



EXPEDITIONARY  
LEARNING

# **Grade 4: Module 3A: Unit 2: Lesson 3**

## **Reading Scientific Text: Learning More about the Inclined Plane**



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

I can determine the meaning of academic words or phrases in an informational text. (RI.4.4)  
I can determine the meaning of content words or phrases in an informational text. (RI.4.4)  
I can explain the main points in a scientific text, using specific details in the text. (RI.4.3)  
I can choose evidence from informational texts to support analysis, reflection, and research. (W.4.9)

**Supporting Learning Targets**

- I can find the meaning of scientific and academic words related to the inclined plane.
- I can determine important information about inclined planes and how they help people do work.
- I can document what I learn about inclined planes in my own words.

**Ongoing Assessment**

- Students' gist statements (homework from Lesson 2)
- Simple Machines Science journal (page 12: Inclined Plane Research Notes)
  - Vocabulary note-catcher
  - Diagram
  - Constructed response captions



| Agenda   | Teaching Notes   |
|--|--|
| <ol style="list-style-type: none"><li>Opening<ol style="list-style-type: none"><li>Engaging the Reader and Writer and Checking on Homework (5 minutes)</li><li>Reviewing Learning Targets (5 minutes)</li></ol></li><li>Work Time<ol style="list-style-type: none"><li>Shared Reading for New Vocabulary (20 minutes)</li><li>Rereading to Visualize Scientific Processes: Part I (10 minutes)</li><li>Rereading to Visualize Scientific Processes: Part II (15 minutes)</li></ol></li><li>Closing and Assessment<ol style="list-style-type: none"><li>Writing a Scientific Caption to Synthesize Learning (5 minutes)</li></ol></li><li>Homework<ol style="list-style-type: none"><li>Look for inclined planes around you (at school or at home). Record examples to share in our next lesson. Either take pictures of the inclined planes, make a sketch of what you saw, or use words to describe what you saw.</li></ol></li></ol> | <ul style="list-style-type: none"><li>In advance: Make a class Inclined Planes anchor chart with three sections (see supporting materials).</li><li>This lesson includes an activity that helps students visualize abstract scientific concepts. In advance, review Part B of Work Time carefully.</li><li>Post: Learning targets.</li></ul> |



| Lesson Vocabulary  | Materials  |
|--|--|
| academic, scientific, interconnected, diagram, caption; inclined plane, force, effort, resistance, reduce, distance, slanted, height | <ul style="list-style-type: none"> <li>• Sticky notes—3 x 5 inches preferred (one per partnership)</li> <li>• Inclined Planes anchor chart (new; one for display)</li> <li>• Equity sticks</li> <li>• <i>Simple Machines: Forces in Action</i> pages 6–7 (book; one per student)</li> <li>• Simple Machines Science journal</li> <li>• Blank paper (one per pair of students)</li> </ul> |

| Opening   | Meeting Students' Needs |
|---|-------------------------|
| <p><b>A. Engaging the Reader and Writer and Checking on Homework (5 minutes)</b></p> <ul style="list-style-type: none"> <li>• Ask the students to mingle and share their gist statements with at least two other students. After each has shared their statement, tell them to explain why theirs is a good one. After they've shared with at least two or three people, give the students 1 to 2 minutes to revise their statements if they think they can improve it based on the conversations they had as they shared.</li> <li>• Ask students to add any revisions to their gist statement on their homework <b>sticky note</b>, or give them a new sticky note if they want to start fresh. Post the gist statements in the top section of the <b>Inclined Planes anchor chart</b>.</li> <li>• Ask the students what they notice about scientific text: <ul style="list-style-type: none"> <li>* “How is scientific text similar to or different from the social studies texts we have read about the Iroquois and Colonial America?”</li> </ul> </li> <li>• Ask students to think then talk with a partner. Use <b>equity sticks</b> to cold call on two or three students. Some possible responses could be: “The social studies texts told a story about what happened in America. But this text just tells facts,” or “This text doesn’t take place anywhere special like New York or Williamsburg.”</li> </ul> |                         |



| Opening (continued)   | Meeting Students' Needs   |
|---|---|
| <p><b>B. Reviewing Learning Targets (5 minutes)</b></p> <ul style="list-style-type: none"><li>• Invite the students to read the first learning target: “I can find the meaning of scientific and academic words related to the inclined plane.” Check to make sure they understand the difference between <i>scientific</i> and <i>academic</i> words.<ul style="list-style-type: none"><li>– <i>scientific</i>: words used specifically in science-related texts and conversations</li><li>– <i>academic</i>: words often seen in other texts and content areas and that are important to understanding the main ideas of the texts</li></ul></li><li>• Tell students in this module they’ll focus on two different types of words: <i>scientific</i> and <i>academic</i>. By knowing these types, students can determine vocabulary and understand the texts better. Remind them that informational text often has a glossary, a place that lists words and definitions. Explain to students they’ll keep track of important academic and scientific vocabulary in their Simple Machines Science journals so they can become better readers and writers of scientific texts.</li><li>• Invite them to read the next two learning targets: “I can determine important information about inclined planes and how they help people do work,” and “I can document what I learn about inclined planes in my own words.” Ask students to identify any words or phrases that seem confusing. Write a synonym or explanation above the unfamiliar words. Then read the learning targets again for understanding. Some possibly confusing words or phrases are:<ul style="list-style-type: none"><li>– <i>determine</i>: decide on; figure out</li><li>– <i>in my own words</i>: not copied directly from the text; a summary of what I read</li></ul></li><li>• Ask the students to give a thumbs-up if they understand what they will be learning today, a thumbs-sideways if they are somewhat clear, and a thumbs-down if they are completely unsure. Clarify as needed.</li></ul> | <ul style="list-style-type: none"><li>• Using learning targets helps students understand the reading’s purpose.</li><li>• Providing visual cues or synonyms helps students understand the learning targets.</li></ul> |



| Work Time  | Meeting Students' Needs  |
|--|--|
| <p><b>A. Shared Reading for New Vocabulary (20 minutes)</b></p> <ul style="list-style-type: none"> <li>• Tell students you will now read <b><i>Simple Machines: Forces in Action</i> pages 6–7</b> aloud again. Ask them to follow along and underline any unfamiliar words. (Students may mark in the text, highlight, or use evidence flags/sticky notes.)</li> <li>• Read the first paragraph on page 6. Ask students to identify unfamiliar words. Point out the bolded words: <i>ramp</i>, <i>inclined plane</i>, <i>work</i>, <i>simple machines</i>. Explain these are scientific words that are important to know to understand what an inclined plane is and does.</li> <li>• Define the phrase <i>inclined plane</i>.             <ul style="list-style-type: none"> <li>– Explain the word <i>inclined</i> means to slope or slant and comes from a Latin word meaning “bend.”</li> <li>– The word <i>plane</i>, in scientific terms, is not like an airplane. Instead, it means a flat surface and also comes from a Latin word meaning “flat surface.”</li> <li>– Therefore the term <i>inclined plane</i> means a flat surface that is slanted or slopes.</li> </ul> </li> <li>• Ask students to turn to the vocabulary section of their <b>Simple Machines Science journal</b> and find the term <i>inclined plane</i> in the left column. Write the definition in the second column.</li> <li>• Direct student’s attention to the third column titled “This helps me know what this word means because ...” Explain when they entered words in their Vocabulary section in Unit 1, they ignored this column because they didn’t have enough information at that time about the words and terms. Now that they’re researching simple machines in more depth, this is an important resource.</li> <li>• For the third column, ask students to think about the following:             <ul style="list-style-type: none"> <li>– This is a space for them to describe the new words and terms so they’ll remember what they mean. This can be in words or sketches (some things students might write could be: “a slanted board” or “a wheelchair ramp” or they could draw a quick sketch of a slanted line).</li> <li>– Each student may write or draw something different in this column.</li> </ul> </li> <li>• Explain the last column identifies how some words they’re learning are <i>interconnected</i>. Ask students to turn and tell a partner how <i>inclined plane</i> and <i>simple machine</i> are connected. All should say: “An inclined plane is one of the simple machines.” Ask them to write this response in the fourth column.</li> </ul> | <ul style="list-style-type: none"> <li>• Students who struggle with language benefit from having individual dictionaries for reference throughout the module.</li> <li>• Deconstruction of complex vocabulary words or phrases in order to understand meaning helps all students with text comprehension.</li> <li>• Provide nonlinguistic symbols (e.g., two circles connected for <i>interconnected</i>) to assist ELLs and other struggling readers in making connections with vocabulary.</li> </ul> |



| Work Time (continued)   | Meeting Students' Needs   |
|---|---|
| <p><i>Note: In the context of the scientific topic of simple machines, the word work has a very specific scientific meaning that is distinct from its "everyday" meaning.</i></p> <ul style="list-style-type: none"><li>Acknowledge this was pretty obvious, but not all the words and phrases they're learning are connected to just one simple machine. For example, they read the word <i>work</i> in the play in Unit 1 and have already entered it in the Vocabulary section of their Science journal. Remind them that work is "the measure of energy or force that it takes to move something." Ask them if inclined planes help a person do work. If the answer is "yes," they should write "inclined plane" in the fourth column for the vocabulary word <i>work</i>. Also invite them to write or draw something in the third column that helps them remember what <i>work</i> is.</li><li>Tell students they will have 15 minutes to continue reading the text with a partner. Write the following words on the board and ask students to look for them along with others they may identify as unfamiliar when they read:<ul style="list-style-type: none"><li>– resistance</li><li>– ramp</li></ul></li><li>Make sure they include them in their Science journal.</li><li>Remind students that some science terms in this text have already been entered in their Science journal. They need to think about these words (<i>effort</i> and <i>force</i>) and how they relate to the inclined plane.</li><li>Ask them to repeat the process of identifying unfamiliar words and recording new scientific terms in their Simple Machines Science journal. Post the following directions:</li><li>Find the meaning of the following words (<i>effort, force, resistance, ramp</i>) along other words you read that are unfamiliar or are important in understanding what inclined planes are by using your glossary or a classroom dictionary.<ol style="list-style-type: none"><li>As you read pages 6–7 in <i>Simple Machines</i>, determine the meaning of each word.</li><li>Look for the word in pages 2–6 of your Science journal and record the definition and fill in the rest of the columns.</li></ol></li><li>Reread pages 6–7 with your partner. Identify other words you think are important in understanding what an inclined plane is, how it works, and how it helps people do work.</li></ul> | <ul style="list-style-type: none"><li>Consider partnering an ELL with a student who speaks the same L1 when discussion of complex content is required. This allows students to have more meaningful discussions and clarify points in their L1.</li><li>Identifying the number of facts that need to be found gives support to struggling learners. (See task cards in Module 2, Unit 2, Lesson 6.)</li></ul> |



| Work Time (continued)   | Meeting Students' Needs |
|---|-------------------------|
| <ul style="list-style-type: none"><li>• Give students 15 minutes to read.</li></ul> <p><i>Note: Some academic words students may identify are: site, required, height, steep, and reduce.</i></p> <ul style="list-style-type: none"><li>• Gather the class together. Ask partnerships to choose one word that's important for understanding inclined planes. Use the following steps to record new words in the middle section of the Inclined Planes anchor chart:<ol style="list-style-type: none"><li>1. Call on one partnership at a time to share one word.</li><li>2. Tell other students to listen carefully. If they hear a word that is also on their own list, they can cross out that word.</li><li>3. Write the word on a sticky note. Add the note to the middle section of the anchor chart.</li></ol></li><li>• Repeat until all words are posted on the anchor chart.</li></ul>   |                         |
| <p><b>B. Rereading to Visualize Scientific Processes: Part I (10 minutes)</b></p> <ul style="list-style-type: none"><li>• Remind students that good readers often read an unfamiliar and complex text several times to understand the content deeply. Tell students to read this text again, this time on their own, focusing specifically on text-dependent questions.</li><li>• Explain to students that together you will answer to the first question by analyzing the sentence structure of the excerpt to better understand the scientific concepts being described:<ul style="list-style-type: none"><li>* "On page 7, the text says, 'If the distance along which you push a rock is twice as long, it takes half the force to do the same work and move the rock to the same height.' How does it help us understand the inclined plane?"</li></ul></li><li>• Explain to students that before we can understand the scientific concepts within a sentence, we need to look at the sentence more closely. Focus students on the picture on page 6 and the diagram on page 7 to help them make sense of the science concept being described.</li><li>• Tell students to take a moment to deconstruct the sentence together. Distribute a piece of <b>blank paper</b> to each partnership. Ask students to fold it in half.</li></ul> |                         |



| Work Time (continued)   | Meeting Students' Needs |
|---|-------------------------|
| <ul style="list-style-type: none"><li>• Ask students to read silently in their heads as you read aloud. Follow this sequence:<ol style="list-style-type: none"><li>1. Read just the first half of the sentence: "If the distance along which you push a rock is twice as long ..."</li><li>2. Ask students to turn and talk with their partner about what that part of the sentence is saying. Listen for: "The length of space the thing is being pushed is two times longer."</li><li>3. Ask students to draw a picture on the left half of their paper that helps them understand this first part of the sentence.</li><li>4. Ask students to hold the paper up when they're finished so you can check for understanding. Look for pictures that are similar to a slanted line that is long with a rock-shaped object on it with arrows or other indications of upward movement.</li></ol></li><li>• Repeat the sentence deconstruction process with the second half of the sentence.<ol style="list-style-type: none"><li>1. Read aloud as students read along silently: "... it takes half the force to do the same work and move the rock to the same height."</li><li>2. Ask students to turn and talk with their partner about what that second part of the sentence means. Listen for responses like: "A person is going to have to do half the work to move the same rock to the same place."</li><li>3. Ask students to draw a picture on the right half of their paper that helps them understand this second part of the sentence.</li><li>4. Ask students to hold the paper up when they're finished so you can check for understanding. Look for pictures that show a person with an object in their hands moving up a long slanted line with the fraction "1/2" near it. Students could also include pictures of a person moving the same-sized object up a shorter slanted line, indicating it takes more effort.</li><li>5. Ask students to share how the process of deconstructing a complex sentence helped them understand science concepts. Allow two to three students to share.</li></ol></li></ul> |                         |



| Work Time (continued)   | Meeting Students' Needs |
|---|-------------------------|
| <p><b>C. Rereading to Visualize Scientific Processes: Part II (15 minutes)</b></p> <ul style="list-style-type: none"><li>• Focus students whole group. Ask them to turn to page 12 (Inclined Plane Research Notes) in their Simple Machines Science journal. Explain that they will read pages 6–7 in Simple Machines: Forces in Action one last time. This time they will look for specific information about the inclined plane.</li><li>• Ask them to talk with a partner about what information they need to look for as they reread the text. Some responses you might hear could be, “We need to draw a diagram.” or “We need to describe what an inclined plane looks like and list some examples.” Clarify what a diagram is vs. an illustration (A diagram is a sketch, outline, or a plan that demonstrates how something works. An illustration has more detail and often has color.)</li><li>• Acknowledge that they may be familiar enough with the text after reading it several times that they could already fill in some of parts of this note-catcher without even looking at the material again. Reiterate that scientists strive to confirm facts, both by doing experiments and by reading carefully. Rereading will help students find more evidence from the text to answer the question about how inclined planes help people do work.</li><li>• Give students 10 minutes to reread pages 6–7 in the text, and then record information in the note-catcher on page 12 of their Science journal. Encourage them to use the process of deconstructing complex sentences if they are unsure of what the text is describing.</li><li>• Circulate to listen in and support as needed. Make sure that students are clear about the type of information they need to find and are using evidence directly from the text. Probe with questions such as “How do you know?” or “Where in the text did you learn that?” in order to ensure they are using evidence from the text (instead of just their own schema).</li></ul> |                         |



| Closing and Assessment  | Meeting Students' Needs   |
|---|---|
| <p><b>A. Writing a Scientific Caption to Synthesize Learning (5 minutes)</b></p> <ul style="list-style-type: none"><li>• Tell students that to synthesize their learning about inclined planes, they will write a caption for the graphic of an inclined plane on the cover of their Simple Machines Science journal. Remind them that they used captions when they read informational text about the Iroquois (in Module 1) and Colonial America (in Module 2). Captions are short (one to two sentences) texts that describe the importance of an image or graphic.</li><li>• Give students 3 minutes to write their caption independently.</li></ul>   | <ul style="list-style-type: none"><li>• Using sentence frames can help ELLs articulate their learning. (i.e., "An inclined plane is _____ [description of how it looks]. Inclined planes help people move things by _____."</li></ul> |
| Homework  | Meeting Students' Needs   |
| <ul style="list-style-type: none"><li>• Look for inclined planes around you (at school or at home). Record examples to share in our next lesson. Either take pictures of the inclined planes, make a sketch of what you saw, or use words to describe what you saw.</li></ul> <p><i>Note: After each lesson, add new scientific terms and academic vocabulary to the class Word Wall (as well as any new notes on anchor charts). In order for students to build knowledge about this topic, they need to be surrounded by key vocabulary so they will be more apt to use it in conversation, not just in science writing. Add the words: inclined plane, effort, force, resistance, ramp, and interconnected. Some of the academic words the students may identify are: site, required, height, steep, and reduce.</i></p> <p><i>In Lesson 4, the students will conduct another simple experiment, this time with levers. In advance, read the experiment on pages 26–27 of Simple Machines: Forces in Action for the list of materials and how to prepare them.</i></p> <p><i>During the experiment in Lesson 4, students will write a hypothesis before they conduct the experiment (just as they did in Lesson 2). They will also write a conclusion at the end to synthesize what they learned about inclined planes. To ensure that this is truly an inquiry experience, cover up the "How Does It Work?" box on page 27. Do this by taping a piece of paper or a large sticky note over that part of the page.</i></p> |   |



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

## Supporting Materials



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**Inclined Planes Anchor Chart**  
(For Teacher Reference)

*(Example is not to scale—create this anchor chart in advance)*

**Inclined Planes**

**Gist Statements:**

(Student sticky notes)

**Important Vocabulary to Know:**

(Student sticky notes)

**Examples of Inclined Planes in Our Lives:**

(Student sticky notes)