Unit 4/Week 5

Title: Life on the Ice

Suggested Time: 4 to 5 days (45 minutes per day)

Common Core ELA Standards: RI.3.1, RI.3.2, RI.3.4, RI.3.5, RI.3.7; W.3.2, W.3.4, W.3.7; SL.3.1, SL.3.2, SL.3.4, SL.3.5; L.3.1, L.3.2, L.3.4

Teacher Instructions

*Refer to the Introduction for further details.*

**Before Teaching**

1. Read the Big Ideas and Key Understandings and the Synopsis. Please do **not** read this to the students. This is a description for teachers, about the big ideas and key understanding that students should take away **after** completing this task.

Big Ideas and Key Understandings

The extreme conditions at the poles require extreme measure by scientists and researchers in order to unlock the secrets these poles hold to the evolution and history of our Earth

Synopsis

In this nonfiction story, readers learn how and why scientists brave the extreme conditions of both poles in order to do research that will help us learn more about our world.

1. Read entire main selection text, keeping in mind the Big Ideas and Key Understandings.
2. Re-read the main selection text while noting the stopping points for the Text Dependent Questions and teaching Vocabulary.

**During Teaching**

1. Students read the entire main selection text independently.
2. Teacher reads the main selection text aloud with students following along. (Depending on how complex the text is and the amount of support needed by students, the teacher may choose to reverse the order of steps 1 and 2.)
3. Students and teacher re-read the text while stopping to respond to and discuss the questions and returning to the text. A variety of methods can be used to structure the reading and discussion (i.e.: whole class discussion, think-pair-share, independent written response, group work, etc.)

Text Dependent Questions

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| **Text-dependent Questions** | **Evidence-based Answers** |
| According to the text and the captions on page 142 and 143, where are the North and South Poles? | The North Pole is located in the middle of the Arctic Ocean. The South Pole is at the bottom of our planet on the continent of Antarctica. |
| Using specific details from the text, compare and contrast the North and South Poles. (Pgs. 142-143) | Both are covered by ice  Both are cold  The North Pole is in the middle of an ocean  The South Pole is on the continent of Antarctica  The South Pole is the coldest place on Earth |
| Reread page 143. Using context clues, can you decode what “isolated” means? What detail is given that suggests Antarctica is isolated? | Isolated means something is separate or far away from other things. Antarctica is isolated so much that no human had even seen the continent until 200 years ago. |
| Reread page 144. What evidence is given to show these places are cold and extreme? | In fall, the sun sets and doesn’t rise again for the entire winter. Months later it shines 24 hours a day all summer long. Very little snow falls in either place, when it does it freezes to ice. Some places in the ice are up to 3 miles thick. |
| The ice in the middle of the Arctic and on Antarctica moves very slowly from the middle to the coast. What can happen to the ice when it reaches the coast? Can you infer from the text how long it has taken the ice to move? (Pg. 145) | When ice moves to the coast, pieces break off and become icebergs. It can be inferred that it has taken 100,000 years to move from the center to the edge. |
| A Ping Pong ball is small and white. Refer back to the text to explain why pilots say that flying to the poles is “like flying in a Ping Pong ball?” (Pg. 146) | “The wind kicks up and the snow blows around. It is hard to know where the sky ends and the land begins.” |
| Find evidence on pages 146 that would explain why pilots change the way they fly when flying into and out of polar regions? | Many of the navigational instruments normally used to guide the plane won’t work there—they fly using the stars. |
| Using the text and captions on page 147, explain what accommodations pilots have to make when landing at the poles? | Pilots use skis instead of tires to land. They also must keep their planes running to prevent them from freezing up. |
| Why do scientists brave the harsh conditions of the poles? What are three facts they have learned through their study of the ice? (Pg. 148) | Scientists brave the conditions in order to learn about the world.  They have learned that the ice hasn’t melted since the last ice age. The ice has been pressed into an ice sheet almost 2 miles thick over the last 100,000 years. The ice is layered. |
| What is something that the scientists learned that is the opposite of what they originally thought? (Pg. 149) | Before, scientists thought climate needed thousands of years to change. Now, they know it can happen much, much faster. |
| Reread page 151. Explain why the Antarctic is “a perfect window to the stars.” | It is very clear because it is cold and dry. The night is six months long. |
| List the items of clothing people wear at the poles and the reason they wear these items. What items should NOT be worn and why? (Pg. 152) | Big boots and big pants (fat boy pants) – keep the cold and wind out; mittens with furry backs – to wipe noses and warm ears. Goggles – protect eyes from sunburn and temporary blindness.  Anything metal should not be worn because “metal that gets so cold will freeze to any skin it touches.” |
| On page 153, the author writes that our bodies are like furnaces needing fuel to keep running. What happens to our “furnaces” at the poles? | Our bodies (the furnaces) work so hard to keep warm that people eat at least twice as much food as usual. |
| Reread the last paragraph on page 154. Describe the effect of constant light or lack of light on human beings. | Scientist say that summer’s constant daylight tricks your body into wanting to keep going without rest but in the constant darkness of winter makes you feel tired much of the time. |
| After temperatures reach +10 degrees and planes are able to fly again, what is the last obstacle to taking off and how do pilots get around that obstacle? (Pg. 155) | Airplanes must go 100mph to take off which is not easy over slippery ice. Sometimes planes travel (or taxi) up to 2 miles to reach that speed. If they still need help, they turn on eight rockets attached to their plane to get the extra boost. |

Vocabulary

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|  | **KEY WORDS ESSENTIAL TO UNDERSTANDING** | **WORDS WORTH KNOWING**  General teaching suggestions are provided in the Introduction |
| **TEACHER PROVIDES DEFINITION**  not enough contextual clues provided in the text | Page 142 - pole  Page 144 - extreme  Page 143 - region | Page 143 - continent  Page 143 - surrounding  Page 145 - coasts  Page 146 - skis  Page 149 - climate  Page 153 - furnace |
| **STUDENTS FIGURE OUT THE MEANING**  sufficient context clues are provided in the text | Page 142 - particles  Page 143 - plunging  Page 143 - isolated  Page 147 - gliding  Page 154 - constant | Page 147 - concrete  Page 148 - wilderness  Page 151 - telescopes |

Culminating Task

* Conditions at the North and South Poles are the harshest on Earth, but the ice at the Poles holds many clues as to the evolution of Earth and the changes it has undergone over the millennia. Scientists flock to the Poles in order to study the ice, attempting to live as comfortably as possible in the extreme conditions. Citing details from your text, write a paragraph that discusses at least three adaptations humans have made in order to survive difficult polar conditions and how these adaptations have helped humans live at the Poles for short periods of time. Please include the page numbers on which you found your supporting details.

Answers may include the following adaptations:

* + Due to polar conditions, pilots must navigate the old-fashioned way, using the stars instead of modern navigational equipment (pg. 146)
  + Planes land with skis instead of wheels on the ice. Once they’ve landed, the skis are lifted in order to prevent them from freezing to the ground (pg. 147)
  + Plane engines are left running, as they may not restart once stopped due to the extreme cold (pg. 147)
  + Visitors to the Poles wear many layers of clothing to stay warm in the cold and wind, including heavy boots, heavy overalls, furry mittens and goggles to prevent snow blindness. No metal is worn, as it may stick to the skin when exposed to extreme cold temperatures (pg. 152)
  + Visitors eat twice as much food as normal to keep their bodies fueled. Our bodies work harder in harsh conditions and require more food or fuel (pg. 153)
  + Visitors learn to build temporary shelters to survive emergency situations outdoors. They learn to huddle together for warmth (pg. 153)
  + Some refrigerators are heated to prevent the spoilage of food (pg. 154)
  + Upon departure, planes can taxi up to two miles in order to achieve maximum speed for liftoff. They are also equipped with eight rockets to give them an extra boost if needed (pg. 155)

Additional Tasks

* Some of the research done at the South Pole involves how humans adapt and survive in extremely isolated conditions. The text states that this research may someday help us develop colonies on the planet Mars, where conditions are as extreme if not more extreme than polar conditions. With a small group, use the information from the text, and write a simply survival plan for a group of researchers going to a Mars colony. What adaptations will you have to make? Will you live under ground or above ground? What kinds of food will you take? What kinds of clothing will you need? How will your space transport land and take off? What will you do to stay healthy and in good shape while on Mars? What kind of research will you do?

Answer: Students can go through the text and locate adaptations scientists made while living in Antarctica and develop a list of their own on chart paper. This project will have many answers and should help students synthesize the information they’ve learned about conditions at the Poles and how researchers can live there.

* Working with a partner or small group, use nonfiction texts or the Internet to do a short research project about polar climate. Explain why the Poles are dry, even though they are covered in ice. Present your findings to the class using at least one visual aid.

Supports for English Language Learners (ELLs) to use with Basal Alignment Project Lessons

When teaching any lesson, it is important to make sure you are including supports to help all students. We have prepared some examples of different types of supports that you can use in conjunction with our Basal Alignment Project Lessons to help support your ELLs. They are grouped by when they would best fit in a lesson. While these supports reflect research in how to support ELLs, these activities can help ALL students engage more deeply with these lessons. Note that some strategies should be used at multiple points within a lesson; we’ll point these out. It is also important to understand that these scaffolds represent options for teachers to select based on students’ needs; it is not the intention that teachers should do *all* of these things at every lesson.

**Before the reading:**

* Read passages, sing songs, watch videos, view photographs, discuss topics (e.g., using the [four corners strategy](http://www.theteachertoolkit.com/index.php/tool/four-corners)), or research topics that help provide context for what your students will be reading. This is especially true if the setting (e.g., 18th Century England) or topic (e.g., boats) is one that is unfamiliar to the students.
* Provide instruction, using multiple modalities, on selected vocabulary words that are *central to understanding the text*. When looking at the lesson plan, you should note the Tier 2 words, particularly those words with high conceptual complexity (i.e., they are difficult to visualize, learn from context clues, or are abstract), and consider introducing them ahead of reading. For more information on selecting such words, go [here](https://achievethecore.org/page/3167/selecting-and-using-academic-vocabulary-in-instruction). **You should plan to continue to reinforce these words, and additional vocabulary, in the context of reading and working with the text. (See additional activities in the During Reading and After Reading sections.)**

**Examples of Activities:**

* Provide students with the definition of the words and then have students work together to create [Frayer models](http://www.theteachertoolkit.com/index.php/tool/frayer-model) or other kinds of word maps for the words.
* When a word contains a prefix or suffix that has been introduced before, highlight how the word part can be used to help determine word meaning.
* Keep a word wall or word bank where these new words can be added and that students can access later.
* Have students create visual glossaries for whenever they encounter new words. Then have your students add these words to their visual glossaries.
* Create pictures using the word. These can even be added to your word wall!
* Create lists of synonyms and antonyms for the word.
* Have students practice using the words in conversation. For newcomers, consider providing them with [sentence frames](https://achievethecore.org/page/3159/ell-supports-for-writing-and-discussion) to ensure they can participate in the conversation.
  + Practice spelling the words using different spelling practice strategies and decoding strategies. Students could take turns spelling with a partner.
* Use graphic organizers to help introduce content.

**Examples of Activities:**

* Have students fill in a [KWL chart](http://www.nea.org/tools/k-w-l-know-want-to-know-learned.html) about what they will be reading about.
* Have students research setting or topic using a pre-approved website and fill in a chart about it. You could even have students work in groups where each group is assigned part of the topic.
* Have students fill in a bubble map where they write down anything that they find interesting about the topic while watching a video or reading a short passage about the topic. Then students can discuss why they picked the information.

**During reading:**

* Read the text aloud first so that ELLs can hear the passage read by a fluent reader before working with the text themselves.
* Allow ELLs to collaborate in their home languages to process content before participating in whole class discussions in English. Consider giving them the discussion questions to look over in advance (perhaps during the first read) and having them work with a partner to prepare.
* Encourage students to create sketch-notes or to storyboard the passage when they are reading it individually or with a partner. This will help show if they understand what they are reading as they are reading it.
* Ask questions related to the who, what, when, why, and how of the passage. For students that may need a little more help, provide them with [sentence stems](https://achievethecore.org/page/3159/ell-supports-for-writing-and-discussion).
* Continue to draw attention to and discuss the words that you introduced before the reading.

**Examples of Activities:**

* Have students include the example from the text in their glossary that they created.
* Create or find pictures that represent how the word was used in the passage.
* Practice creating sentences using the word in the way it was using in the passage.
* Have students discuss the author’s word choice.
* Use graphic organizers to help organize content and thinking.

**Examples of Activities:**

* Have students fill in a chart to keep track of their 5ws while they read to help them summarize later and figure out the central idea of a passage.
* It may again be beneficial to have somewhere for students to store new words that they encounter while reading the text. Students could use a chart to keep track of these new words and their meanings as they read.
* If you had students fill in a KWL, have them fill in the “L” section as they read the passage.
* Utilize any illustrations or text features that come with the story or passage to better understand the reading.
* Compare/contrast the passage with what the illustrations convey about the passage. Have students consider if the illustrations look the way they visualized the passage in their own minds or if the passage matches their predictions based on the illustrations.
* Identify any text features such as captions and discuss how they contribute to meaning.

**After reading:**

* Present directions for any post-reading assignments orally and visually; repeat often; and ask English Language Learners to rephrase.
* Allow ELLs to use English language that is still under development. Students should not be scored lower because of incorrect spelling or grammar (unless the goal of the assignment is to assess spelling or grammar skills specifically). When grading, be sure to focus on scoring your students only for the objective(s) that were shared with students.
* Scaffold questions for discussions so that questioning sequences include a mix of factual and inferential questions and a mix of shorter and more extended responses. Questions should build on each other and toward inferential and higher-order-thinking questions. There are not many factual questions already listed in the lesson instructions, so you will need to build some in as you see fit. More information on this strategy can be found [here](https://achievethecore.org/aligned/creating-sequencing-text-dependent-questions-support-english-language-learners/).
* Reinforce new vocabulary using multiple modalities

**Examples of activities:**

* Using the words that you had students work with before reading, have students write sentences in reference to the passage that you just finished reading.
* Require students to include the words introduced before reading in the culminating writing task.
* For newcomers, print out pictures that represent the words that you focused on and have students match the words to the pictures.
* Based on different features of the words, have the students sort them into different categories and explain their choices. For example, the students could sort the words by prefixes, suffixes, connotation, etc.
* After reading the passage, continue to examine important sentences (1–2) in the text that contribute to the overall meaning of the text. Guide students to break apart these sentences, analyze different elements, and determine meaning. More information on how to do this, including models of sentence deconstruction, can be found [here](https://achievethecore.org/page/3160/juicy-sentence-protocol).
* Provide differentiated scaffolds for writing assignments based on students’ English language proficiency levels.

**Examples of Activities:**

* For all students, go over the prompt in detail, making sure to break down what the prompt means before having the students get to work. Then have the students explain the directions back to you.
* Have students create an evidence tracking chart during reading, then direct them to look back over their evidence chart and work with a group to see if their evidence matches what the rest of the class wrote down. If some of the chart does not match, students should have a discussion about why.
* For students who need more support, model the proper writing format for your students and provide them with a properly formatted example for reference.
* For newcomers, you may consider creating sentence or paragraph frames to help them to write out their ideas.
* To further discussion about the passage, have students create their own who, what, when, where, why, and how questions related to the passage to ask each other and have students pair up and practice asking each other the questions. If available, pair students of the same home language to support the use of language still under development.