



EXPEDITIONARY  
LEARNING

# Grade 5: Module 2B: Unit 2: Overview



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**Unit 2, Case Study: *The Boy Who Invented TV: The Story of Philo Farnsworth***

In Unit 2, students continue to build their reading and writing skills as well as their understanding of how new or improved technologies are developed to meet the needs of society, through a case study of Philo Farnsworth, the inventor of television. They will examine how Philo Farnsworth became motivated to develop new and useful devices that made life easier in rural America, and how he persuaded others to invest in his ideas. For the mid-unit assessment, students will

demonstrate their ability to apply what they have learned to determine the meaning of new vocabulary, as well as recognize and summarize the main ideas of an informational text by completing a text-dependent questions and short-answer quiz. At the conclusion of Unit 2, students are assessed on their ability to write a four-paragraph, on-demand essay about why Philo Farnsworth invented television, as well as how television changed people's lives.

**Guiding Questions and Big Ideas**

- *New or improved technologies are developed to meet societal demands.*
- *Text structure and visual elements can support readers' understanding of complex ideas.*
- **How do new or improved technologies meet societal needs?**
- **How do authors structure text to engage and support readers' understanding of complex ideas?**



Mid-Unit 2 Assessment	<p><b>Text-Dependent Questions: “The TV Guy”</b></p> <p>This assessment centers on NYSP12 ELA CCLS RI.5.1, RI.5.2, RI.5.4, and L.5.4. For this assessment, students will read an article about Philo Farnsworth called “The TV Guy,” then complete multiple-choice and short-answer text-dependent questions. This short “quiz” requires students to use quotes from the text to support an inference and to summarize the main idea of the text using key details. Students are also asked to use a variety of strategies to discover the meanings of unknown words.</p>
End of Unit 2 Assessment	<p><b>On-Demand Informational Writing: Philo Farnsworth’s Invention of the Television and How It Changed People’s Lives</b></p> <p>This assessment centers on NYSP12 ELA CCLS RL.5.3, W.5.2, and L.5.4 and has two parts. In Part 1, students will read excerpts from an article called “Television” and answer a series of short-response and multiple-choice text-dependent questions to explain the relationship between people and ideas, determine the meaning of unfamiliar terms using a variety of strategies, and organize parts of an introductory paragraph related to the essay they will write for Part II of the assessment. During Part 2, students will synthesize the information (in the form of notes) that they have gathered during previous lessons, and will write an informational essay about the invention of the television and how it changed people’s lives. Students’ essays will be written using a “Painted Essay” structure that includes: a well-organized introductory paragraph, two proof paragraphs, and a conclusion.</p>



### Content Connections

This module is designed to address English Language Arts standards as students read literature and informational text about inventions that have been developed to meet societal needs. However, the module intentionally incorporates scientific practices and themes to support potential interdisciplinary connections to this compelling content.

These intentional connections are described below.

#### **NYS Science Standard 1: Analysis, Inquiry, and Design: Engineering Design**

##### *Key Idea 1:*

- Engineering design is an iterative process involving modeling and optimization (finding the best solution within given constraints); this process is used to develop technological solutions to problems within given constraints.
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- T1.1 Identify needs and opportunities for technical solutions from an investigation of situations of general or social interest.
  - T1.1a Identify a scientific or human need that is subject to a technological solution which applies scientific principles.
- T1.2 Locate and utilize a range of printed, electronic, and human information resources to obtain ideas.
  - T1.2a Use all available information systems for a preliminary search that addresses the need.

#### **Next Generation Science Standards: 3–5 Engineering Design**

##### **ETS1.B: Developing Possible Solutions**

- Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)
- At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)
- Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3-5-ETS1-3)



**Central Texts**

1. Kathleen Krull, *The Boy Who Invented TV: The Story of Philo Farnsworth* (New York: Random House, 2009), ISBN: 978-0-375-84561-1.
2. I Love History, "The TV Guy," <http://www.ilovehistory.utah.gov/people/difference/farnsworth.html>.
3. Wessels Living History Farm, "TV Turns On," [http://www.livinghistoryfarm.org/farminginthe40s/life\\_27.html](http://www.livinghistoryfarm.org/farminginthe40s/life_27.html).
4. Video: "Television Takes the World by Storm," History.com, <http://www.history.com/topics/radio-and-television/videos#television-takes-the-world-by-storm>.
5. "Television." World Book Online InfoFinder. World Book, 2014. Web. 6 Feb. 2014.



**This unit is approximately 3 weeks or 13 sessions of instruction.**

Lesson	Lesson Title	Long-Term Targets	Supporting Targets	Ongoing Assessment	Anchor Charts & Protocols
<b>Lesson 1</b>	Building Background Knowledge: <i>The Boy Who Invented TV</i> , “Life before Philo”	<ul style="list-style-type: none"> <li>I can engage effectively in a range of collaborative discussions with diverse partners on grade 5 topics and texts. (SL.5.1)</li> <li>I can determine two or more main ideas from a text and explain how they are supported by key details. (RI.5.2)</li> <li>I can summarize the text. (RI.5.2)</li> </ul>	<ul style="list-style-type: none"> <li>I can engage in collaborative discussions with my peers.</li> <li>I can determine the two main ideas about “Life before Philo” from <i>The Boy Who Invented TV</i> by identifying key supporting details.</li> <li>I can summarize the main ideas about “Life about Philo” from <i>The Boy Who Invented TV</i>.</li> </ul>	<ul style="list-style-type: none"> <li>Building Background Knowledge graphic organizer</li> <li>Main Ideas and Summary graphic organizer: Life before Philo</li> <li>Group Norms Checklist (Teacher assessment)</li> </ul>	<ul style="list-style-type: none"> <li>Supporting Details/Main Ideas/Summary anchor chart</li> <li>Group Norms anchor chart</li> <li>Vocabulary Strategies anchor chart</li> <li>Quote/Paraphrase anchor chart</li> </ul>
<b>Lesson 2</b>	Determining Main Ideas and Summarizing: Philo Farnsworth's Early Years	<ul style="list-style-type: none"> <li>I can determine two or more main ideas from a text and explain how they are supported by key details (RI.5.2)</li> <li>I can summarize the text. (RI.5.2)</li> <li>I can determine or clarify the meaning of unknown and multiple –meaning words and phrases by choosing flexibly from a range of strategies. (L.5.4)               <ol style="list-style-type: none"> <li>I can use context as a clue to the meaning of a word or phrase.</li> <li>I can use common, grade appropriate Greek and Latin affixes and roots as clues to the meaning of a word.</li> </ol> </li> <li>I can engage effectively in a range of collaborative discussions with diverse partners on grade 5 topics and texts. (SL. 5.1)</li> </ul>	<ul style="list-style-type: none"> <li>I can determine two main ideas from pages 2-9 of <i>The Boy Who Invented TV</i> by identifying key supporting details.</li> <li>I can summarize pages 2-9 of <i>The Boy Who Invented TV</i>.</li> <li>I can determine the meaning of key words and phrases using a variety of strategies.</li> </ul>	<ul style="list-style-type: none"> <li>Main Ideas and Summary graphic organizer: Philo's Childhood</li> <li>Vocabulary, four-column chart ( in journal)</li> <li>Group Norms Checklist (teacher assessment)</li> </ul>	<ul style="list-style-type: none"> <li>Dissecting a Vocabulary Word anchor chart</li> <li>Group Norms anchor chart</li> <li>Main Ideas and Summarizing anchor chart</li> <li>Vocabulary Strategies anchor chart</li> <li>Four Corners protocol</li> <li>Popcorn Read protocol</li> </ul>



Lesson	Lesson Title	Long-Term Targets	Supporting Targets	Ongoing Assessment	Anchor Charts & Protocols
<b>Lesson 3</b>	Making Inferences: What Motivates Philo Farnsworth?	<ul style="list-style-type: none"> <li>I can engage effectively in a range of collaborative discussions with diverse partners on grade 5 topics and texts. (SL.5.1)</li> <li>I can quote accurately from the text when explaining what the text says explicitly and when making inferences. (RI.5.1)</li> <li>I can determine the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies. (L.5.4)               <ul style="list-style-type: none"> <li>I can use context as a clue to the meaning of a word or phrase.</li> <li>I can consult reference materials, both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>I can engage in collaborative discussions with peers.</li> <li>I can make inferences using quotes and paraphrased details from the text.</li> <li>I can determine the meaning of key words using a variety of strategies.</li> </ul>	<ul style="list-style-type: none"> <li>Making Inferences graphic organizers: What Motivated Philo Farnsworth?</li> <li>Vocabulary, four-column chart (in journal)</li> <li>Group Norms Checklist (teacher assessment)</li> </ul>	<ul style="list-style-type: none"> <li>Making Inferences anchor chart</li> <li>Vocabulary Strategies anchor chart</li> <li>Group Norms anchor chart</li> <li>Stretch-o-Meter protocol</li> </ul>
<b>Lesson 4</b>	Making Inferences and Summarizing: Philo Farnsworth's Idea for "Capturing Light in a Bottle"	<ul style="list-style-type: none"> <li>I can quote accurately from the text when explaining what the text says explicitly and when making inferences. (RI.5.1)</li> <li>I can determine the meaning of general academic and domain-specific words. (RI.5.4)</li> <li>I can determine two or more main ideas from a text and explain how they are supported by key details. (RI.5.2)</li> <li>I can summarize the text. (RI.5.2)</li> </ul>	<ul style="list-style-type: none"> <li>I can make inferences using quotes and paraphrased details from <i>The Boy Who Invented TV</i>.</li> <li>I can determine the meaning of academic and scientific words using a variety of strategies.</li> <li>I can write a summary paragraph explaining the multiple main ideas in pages 2-17 of <i>The Boy Who Invented TV</i>.</li> </ul>	<ul style="list-style-type: none"> <li>Graphic novel templates (from homework)</li> <li>Making Inferences graphic organizer: Developing a Solution</li> <li>Vocabulary, four-column chart (in journal)</li> <li>Summary of pages 2-17 (in journal)</li> </ul>	<ul style="list-style-type: none"> <li>Making Inferences anchor chart</li> <li>Main Ideas and Summary anchor chart</li> <li>Popcorn Read protocol</li> </ul>



Lesson	Lesson Title	Long-Term Targets	Supporting Targets	Ongoing Assessment	Anchor Charts & Protocols
<b>Lesson 5</b>	Mid-Unit Assessment: Text-Dependent Questions about “The TV Guy”	<ul style="list-style-type: none"> <li>• I can quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (RI.5.1)</li> <li>• I can summarize a text. (RI.5.1)</li> <li>• I can determine two or more main ideas of a text and explain how they are supported by key details. (RI.5.1)</li> <li>• I can determine the meaning of general academic and domain – specific words and phrases in a text relevant to a grade 5 topic or subject area. (RI.5.4)</li> <li>• I can determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies. (L.5.4)</li> </ul>	<ul style="list-style-type: none"> <li>• I can quote accurately from the text when making an inference about why Philo Farnsworth was named one of the most important people of the 20<sup>th</sup> century by <i>Time</i> magazine.</li> <li>• I can write a statement to summarize what the article: “The TV Guy” is mostly about using key details that support the main idea(s).</li> <li>• I can use a variety of strategies to determine the meaning of unknown words.</li> </ul>	<ul style="list-style-type: none"> <li>• Independent Reading Choice Board response (from homework)</li> <li>• Mid-Unit 2 Assessment</li> <li>• Tracking My Progress, Mid-Unit 2 recording form</li> </ul>	
<b>Lesson 6</b>	Using Quotes to Explain: Why Philo Farnsworth Invented Television	<ul style="list-style-type: none"> <li>• I can explain what a text says using quotes from the text. (RI.5.1)</li> <li>• I can determine the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies. (L. 5.4)               <ul style="list-style-type: none"> <li>a. I can use context as a clue to the meaning of a word or phrase.</li> <li>c. I can consult reference materials, both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• I can explain <i>why</i> Philo Farnsworth wanted to invent television.</li> <li>• I can determine the meaning of unknown words and phrases using a variety of strategies.</li> </ul>	<ul style="list-style-type: none"> <li>• Fluency self-assessment (from homework)</li> <li>• Independent Reading Choice Board response (from homework)</li> <li>• Gist statement (in journal)</li> <li>• The Invention of Television note-catcher</li> <li>• Vocabulary defined (in journal)</li> </ul>	<ul style="list-style-type: none"> <li>• Vocabulary Strategies anchor chart</li> <li>• Popcorn Read protocol</li> </ul>





Lesson	Lesson Title	Long-Term Targets	Supporting Targets	Ongoing Assessment	Anchor Charts & Protocols
<b>Lesson 7</b>	Using Quotes to Explain Relationships: How the Invention of Television Changed People's Lives	<ul style="list-style-type: none"> <li>I can explain what a text says using quotes from the text. (RI.5.1)</li> <li>I can explain important relationships between people, events and ideas in a historical, scientific or technical text based on specific information in the text. (RI.5.3)</li> </ul>	<ul style="list-style-type: none"> <li>I can explain how television changed people's lives, using paraphrased details from the video and quotes from the text.</li> <li>I can identify the role of television in people's lives, based on information from the video and article.</li> </ul>	<ul style="list-style-type: none"> <li>How Television Changed People's Lives note-catcher</li> <li>Text-Dependent Questions: The Role of Television in People's Lives</li> <li>Vocabulary defined (in journal)</li> <li>Fluency self-assessment</li> <li>Independent Reading Choice Board response</li> <li>Group Norms Checklist (teacher assessment)</li> </ul>	<ul style="list-style-type: none"> <li>Quote/Paraphrase anchor chart</li> <li>Vocabulary Strategies anchor chart</li> <li>Stretch-O-Meter protocol</li> </ul>
<b>Lesson 8</b>	Analysis, Reflection, and Introduction to the Painted Essay: The Invention of Television	<ul style="list-style-type: none"> <li>I can choose evidence from literary or informational texts to support analysis, reflection and research. (W.5.9)</li> <li>I can write informative/explanatory texts to examine a topic and convey ideas and information clearly. (W.5.2)</li> </ul>	<ul style="list-style-type: none"> <li>I can analyze evidence from the texts I have read and viewed in order to explain if television changed people's lives in the ways Philo Farnsworth hoped it would.</li> <li>I can describe the Painted Essay structure for writing an essay.</li> </ul>	<ul style="list-style-type: none"> <li>Analyze and Explain task</li> <li>Painted Essay template, color-coded</li> </ul>	<ul style="list-style-type: none"> <li>Back-to-Back, Face-to-Face protocol</li> </ul>
<b>Lesson 9</b>	The Painted Essay: The Introductory Paragraph	<ul style="list-style-type: none"> <li>I can write informative/explanatory texts to examine a topic and convey ideas and information clearly. (W.5.2)               <ul style="list-style-type: none"> <li>I can introduce a topic clearly.</li> <li>I can provide a general observation and focus.</li> <li>I can group related information logically.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>I can identify and explain the purpose of the introduction, thesis, and points of an introductory paragraph about the invention of the electric motor.</li> <li>With peers, I can sort and color-code the introduction, focus, and points of an introductory paragraph about the invention of basketball.</li> </ul>	<ul style="list-style-type: none"> <li>Independent Reading Choice Board responses</li> <li>Independent reading index card (completed during Opening A)</li> <li>The Electric Motor introductory paragraph, color-coded.</li> <li>Basketball introductory paragraph, sorted and color-coded</li> </ul>	<ul style="list-style-type: none"> <li>Parts of a Painted Essay anchor chart</li> </ul>



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<b>Lesson 10</b>	The Painted Essay: Writing Proof Paragraphs	<ul style="list-style-type: none"> <li>I can write informative/explanatory texts to examine a topic and convey ideas and information clearly. (W.5.2) <ul style="list-style-type: none"> <li>I can develop the topic with facts, definitions, details, and quotations.</li> </ul> </li> <li>I can choose evidence from literary or informational texts to support analysis, reflection, and research. (W.5.9)</li> </ul>	<ul style="list-style-type: none"> <li>I can determine reasons and evidence related to the first and second points of an essay about the invention of basketball.</li> <li>I can write two proof paragraphs for an essay about the invention of basketball by using reasons and evidence related to each point in my introductory paragraph.</li> </ul>	<ul style="list-style-type: none"> <li>Independent Reading Choice Board response (from homework)</li> <li>Proof Paragraphs graphic organizer</li> <li>Written proof paragraphs</li> </ul>	<ul style="list-style-type: none"> <li>Parts of a Painted Essay anchor chart</li> </ul>
<b>Lesson 11</b>	The Painted Essay: Developing a Conclusion and Adding Linking Words	<ul style="list-style-type: none"> <li>I can write informative/explanatory texts to examine a topic and convey ideas and information clearly. (W.5.2) <ul style="list-style-type: none"> <li>I can use linking words and phrases to connect ideas within categories of information.</li> <li>I can use specific language and key vocabulary to explain the topic.</li> <li>I can construct a concluding statement or section of an informative/explanatory text.</li> </ul> </li> <li>I can effectively engage in a range of collaborative discussions with diverse partners on grade 5 topics and texts, building on others' ideas and expressing my own ideas clearly. (SL.5.1)</li> </ul>	<ul style="list-style-type: none"> <li>I can write a conclusion for my essay about the invention of basketball, using specific language and key vocabulary.</li> <li>I can identify the types of linking words used to connect ideas in a model essay about the invention of the electric motor.</li> <li>I can connect the ideas in my essay about the invention of basketball by using linking words.</li> </ul>	<ul style="list-style-type: none"> <li>Written conclusion paragraph that include specific language and key terms</li> <li>Linking words coded on model electric motor essay</li> <li>Linking words added to proof paragraphs and conclusion of basketball essay</li> </ul>	<ul style="list-style-type: none"> <li>Linking Words anchor chart</li> <li>Parts of a Painted Essay anchor chart</li> <li>Four Corners protocol</li> <li>Back-to-Back, Face-to-Face protocol</li> </ul>



Lesson	Lesson Title	Long-Term Targets	Supporting Targets	Ongoing Assessment	Anchor Charts & Protocols
<b>Lesson 12</b>	End of Unit Assessment: On-Demand Informational Writing: Philo Farnsworth's Invention of the Television and How It Changed People's Lives, Part 1	<ul style="list-style-type: none"> <li>I can explain the relationships or interactions between two or more individuals, events, ideas or concepts in a historical, scientific, or technical text based on specific information in the text. (RI.5.3)</li> <li>I can write informative/explanatory texts to examine a topic and convey ideas and information clearly. (W.5.2) <ul style="list-style-type: none"> <li>I can introduce a topic clearly, provide a general observation and focus, and group related information logically.</li> </ul> </li> <li>I can determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies. (L.5.4)</li> </ul>	<ul style="list-style-type: none"> <li>I can explain the relationship between society and the invention of television.</li> <li>I can determine the meaning of unknown words using a variety of strategies.</li> <li>I can identify the parts of an introductory paragraph about the invention of television.</li> </ul>	<ul style="list-style-type: none"> <li>Independent Reading Choice Board response</li> <li>End of Unit 2 Assessment, On-Demand Informational Writing: Philo Farnsworth's Invention of the Television and How It Changed People's Lives, Part 1</li> </ul>	



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<b>Lesson 13</b>	End of Unit Assessment: On-Demand Informational Writing: Philo Farnsworth's Invention of the Television and How It Changed People's Lives, Part 2	<ul style="list-style-type: none"> <li>I can write informative/explanatory texts that convey ideas and information clearly. (W.5.2) <ul style="list-style-type: none"> <li>Introduce a topic clearly, provide a general observation and focus, and group related information logically; including formatting (e.g. headings), illustrations, and multimedia when useful to aiding comprehension.</li> <li>I can develop the topic with facts, definitions, details, and quotations.</li> <li>I can use linking words and phrases to connect ideas within categories of information (e.g. in contrast, especially).</li> <li>I can use precise, content-specific vocabulary to inform or explain about a topic.</li> <li>I can construct a concluding statement or section of an informative/explanatory text.</li> </ul> </li> <li>I can produce clear and coherent writing that is appropriate to task, purpose, and audience. (W.5.4)</li> <li>I can choose evidence from literary or informational texts to support analysis, reflection, and research. (W.5.9)</li> </ul>	<ul style="list-style-type: none"> <li>I can write an informational essay that explains why Philo Farnsworth invented TV and how it changed people's lives.</li> <li>I can draw upon evidence from the informational texts I've read about Philo Farnsworth and the invention of TV to support the ideas presented in my essay.</li> <li>I can reflect on my learning about Philo Farnsworth's invention of television and how it changed people's lives.</li> </ul>	<ul style="list-style-type: none"> <li>Independent Reading Choice Board response (from homework)</li> <li>End of Unit 2 Assessment: On-Demand Information Writing: Philo Farnsworth's Invention of the Television and How It Changed People's Lives, Part 2</li> <li>Tracking My Progress, End of Unit 2 recording form</li> </ul>	<ul style="list-style-type: none"> <li>Parts of a Painted Essay anchor chart</li> <li>Linking Words anchor chart</li> <li>Back-to-Back, Face-to-Face protocol</li> </ul>



**Optional: Experts, Fieldwork, and Service**

**Experts:**

- Invite local television newscasters, producers, directors, or other individuals involved in the television industry to come speak to the class about how they develop and produce television shows or how they choose shows to air.

**Fieldwork:**

- Arrange for students to take a tour of a nearby television studio.

**Service:**

- Consider teaching students about public service announcements, also called PSAs (what they are and their purpose), then ask students to identify a local issue they want to research and create a PSA for to share with classmates and/or other students in the school.

**Optional: Extensions**

- Coordinate with a technology teacher to help students plan for and create their own news program related to events and important happenings taking place at the school.



### Preparation and Materials

- Collect a variety of independent reading choices for students to select from (see the Recommended Texts List for Unit 2 of this module).
- Some lessons suggest that students work with small white boards and dry erase markers. If this is not possible, students could just work on large pieces of scratch paper.
- Students should continue to work toward mastery of fluent reading skills outlined in the **Foundational Reading and Language Skills Resource Package**. To help students increase accuracy and move on to establishing goals aligned to more complex criteria described in the Fluency Self-Assessment, such as punctuation, phrasing and expression, consider having students reread pages of *Max Axiom* during partner and independent reading times. Providing a text that is both familiar and engaging will increase students' ability to attain fluency skills. As students work to develop their four-paragraph informational essays, beginning in Lesson 8, consider using resources from the packet related to instruction around Language Standards (e.g., "Show the Rule Strategy.")