

<b>Day 3</b>			
<b>Tools That Help Us</b>			
<b>Reading Strategy:</b> Reading for Specific Information on the Internet		<b>Science Concept:</b> Making Things Appear Bigger	
<b>Reading TEKS:</b> 2.9F	<b>Figure 19:</b> Reading/Comprehension Skills A	<b>ELPS:</b> Speaking K-12, 19 TAC 74.4(c)(4) D & E	<b>Science TEKS:</b> 2.2(A, D), 2.4(A, B)
<b>Materials for Reading Mini Lesson:</b> chart paper, markers, butterfly inquiry chart, webpage about butterflies to model the strategy and list of suggested lesson websites (Go to Project website), computer and projector;			
<b>Materials for Inquiry Circle Groups:</b> group inquiry charts, pencils, variety of nonfiction texts for each group, access to websites and online books			
<b>Materials for Science Whole Group Lesson:</b> See section for details.			
<b>Content Vocabulary:</b>			
<b>Magnify</b> — To make something appear larger than it is.			
<b>Hand lens</b> — A small device used to magnify something that an entomologist or naturalist is looking at. Consists of a lens made of glass or plastic and attached to a frame.			
<b>Entomologist</b> — A person who studies or is an expert in the branch of zoology concerned with insects.			
<b>Science and Literacy Connection:</b> We use tools to discover new information. We can use tools such as computers and iPads to access credible online resources to gather the information we need. During science experiments and observations, we use tools like hand lenses to gather information about organisms.			

For an expanded version of the Standards listed above, see page 6.

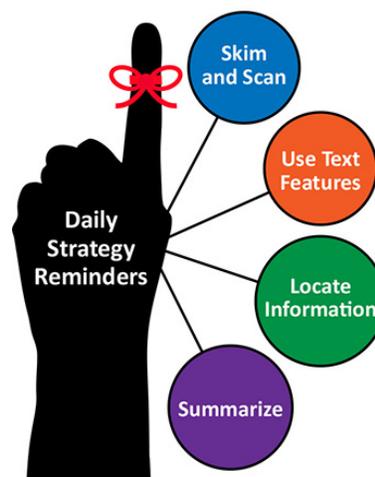
## Reading Mini-lesson — 15 minutes

### OVERVIEW

When doing scientific research, we must remember to think, talk, and read like a scientist. A scientist will use many different resources when researching information. In many cases, a scientist will read texts on the internet to get the most up to date information.

Explain the strategy:

- **Tell what the strategy is (declarative knowledge)**
  - Say something like, “Our strategy today is called “reading for specific information on the internet. I will use many sources while doing my research such as books, videos, and websites.”
- **Tell when and why to use the strategy (conditional knowledge)**
  - Say something like, “I know to use this strategy (reading for specific information on the internet) because sometimes the books I have available may be outdated or simply do not include what I am looking for. When this happens, I can get more information on the internet. As a strategic reader, I will scan the website because I do not need to read every word when I am looking for specific information. Just like when I scan a page in a book, this strategy is important because it saves me lots of time. As a strategic reader using the

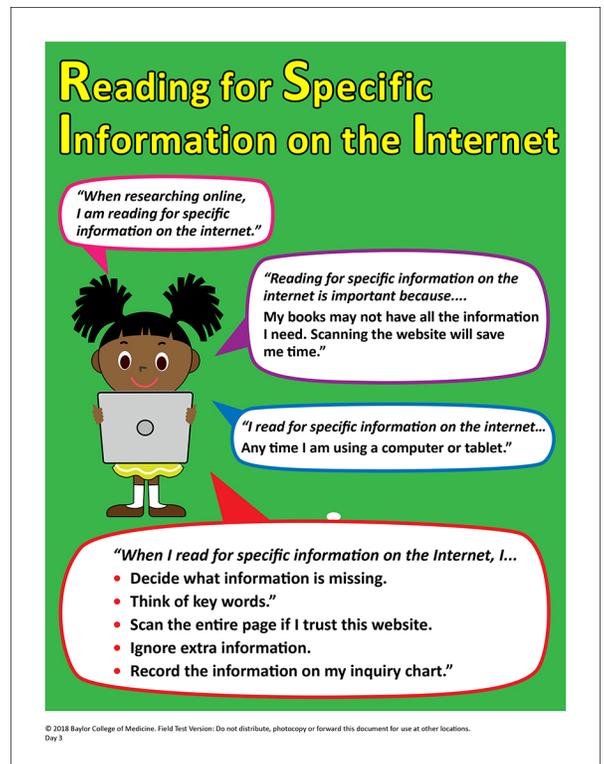


internet, I will also be skeptical about what I read online and always use websites that I can trust. Therefore, I will only use a website that my teacher has approved.”

(Before allowing your students online, you may want to insure that the suggested websites are not blocked by your school district. You may also choose to bookmark the websites on your browser and/or create QR codes that students can scan to go directly to the website.)

• **Tell how to employ the strategy (procedural knowledge)**

- Say something like (while you model the strategy), “The first thing I will do is think what I need to research today!”
- “Now, I will look at my inquiry chart to determine what specific information I need to locate. Since we just started our research, I have to pick one thing to start with. In a few days, my chart will help me know what data is missing.”
- “Then I think about a few key words that I need to look for on my website.”
- “When I am on a website, the first thing I do is check to see if I can believe what is on the website. I will look for an author to be listed and I will be sure they are not trying to sell me something.”
- “I must remember to scan the entire page on the screen. Just like in a book, the text features are important and can lead me to valuable information.”
- “If I do not find the information I need, I should try another website.”
- “While scanning, I may see a hyperlink that I can click on for more information. If my mouse turns from an arrow to a hand, I know this is something I can click on. Sometimes the hyperlink will be words that are often colored or bold, and other times it may be a picture or icon. I may also see short videos to play.”
- “Sometimes websites have extra information that I should ignore. This could be advertisements, videos (not about my research topic), and even pop ups. I can ignore them.”
- “If I find myself on a website that is not useful, I can use the back button at the top of my browser to get back to the website where I started.” (Alternatively, you could have websites bookmarked and have students return to the correct place using the bookmark.)
- “Once I find the specific information I need, I must remember to record it on the inquiry chart. That includes the URL for the website I used.” (You may need to model where to find the URL on the webpage and where to record it on the Inquiry chart.)
- “This is a strategy I will use every time I read for specific information on the internet.” (You may have some groups working online while others are working in traditional texts throughout the inquiry circle groups.)



**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 experiments. 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

1. Say something like, “It is time to get into our inquiry circle groups. You will be with the same research team as yesterday.”
2. Say something like, “When we research organisms, 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

1. Say something like, “We have anchor charts to help guide your thinking. Do not forget to use them while in groups.” Refer to the “Language of a Scientist” 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.
2. “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.”
3. “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.
4. While groups are working together, walk around the room to facilitate as needed.

#### After Inquiry Circle Groups — 5 minutes

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

## Science Whole Group Lesson — 30 minutes

### OVERVIEW

In this activity, students use a simple science tool, a hand lens, to learn about magnification in preparation for making observations of their butterfly larvae.

### GUIDING QUESTION

What is the value of scientific tools? How do tools extend the senses to enable deeper investigations?

### BACKGROUND INFORMATION

Scientists use many tools in their investigations. Tools like microscopes, beakers, thermometers, rulers, Bunsen burners, and instruments of all kinds extend the ability of scientists to observe, measure, and experiment. Some tools are very complicated like those seen in CSI-type television shows, but many others are simple. One simple scientific tool is the hand or magnifying lens. It enables scientists to magnify small things like the fibers and spikes extending from the skin covering of butterfly larva. Hand lenses are especially useful when scientists are working in their outside laboratories. A hand lens is much easier to carry than a heavy microscope.

While most students are probably familiar with hand lenses, it is a good idea to have students practice using them properly. The plastic hand lenses used in this activity have a large and a small lens built into the handle. The large lens magnifies 3 times and the small lens magnifies 6 times.

Hand lenses will be of great help to student teams as they begin their observations of butterfly larva in the chambers. Upon arrival, the butterfly larva will be only about a centimeter long. They will be dark in color and it will be hard to see details. Painted lady larva undergo 5 growth stages before forming a chrysalis and going through metamorphosis to become adult butterflies. The growth stages are called instars. As the larva feed and grow, they become tight inside their skins. The skins molt (split open) so the larva has room to grow. In other words, the next instar begins.

### SAFETY

It is always good to remind the students not to use magnifying lenses to look at bright lights and, especially not to look at the sun. Severe eye damage can occur. Proper handling of the magnifiers should be modeled.

### MATERIALS

#### For the Teacher

- Download and print the “Hand Lens Exploration Card Template” page (03-Lens Template.pdf). Check the application print settings to ensure the file will print at the actual size of 100% on 8.5-in. x 11-in. paper. Do not fit, shrink or scale the page. Copy onto cardstock and cut out the cards.

#### Per Student

- Hand Lens Exploration card
- Plastic hand lens with embedded magnifier
- Science notebooks
- pencils

## DAILY OBSERVATIONS

Give students time to observe their organisms (whether they are in the larvae, pupa, or adult stage), take measurements of the larvae (if applicable), and record their observations in their science notebooks. Facilitate group discussions by asking questions like, “What did you notice?” “What has changed since the last time you observed your organisms?”

## PROCEDURE

### **Engage**

1. Tell the students that today they will learn how to properly use a science tool that they are familiar with. Hold up a hand lens and ask for volunteers to explain what they are used for.
2. Ask, “Can anyone explain why it has 2 different lenses?”. Accept their responses and discuss how the hand lens might help them in their investigation.

### **Explore**

3. Show students the proper way to hold the lens from the handle only, then distribute hand lenses.
4. Show the Hand Lens Exploration cards to the students. Tell the class that they will use the large lens first to look at the line of numbers on the card. Ask them to count how many numbers they can see at a time.
5. Tell them to write their answer in their science notebooks and to draw the numbers as big as they look.
6. Next, they will do the same thing, but will use the smaller lens. Remind them to count and write how many numbers they see at a time, and to draw how big they look.

**Note:** It’s a good idea to walk the students through this procedure because of the amount of text on the exploration card.

7. When they have finished looking at the numbers, discuss the difference between using the larger lens compared to the smaller lens. Have students share their observations.
8. Next, instruct the students to go around the room and look at 5 different things using both the large and small lenses, then write about their observations in their butterfly notebooks.
9. Give students about 15 to 20 minutes to make their explorations. Provide them with sentence stems for writing such as “I discovered,” “I found,” or “I noticed”.

### **Explain**

10. In class discussion, have students share their discoveries. What could they see better with their hand lenses than they could with their unaided eyes? How will hand lenses help them in their investigation? Explain what an entomologist is. How would a hand lens help an entomologist in their work?

### **Extend**

11. Ask, “Is there anything they could see better without hand lenses?” (Hand lenses and microscopes make very tiny things easy to see but they are not good for the larger view. For example, looking just

at the bark of a tree with a hand lens will not tell you what the tree itself looks like or how big it is. Both the close up and the wide view are important.)

12. Discuss other examples of how magnification makes it easier to see things (eyeglasses, binoculars, etc.)

**Evaluate**

13. Were students able to communicate the concept of how magnification helps us to see things better?

**Expanded Standards**

**Reading TEKS:** 2.9F Multiple genres: listening, speaking, reading, writing, and thinking using multiple texts--genres. The student recognizes and analyzes genre-specific characteristics, structures, and purposes within and across increasingly complex traditional, contemporary, classical, and diverse texts. The student is expected to: (F) recognize characteristics of multimodal and digital texts.

**Figure 19:** Reading/Comprehension Skills. Students use a flexible range of metacognitive reading skills in both assigned and independent reading to understand an author's message. Students will continue to apply earlier standards with greater depth in increasingly more complex texts as they become self-directed, critical readers. The student is expected to: (A) establish purposes for reading selected texts based upon content to enhance comprehension

**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:**

2.2 Scientific investigation and reasoning. The student develops abilities necessary to do scientific inquiry in classroom and outdoor investigations. The student is expected to:

- (A) ask questions about organisms, objects, and events during observations and investigations;
- (D) record and organize data using pictures, numbers, and words

2.4 Scientific investigation and reasoning. The student uses age-appropriate tools and models to investigate the natural world. The student is expected to:

- (A) collect, record, and compare information using tools, including computers, hand lenses, rulers, plastic beakers, magnets, collecting nets, notebooks, and safety goggles or chemical splash goggles, as appropriate; timing devices; weather instruments such as thermometers, wind vanes, and rain gauges; and materials to support observations of habitats of organisms such as terrariums and aquariums; and
- (B) measure and compare organisms and objects.