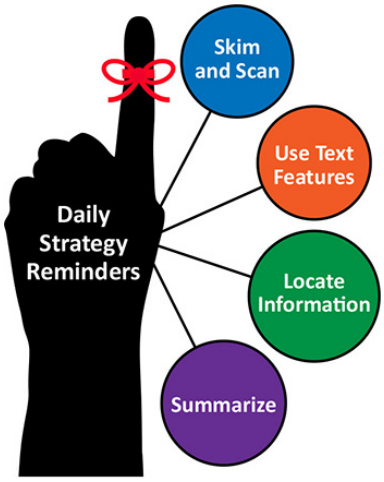
Day 11 Who are the Producers in Aquatic Ecosystems?		
Reading Strategy: Monitoring Comprehension		**Science Concept:** Identifying producers and consumers in a pond ecosystem
Reading TEKS: 3.6 I	**ELPS:** Speaking K-12, 19 TAC 74.4(c)(4)	**Science TEKS:** 3b2B, 3b4, 3b9B
Materials for Reading Mini-lesson: 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: **Food chain –** sequence of whom eats whom in an ecosystem that provides the transfer of energy between organisms **Producers** – make their own food from simple substances and energy from the Sun (Ex. plants) **Consumers** – Cannot make their own food, must obtain energy from consuming (eating) producers or other consumers **Decomposers** – break down dead plants and animals, returning important nutrients to continue the food chain **Energy** – required by organisms on Earth to move, grow, and sustain themselves. Food provides energy and other raw materials necessary for life		
Science and Literacy Connection: Scientists use all kinds of information to make sure that they understand or can make sense of what they are observing or researching.		

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

Reading Mini-lesson — 15 minutes

OVERVIEW

Scientists always pay close attention to the world around them. When measuring liquids in an investigation, they must monitor the amount poured into a beaker. When making observations of ecosystems, they closely monitor changes that occur. Scientists also monitor their comprehension while they read!

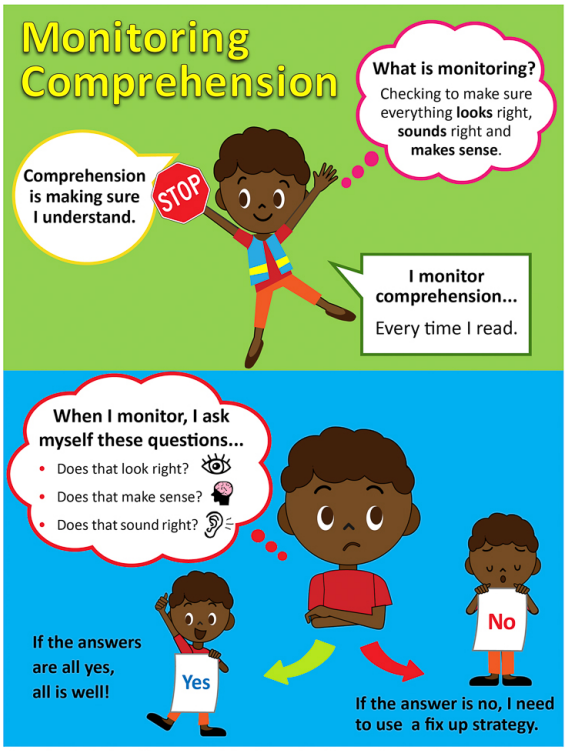


Explain the strategy:

- **Tell what the strategy is (declarative knowledge)**
  - Say something like, "Our strategy today is called monitoring comprehension. Monitoring means Checking to make sure everything looks right, sounds right, and makes sense. I have to be in charge of my own reading."

- **Tell when and why to use the strategy (conditional knowledge)**
  - Say something like, "I monitor my comprehension every time I read. Sometimes a text is easy, so I don't notice my monitoring. I may notice it more when a text is difficult. As a strategic reader, I monitor as I read because reading is supposed to make sense. This strategy will help me be aware of my metacognition (what I'm thinking as I read) because it makes me pay close attention."
- **Tell how to employ the strategy (procedural knowledge)**
  While you model the strategy, you might want to say something like this to the readers:
  - I ask myself three things while I am reading:
    - Does that look right?
    - Does that sound right?
    - Does that make sense?
  - If the answers to these questions are yes, then all is well. If the answer is "no," then I have to use a fix-up strategy. (Comprehension fix-up mini lesson will be tomorrow).
  - When I am finished reading, I will ask myself, "What did I learn?" If I can answer this, all is well. If I cannot, then I should use a comprehension fix-up strategy.

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 in 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

Student teams will draw their ideas of what a pond ecosystem looks like. When complete, they will identify the producers and consumers in a pond food chain.

GUIDING QUESTIONS

Who are the producers in a pond ecosystem? What does a pond food chain look like?

BACKGROUND INFORMATION

Aquatic ecosystems, like terrestrial ecosystems, all depend on producers for the stability and success of their food chains and food webs. Ponds support a variety of ecosystems both on the surface surrounding it and beneath its waters.

Algae, single-celled photosynthetic organisms, are the primary producers in pond waters, with other aquatic plants contributing to the energy of food chains to a lesser extent.

Suspended in water, this phytoplankton creates the energy necessary for the consumers' survival, as well as being a source of dissolved oxygen to the pond.

SAFETY

Remind students to follow safety rules for making observations on their sample.

MATERIALS

- Blank student pond pdf.
- pond1 pdf.
- Pond jpeg. image
- Pencils
- Chart paper
- Computer/projector

SET UP

- Make copies of the blank student pond pdf. (1 per student)
- Draw the same image on a sheet of chart paper (you will save for later use)
- Prepare to project pond jpeg. (or make copies)
- You will also project the pond1 pdf. when noted below

DAILY OBSERVATIONS

Students observe their samples and record data/information on data logs in their science notebooks.

PROCEDURE

Engage

1. Project pond jpeg. Ask the class to describe what they are looking at. Accept all responses.
2. Identify the image as a pond. Explain that a natural pond is a body of water surrounded by banks, land that is alongside or surrounds it, and rises above the water level.
3. Ask if they know of any other types of ponds (man-made).
4. Explain that unlike rivers or streams, pond waters are still- they don't flow.

Explore

5. Distribute the blank student pond pdf. and post the chart paper you have with the same image. (Tell the students this is a cross-section view of the pond.)
6. Refer back to the projected image and ask students to describe what they see in the photograph (grass, plants, any sign of life?)
7. Point out and identify the banks surrounding the pond.
8. Ask them to think about what kinds of animals might live in the area around the pond? Then, have students draw their ideas in the appropriate place on the Pond doc.
9. Tell the class that even though you may not see it (even in real life) there is an ecosystem under the surface of the pond!
10. Ask the students to draw their ideas of what they think we might find living **IN** the pond.
11. Allow 5 minutes for them to complete their drawings, circulating around the room as they do to see what they are thinking.

Explain

12. When time is up, ask volunteers to share what they have drawn into the pond. (Expect them to have fish, perhaps insects, frogs, turtles, etc.) Quickly sketch all their ideas on the chart paper.
13. Remind students that in the last lesson they discussed the importance of producers in a food chain. Ponds have their own food chains. Ask them who the producers are in the pond. (answers may vary).
14. Explain that submerged or floating plants in the pond may provide some of the energy for the food chain, but that the main producer is a microscopic organism: algae.
    Algae, other phytoplankton, and bacteria are at the base of the food chain in any aquatic ecosystem. They are the primary producers.
15. Explain that these primary producers are so small that many of them can only be seen through a microscope- but they are present in the water!

16. Refer students to the drawing you have made on the chart paper. Ask if they can point out a possible simple food chain (who eats who?) that begins with algae. Accept their responses and note on the chart paper.
17. After discussing their ideas, project the pond 1 pdf. (Algae, tadpoles, fish, heron). Point out and discuss each part of the chain beginning with the phytoplankton (algae).
18. Explain that this is a simple food chain, and based on their ideas, they can see that there are many possibilities. When you have many food chains, it becomes a food web!

Elaborate

19. Tell students that they will learn more about algae in the next lesson.
20. Ask them to look for food chains as they continue their research on other ecosystems!

Evaluate

21. Did the students identify appropriate organisms that live around and in the pond ecosystem?
22. Were any connections made between organisms around the pond and in the pond?
23. Did students give reasonable explanations about producers in a pond?
24. Did students communicate understanding about a pond food chain?

Expanded Standards

Reading TEKS: 3.6I 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: (I) monitor comprehension and make adjustments such as re-reading, using background knowledge, asking questions, and annotating when understanding breaks down.
ELPS: Student Expectations for Speaking K-12, 19 TAC 74.4(c)(4) The student is expected to: (D) speak using grade-level content area vocabulary in context to internalize new English words and build academic language proficiency; (E) share information in cooperative learning interactions;
Science TEKS: 3b2B: The student is expected to collect and record data by observing and measuring using the metric system and recognize differences between observed and measured data. 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.

3b9B: The student is expected to identify and describe the flow of energy in a food chain and predict how changes in a food chain affect the ecosystem such as removal of frogs from a pond or bees from a field.