ the strategy (procedural knowledge)**
  While you model the strategy, you might want to say something like this to the

readers:

- "The first thing I need to do is think about the topic (that's pond ecosystems) and what **I already know** about the topic (pond ecosystems)."
- "Next, I will draw a conclusion about **what the author wants me to know** about the topic (pond ecosystems)—that is, I'll take what I already know about the topic (pond ecosystems) and then I'll combine that with the most **important details** the author is telling me."
- "Now, I have to **put these things together** to get the main idea. I will think, 'What would the author tell me was the most important idea from the reading if she were standing here next to me?'"
- "I will put the main idea in my own words and record it on the inquiry chart."



Practice in text (print, video, or interview)
Post the anchor chart in your classroom so students can refer to it while in their inquiry circles. Encourage scientists to use the strategy during their Inquiry Circles.

Inquiry Circle Groups — 30 minutes

OVERVIEW

Scientists work in teams when conducting research and investigations. 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
You might want to say something like this to the readers:

- It is time to get into our inquiry circle groups. You will be with the same research team as yesterday.
- When we research ecosystems, we will practice our roles as scientists. We will do this because scientists have a special way in which they observe the world, read scientific texts, and write reports. There is no better way to learn about science than to become a scientist!

During Inquiry Circle Groups — 20 minutes
You might want to say something like this to the readers:

- We have anchor charts to help guide your thinking. Do not forget to use them while in groups. (Refer to the "Inquiry Tool Box" anchor chart and the daily anchor chart. Remind students that they can use all the reading strategies taught, not just the one for that day.)
- My role is to help guide the inquiry circle groups, but I expect you to work as a scientific team to solve your problems together.
- Do not forget to answer your research questions and record it on the inquiry chart. It is important to record your sources on the inquiry chart as you complete it. (Be sure to explicitly explain how students should use the chart.)

(While groups are working together, walk around the room to facilitate as needed.)

After Inquiry Circle Groups — 5 minutes

You might want to say something like this to the readers:

- As we are concluding our inquiry circle groups for today, each group will have a chance to share what they accomplished and learned.
- The Lab Director should lead the discussion with their inquiry circle group about today's results. For example, what did you learn about your ecosystem? Which reading strategies did you use? What problems did you encounter? How did you resolve those problems?
- The Data Scientist will now share with the entire class either something the group learned about their ecosystem, which reading strategy(ies) were used, or how the group solved a problem.

Science Whole Group Lesson — 30 -45 minutes

OVERVIEW

Students will learn about tools that different scientists use in their work. They will also explore with magnifiers, color charts and the digital microscope in preparation for their investigations

GUIDING QUESTIONS

What are the best tools to use for my investigation? How will I use them? What kind of data will they help me collect?

BACKGROUND INFORMATION

Scientists use many tools to conduct research and investigations; to make observations; and to take measurements. Some tools are very simple, like a hand lens or a graduated cylinder, or they can be very high-tech like laser measuring devices or complex computer systems. The type of tools they use depends on what kind of work they do, and where.

SAFETY

Address any potential issues/hazards for using the tools before students explore with them. Give them clear directions on how to use them.

MATERIALS

- Digital microscope
- Hand lens & loupes
- Tools of Science pptx.
- Computer (to attach digital microscope)

- Computer monitor or projector
- Containers (plastic shoeboxes or similar) for holding tools- 1 per team
- Instructions for Using the Digital Microscope (for students) doc.

SET UP

Before the class:

- Preview and prepare PPT for viewing
- Digital microscope should be set up with computer with output from monitor or projector (Teacher- see instructions that come with microscope).
- Gather containers (plastic shoebox or similar) for holding materials- 1 per team
- Label each container with a team identifier (number, name, etc.)
- Gather loupes &/or magnifiers, color chart, AND any available tools that were listed in student data logs
- Set up separate station for students to explore with the microscope.
- Print out the student instructions for using the digital microscope

DAILY OBSERVATIONS

Not at this time

PROCEDURE

Engage:

1. Begin the class by showing the Tools of Science pptx. (showing different types of scientists using different types of tools) (6 slides)
2. At each slide, discuss what the scientists are doing and what they are using in their work. Ask students to consider what other tools might be appropriate to use for that particular type of work or investigation.
3. Why might the tools be different for different investigations? (Because it depends on what kind of data you need to collect)
4. Final slide – What tools will YOU use in your investigations?

Explore

5. Announce to the class that you have organized boxes with some of the tools each team may use for their investigations. Tell them that you checked their data logs and have put together many of the tools they indicated they needed.
6. If needed, explain that some of the equipment teams requested may not be available and you will talk with those teams individually about alternatives.
7. Additionally, tell them that you have set up a practice station for using the digital microscope, and that you will help them learn how to use it when they come to the station. **(The teacher will bring a team at a time to explain the proper handling of the microscope using the printed instructions, but without an actual sample.)**

Explain

8. Remind all students to make notes in their science notebooks as they explore the tools.
9. They should describe which tools they will use and explain what information they will collect with them.

Elaborate

10. After exploring with tools, ask the Data Scientists to share which tools their team has decided to use and to explain why (what information will they collect with them?).

11. Remind them that they may need to change/add tools as they move through the investigations because it's difficult to know exactly what they need until they plan and begin their investigations.

Evaluate

12. Did students use/handle the tools and equipment correctly?
13. Were their written explanations for their choice of tools accurate or reasonable?
14. Did they communicate any prior knowledge that helped them to make connections to how they will use tools or equipment effectively?

EXPANDED STANDARDS

Reading TEKS: 3.6G 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: (G) evaluate details read to determine key ideas

ELPS: Student Expectations for Reading 2-12, 19 TAC 74.4(c)(4) The student is expected to:(I) demonstrate English comprehension and expand reading skills by employing basic reading skills such as demonstrating understanding of supporting ideas and details in text and graphic sources, summarizing text, and distinguishing main ideas from details commensurate with content area needs.

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. 3b4: The student is expected to collect, record, and analyze information using tools, including cameras, computers, hand lenses, metric rulers, Celsius thermometers, wind vanes, rain gauges, pan balances, graduated cylinders, beakers, spring scales, hot plates, meter sticks, magnets, collecting nets, notebooks, and Sun, Earth, and Moon system models; timing devices; and materials to support observation of habitats of organisms such as terrariums and aquariums.