Unit 4/Week 1

Title: So You Want to Be an Inventor?

Suggested Time: 5 days (45 minutes per day)

Common Core ELA Standards: RI.4.1, RI.4.2, RI.4.3, RI.4.7; W.4.2, W.4.4, W.4.7, W.4.8, W.4.9; SL.4.2; L.4.1, L.4.2, L.4.5

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

In order to be an inventor, you must take risks and try out many solutions to a problem even if it means experiencing failure.

Inventions make our lives easier but they are not easy to create.

Synopsis

This informational text details traits and characteristics that different inventors throughout history have demonstrated and how those traits helped them reach their goals.

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** |
| What inventions did Benjamin Franklin invent? (Pg. 417) | Swim paddle, kick paddles, Franklin stove, lightning rod, fireplace damper, library stepstool, odometer and bifocal glasses. |
| Why did Cyrus McCormick invent the mechanical reaper? (Pg. 418) | He was tired of reaping, or collecting the wheat, on his family’s farm with a hand scythe because it took a long time. The mechanical reaper shortened the work to only a few hours what previously took an entire day. |
| On page 420, the author writes, “An inventor must be as stubborn as a bulldog.” What does the author mean by the phrase, “stubborn as a bulldog”? Use evidence from the text to support your answer  | The author is saying that it may take time to reach your goals and you can’t give up. The text states that Charles Goodyear spent ten years working to make rubber usable and Thomas Edison spent over a year looking for a filament that would glow without burning. |
| Look at the illustrations on page 422. Describe how the illustrations help the reader better understand the text. | The first illustration illustrates how sometimes inventors work alone while the second illustration shows how some inventors prefer working in teams. This helps the reader understand that not all inventors work in the same manner. |
| What inventions were created as a result of Henry Ford’s invention of mass production and the moving assembly line? (Pg. 423) | Henry Ford perfected mass production and the assembly line so that his automobiles could be made faster. Other inventions connected to the automobile include: Mary Anderson invented windshield wipers, Garrett Morgan the traffic light, Elmer Wavering invented the car radio, and Allen Breed the airbag. |
| On page 425, the author writes, ”Keep a sharp eye on your inventions-copycats are out there!” What does the author mean by this? | The author means that someone may try to copy or even steal your invention. For instance, Joseph Henry invented a telegraph system in the 1830s, but in 1844 Samuel Morse made it even better. Thus, Samuel Morse was given credit for inventing the telegraph even though it was originally Henry’s idea. |
| What does the author mean by the phrase, “barriers to be broken”, on page 426? | There will always be new things to invent because there are always problems that need to be solved in the world. |
| Using the text, name three materials Thomas Edison used to create filament. Which material finally worked to create the filament? | Thomas Edison tried platinum, nickel, gold, silver, fish line, cotton thread, coconut hair, human hair, wood shaving, and cork. He finally found that carbonized bamboo would work. |
| How did Johannes Gutenberg’s invention of the printing press affect people learning to read? | Before the printing press it took a year to write a book by hand. With the printing press, books could be printed in a day, which meant more books were created. Thus, people decided to learn to read because books were more available. |
| Alfred Nobel created dynamite. Why did Nobel have to move his experiments outside?  | Nobel’s experiments were dangerous because he was working with explosives. Nobel was ordered to move his work outside after five people were killed in an explosion. |
| Why did Elijah McCoy invent a lubricator that oiled pistons, gears, and bearings on a train? | Previously, in order to oil the pistons’ gears and bearings on a train the train must be stopped. Elijah McCoy’s invention of lubrication allowed this process to be done while the train was still running, thus saving time. |
| What is the main idea of the text? Find specific details from the text to support your claim.  | Sample response: Anyone can be an inventor if they are willing to tackle a problem and invent something to solve the problem. A president can be an inventor. For example, Thomas Jefferson invented a two faced clock which could be seen from both inside and outside. Josephine Cochran, a woman, invented the washing machine when she was tired of washing dishes by hand. Although it took ten years, Charles Goodyear invented ways to make rubber useful such as the tire. (Responses may vary) |

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 420 - hoaxerPage 425 - barriersPage 426 - quest | Page 417 - fireplace damperPage 420 - treatingPage 420 - filamentPage 423 - mass productionPage 425 - questPage 425 - medical miracles |
| **STUDENTS FIGURE OUT THE MEANING**sufficient context clues are provided in the text | Page 419 - whirlingPage 420 - stubborn as a bulldogPage 420 - mocked | Page 416 - tinkerPage 418 - reapingPage 420 - chuggedPage 421 - trampledPage 422 - forgedPage 424 - bargePage 425 - telegraph |

Culminating Task

* Re-Read, Think, Discuss, Write
* In the text, the author gives the trait of inventors. Pick two of the traits. Using specific evidence from the text, summarize why those traits are important.

Answer: Two traits that an inventor may have are stubbornness and perseverance. Robert Goddard, who invented the liquid fuel rocket, persevered even though reporters from newspapers laughed at him and called him “Moon Man.” He showed perseverance because he refused to give up. It would have been easy for him to give up because everyone was making fun of him, but he wouldn’t give in to their ridicule. Charles Goodyear was as “stubborn as a bulldog” when he spent ten years and all his money trying to make rubber usable. The author used this simile to describe him because he refused to give up, just like Robert Goddard. He also showed that he was stubborn because he spent so long working on making rubber usable and used all of his money to do so. This showed that he was stubborn because it would have been easy for him to give up and not spend that much time and effort on his invention. (Responses will vary.)

Additional Tasks

* *Select one inventor from the main selection and do additional research on this person using the Internet. Create a PowerPoint for to present to the class which includes the name of the inventor, invention(s) he/she created that are mentioned in the text and that you researched, why he/she created these inventions, and what challenges or other information learned regarding this particular inventor. In addition to this, you will turn in the notes you took and a list of sources.*

Answer: Answers will vary.

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.