



EXPEDITIONARY
LEARNING

Grade 5: Module 2B: Unit 3: Lesson 3

Expert Research Groups: How the Traffic Signal and Airplane Met Society's Needs, Part 2



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

I can conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (W.5.7)

I can gather relevant data from print and digital sources; I can summarize or paraphrase information in notes and finished work. (W.5.8)

I can quote accurately from the text when explaining what the text says explicitly and when making inferences. (RI.5.1)

I can determine the meaning of general academic and domain-specific words. (RI.5.4)

Supporting Learning Targets

- I can conduct research to take notes about how an invention was developed to meet society's needs.
- I can explain what people needed and how their needs were met, using quotes from the text.
- I can determine the meaning of unfamiliar words and phrases by using context clues and other strategies.

Ongoing Assessment

- Independent Reading Choice Board response (from homework)
- Expert Text note-catcher: The Airplane (airplane expert groups)
- Invention of the Traffic Signal note-catcher (traffic signal expert groups)
- Vocabulary cards (from homework)



Agenda	Teaching Notes
<ol style="list-style-type: none">Opening<ol style="list-style-type: none">Homework Review and Engaging the Reader (5 minutes)Work Time<ol style="list-style-type: none">Determining the Gist: Expert Text 2 (15 minutes)Second Read: Close Reading Guide: "Garrett Morgan: Inventor Hero" or Expert Text Note-catcher: The Airplane (30 minutes)Closing and Assessment<ol style="list-style-type: none">Debrief and Review Learning Targets (10 minutes)Homework<ol style="list-style-type: none">Splash Page sketch.Independent reading.	<ul style="list-style-type: none">This lesson follows a similar pattern to Lesson 2.In the Opening of this lesson, students participate in a vocabulary charades activity. This task is designed to help them reflect on the meaning of vocabulary terms and think creatively about how to represent definitions in an active way. As this can be a challenging concept for students, consider modeling how to silently dramatize terms using words that are familiar to the class.Students in expert groups read one of two new articles about the invention of the traffic signal or the invention of the airplane. While the airplane expert groups work to complete their Expert Text note-catchers and determine the meaning of unknown words and phrases using context clues and other strategies, you lead the traffic signal expert groups through a close read of the article "Garrett Morgan: Inventor Hero" using the Close Reading Guide in the supporting materials.During an extended debrief, students from both expert groups mingle with members of other triads who are studying the same invention to share and compare the definitions, synonyms, and drawings of key terms they recorded on their vocabulary cards.In the Closing, students participate in the Hot Seat protocol to answer a series of questions about why and how the inventions they are studying were developed, as well as the impact those inventions had on people's lives.In advance:<ul style="list-style-type: none">Review and become familiar with Hot Seat from Checking for Understanding Techniques (see Appendix) to clarify directions and guide student discussions during the debriefing.Create and place numbered Hot Seat Tickets under all student chairs before the debriefing (see the supporting materials). Note that several students will have the same Hot Seat questions; however, due to the open-ended nature of each question, their answers should vary.Review Glass, Bugs, Mud in Checking for Understanding Techniques (see Appendix).Consider creating Expert Folders for students to keep track of materials distributed in Lessons 2–4.Post: Expert Text anchor chart, Vocabulary Strategies anchor chart, learning targets, lesson vocabulary from expert texts.



Lesson Vocabulary	Materials
<p>conduct research, take notes, invention, developed, explain, needed/needs, met, quotes, determine, meaning, context</p> <p>From “Garrett Morgan: Inventor Hero”: prevent, tragedy, visible, caution, intersection, oncoming</p> <p>From “The Invention of the Airplane”: tackling, field, interest, attempts, manufacture, substantial, regarding, capacity</p>	<ul style="list-style-type: none">• Journals (begun in Unit 1, Lesson 1; one per student)• Document camera• Index cards (eight per student)• “Garrett Morgan: Inventor Hero” (one per student in traffic signal expert groups)• “The Invention of the Airplane” (one per student in airplane expert groups)• Group Norms anchor chart (begun in Unit 1, Lesson 1)• Expert Text anchor chart (begun in Lesson 2)• Invention of the Traffic Signal note-catcher (one per student in traffic signal expert groups)• Invention of the Traffic Signal: Close Reading Guide (for teacher reference)• Expert Text Note-catcher: The Airplane (one per student in airplane expert groups)• Expert Text Note-catcher: The Airplane (answers, for teacher reference)• Airplane task card (one per student in airplane expert groups)• Dictionaries (one per triad)• Vocabulary Strategies anchor chart (begun in Unit 1, Lesson 2)• Vocabulary Definitions: Lesson 3 (for teacher reference)• Hot Seat Tickets (one per student)• Graphic Novel Sketch, Part 1 (one per student)



Opening	Meeting Students' Needs
<p>A. Homework Review and Engaging the Reader (5 minutes)</p> <ul style="list-style-type: none"> Ask students to join their expert group triads from Lesson 2. Then, ask triads studying the same invention to “pair up.” Explain that in order to review the vocabulary terms students defined for homework, they will participate in vocabulary charades. Ask students to take out the vocabulary cards they completed for homework. Then give these directions: <ol style="list-style-type: none"> One member of your group of six chooses one term from the vocabulary cards to silently act out for the rest of the group to guess. Group members get a total of three tries to figure out which word their peer is acting out. If no one guesses the correct word after three tries, the student tells the group what word they were trying to act out. A new group member repeats Steps 1–3. Clarify directions or model as necessary. Explain that abstract terms may be harder to act out, but breaking the word into two parts and acting each part individually can help. Remind students that they are all familiar with the list of possible terms. Choose one student from each group to start the activity. Ask them to begin and circulate to offer support. After 3 minutes, focus students whole group. Ask triads to discuss: <ul style="list-style-type: none"> * “How do key terms from the text help you to better understand how the invention you are studying was developed to meet people’s needs?” After 1 minute, invite a couple of students to share their ideas whole group. Listen for examples such as: <ul style="list-style-type: none"> – “The word <i>pioneers</i> from the Wright brothers article helped me understand that their idea for how to build a plane was new and innovative for the time.” – “The word <i>congested</i> from the Garrett Morgan article helped me understand how busy and crowded intersections were during his time.” Explain that students’ work today is similar to the work they completed in the previous lesson. They will continue to determine the meaning of key terms and capture notes about an invention that was developed to meet societal needs. These tasks will help them recognize important ideas from the text and prepare for the on-demand note-taking assessment in Lesson 5. 	<ul style="list-style-type: none"> Offer a sentence frame to help students participate in the discussion: “The word _____ helped me understand how _____ met people’s needs because_____.”



Work Time	Meeting Students' Needs
<p>A. Determining the Gist: Expert Text 2 (15 minutes)</p> <ul style="list-style-type: none">• Ask students to take out their journals and separate themselves into their triads from Lesson 2.• Tell them that their task for today is to capture notes from a new article about either the traffic signal or airplane to add to their knowledge about the invention they are studying and how it affected society.• Tell them that their work with the new texts begins with reading for gist, but today they will also be asked to locate and consider key terms from their texts during this first read.• Use a document camera to display the vocabulary terms for each expert group.<ul style="list-style-type: none">– Airplane expert group key terms: <i>tackling, field, interest, attempts, manufacture, substantial, regarding, capacity</i>– Traffic signal expert group key terms: <i>prevent, tragedy, visible, caution, intersection, oncoming</i>• Distribute eight index cards to each student.• Direct them to record each of their vocabulary terms on one side of their index cards.• Display these directions:<ol style="list-style-type: none">1. Read your new expert text with triad members. Take turns reading aloud while other group members follow along silently.2. Circle key vocabulary terms as you notice them in the text.3. Discuss the gist of the text with your triad members. Try to include at least one key term in your gist statement.4. Record the gist on the same page in your journal that you recorded the gist from Lesson 2.5. If time permits, begin discussing the key terms with group members and record synonyms or definitions for each word on the front of your index cards.• Clarify directions as needed, and then distribute the articles “Garrett Morgan: Inventor Hero” and “The Invention of the Airplane” to the appropriate expert groups.• Ask students to begin and circulate to support their work and offer guidance.• After 7 or 8 minutes, refocus students whole class. Cold call a few from each expert group to share their gist statement aloud with the class. Listen for responses such as:<ul style="list-style-type: none">– “The Wright brothers’ heavier-than-air craft had a substantial impact on the field of airplane development.”– “Garrett Morgan was concerned for others, so he invented machines to help prevent tragedies.”	<ul style="list-style-type: none">• In addition to displaying each expert group’s key terms and directions for the activity, consider providing some students with their own version, especially those who you know have trouble seeing the board or tracking from board to paper.• Consider reading with a small group of students who struggle with complex text. Modify the length of the text, but carefully select deletions so they are still prepared to contribute a meaningful gist and vocabulary to their triad discussions.



Work Time (continued)	Meeting Students' Needs
<p>B. Second Read: Close Reading Guide: “Garrett Morgan: Inventor Hero” or Expert Text Note-catcher: The Airplane (30 minutes)</p> <ul style="list-style-type: none"> Focus students’ attention on the learning targets: <ul style="list-style-type: none"> * “I can conduct research to take notes about how an invention was developed to meet society’s needs.” * “I can explain what people needed and how their needs were met, using quotes from the text.” * “I can determine the meaning of unfamiliar words and phrases by using context clues and other strategies.” Underline the key terms students are familiar with from previous units and lessons: <i>conduct research, take notes, invention, developed, explain, needed/needs, met, quotes, determine, meaning, and context</i>. Point out that these are the same targets they worked on during the previous lesson. Ask triads to discuss: <ul style="list-style-type: none"> * “How did you work independently and with triad group members to meet these targets during the previous lesson?” After 1 or 2 minutes, cold call a variety of students to share their group’s thinking whole class. Listen for responses such as: <ul style="list-style-type: none"> – “We reread our articles to locate details about the background of our invention, the inventor(s), the process and solution, and the impact of the invention on people’s lives.” – “We took notes in the form of quotes and paraphrased details from the text.” – “We responded to the questions in the thought and speech bubbles to explain what people needed and how their needs were met, based on the notes from the four boxes on our note-catchers.” – “We determined the meaning of unfamiliar words by using context clues and parts of the word we already knew, and by using resources such as dictionaries and glossaries.” Explain that although both expert groups used the same Expert Text note-catchers in Lesson 2 to meet these targets, today only the airplane expert groups will use those note-catchers to capture ideas from their new text. The traffic signal expert groups will participate in a teacher-directed close reread and note capture of the article “Garrett Morgan: Inventor Hero.” Say something like: <ul style="list-style-type: none"> * “I will need the airplane expert groups to work more independently today as I work with the triads studying Garrett Morgan’s invention of the traffic signal.” Remind airplane expert group members that they can refer to the Group Norms anchor chart for ideas about how to work well together, as well as the Expert Text anchor chart if they get stuck or need a reminder about how to complete various sections of their Expert Text note-catchers. 	<ul style="list-style-type: none"> Consider providing a task card to keep all students moving in case they are ready for you before you are at a good stopping point with an expert group. Offer a sentence frame to provide all students access to the group discussion before cold calling: “Quotes and paraphrased details helped me with my thoughts and speech bubble sections because _____” or “I knew a detail was relevant if _____.”



Work Time (continued)	Meeting Students' Needs
<ul style="list-style-type: none">• Distribute The Invention of the Traffic Signal note-catcher to the appropriate expert groups. Ask triads to read through each of the questions on their note-catchers together and restate each question in their own words to demonstrate that they understand what the question is asking.• As traffic signal expert groups are reading and restating, distribute the Expert Text Note-catcher: The Airplane and Airplane task card to the airplane expert groups.• Read the directions on the task card aloud and provide clarification as needed. Make sure students have access to print or online dictionaries. Ask students to begin.• Return to work with the traffic signal expert groups. Take a moment to allow a few students to share out their restatements of the questions on their The Invention of the Traffic Signal note-catchers. Address misinterpretations as needed.• Use the Invention of the Traffic Signal Close Reading Guide (for teacher reference) to lead the traffic signal expert groups through "Garrett Morgan: Inventor Hero."• When the traffic signal triads have answered all but the final question on their note-catchers, give them these directions:<ol style="list-style-type: none">1. With group members, read and restate the final question on your note-catcher.2. Review your responses to the other questions on your note-catcher and information from the article to help you determine an answer to the last question.3. Discuss your thinking with group members, and then record a response to the final question.4. Use context clues and other strategies to determine the meaning of key terms you recorded onto index cards during Work Time A. Write a short definition or synonym and draw a picture of the meaning of each word on the back of your index cards.• Clarify as needed. Remind traffic signal expert groups to refer to the Group Norms anchor chart for ideas about how they can work together to complete each task cooperatively, and the Vocabulary Strategies anchor chart for ways to determine the meaning of unfamiliar words and phrases. Have dictionaries available for their use.• As traffic signal expert groups get started, move back to work with the airplane expert groups. Stop them in their work to ask how many triads have completed the speech and thought bubble questions on the Expert Text note-catcher. If most of the groups have <i>not</i> completed these parts of the note-catcher, allow them 1 or 2 additional minutes to discuss their thinking about how to answer each question and then record their responses. Circulate to offer guidance.	



Work Time (continued)	Meeting Students' Needs
<ul style="list-style-type: none">• Once airplane experts have answered the thought and speech bubble questions, cold call a few to share their responses aloud. See the Expert Text Note-catcher: The Airplane (answers, for teacher reference) for possible responses.• Ask the airplane expert groups to consider and discuss:<ul style="list-style-type: none">* “How did quotes and paraphrased details in your notes help you answer the thought and speech bubble questions?”* “How did you determine which information from the article was relevant?”• After 1 or 2 minutes, cold call a few students to share out. Listen for ideas like:<ul style="list-style-type: none">– “I looked for words and phrases in the quotes and paraphrased details on my note-catcher that were related to key terms from the thought and speech bubble questions; I summarized related details to craft a response to the thought and speech bubble questions.”– “I referred to the prompts in each box to help me determine whether certain details were relevant, the kind of information that could be used to respond to the prompt accurately.”• Focus students' whole group. Invite a few to share out an example of how they used one of the strategies on the Vocabulary Strategies anchor chart to define an unknown word. Listen for them to describe how they used context clues, Greek or Latin roots, familiar parts of a word, or a dictionary to define key terms.• Allow students 2 or 3 minutes to mingle with members of other triads who are studying the same invention to share and compare the definitions, synonyms, and drawings of key terms they recorded onto index cards.• As time permits, allow students to make revisions to their vocabulary cards and note-catchers, based on new understandings about key terms after conversations with peers.• Collect students' completed vocabulary cards to review. See Vocabulary Definitions: Lesson 3 (for teacher reference) and the Teaching Note at the end of this lesson, after Homework.• Ask students to hold on to their note-catchers to use during an extended debrief of their learning.	



Closing and Assessment	Meeting Students' Needs
<p>A. Debrief and Review Learning Targets (10 minutes)</p> <ul style="list-style-type: none"> Review the Hot Seat protocol with students and clarify directions as needed. Have them check under their seats for a Hot Seat Ticket and locate the number on their ticket. Explain that this number indicates the order in which they will answer the questions on the ticket. Encourage students to take a moment to silently read and consider their question, then refer to their notes, articles, and vocabulary cards to help them formulate a response to each question. In number order, ask students to read their question aloud and share their response. Answers to Hot Seat questions will vary, but responses might include: <ul style="list-style-type: none"> “The airplane changed people’s lives by making travel much easier and more comfortable. It also improved defense services and emergency rescues.” “The traffic signal changed people’s lives by making streets more organized so there were fewer accidents and pedestrians could cross safely.” “The Wright brothers’ interest and passion in flying machines as well as their determination to work for many years helped them develop a heavier-than-air plane.” “Garrett Morgan’s concern for others and his mechanical-mindedness helped him succeed in building a traffic signal because he was able to create one that worked at day and night and for cars, carriages, and pedestrians.” “I think the quote, ‘Airplanes gave us the opportunity to explore different parts of the world. Tackling emergency situations like floods became easier. Airplanes are also an important part of the defense services’ was most helpful because it gives specific examples of needs that have been met by airplanes.” “The quote, ‘To solve these problems, Morgan invented an electric traffic signal with three positions: stop, go, and an all direction stop for vehicles to let pedestrians cross in safety. His signals could operate 24 hours a day, with a spotlight for nighttime use’ was most helpful to me because it explained what his signal did to make the streets safer all day long.” “I notice that the Wright brothers worked on their invention for many years, just like Philo Farnsworth.” “Garrett Morgan and Michael Faraday were both mechanically minded.” Praise students for their ability to make inferences and use details from their notes, the text, and key terms to help them think about why and how the inventions they are studying were developed as well as the impact those inventions had on people’s lives. 	<ul style="list-style-type: none"> To support students who struggle to synthesize information quickly, invite them to a small group, narrow their Hot Seat questions so they each have something similar, and support them in consolidating their ideas to be ready to share when it’s their turn.



Closing and Assessment (continued)	Meeting Students' Needs
<ul style="list-style-type: none">• Read each of the learning targets aloud and ask students to use Glass, Bugs, and Mud to demonstrate their level of mastery toward each target. Note those who show bugs or mud, as they may need more support taking notes or determining the meaning of key terms.• Distribute the Graphic Novel Sketch, Part 1. Read through the directions with students and provide clarification as needed.	
Homework	Meeting Students' Needs
<ul style="list-style-type: none">• Reread your article: "Garrett Morgan: Inventor Hero" or "The Invention of the Airplane." Complete your Graphic Novel Sketch, Part 1. Read independently for at least 15 or 20 minutes. <p><i>Note: Because students will need access to their note-catchers for homework, find a time before the end of the day to make copies of their Expert Text and The Invention of the Traffic Signal note-catchers to gauge their ability to locate and record relevant notes (in the form of quotes and paraphrased details from the text). Make determinations about which students may need additional support to master these skills before taking the on-demand note-taking mid-unit assessment in Lesson 5.</i></p> <p><i>Review the definitions/synonyms/drawings on students' vocabulary cards to evaluate whether they may require additional support before they can independently use a variety of strategies to determine the meaning of unfamiliar words and phrases. Be prepared to return students' cards in the next lesson.</i></p>	



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Supporting Materials

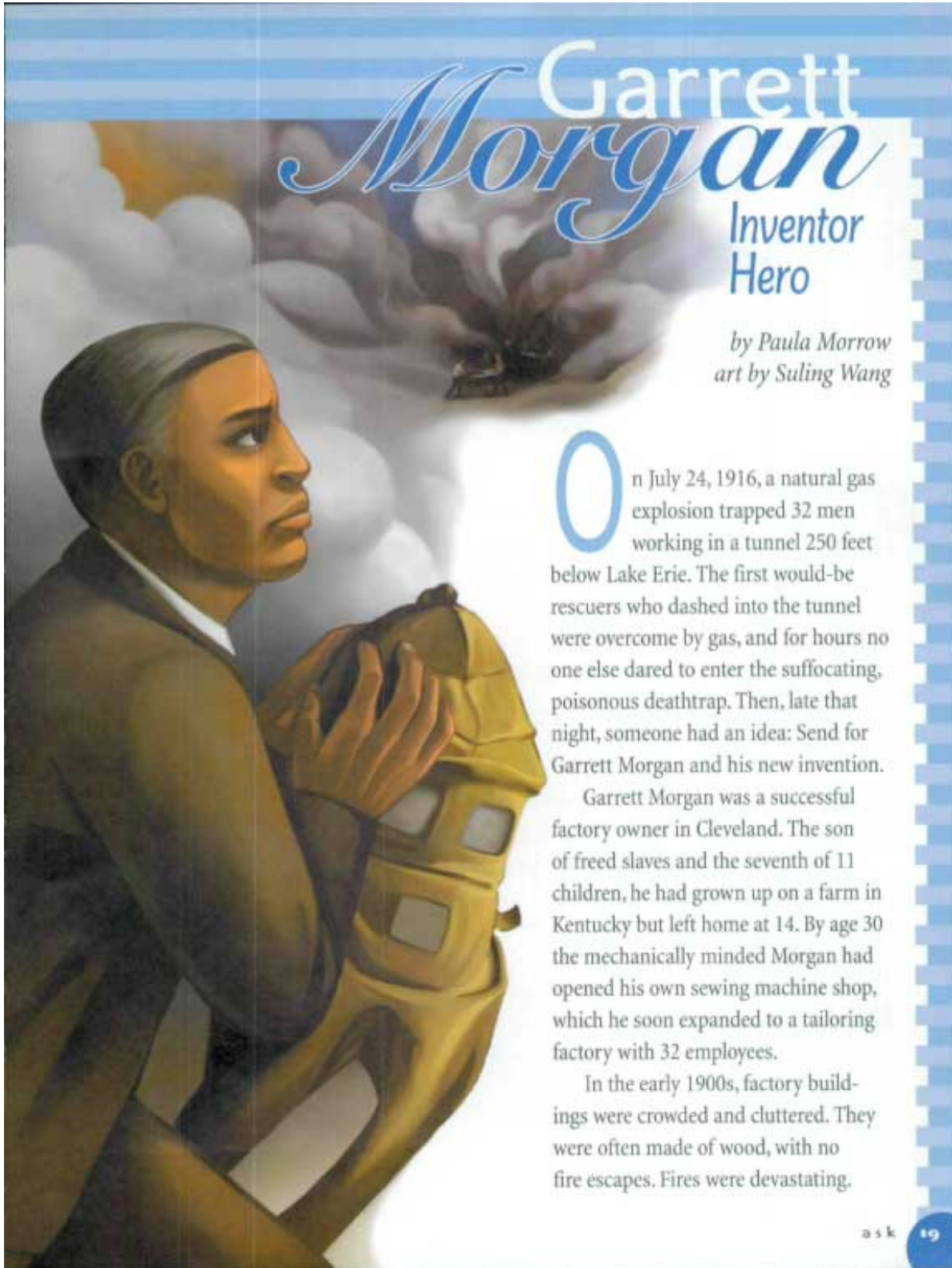


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Garrett Morgan: Inventor Hero



Garrett Morgan

Inventor Hero

by Paula Morrow
art by Suling Wang

On July 24, 1916, a natural gas explosion trapped 32 men working in a tunnel 250 feet below Lake Erie. The first would-be rescuers who dashed into the tunnel were overcome by gas, and for hours no one else dared to enter the suffocating, poisonous deathtrap. Then, late that night, someone had an idea: Send for Garrett Morgan and his new invention.

Garrett Morgan was a successful factory owner in Cleveland. The son of freed slaves and the seventh of 11 children, he had grown up on a farm in Kentucky but left home at 14. By age 30 the mechanically minded Morgan had opened his own sewing machine shop, which he soon expanded to a tailoring factory with 32 employees.

In the early 1900s, factory buildings were crowded and cluttered. They were often made of wood, with no fire escapes. Fires were devastating.

ask 19



Garrett Morgan: Inventor Hero

Morgan's safety hood (shown below) was the model for the gas mask used by the U.S. Army during World War I. The gas mask saved countless lives.



Concerned about his employees, Morgan experimented with a "safety hood" that would allow the wearer to breathe despite a fire's toxic smoke. Morgan knew smoke rises during a fire, so he created a heat-resistant hood with a long tube reaching to the floor. Wearing Morgan's hood, a firefighter could breathe the cleaner air near the ground. Morgan lined the breathing tube with a sponge-like material that was moistened before use to cool and filter the air. A second tube released exhaled air.

Roused from home on the night of the tunnel explosion, Garrett rushed to the disaster site with samples of his safety hood.



Anxious survivors of the tunnel disaster wait to see if Garrett Morgan's invention will save the trapped workers.

Still in their pajamas, he and his brother Frank put on hoods and bravely entered the tunnel. It was a dangerous test of the invention, but they saved two lives and recovered four bodies before officials closed the site. Morgan knew that more lives might have been saved if he had been called sooner.

The daring rescue made Morgan famous and brought requests for safety hoods from fire departments around the country. But his greatest reward was knowing that his invention would now save more people.

Over the years, Morgan patented many ideas that saved lives or made life easier. In those days, city streets were crowded with horses, carriages, bicycles, and pedestrians. One day, Morgan—the first African American in Cleveland to



Garrett Morgan: Inventor Hero

buy an automobile—was driving his new car when he witnessed a terrible collision between another car and a horse-drawn carriage. Morgan decided that traffic-control signals could prevent such tragedies.

Other inventors had experimented with this idea, but their mechanical signals had to be operated by hand and were not visible at night. In addition, existing signals had no caution sign between stop and go, so a driver going one direction might start across an intersection before an oncoming driver had time to stop. To solve these problems, Morgan invented an electric traffic signal with three positions: stop, go, and an all-directional stop for vehicles to let pedestrians cross in safety. His signals could operate 24 hours a

day, with a spotlight for nighttime use. After patenting his design, Morgan sold the rights to General Electric Corporation for \$40,000. His signals were used across the country and set the standard for the red-yellow-green traffic lights we use today.

Once in a while, someone comes along who actively looks for ways to keep others safe. Such a person was Garrett Morgan who, in addition to his inventive genius, was blessed with genuine concern for the well-being of other people.

Why worry about traffic when you can fly?



The patent drawing for Garrett Morgan's three-position traffic light.

When's my turn to go?



A good old-fashioned traffic jam—before Garrett Morgan's invention.

Do pedestrians or horses have the right of way?





The Invention of the Airplane (excerpts)
by Shashank Nakate

The invention of the airplane changed the way we travel and also made traveling very comfortable. Airplanes gave us the opportunity to explore different parts of the world. Tackling emergency situations like floods became easier. Airplanes are also an important part of the defense services.

Who Invented the Airplane?

The Wright brothers from the USA invented the first airplane. They used to study the experiments and research taking place in the field of airplane development. Their interest and passion for airplanes led to the development of the first heavier-than-air plane.

First Airplane to Fly

The Wright brothers, Wilbur and Orville, began working on the idea of building airplanes in 1899. They finally succeeded in flying the first airplane on 17th December, 1903. It was a historic day, since many attempts to manufacture an airplane had earlier met with failure.

Airplane History

Substantial work in the field of airplane development took place in the 19th century. However, there was a lot of interest among people regarding airplanes from the times of Leonardo da Vinci. Though the airplane was invented in 1903, it became popular only after the government of America used it for the Air-Mail service. Thereafter, airplanes gained popularity and were used for many different purposes.

Today's airplanes have become technologically advanced and possess a sophisticated design. The recently launched Airbus 380 is the biggest passenger airplane. It has a capacity to carry 853 passengers and travel at a speed of 900 km/hr. The Antonov An-225 Mriya is the heaviest aircraft in the world.



Invention of the Traffic Signal note-catcher

Refer to the article “Garrett Morgan: Inventor Hero” to help you respond to these questions.

<p>Reread Paragraph 2 silently; then use details from the text to answer the questions on the right.</p>	<p>Locate and circle the phrase “mechanically minded.” What do you think “mechanically minded” means? What words from the text make you think so?</p> <p>Underline the parts of this paragraph that explain how Garrett Morgan demonstrated he was “mechanically minded.”</p>
<p>Whisper read Paragraph 6, then use details from the text to answer the questions on the right.</p>	<p>Why did Garrett Morgan think people needed a traffic-control signal?</p>



Invention of the Traffic Signal note-catcher

Refer to the article “Garrett Morgan: Inventor Hero” to help you respond to these questions.

Reread Paragraph 7 silently; then use details from the text to answer the questions on the right.

What were some of the problems with other inventors’ ideas for a traffic signal?

How was Garrett Morgan’s traffic-control signal different from previous signals?

Reread to underline words and phrases from this paragraph that helps you understand how Garrett Morgan’s traffic-control signal made intersections safer for people.

The article states, “His signals were used across the country and set the standard for the red-yellow-green traffic lights we use today.” Locate and circle the phrase “set the standard.” Underline words from the text that help you determine the meaning of this phrase. What does “set the standard” mean?



Invention of the Traffic Signal note-catcher

Refer to the article “Garrett Morgan: Inventor Hero” to help you respond to these questions.

<p>Reread Paragraph 8 aloud together with your group members, then use details from the text to answer the questions on the right.</p>	<p>Reread to locate and underline words and phrases that describe what type of person Garrett Morgan was. Then paraphrase the text you underlined to describe Garrett Morgan.</p> <p>How did these qualities lead Garrett Morgan to the development of his traffic-control signal?</p>
<p>Refer to the visual elements at the end of the article.</p>	<p>What types of visual elements are used to help the reader understand what people’s problem was? Explain.</p> <p>What types of visual elements are used to help the reader understand the solution to people’s problem? Explain.</p>
<p>Review your answers to the above questions and the article to help you respond to the prompt on the right.</p>	<p>In your own words, explain what people needed.</p> <p>How did Garrett Morgan’s invention of the traffic-control signal meet people’s needs?</p>



Invention of the Traffic Signal: Close Reading Guide
(For Teacher Reference)

Total Time: 30 minutes

Directions	Questions	Teaching Notes
Reread Paragraph 2 silently; then use details from the text to answer the questions on the right.	<p>Locate and circle the phrase “mechanically minded.” What do you think “mechanically minded” means? What words from the text make you think so?</p> <p>Underline the parts of this paragraph that explain how Garrett Morgan demonstrated he was “mechanically minded.”</p>	<p>Give students 1 or 2 minutes to read the second paragraph and circle the phrase “mechanically minded.”</p> <p>Ask them to consider and discuss in groups what they think this phrase means (encourage them to refer to the Vocabulary Strategies anchor chart for ideas about how to determine the meaning of unfamiliar words).</p> <p>Cold call a few students to share what they think “mechanically minded” means and which words in the text made them think so. Listen for responses like:</p> <p><i>I think mechanically minded means being smart about/good with machines because the article says Garrett Morgan opened a sewing machine shop and expanded it into a factory; he was a successful factory owner by age 30.</i></p> <p>Ask students to record a response to the first question, then read the second question aloud. Draw their attention to the word <i>demonstrated</i>. Ask them to quickly discuss what they think <i>demonstrated</i> means. After 1 minute, invite one or two students to share their thinking. Listen for:</p> <p><i>Demonstrated means showed what someone did.</i></p>



Invention of the Traffic Signal: Close Reading Guide
(For Teacher Reference)

Directions	Questions	Teaching Notes
		<p>Ask students to quickly look back through the second paragraph to locate and underline examples of how Garrett Morgan demonstrated he was mechanically minded. After 2 minutes, cold call a few students to share out. Listen for:</p> <p><i>Garrett Morgan demonstrated he was mechanically minded because he was “a successful factory owner (in Cleveland)”;</i> <i>by age 30 he had opened his own sewing machine shop; he “expanded to a tailoring factory (with 32 employees).”</i></p>
Whisper read Paragraph 6, then use details from the text to answer the questions on the right.	Why did Garrett Morgan think people needed a traffic-control signal?	<p>Give students 1 or 2 minutes to whisper read the paragraph. Then, reread the question and allow them to quickly go back to the text to locate and record details that help them understand the reasons Garrett Morgan thought people needed a traffic-control signal. Cold call a few students to share out their thinking. Listen for:</p> <p><i>The reasons Garrett Morgan thought people needed a traffic signal were that city streets were crowded; he saw a terrible collision between a car and a horse-drawn carriage; he thought traffic control signals could prevent tragedies.</i></p>



Invention of the Traffic Signal: Close Reading Guide
(For Teacher Reference)

Directions	Questions	Teaching Notes
Reread Paragraph 7 silently; then use details from the text to answer the questions on the right.	<p>What were some of the problems with other inventors' ideas for a traffic signal?</p> <p>How was Garrett Morgan's traffic-control signal different from previous signals?</p> <p>Reread to underline words and phrases from this paragraph that helps you understand how Garrett Morgan's traffic-control signal made intersections safer for people.</p>	<p>Allow students 1 or 2 minutes to reread Paragraph 7 to locate details that help them answer the question. Cold call a few students to share their thinking whole group. Listen for:</p> <p><i>Some problems were that their "signals had to be operated by hand and were not visible at night" and "existing signals had no caution sign between stop and go, so a driver going one direction might start across an intersection before an oncoming driver had time to stop."</i></p> <p>Next, prompt students to reread the paragraph and underline words and phrases that help them understand how Garrett Morgan's traffic signal made intersections safer for people. After 1 or 2 minutes, cold call a few students to share out the text they underlined. Listen for:</p> <p><i>Garrett Morgan's signal had three positions: "stop, go, and an all directional stop for vehicles to let pedestrians cross in safety" and "his signals could operate 24 hours a day, with a spotlight for nighttime use." They allowed pedestrians to cross the street safely and signaled drivers when it was their turn to go so they would not crash into each other.</i></p>



Invention of the Traffic Signal: Close Reading Guide
(For Teacher Reference)

Directions	Questions	Teaching Notes
	<p>The article states, “His signals were used across the country and set the standard for the red-yellow-green traffic lights we use today.” Locate and circle the phrase “set the standard.” Underline words from the text that help you determine the meaning of this phrase. What does “set the standard” mean?</p>	<p>As time allows, consider asking students to come to the front of the classroom to dramatize the problems and solutions they describe.</p> <p>Ask students to locate and circle “set the standard” in this paragraph. Then ask them to reread and underline context clues that help them understand the meaning of this term. Direct triads to briefly discuss the term, the text they underlined, and what they think this phrase means. After 2 minutes, cold call a few students to share out their definitions and explain how they arrived at them. Listen for ideas such as:</p> <p><i>I think “set the standard” means that newer inventions were based on Garrett Morgan’s invention because the article explains that the signal Garrett Morgan came up with is the basis for the modern red, yellow, and green traffic lights we use today.</i></p>



Invention of the Traffic Signal: Close Reading Guide
(For Teacher Reference)

Directions	Questions	Teaching Notes
Reread Paragraph 8 aloud together with your group members; then use details from the text to answer the questions on the right.	<p>Reread to locate and underline words and phrases that describe what type of person Garrett Morgan was. Then paraphrase the text you underlined to describe Garrett Morgan.</p> <p>How did these qualities lead Garrett Morgan to the development of his traffic-control signal?</p>	<p>Allow students 2 or 3 minutes to chorally read the paragraph with group members and underline text that describes what type of person Garrett Morgan was. Then, invite a few students to share out details they underlined. Listen for:</p> <p><i>Garrett Morgan was the type of person who looked for ways to keep people safe; he was an inventive genius; he was genuinely concerned for the well being of other people.</i></p> <p>Then, ask students to consider and discuss with group members: “How could you paraphrase these details, in your own words, to describe what type of person Garrett Morgan was?” After 1 or 2 minutes, cold call a few students to share their thinking whole group. Listen for suggestions like:</p> <p><i>Garrett Morgan was a great inventor who wanted nothing more than to make people’s lives safer.</i></p> <p>Ask students to read and restate the second question in their own words. Invite a few to share out how they restated the question.</p> <p>Tell students to take a moment to go back to the text to help them formulate a response to the question. After 1 or 2 minutes, cold call a few students to share out their thinking. Listen for:</p> <p><i>Because Garrett Morgan cared about safety and other people and was inventive, he was able to develop a traffic signal that would help pedestrians, cars, and carriages stay safe and avoid tragedy in busy intersections.</i></p>



Invention of the Traffic Signal: Close Reading Guide
(For Teacher Reference)

Directions	Questions	Teaching Notes
Refer to the visual elements at the end of the article.	<p>What types of visual elements are used to help the reader understand what people's problem was? Explain.</p> <p>What types of visual elements are used to help the reader understand the solution to people's problem? Explain.</p>	<p>Give students 2 minutes to review the visual elements (if they need support identifying and naming the types of visual elements in the photo, remind them that they may refer to the Visual Elements resource in their journals, from Unit 1, Lesson 1, for support.) Cold call a few students to share out their thinking. Listen for:</p> <p><i>The article has a (historical) photo of how busy intersections were (the number of people, cars, carriages using the road at the same time); there is a thought bubble coming from a person in the photo that shows a person wondering, "Do pedestrians or horses have the right of way?"; there is a cartoon animal with a speech bubble asking, "When's my turn to go?"</i></p> <p>Focus students on the second question and point out that this time they are looking for visual elements that support their understanding of the solution to the problem. After 1 or 2 minutes, cold call a few students to share out the visual elements that support their understanding of the solution. Listen for:</p> <p><i>There is a patent drawing of Garrett Morgan's traffic-control signal that shows how signs popped out and were visible to show when people could take turns crossing; it shows how Garrett Morgan's traffic signal worked.</i></p>



Invention of the Traffic Signal: Close Reading Guide
(For Teacher Reference)

Directions	Questions	Teaching Notes
Review your answers to the above questions and the article to help you respond to the prompt on the right.	<p>In your own words, explain what people needed.</p> <p>How did Garrett Morgan's invention of the traffic-control signal meet people's needs?</p>	<p>Allow students 2 or 3 minutes to review their responses, discuss their thinking with group members, and write a response to the first question. Then, invite a few students to share their thinking aloud. Listen for:</p> <p><i>People needed a way to avoid collisions in busy intersections and a way for pedestrians to cross intersections safely.</i></p> <p>Focus students on the second question. Once again, ask them to review their responses, discuss their thinking in groups, and then formulate a response to the question. After 2 minutes, cold call a few students to share out their thinking. Listen for ideas like:</p> <p><i>Garrett Morgan's invention told people when it was safe to stop, go, and let pedestrians cross in safety (so there would be fewer collisions).</i></p>



Expert Text Note-catcher: The Airplane

What need or want inspired the development of this invention?

How were people's needs met, and by whom?

Background information about the
INVENTION

Explain why people needed or wanted this invention.

Background information about the
INVENTOR(S)

Explain the inventor(s) history, motivation to solve the problem, special skills, and/or preparation.

Information about developing a
SOLUTION

Explain how the inventor(s) solved the problem.

Information about the **IMPACT**

Explain how this invention changed people's lives.



Airplane Task Card

1. Independently, reread the article “The Invention of the Airplane.”
2. As you read, look for and underline details that respond to the prompt in each gray box of your note-catcher: background about the INVENTION; background about the INVENTOR(S); information about developing a SOLUTION; and information about the IMPACT.
3. With your triad, share the details you underlined and discuss:
 - * “Is this information *relevant*?”
 - * “Where should I record this information on my note-catcher (which gray box)?”
 - * “Should I quote this information or paraphrase it on my note-catcher? Why?”
4. Record at least one or two relevant details in each box (make sure to record quotes and paraphrased information on your note-catcher).
5. Refer to your notes (quotes and paraphrased details) to help you respond to the thought and speech bubble questions. Remember to use key terms from the questions in your responses.
6. Once you have completed your note-catcher, work with group members to determine the meaning of key terms on your vocabulary cards, using context clues and other strategies. On the back of your index cards, write a synonym or definition and draw a picture to show the meaning of each word.



Expert Text Note-catcher: The Airplane
(Answers, for Teacher Reference)

What need or want inspired the development of this invention?

People had wanted to fly since the time of da Vinci, and earlier attempts to invent airplanes had failed.

How were people's needs met, and by whom?

The Wright brothers' invention of the airplane in 1903 allowed people to fly comfortably to places all over the world. Airplanes are also used to help in emergency situations and with our defense services.

Background information about the INVENTOR(S)
Explain the inventor(s) history, motivation to solve the problem, special skills, and/or preparation.

- "They used to study the experiments and research taking place in the field of airplane development."
- They had an interest and passion for airplanes that led to their development of the first heavier-than-air plane.

Information about developing a SOLUTION
Explain how the inventor(s) solved the problem.

- They began working on their idea for a plane in 1899.
- "They finally succeeded in flying the first airplane on 17th December, 1903."

Information about the IMPACT
Explain how this invention changed people's lives.

- "The invention of the airplane changed the way we travel."
- Airplanes make traveling more comfortable.
- Airplanes allow us to visit and explore other parts of the world.
- They are used to help during emergency situations such as floods.
- They "are an important part of the defense services."
- An Airbus 380 can carry 853 passengers to places around the world.



Vocabulary Definitions: Lesson 3
(For Teacher Reference)

“Garrett Morgan: Inventor Hero”	“The Invention of the Airplane”
prevent – stop, avoid	tackling – confronting; dealing with a difficult situation
tragedy – disaster; something bad that happens	field – area, subject
visible – can be seen; noticeable; in sight	interest – something someone enjoys doing
caution – warning	attempts – efforts
intersection – crossing point, overlapping streets	manufacture – build, create, make, construct
oncoming – approaching, getting closer	substantial – large amount; significant
	capacity – the amount something can hold



Hot Seat Tickets

<p>1</p> <p>How did the invention you are studying change people's lives?</p>	<p>1</p> <p>How did the invention you are studying change people's lives?</p>
<p>2</p> <p>What special skills helped the inventor(s) you are learning about succeed where others did not?</p>	<p>2</p> <p>What special skills helped the inventor(s) you are learning about succeed where others did not?</p>
<p>3</p> <p>Which three vocabulary terms do you think are most important to the gist of the article you read? Explain your thinking.</p>	<p>3</p> <p>Which three vocabulary terms do you think are most important to the gist of the article you read? Explain your thinking.</p>
<p>4</p> <p>Which quote from the text best helps you explain how people's needs were met by this invention?</p>	<p>4</p> <p>Which quote from the text best helps you explain how people's needs were met by this invention?</p>
<p>5</p> <p>What similarities do you notice between the inventor you are studying and Philo Farnsworth?</p>	<p>5</p> <p>What similarities do you notice between the inventor you are studying and Philo Farnsworth?</p>



Graphic Novel Sketch,
Part 1

The Splash Page of a graphic novel introduces the situation, characters, and setting through the use of detailed images. It is a visual way for the author to communicate important information to the reader. This sketch is an opportunity to share information about the topic you are researching in a visual way to help you prepare to create your own graphic novelette.

Directions:

1. Read and consider the thought bubble on your Expert Text note-catcher to identify details that help explain the **need** or **want** that inspired the development of the invention you are researching.
2. Use the panel provided to sketch one image for a Splash Page that introduces the need or want that inspired the development of the invention. Your sketch should include visual representations of the details you identified in Step 1.
3. Include a speech or thought bubble with text that explains/states the need or want that inspired the development of the invention you are studying.
4. Finish the sketch by using one color to draw attention to the most important details.

