



EXPEDITIONARY
LEARNING

Grade 4: Module 3A: Unit 2: Lesson 1

Setting Purpose for a Deeper Study of Simple Machines



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Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)

I can explain what a text says using specific details from the text. (RI.4.1)

I can effectively engage in discussions with diverse partners about fourth-grade topics and texts. (SL.4.1)

I can recall information that is important to a topic. (W.4.8)

Supporting Learning Targets

- I can self-assess my progress toward the learning targets.
- I can identify what I already know about simple machines and what I want to learn.
- I can ask questions about simple machines.
- I can follow our class norms when I participate in a conversation.

Ongoing Assessment

- Tracking My Progress, End of Unit 1 recording form
- Simple Machines KWL anchor chart
- Page 10 of Simple Machines Science journal



Agenda	Teaching Notes
<ol style="list-style-type: none">1. Opening<ol style="list-style-type: none">A. Tracking My Progress Reflection (10 minutes)B. Engaging the Reader and Writer and Reviewing Learning Targets (5 minutes)2. Work Time<ol style="list-style-type: none">A. Building Background Knowledge: What We Already Know about Simple Machines (10 minutes)B. Building Background Knowledge: What We Want to Know about Simple Machines (10 minutes)C. Revisiting the Guiding Question: Concentric Circle Protocol (20 minutes)3. Closing and Assessment<ol style="list-style-type: none">A. Group Mingle (5 minutes)4. Homework<ol style="list-style-type: none">A. Continue your independent reading book for this module at home.	<ul style="list-style-type: none">• The opening of this lesson serves as a bridge between Units 1 and 2; students reflect on their progress toward the Unit 1 targets. Then Unit 2 is launched in earnest.• In advance: Write the guiding question (“How do simple machines affect our lives?”) on chart paper, leaving room for students to post sticky notes around or under it.• For the Concentric Circles protocol, identify an open space large enough for two circles and student movement.• Review: Concentric Circles protocol in (see Appendix).• Post: Learning targets.



Lesson Vocabulary	Materials
hypothesis, prove, disprove, accuracy	<ul style="list-style-type: none">• Tracking My Progress, End of Unit 1 recording form (one per student)• Simple Machines Science journals—page 10: KWL chart (from Unit 1, Lesson 1)• Equity sticks• Simple Machines KWL anchor chart (new; co-created with students during Work Time A)• “The Machine” (pages 219–221 in <i>Take a Quick Bow!</i> by Pamela Marx)• <i>Simple Machines: Forces in Action</i> pages 4–5 (book; one per student)• Guiding Question chart• Writing paper



Opening	Meeting Students' Needs
<p>A. Tracking My Progress Reflection (10 minutes)</p> <ul style="list-style-type: none">• Discuss the learning target: "I can self-assess my progress toward the learning targets." Have students talk to a partner; remind them what it means to "self-assess." Have students share their thinking and clarify as necessary.• Congratulate students on their hard work on Unit 1. Distribute the Tracking My Progress, End of Unit 1. Remind students that successful learners keep track and reflect on their own learning. Point out that students have been doing this informally all year, during debriefs when they consider how they are making progress toward the learning targets.• If necessary, review how to complete this reflection form. Remind students that in Step 1, they explain what the target means to them. For example, the first target is: "I can use literary terms to describe parts of a story or drama." They should write what the target means "in their own words" by explaining that the target means to describe parts of a story or play using the correct vocabulary terms.• Point out the second step, and explain that this is similar to the thumbs-up, thumbs-sideways, or thumbs-down that they have used in previous lessons. They should also explain why they think they "need more help," "understand some," or are "on the way," and give examples. Consider giving students an example such as: "I circled that I need more help because I can't remember what the word <i>literary</i> means."• Collect students' self-assessments to guide instructional decisions during the next unit.	<ul style="list-style-type: none">• For students who struggle with language, consider giving a list of key academic and scientific words they might use in their reflections.
<p>B. Engaging the Reader and Writer and Reviewing Learning Targets (5 minutes)</p> <ul style="list-style-type: none">• Tell students they will continue to increase their knowledge about simple machines in this unit by doing some research and will even get to conduct some science experiments.• Ask students to read the second learning target silently. Have them give a thumbs-up if they are clear on what they will be expected to do, a thumbs-sideways if they understand part but not all of what to do, and a thumbs-down if they are very unsure about what they should do.	



Work Time	Meeting Students' Needs
<p>A. Building Background Knowledge: What We Already Know about Simple Machines (10 minutes)</p> <ul style="list-style-type: none"> • Distribute the Simple Machines Science journals—page 10: KWL chart. Explain the KWL table to students if a KWL chart has not been used yet with your class (<i>K</i> = What we know or think we know: prior knowledge about the topic; <i>W</i> = What we want to know: our questions; and <i>L</i> = What we learned: answers to our questions or information that confirms/refutes our prior knowledge). Explain that for the next several days the class will record their knowledge, questions, and learning using this chart. Invite the students to take about 5 minutes to list all they already know about simple machines in the left K column. • Use equity sticks to cold call four to five students to share out whole group. Record students' comments (both accurate and inaccurate) in the K column on the Simple Machines KWL anchor chart. (For example, a student may share correct information such as: "A bicycle is a simple machine." Or they might inaccurately say: "A cell phone is a simple machine"). Tell students that during this unit, they will continue to learn about simple machines and will be looking for evidence from the text and their experiments to either confirm or revise their current knowledge. This chart will grow throughout this unit as a way to document the class's growth in scientific knowledge about simple machines. • Tell students that accuracy is important in scientific research. Scientists will make a guess, called a <i>hypothesis</i>, that is often based on what they think they know about a topic, but they always look for facts or data (either from reading or from their own research) to determine whether that guess is correct or not. They state a hypothesis before conducting an experiment. In other words, they make an educated guess about the results of the experiment based on what they know about a topic. • Explain that students now will work with a partner for about 5 minutes to determine whether the information they have listed in the K column is true or not by using "The Machine" (pages 219–221 in <i>Take a Quick Bow!</i>) as well as Simple Machines: Forces in Action pages 4–5. • Give directions: <ol style="list-style-type: none"> 1. Mark a Y if what you listed can be checked as correct. 2. Mark an N if what you listed is shown to be incorrect. 3. Put a ? if you did not find evidence in this text relating to a piece of information you listed. (You may need to read another text to find out.) 	<ul style="list-style-type: none"> • For students needing additional support, consider allowing students to draw their ideas, or notes when appropriate. • Students needing additional support may need to share in a partnership or triad in order to help them articulate their thinking.



Work Time (continued)	Meeting Students' Needs
<p>B. Building Background Knowledge: What We Want to Know about Simple Machines (10 minutes)</p> <ul style="list-style-type: none">• Tell students they will now think about their curiosity regarding simple machines. What do they want to learn about them? Explain that it is this process that scientists go through that guides their research and discovery of new things in the world of science. Without deep curiosity, scientists wouldn't have any motivation to conduct experiments or research a topic. Scientists often ask: "Why?" or "How come?" or "What if?"• Invite student partnerships to join another partnership to form a group of four. Each group of four will generate at least three questions that they <i>want</i> to know about simple machines. Each student will record the group's questions in their individual chart on page 10 of their Simple Machines Science journals. If students do not have much background knowledge about this topic, they may not have many questions at this time. This is okay, because the class will revisit and record more on this chart as they read other texts. Reiterate that they will be looking for the answers to these questions throughout the unit.	<ul style="list-style-type: none">• Consider partnering an ELL student with a student who speaks the same L1 for discussion of complex content, or partner an ELL with a native speaker of English. Interacting with the content in English can facilitate language acquisition for ELLs.



Work Time (continued)	Meeting Students' Needs
<p>C. Revisiting the Guiding Question: Concentric Circle Protocol (20 minutes)</p> <ul style="list-style-type: none">• Draw the students' attention to the Guiding Question chart. Distribute a piece of writing paper to each student. Ask them to take a few minutes to think and write about the guiding question:<ul style="list-style-type: none">* "How do simple machines affect our lives?"• Encourage them to concentrate on their thinking and how to express that in writing without worrying about spelling or handwriting. They are the only ones who will be reading them.• Ask the students to find a partner and number off by 1s and 2s (if there is an uneven number of students, triads are fine). Tell them to bring their papers and a pencil with them as they form two circles. Direct all 1s to form an inner circle (shoulder-to-shoulder), facing out. Then direct the 2s to stand in front of their partners.• Remind them of the Concentric Circles protocol directions. Ask the students to talk with their partners about how they think simple machines affect people's lives.• Before rotating the outside circle two people to the left, encourage the students to jot down any new thinking or ideas they discussed with their partner.• Rotate the circle and repeat the process twice more. Each time, ask the students to talk with their partners about how they think simple machines affect people's lives.• As the students are discussing the topic, circulate and listen for comments such as: "Simple Machines help people do heavy work more easily," or "Simple machines help people move heavy things with less effort."	<ul style="list-style-type: none">• Using sentence frames can help ELLs articulate their learning. Using the word "because" in the sentence frame helps all students support their thinking with evidence.• If there are an odd number of students in the Concentric Circles protocol, consider supporting students who struggle with verbalizing their thinking by creating triads.



Closing and Assessment	Meeting Students' Needs
<p>A. Group Mingle (5 minutes)</p> <ul style="list-style-type: none">Ask the students to review the learning target:<ul style="list-style-type: none">* "I can identify what I already know about simple machines and what I want to learn."Give directions:<ol style="list-style-type: none">Find a partner.Share information from your KWL chart: one thing you know about simple machines (feel free to add anything your partner says to your list).Share information from your KWL chart: one thing you want to know about simple machines (feel free to add anything your partner says to your list).Repeat this with two more people.	<ul style="list-style-type: none">Posting sentence frames can assist ELLs and other students needing additional support in contributing to classroom discussions.
Homework	Meeting Students' Needs
<ul style="list-style-type: none">Continue your independent reading book for this module at home. <p><i>Note: In preparation for deeper learning about simple machines, add new scientific terms and academic vocabulary to your class Word Wall (in addition to the class anchor charts) at the end of each lesson. Students must be surrounded with key vocabulary to make them more apt to use it in conversation, not just in writing about science. Add the vocabulary words: hypothesis, prove, disprove, accuracy.</i></p> <p><i>In Lesson 2 the students will conduct a simple experiment on inclined planes. Make sure to read the experiment in Simple Machines: Forces in Action (pages 8–9) for the list of materials and how to prepare them.</i></p> <p><i>During the experiment in Lesson 2, students will be asked to write a hypothesis before they conduct the experiment and a conclusion at the end describing what they learned about inclined planes. To ensure that this is truly an inquiry experience, cover up the bottom of page 9 by either taping a half-sheet of paper or several large sticky notes over that part of the page.</i></p>	



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Supporting Materials



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Tracking My Progress, End of Unit 1

Name: _____

Date: _____

Learning target: I can use literary terms to describe parts of a story or drama. (RL.4.5)

1. The target in my own words is:

2. How am I doing? Circle one.

I need more help to learn this



I understand some of this



I am on my way!



3. The evidence to support my self-assessment is:



Tracking My Progress, End of Unit 1

Name:

Date:

Learning target: I can describe the differences in structure of drama and prose. (RL.4.5)

1. The target in my own words is:

2. How am I doing? Circle one.

I need more help to learn this



I understand some of this



I am on my way!



3. The evidence to support my self-assessment is:



Tracking My Progress, End of Unit 1

Name:

Date:

Learning target: I can explain what a text says using specific details from the text. (RL.4.1)

1. The target in my own words is:

2. How am I doing? Circle one.

I need more help to learn this



I understand some of this



I am on my way!



3. The evidence to support my self-assessment is:
