EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1:
Overview

Unit 1: Building Background Knowledge: *Investigating the Scientific Method with Max Axiom* and Considering How Technologies are developed to Meet Societal Needs

In this unit, students begin to build background knowledge about the process of scientific inquiry and how new or improved technologies are developed to meet the needs of society. Students begin the unit by reading the graphic novel *Investigating the Scientific Method with Max Axiom Super Scientist*. As they read, they focus on identifying the steps Max Axiom, the main character, takes to solve a societal problem, as well as analyzing how the visual elements found in a graphic novel support their understanding of complex ideas. After reading the graphic novel, students continue to build their knowledge through informational texts about real inventions developed to meet people's needs, such as the electric motor, windshield wipers, the paper bag machine, and the game of basketball. Students will focus on learning about the ways authors structure informational texts to relay the story of each invention and support readers' understanding of complex ideas, as well as how to form and share an opinion based on research and evidence.

Guiding Questions And Big Ideas
• **How do authors structure text and use visual elements to engage and support readers' understanding of complex ideas?** • **How do new or improved technologies meet societal needs?** • *Text structure and visual elements can support our understanding of complex ideas.* • *New or improved technologies are developed to meet societal demands.*

Mid-Unit 1 Assessment	**Text Dependent Questions: *Investigating the Scientific Method with Max Axiom Super Scientist*, pages 24–27** This assessment centers on NYSP12 ELA CCLS RL.5.7, W.5.9, and L.5.4. For this assessment, students read unfamiliar pages from *Investigating the Scientific Method with Max Axiom Super Scientist* to answer multiple-choice and short response text-dependent questions in order to demonstrate their ability to determine the meaning of unfamiliar words and phrases from context, analyze how visual elements support readers' understanding, and use details and key terms from the text to support their explanations.
End of Unit 1 Assessment	**Using Quotes to Explain Relationships and Support an Opinion** This assessment centers on NYSP12 ELA CCLS RI.5.1, RI.5.3, RI.5.4, RI.5.5, and W.5.1a and b. Students read two new informational articles: "Big Thinkers: Was Steve Jobs this Generation's Thomas Edison?" and "Steve Jobs." They first determine the meaning of unfamiliar words from context. Then, students compare and contrast the structure of the two articles and explain how the information presented in each article supports their understanding of how Steve Jobs developed technologies to meet people's needs. Students synthesize their thinking by writing an opinion paragraph about which of the inventions they have read they feel is most important to people. The task requires students to draw upon new information from the articles, plus information and key terms from other informational texts they read during the second half of the unit.

Content Connections

This module is designed to address English Language Arts standards as students read literature and informational text about the scientific method and how technologies are 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.

- 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)

Texts
1. Donald B. Lemke, *Investigating the Scientific Method with Max Axiom Super Scientist* (Mankato, Minnesota: Capstone Press, 2008), ISBN: 978-1-4296-1760-4.
2. "The Electric Motor" (written by Expeditionary Learning for instructional purposes).
3. "Ingenious Inventions by Women: The Windshield Wiper and Paper Bag Machine" (written by Expeditionary Learning for instructional purposes).
4. "Dr. James Naismith, Inventor of Basketball," as found at www.kansasheritage.org/people/naismith.html (excerpts).
5. "First College Basketball Game," as found at www.americaslibrary.gov/jb/progress/jb_progress_basketball_1.html, www.americaslibrary.gov/jb/progress/jb_progress_basketball_2.html, and www.americaslibrary.gov/jb/progress/jb_progress_basketball_3.html.
6. "Big Thinkers: Was Steve Jobs this Generation's Thomas Edison?" in *Junior Scholastic,* November 21, 2011, as found at *The Free Library* at http://www.thefreelibrary.com/Big+thinkers%3A+was+Steve+Jobs+this+generation's+Thomas+Edison%3F-a0274791330.
7. "Steve Jobs," as found at www.timeforkids.com/news/steve-jobs/21806 (excerpts).

This unit is approximately 2 weeks or 10 sessions of instruction.

Lesson	Lesson Title	Long-Term Targets	Supporting Targets	Ongoing Assessment	Anchor Charts & Protocols
Lesson 1	Building Background Knowledge: *Investigating the Scientific Method with Max Axiom Super Scientist*	• I can engage effectively in a range of collaborative discussions with diverse partners about fifth-grade topics and texts. (SL.5.1) • I can analyze how visual and multimedia elements contribute to the meaning, tone or beauty of a text. (RL.5.7) • I can recognize, interpret, and make connections in narratives, poetry, and drama to other texts, ideas, cultural perspectives, eras, personal events, and situations. (RL.5.11) a. I can self-select texts to develop personal preferences regarding favorite authors. b. I can use established criteria to categorize, select texts, and assess to make informed judgments about the quality of the pieces.	• I can use group norms to locate and discuss the visual elements in the graphic novel *Max Axiom*. • I can analyze the visual elements and splash page in *Max Axiom* to make predictions about the story. • I can use established criteria to select a text for independent reading.	• Written prediction (in journal) • Independent text selection • Independent Reading Choice Board Response	• Triad Talk Norms • Criteria for Selecting Texts • Infer the Topic protocol

Lesson	Lesson Title	Long-Term Targets	Supporting Targets	Ongoing Assessment	Anchor Charts & Protocols
Lesson2	Paraphrasing Quotes and Analyzing Visual Elements: Investigating the Scientific Method with *Max Axiom Super Scientist*	• I can quote accurately from a text when explaining what the text says explicitly and when drawing inferences. (RL.5.1) • I can paraphrase information in notes and finished work. (W.5.8) • I can analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text. (RL.5.7) • I can determine the meaning of unknown and multiple –meaning words and phrases based on fifth-grade reading and content, choosing flexibly from a range of strategies. (L.5.4) a. I can use context as a clue to the meaning of a word or phrase. b. I can use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word.	• I can explain the first steps Max Axiom takes to solve a problem by paraphrasing quotes from *Max Axiom*. • I can analyze how visual elements in *Max Axiom* contribute to my understanding of the steps Max Axiom takes to solve a problem. • I can determine the meaning of unknown words and phrases using a variety of strategies.	• Gist statement (in journal) • *Max Axiom*: Details and Visual Elements graphic organizer, page 1 • Vocabulary defined (in journal) • Independent Reading Choice Board response	• Group Norms • Close Readers Do These Things

Lesson	Lesson Title	Long-Term Targets	Supporting Targets	Ongoing Assessment	Anchor Charts & Protocols
Lesson 3	Paraphrasing Quotes and Analyzing Visual Elements, Part 2: *Investigating the Scientific Method with Max Axiom Super Scientist*	• I can paraphrase information in notes and finished work. (W.5.8) • I can analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text. (RL.5.7) • I can determine the meaning of unknown and multiple-meaning words and phrases based on fifth-grade reading and content, choosing flexibly from a range of strategies. (L.5.4) a. I can use context as a clue to the meaning of a word or phrase. b. 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.	• I can explain the next steps Max Axiom takes to solve a problem by paraphrasing quotes from *Max Axiom*. • I can analyze how visual elements in *Max Axiom* contribute to my understanding of the steps Max Axiom takes to solve a problem. • I can use context clues and reference materials to determine the meaning of key words and phrases.	• Entry task (from Lesson 2 homework) • Gist (in journal) • *Max Axiom*: Details and Visual Elements graphic organizer, page 2. • Vocabulary defined (in journal) • Independent Reading Choice Board response	• Close Readers Do These Things • Quote/Paraphrase • Vocabulary Strategies

Lesson	Lesson Title	Long-Term Targets	Supporting Targets	Ongoing Assessment	Anchor Charts & Protocols
Lesson 4	Paraphrasing Quotes and Analyzing Visual Elements, Part 3: *Investigating the Scientific Method with Max Axiom Super Scientist*	• I can quote accurately from a text when explaining what the text says explicitly and when drawing inferences. (RL.5.1) • I can paraphrase information in notes and finished work. (W.5.8) • I can analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text. (RL.5.7) • I can determine the meaning of unknown and multiple –meaning words and phrases based on fifth-grade reading and content, choosing flexibly from a range of strategies. (L.5.4) a. I can use context as a clue to the meaning of a word or phrase. c. I can use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word.	• I can explain the next steps Max Axiom takes to solve a problem by paraphrasing quotes from *Max Axiom*. • I can analyze how visual elements in *Max Axiom* contribute to my understanding of the steps Max Axiom takes to solve a problem. • I can determine the meaning of unknown words and phrases using a variety of strategies.	• Gist (in journal) • *Max Axiom*: Details and Visual Elements graphic organizer, page 3. • Response to reflection questions (in journal) • Vocabulary defined (in journal) • Independent Reading Choice Board response	• Group Norms • Vocabulary Strategies

Lesson	Lesson Title	Long-Term Targets	Supporting Targets	Ongoing Assessment	Anchor Charts & Protocols
Lesson 5	Paraphrasing Quotes and Analyzing Visual Elements, Part 4: *Investigating the Scientific Method with Max Axiom Super Scientist*	• I can quote accurately from a text when explaining what the text says explicitly and when drawing inferences. (RL.5.1) • I can paraphrase information in notes and finished work. (W.5.8) • I can analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text. (RL.5.7) • I can draw evidence from literary texts to support analysis, reflection, and research. (W.5.9)	• I can explain the next steps Max Axiom takes to solve a problem by paraphrasing quotes from *Max Axiom*. • I can analyze how visual elements in *Max Axiom* contribute to my understanding of the steps Max Axiom takes to solve a problem. • I can draw evidence from the text and visual elements in *Max Axiom* to support my analysis of how Max Axiom used a process to solve a problem.	• Graphic Novel Template A, B, or C (from homework) • Gist (in journal) • *Max Axiom*: Details and Visual Elements graphic organizer, page. 4 • Response to reflection questions (in journal) • Open Response task card • Independent Reading Choice Board response	• Vocabulary Strategies • Think-Aloud protocol
Lesson 6	Mid-Unit Assessment: Analyzing Visual Elements in a Graphic Novel	• I can analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text. (RL.5.7) • I can draw evidence from literary texts to support analysis, reflection, and research. (W.5.9) • I can determine or clarify the meaning of unknown and multiple-meaning words and phrases based on fifth-grade reading and content, choosing flexibly from a range of strategies. (L.5.4)	• . I can explain how visual elements add meaning to the description of the scientific problem Max Axiom will encounter next. • I can determine the meaning of unfamiliar words and phrases using a variety of strategies. • I can reflect on my learning about how visual elements add meaning to the text and use a variety of strategies to determine the meaning of unfamiliar words and phrases.	• Mid-Unit 1 Assessment: Analyzing Visual Elements in a Graphic Novel • Tracking My Progress: Mid –Unit 1 recording form	• Close Readers Do These Things • Vocabulary Strategies

Lesson	Lesson Title	Long-Term Targets	Supporting Targets	Ongoing Assessment	Anchor Charts & Protocols
Lesson 7	Using Quotes to Explain Relationships: The Invention of the Electric Motor	• I can quote accurately from a text when explaining what the text says explicitly. (RL.5.1) • I can determine the meaning of general academic and domain-specific words and phrases. (RI.5.4) • I can explain the relationship between two or more individuals, events, ideas, or concepts in a scientific text based on specific information in the text. (RI.5.3)	• I can explain how the electric motor meets societal needs using quotes from the text. • I can determine the meaning of unfamiliar words and phrases from context. • I can identify the relationships between electricity and the electric motor based on information from the text.	• Independent Reading Choice Board response (from homeworko • Gist statement (in journal) • Cause and Effect note-catcher: "The Electric Motor" • Vocabulary (in glossary) • Answers to text-dependent questions: "The Electric Motor"	• Close Readers Do These Things • Vocabulary Strategies
Lesson 8	Using Quotes and Opinion Writing: Ingenious Inventions by Women	• I can quote accurately from a text when explaining what the text says explicitly. (RI.5.1) • I can determine the meaning of general academic and domain-specific words and phrases. (RI.5.4) • I can write opinion pieces supporting a point of view with reasons and information. (W.5.1) a. I can introduce a topic clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support my purpose. b. I can provide logically ordered reasons that are supported by facts and details.	• I can explain how the windshield wiper and paper bag machine met societal needs using quotes from the text. • I can determine the meaning of unfamiliar words and phrases from context. • With peers, I can write an opinion paragraph about which invention meets a greater societal need.	• Graphic Novel Template A, B or C (from homework) • Gist statement (in journal) • Compare and Contrast note-catcher • Vocabulary (in journal) • Group opinion paragraph (on chart paper) • Independent Reading Choice Board response	• Close Readers Do These Things • Group Norms • Vocabulary Strategies • Opinion Paragraph

Lesson	Lesson Title	Long-Term Targets	Supporting Targets	Ongoing Assessment	Anchor Charts & Protocols
Lesson 9	Using Quotes and Comparing and Contrasting Structure: The Invention of Basketball	• I can quote accurately from a text when explaining what the text says explicitly. (RI.5.1) • I can compare and contrast the structure of information in two or more texts. (RI.5.5)	• I can explain how the game of basketball was developed to meet societal needs using quotes from the text. • I can compare and contrast the structure of two articles that explain the invention of basketball. • I can explain how comparing and contrasting the structure of what I read supports my understanding of the ideas presented in informational texts.	• Entry task (Lesson 8 homework) • Problem and Solution note-catcher: "Dr. James Naismath, Inventor of Basketball: • Sequential note-catcher: "First College Basketball Game" • Venn Diagram • Synthesis questions (responses in journal) • Independent Reading Choice Board response	• Close Readers Do These Things • Group Norm • Vocabulary Strategies • Back-to-Back, Face-to-Face protocol

Lesson	Lesson Title	Long-Term Targets	Supporting Targets	Ongoing Assessment	Anchor Charts & Protocols
Lesson 10	End of Unit Assessment: Using Quotes to Explain Relationships and Support an Opinion	• I can determine the meaning of words and phrases as they are used in a text, including figurative language such as metaphors and similes. (RI.5.4) • I can quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (RI.5.1) • 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) • I can compare and contrast the overall structure (e.g. chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts. (RI.5.5) • I can write opinion pieces on topics or texts, supporting a point of view with reasons and information. (W.5.1) a. Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer's purpose. b. Provide logically ordered reasons that are supported by facts and details.	• I can determine the meaning of unfamiliar words and phrases using a variety of strategies. • I can analyze the way text is structured to support readers' understanding of complex ideas. • I can write an opinion paragraph to explain which invention has been most important to people. • I can reflect on my learning about how new or improved technologies are developed to meet societal needs.	• End of Unit 1 Assessment: Using Quotes to Explain Relationships and Support an Opinion • Tracking My Progress: End of Unit 1 Recording Form • Independent Reading Choice Board response	• Criteria for Selecting Texts • Close Readers Do These Things • Vocabulary Strategies • Four Corners protocol

Optional: Experts, Fieldwork, And Service

Experts:
- Consider inviting local inventors and scientists to discuss their process with students and/or lead them in an experiment that demonstrates their application of methods related to scientific inquiry.

Fieldwork:
- Arrange for students to visit a laboratory conducting authentic research related to a local problem or need, or arrange a trip to a local science museum.

Service:
- Locate and pique students' interest in a local problem or need that would allow them to engage in a process of scientific inquiry that would lead to a possible solution.

Optional: Extensions

- Consider organizing an Invention Convention, an opportunity for students to work independently or in groups to identify a societal/local need or problem, develop a solution using a process of scientific inquiry, and then present their invention and findings to an audience of their peers and/or members of the school and local community.

Preparation and Materials

1. See the Module Overview document for details regarding a stand-alone document, **Foundational Reading and Language Standards: Resources, Guidelines, and Recommendations**. Unit 1 introduces some of these resources, most specifically the Fluency Packet, aligned with RF.5.5 and RF.5.6.
2. See the Recommended Texts list for this unit to gather a variety of texts for students to choose from for independent reading (Lesson 1).

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1:
Recommended Texts

The list below includes texts with a range of Lexile® text measures about the scientific method scientist that invented things that changed people's lives. This provides appropriate independent reading for each student to help build content knowledge about the topic.

It is imperative that students read a high volume of texts at their reading level in order to continue to build the academic vocabulary and fluency demanded by the CCLS

Where possible, texts in languages other than English are also provided. Texts are categorized into three Lexile levels that correspond to Common Core Bands: below grade band, within band, and above band. Note, however, that Lexile® measures are just one indicator of text complexity, and teachers must use their professional judgment and consider qualitative factors as well. For more information, see Appendix 1 of the Common Core State Standards.

Common Core Band Level Text Difficulty Ranges:
(As provided in the NYSED Passage Selection Guidelines for Assessing CCSS ELA)

- Grade 2–3: 420–820L
- Grade 4–5: 740–1010L
- Grade 6–8: 925–1185L

Title	Author And Illustrator	Text Type	Lexile Measure
Lexile text measures below band level (under 740L)			
Inventions: Great Ideas and Where they Came From	Sarah Houghton (author)	Informational	540
Steve Jobs, Steve Wozniak and the Personal Computer	Donald Lemke (author)	Informational	600
Johann Gutenberg and the Printing Press	Kay Melchisedech (author) Tod Smith (illustrator)	Informational GN	620
Marie Curie and Radioactivity	Connie Miller (author) Scott Larson and Mark Heike (illustrator)	Informational GN	640

Title	Author And Illustrator	Text Type	Lexile Measure
Alexander Graham Bell and the Telephone	Jennifer Fandel (author) Keith Tucker (illustrator)	Informational GN	660
How to Think Like a Scientist: Answering Questions by the Scientific Method	Stephen Kramer (author)	Informational	680
Marvelous Mattie: How Margaret E. Knight Became and Inventor	Emily Arnold McCully (author)	Biography	720
In the Bag! Margaret Knight Wraps it Up	Monica Kulling (author)	Biography	725*
The Man who Invented Basketball: James Naismith and His Amazing Game	Edwin Wyckogg (author)	Biography	725*
Lexile text measures within band level (740L-1010L)			
Jonas Salk and the Polio Vaccine	Katherine Krone (author)	Informational GN	760
The Scientific Method in the Read World	L.E. Carmichael (author)	Informational	770
Machines and Inventions	Ian Graham (author)	Informational	860
Now & Ben: The Modern Inventions of Benjamin Franklin	Gene Baretta (author)	Informational	910
Neo Leo: The Ageless Ideas of Leonardo daVinci	Gene Baretta (author)	Informational	930
A Wizard from the Start: The Incredible Boyhood &Amazing Inventions of Thomas Edison	Don Brown (author)	Informational	940

*Lexile based on a conversion from Accelerated Reading level;

Title	Author And Illustrator	Text Type	Lexile Measure
Build a Better Mousetrap: Make Classic Inventions, Discover Your Problem Solving Genius and Take the Inventor's Challenge	Ruth Kassinger (author)	Informational	950*
Bone detective : The Story of Forensic Anthropologist Diane France	Lorraine Hopping (author)	Biography	950
Natures Machines: The Story of Biomechanist Mimi Koehl	Deborah Parks (author)	Biography	950*
The Top Ten Inventions that Changed the World	Chris Oxlade (author)	Informational	960*
What's the Big Idea? : Inventions that Changed Life on Earth Forever	Helaine Becker (author)	Informational	970*
Lexile text measures above band level (over 1010L)			
Mistakes that Worked	Charlotte Jones (author) John O'Brien (illustrator)	Informational	1040
Robo World: The Story of Robot Designer Cynthia Breazel	Jordan Brown (Author)	Biography	1040
Gene Hunter: The Story of Neuropsychologist Nancy Wexler	Adele Glimm (author)	Biography	1040*
Michael Farady, Father of Electronics	Charles Ludwig (author)	Informational	No LXL
Incredible Inventions	Lee Bennett Hopkins (compiled) Julia Sarcone-Roach (illustrator)	Poetry	NP

*Lexile based on a conversion from Accelerated Reading level.

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 1

Building Background Knowledge: *Investigating the Scientific Method with Max Axiom Super Scientist*

Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)
I can engage effectively in a range of collaborative discussions with diverse partners about fifth-grade topics and texts. (SL.5.1) I can analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text. (RL.5.7) I can recognize, interpret, and make connections in narratives, poetry, and drama to other texts, ideas, cultural perspectives, eras, personal events, and situations. (RL.5.11) a. I can self-select texts to develop personal preferences regarding favorite authors. b. I can use established criteria to categorize, select texts, and assess to make informed judgments about the quality of the pieces.

Supporting Learning Targets	Ongoing Assessment
• I can use group norms to locate and discuss the visual elements in the graphic novel *Max Axiom*. • I can analyze the visual elements and splash page in *Max Axiom* to make predictions about the story. • I can use established criteria to select a text for independent reading.	• Written prediction (in journal) • Independent text selection • Independent Reading Choice Board response

Agenda	Teaching Notes
1. Opening A. Engaging the Reader: Infer the Topic Protocol (10 minutes) 2. Work Time A. Establishing Groups and Discussing Visual Elements of a Graphic Novel (25 minutes) B. Analyzing Visual Elements in *Max Axiom*: Making Predictions Based on the Splash Page (13 minutes) C. Introducing Text Selection Criteria and Independent Reading Options (7 minutes) 3. Closing and Assessment A. Debrief and Reviewing Learning Targets (5 minutes) 4. Homework A. Read your independent reading book for at least 30 minutes. Respond to one question on the Independent Reading Choice Board. Your response will be your entry task for Lesson 2.	• The purpose of this first lesson is to build student engagement with the module topic: inventions that meet societal demands. The lesson also introduces students to specific visual elements found in the graphic novel *Investigating the Scientific Method with Max Axiom Super Scientist*, which students will read during the first half of this unit. • During the Opening, students are introduced to Infer the Topic protocol. The purpose of this activity is to allow them to collaborate with a variety of peers to make inferences and uncover meaning in one of the big ideas of this module, "New or improved technologies are developed to meet societal demands." Help build excitement during this activity. • In advance: – Review Triad Talk norms (from Module 1, Unit 2, Lesson 2), which students do in groups of four in Work Time A. – Review and familiarize yourself with student directions for Infer the Topic protocol (different from the teacher directions) located in Appendix (see supporting materials). – Prepare artifacts for Infer the Topic protocol (see list of artifacts in supporting materials). – Please bear in mind that Youtube, social media video sites, and other website links may incorporate inappropriate content via comment banks and ads. While some lessons include these links as the most efficient means to view content in preparation for the lesson, be sure to preview links, and/or use a filter service, such as www.safeshare.tv, for actually viewing these links in the classroom. – Predetermine groups of four. Ideally, these are heterogeneous groups, where students work with different classmates than in Module 1. Post groups on chart paper to save time during the lesson. – Display the Triad Talk Norms anchor chart (from Module 1, Unit 2, Lesson 2), or create a new chart. – Familiarize yourself with *Investigating the Scientific Method with Max Axiom Super Scientist* and the visual elements that are found in a graphic novel (see Visual Elements of a Graphic Novel reference page in supporting materials). – Prepare a selection of independent reading book choices (see Recommended Texts list for this module). – Create Criteria for Selecting Texts anchor chart.

Lesson Vocabulary	Materials
technologies, societal needs, structure, visual elements, engage, support, complex, norms, locate, discuss, genre, graphic novel, analyze, splash page, predictions, established criteria, select, close-up image, scenes, sequentially, random, passage (of time), locations	• Infer the Topic Protocol student directions (one to display) • Document camera • Infer the Topic note-catcher (one per student) • Artifacts (one per pair of students) • List of artifacts (for teacher reference) • Triad Talk Norms anchor chart (from Module 1, Unit 2, Lesson 2) • Journals (one per student) • *Investigating the Scientific Method with Max Axiom Super Scientist* (book; one per student) • Visual Elements of a Graphic Novel reference page (one per student) • Tape, glue, or staples (one per student) • Criteria for Selecting Texts anchor chart (new; teacher-created) • Independent Reading Choice Board (one per student)

Opening	Meeting Students' Needs
A. Engaging the Reader: Infer the Topic Protocol (10 minutes) • Gather students whole group. Say something like: "Today we are beginning a new module, and your job is to do some investigating so you can make an inference about what we will be studying. You are going to look at a variety of artifacts including pictures, headlines, quotes, and articles as you participate in Infer the Topic protocol with your peers." • Display **Infer the Topic Protocol student directions** using the **document camera**. Read directions aloud and clarify as needed. • Distribute **Infer the Topic note-catchers** to each student. Have students pair up and distribute one of the **artifacts** that you previously prepared using the **list of artifacts (for teacher reference)** to each pair, then ask them to begin. Circulate to support. • After several minutes, pause and focus whole group on step 5 of the protocol. Cold call individuals to share out their inferences about the topic of the unit. Encourage students to explain specifically how evidence from their artifacts supports their inferences. Listen for ideas such as: – "I think we will be learning about inventors or inventions because some of our artifacts showed pictures of inventions." – "I think we are learning about why inventions are important for the world because my artifact showed pictures of important inventions and my partner's artifact says 'Inventions that changed the world.'" – "I think the topic of this module is how inventions make life better because my artifact shows inventions that make it easier to cook and clean," or similar suggestions. • After a handful of students share, say something like: "You identified a lot of important clues in those artifacts. Your investigatory skills have helped you infer that in this module we are studying inventions that have been developed to meet people's needs. Let's discuss the guiding questions that will help us focus as we learn more about this topic." * "How do new or improved technologies meet societal needs?" * "How do authors structure text and use visual elements to engage and support readers' understanding of complex ideas?" • Focus students on the first guiding question. Circle the terms technologies and societal needs. Ask students to think and then turn and talk about the meaning of these terms. • After 1 minute, invite a few students to share their ideas. Listen for: – "Technologies are new tools or inventions." – "Societal needs are things that people or communities need," or similar suggestions.	• Display guiding questions to support all students, but especially visual learners. • Model the process of viewing an image and thinking of a hint. • Model the process of viewing an image and thinking of a story. • To support ELL students, consider modifying the prompt so students can give a clue by showing an action.

Opening (continued)	Meeting Students' Needs
• Say something like: "We will continue to come back to the first guiding question throughout this module, but today we are going to focus primarily on the second question. Let's take a closer look at that one now." Ask for a volunteer to read the second guiding question aloud. • Circle the terms *structure*, *visual elements*, *engage*, *support*, and *complex*. Ask students to take a minute to consider these terms. Then, direct them to turn and talk about the meaning of each term. • After 1 or 2 minutes, invite several students to share their definitions with the class. Listen for: – "Structure is the way something is built or put together in text." – "Chapters, paragraphs, tables of contents, and indexes are part of the structure of a story." – "Visual elements are what I can see in the book, such as pictures, colors, and text." – "Engage means to get someone involved in or interested in." – "Support means to help." – "Complex means complicated or challenging; having many parts," or similar suggestions. If students are unable to define key terms from the second guiding question, define for them. • After reviewing key vocabulary, ask students to consider how they could restate the second guiding question in their own words. Invite a few students to share their thinking whole group. • Remind students to keep this guiding question in mind as they begin exploring their new text, a graphic novel called *Investigating the Scientific Method with Max Axiom Super Scientist* by Donald B. Lemke. Explain that their analysis of this text will support their understanding of how structure and visual elements in a graphic novel help readers build knowledge and understanding about more complex ideas.	

Work Time	Meeting Students' Needs

A. Establishing Groups and Discussing Visual Elements of a Graphic Novel (25 minutes)
• Say something like: "Throughout this unit, you will have an opportunity to collaborate with members of a small group as you read and analyze the text *Investigating the Scientific Method with Max Axiom Super Scientist*. Before we get started, let's review the norms you used in Module 1 as you worked in triads." Introduce the learning target:
  * "I can use group norms to locate and discuss the visual elements in the graphic novel *Max Axiom*."
• Circle the term *norms* and ask students to consider the meaning of this word. Invite students to share their definition with the class. Listen for: "Norms are expectations we have of everyone," "ways we expect everyone to act," or similar suggestions.
• Display the **Triad Talk Norms anchor chart** (from Module 1). Ask students to Think-Pair-Share the norms that were most helpful for them as they worked in teams of three.
• After 1–2 minutes, cold call several students to share out their thinking. Listen for ideas such as:
  – "I think the norm, 'each person must contribute to the discussion, but take turns talking' helped my group because we all got to share and listen to others' ideas."
  – "Asking questions like, 'Would you like to add to my idea?' or 'Can you tell us what you're thinking?' helped my group because we were able to better understand our group members' ideas."
  – "For my group the norm, 'each person should show the others specific details from the text, pointing to specific page numbers, paragraphs, and lines' was helpful because we could see where our group members' thinking came from," or similar suggestions.
• Tell students that the norms for a group of four are no different and they will continue to follow these norms as they work with their new group members. Draw a line through the words "Triad Talk" and above them write the word "Group" so the chart is now labeled "Group Norms." Leave displayed for student reference throughout this module.
• Place students in their predetermined groups of four and tell them they will remain in these groups throughout the unit.
• Then, distribute one **journal** and the book ***Investigating the Scientific Method with Max Axiom Super Scientist*** to each student. Give students a moment to examine the text, then ask:
  * "What do you notice about this new text?"
	• Display the learning target for student reference.
	• Consider creating an anchor chart that includes a pictorial example of each visual element.
	• Many of the descriptions of visual elements contain high leverage vocabulary terms. Consider discussing and defining additional vocabulary or keeping a word wall associated with this module. Some terms that may be valuable to discuss further include: dialogue, type, equipment, displays, and documents.

Work Time (continued)	Meeting Students' Needs
• Listen for students to make comments about the structure, images, and graphics found in the text such as: – "It looks like a comic book because it has boxes with characters and action." – "I notice there is a table of contents." – "There are four sections, each with a different title." – "There is a glossary in the back." – "I notice there are speech bubbles." • Say something like: "This is an exciting new *genre* called a *graphic novel*. Graphic novels are stories presented in a style that is similar to a comic book. While graphic novels are considered literature, this particular graphic novel contains real information that is meant to help us understand the scientific method." • Ask students to discuss similarities and differences between how *Max Axiom* and *Esperanza Rising* are structured. • After 2–3 minutes, cold call students from each group to share out a similarity or difference they noticed. Listen for: – "*Esperanza Rising* has chapters, and *Max Axiom* is similar because it has sections." – "*Max Axiom* has a table of contents." – "*Esperanza Rising* is mostly text, no pictures, whereas *Max Axiom* has a lot of images." • Tell students that while graphic novels are similar to other novels in many ways, one distinct difference is how they use visual elements to communicate a significant part of the story. Throughout the first part of this unit, they are learning about how visual elements support their understanding of the information presented in the text. Refer back to the learning target, * "I can use group norms to locate and discuss the visual elements in the graphic novel *Max Axiom*." • Underline the terms *locate and discuss*. Invite a few students to restate the target in their own words. • Distribute the **Visual Elements of a Graphic Novel reference page** and ask students to **tape, glue**, or **staple** it onto the first blank page in their journals. Tell students the reference page can help them understand the specific types of visual elements found in a graphic novel because it names and defines each one. Explain that many terms may be new to them, and their definitions may also contain new vocabulary. Reassure students that they will get to continue building their understanding about each element as they analyze *Max Axiom* more closely in future lessons.	

Work Time (continued)	Meeting Students' Needs
• Ask students to follow along silently as you read the description for the first visual element, the *splash page*, aloud. • Then, draw students' attention to the phrase *close-up image*. Ask them to quickly think about and discuss what they believe a close-up image is. Invite a few students to share out their definitions whole group. Listen for: – "A picture that zooms in on one part of an object or person to make it look really big," or similar ideas. • Direct students to work with their group members to find the splash page. Remind them that they can use their reference sheets for support. • Give students 1 minute to discuss. Then, ask them to hold up and point to the splash page. • Call on a few students to explain how they identified the splash page. Listen for: – "Pages 4 and 5 are the first two pages and they grab your attention." – "I noticed the eye on page 4 is a close-up image," and similar ideas. • Focus students' attention on the definition of frames/panels. Ask students to follow along silently as you read the definition aloud. • Have students locate and circle the terms *scenes*, *sequentially*, and *random* in the definition. • Direct students to think about then discuss in groups the meaning of each term they circled. • Invite several students to share out their thinking whole group. Listen for: – "Scenes are where the action takes place." – "Sequentially means in time order, like first, next, and last." – "Random means they jump around instead of being in sequential order," or similar suggestions. • Say something like: "Let's take a moment to consider the frames or panels on the splash page. The format of a graphic novel is different from the format of other types of novels. As we just read, the frames or panels in a graphic novel contain each of the scenes. Notice that some frames are larger than others, and that the panels on page 4 are organized differently than those on page 5. The author of a graphic novel often uses frame size and location to draw your attention to important ideas. As I read aloud, pay attention to the order the author intends for this book to be read. This will help you read the rest of this graphic novel independently, as well as other graphic novels you choose to read in the future."	

Work Time (continued)	Meeting Students' Needs
• Read pages 4 and 5 of *Max Axiom* aloud as students read along silently, starting with the Section 1 heading "A World of Questions." Read top to bottom and left to right. Then come back to the "Definition of 'Levee'" and "Steps of the Scientific Method" insets last. Make sure to point out to students the order in which you read each frame. • Give students a minute to think about then discuss in groups: – "What did you notice about the order in which the frames were read?" • Cold call a few students to share what they discussed. If students do not name the sequencing strategies you highlighted while reading aloud, bring them to their attention. Note the first frame on page 5, which takes up the first vertical half of the page. Say something like: "Authors intend for us to read larger frames from top to bottom before moving right." • Refocus students' attention on their reference sheets. Ask them to read aloud with you the definition of "gutters." Ask students to consider the meaning of the terms *passage* and *location* in this description. • Invite a few students to share possible definitions for the word passage as it is used here. Listen for: – "Passage means something that moves past, or when time goes by." – "Location is a place," or similar suggestions. • Have students locate and discuss the gutters on the splash page. Remind them to consult their reference sheets. • After 1 minute, ask students to hold up and point to the gutters they found. Invite a few students to explain how they identified the gutters. Listen for: – "This part is the white space between the frames." – "This gutter moves the action from the laboratory to the motorcycle," or similar examples. • Refocus students' attention on their reference sheets and ask them to read aloud with you the definition of "ambient sounds." • Give students a moment to point to an example of an ambient sound on the splash page ("BEEP!" on page 4). • Ask students to read the definition for "thought bubbles/speech bubbles" aloud with you. Clarify as needed. • Direct students to locate and discuss examples of thought bubbles and speech bubbles from the splash page. • After 1 minute, call on a few students to explain how their group identified the difference between thought bubbles and speech bubbles. Listen for: "We saw that when the mayor was talking, there was a text bubble coming from her mouth"; "We noticed on page 5 that when Max is thinking, the bubbles aren't connected to his mouth," or similar suggestions.	

Work Time (continued)	Meeting Students' Needs
• Have students read the description for "font size, color, style" aloud with you. Define terms from the description as needed. Ask students to discuss with group members what they notice about the font size, color, and style of words on the splash page. • After 1 minute, call on a few students to share what their groups noticed about the font. Listen for: – "We noticed that the font looks more like handwriting than the font in most novels." – "We noticed that text in the speech bubbles is black, but in the information boxes it's white and yellow," and similar ideas. • Ask students to read aloud with you the description of "images/photos." Provide clarification as needed. • Have students locate and discuss one image from the splash page they feel relays important details about the story. Remind students to focus only on the details they can learn from the images, not the text. • After 1 minute, invite a few students to share which image they chose and why. Listen for students to highlight details from the images, such as the worried reflection of the mayor's face in Max's sunglasses, the sense of action in the last frame, the zoomed-in tablet showing steps of the scientific method, or the concerned look in the close-up image of the mayor's eye. • Ask students to read the description of "colors" aloud with you. Clarify as needed. Direct students to make observations about and discuss the colors used in *Max Axiom*. • After 1 minute, cold call a few students to share their observations. Listen for: – "We noticed that the colors are very bold." – "We noticed that the primary colors red, yellow, and blue are used a lot," or other ideas. • Direct students to read the description of "diagrams/information boxes" with you, then locate and discuss a diagram or information box from the splash page with group members. • After 1 minute, call on a few students to explain how they located the diagram or information box. Listen for students to identify the changes in color and frame around the information box that provides a definition for "levee." • Then say something like: "As we read this graphic novel more closely, consider how visual elements contribute to the meaning of the text both individually and together. During the next part of Work Time, your group will have the opportunity to analyze visual elements and closely read the splash page in order to make predictions about the story *Investigating the Scientific Method with Max Axiom Super Scientist*."	

Work Time (continued)	Meeting Students' Needs

B. Analyzing Visual Elements in Max Axiom: Making Predictions Based on the Splash Page (13 minutes)
• Introduce the learning target:
  * "I can analyze the visual elements and splash page in *Max Axiom* to make predictions about the story."
• Ask students:
  * "What words in this learning target stand out to you as being powerful?"
• Listen for students to name the terms *analyze* and *predictions,* as well as "visual elements" and "splash page," which were previously discussed. If students don't name these terms, bring them to their attention. Underline all four terms.
• Ask students to discuss their thoughts about the meaning of the terms "analyze" and "predictions" with group members.
• After 1 minute, invite several students to share their thinking aloud. Listen for:
  – "Analyze means to examine closely, study deeply, evaluate, consider, explore."
  – "Predictions are guesses, or what you think will happen based on evidence," or similar suggestions.
• Invite a few students to restate the learning target in their own words.
• Then, refocus students' attention on pages 4 and 5 of *Max Axiom*, the splash page. Have students reread these pages in groups, either aloud together or by alternating frames.
• Allow students 5 or 6 minutes to reread and discuss in groups:
  * "Based on the splash page, what do you predict this story will be about?"
  * "How do visual elements found on the splash page support your prediction?"
• After students complete their analysis and discussion, invite members from each group to share out their predictions. Ask students to explain how the text and visual elements found on the splash page supports their prediction. Listen for:
  – "I think the story will be about Max Axiom solving a problem because the panels on the splash page show a woman who is calling Max Axiom for help."
  – "I think the story will be about Max Axiom using the scientific method to solve a problem about a levee because in the biggest frame there is an information box about the term levee and Max is saying that scientists use the scientific method to solve problems," or similar suggestions.
• Ask students to turn to a new page in their journals to record a prediction about the story.
	• Display the learning target for student reference.
	• As students begin using visual elements on the splash page to make predictions, consider giving them 1 minute to silently review the questions and analyze the pages followed by 3 to 4 minutes of group discussion.
	• To support learners, display all discussion questions for student reference.

Work Time (continued)	Meeting Students' Needs
C. Introducing Text Selection Criteria and Independent Reading Options (7 minutes) • Tell students that today they will be choosing an independent reading book for homework throughout this unit. • Read the final learning target aloud: * "I can use established criteria to select a text for independent reading." • Remind students that to become better readers and writers, it is important to read a variety of books with just the right level of challenge. Explain that the more students read, the more they will be able to learn about the fascinating world they live in. • Display the **Criteria for Selecting Texts anchor chart.** Read each of the criteria aloud and provide clarification as needed. Then, ask students to consider the criteria as they choose a book to read independently. • Give students 5 minutes to choose a book. If any students are unable to choose a book in the time allotted, find other times during the day for them to review the **Independent Reading Choice Board** and select a text.	• Consider modeling how to use each of the criteria to select an independent reading book.

Closing and Assessment	Meeting Students' Needs

A. Debrief and Reviewing Learning Targets (5 minutes)
• Have students read the learning targets aloud. Ask students to turn and talk:
  – "Share your prediction about Max Axiom and explain which visual elements helped you make your prediction."
  – "Explain which group norms helped you in your work today."
• After 2 minutes, refocus whole class. Cold call a few students to share which visual elements helped them make a prediction or which norms helped them in their work today.
• Ask students to use the Fist to Five protocol to demonstrate their mastery of each of the learning targets. Note students who show a three, two, one, or fist, as they may need more support analyzing visual elements or making a text selection independently based on criteria.
	• Consider posting the discussion prompts for student reference.

Homework	Meeting Students' Needs
• Read your independent reading book for at least 30 minutes. Respond to one question on the Independent Reading Choice Board. Your response will be used in your entry task for Lesson 2.	• Allow struggling writers to dictate their responses to someone at home.

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 1

Supporting Materials

Infer the Topic Protocol Student Directions

Purpose: This protocol helps build anticipation and pique your curiosity about the topic we are about to begin studying in-depth.

1. Your team will receive one "artifact:" a photograph, a book cover, a sketch, a diagram, a quote, a newspaper headline, or an article.

2. With your partner, take a moment to study your artifact. If it's an article, don't read the whole thing. Look at the headline(s), headings, and/or captions.

(Note: It's okay if you and your partner do not agree and have different ideas captured on your note-catchers.)

3. Use your Infer the Topic note-catcher to capture your thoughts (1–2 minutes).

   - What is this artifact?
   - What does it remind you of?
   - What questions do you have about it?
   - What can you infer the new topic of study will be?

4. When your teacher prompts you, quickly find another team. Take turns showing your artifacts and sharing what you recorded on your note-catchers. Discuss the questions below and capture your thoughts in the next section of your note-catcher (2–3 minutes).

   - What is the other team's artifact?
   - What does it remind you of?
   - What questions do you have about it?
   - Now what do you infer the upcoming topic of study will be?

5. Join in the whole group discussion. Your teacher will ask for a few volunteers to share their artifacts and their prediction about the upcoming unit of study. Your teacher will reveal the topic by the end of this discussion (3 minutes).

Infer the Topic Note-catcher

Name:

Date:

Infer the Topic Note-catcher

I think my artifact is …	My artifact reminds me of …
Questions I have …	I think we're going to be studying …

I think the other team's artifact is …	Their artifact reminds me of …
Questions I have …	I think we're going to be studying …

After the class discussion, I know we will be studying …

List of Artifacts (for Teacher Reference)

Historical *New York Times* Newspaper Article with Images: "Inventors, 1910"
http://sundaymagazine.org/2010/12/inventors-who-take-no-profits-from-their-work/
INVENTORS WHO TAKE NO PROFITS FROM THEIR WORK: Give the Results of their Skill and Study Without Charge for the Good of Mankind, Declining Royalties. The Sunday Magazine, December 4, 1910. Public Domain

Magazine Cover: *Science and Invention*
http://upload.wikimedia.org/wikipedia/commons/thumb/a/a0/Science_and_Invention_Nov_1928_Cover_2.jpg/220px-Science_and_Invention_Nov_1928_Cover_2.jpg
"Science & Invention", November 1928. Volume 16 Number 7.

Historical Photo: Inventor George Washington Carver
http://www.loc.gov/pictures/item/2001703725/
Johnston, Frances Benjamin. "Laboratory at Tuskegee Institute, Ala." 1902. Photograph. Library of Congress, [reproduction number, LC-USZ62-2248]

Book Cover: Inventor, Philo T. Farnsworth
http://i43.tower.com/images/mm111395440/philo-t-farnsworth-visionary-inventor-television-tim-oshei-hardcover-cover-art.jpg
Used with permission.

Image: "Inventor, Benjamin Franklin"
https://www.patentplaques.com/blog/wp-content/uploads/2013/01/faranklin-inventions.png
Benjamin Franklin

Historical Sketch: "Patent Diagram"
http://www.msad40.org/~library-hazelton/images/greenwood.gif
United States Patent Office. Public Domain

Rocket Scientist with Turbopumps
http://commonhealth.wbur.org/files/2011/03/scientists-at-work-300x225.jpg
National Aeronautics and Space Administration. Public Domain

Poster: "Jim al Khalili, quote"
http://izquotes.com/quotes-pictures/quote-all-scientists-must-communicate-their-work-for-what-is-the-point-of-learning-new-things-about-how-jim-al-khalili-206173.jpg
Jim Khalil

Historical Magazine Covers: *Science and Invention*
http://dyn3.heritagestatic.com/lf?set=path[6%2F9%2F4%2F3%2F6943591]%2Csizedata[450x2000]&call=url[file%3Aproduct.chain]
Science and Invention Magazine. Public Domain

List of Artifacts (for Teacher Reference)

Quote: Thomas Edison (One)
"I never perfected an invention that I did not think about in terms of the service it might give others."
http://www.thomasedison.com/quotes.html

Quote: Thomas Edison (Two)
"I find out what the world needs, then I proceed to invent."
http://www.thomasedison.com/quotes.html

Quote: Thomas Jefferson
"Considering the exclusive right to invention as given not of natural right, but for the benefit of society."
http://press-pubs.uchicago.edu/founders/documents/a1_8_8s12.html

Moon Box for Apollo
http://commons.wikimedia.org/wiki/File:Y12_moon_box_for_apollo_11.jpg
United States National Nuclear Safety Administration. Public Domain

Ida Bengston Scientist
http://commons.wikimedia.org/wiki/File:Ida_Bengston.jpg
National Institutes of Health. Public Domain

Ruth McGuire Scientist
http://commons.wikimedia.org/wiki/File:Ruth_Colvin_Starrett_McGuire_(1893-1950)_-_Smithsonian_Institution_Archives.jpg
Acc. 90-105 - Science Service, Records, 1920s-1970s, Smithsonian Institution Archives

Visual Elements of a Graphic Novel Reference Page

Visual Element	Description
Splash page	First two pages; gets the reader's attention; uses large and close-up images
Frames/panels	The boxes that contain scenes and/or information; some are larger than others; can be arranged sequentially or in a more random order
Gutters	The space between the frames/panels; moves from one scene to another to show changing actions, the passage of time, or to make changes in locations
Ambient sounds	Words that show sounds
Thought bubbles/speech bubbles	What the characters think/what the characters say
Font size, color, style	Text, captions, information, or dialogue in the story that uses different styles of type and/or different colors
Images/photos	Drawings/pictures of characters, settings, actions, important details and information
Colors	Blue, green, red, black, white, brown, etc.; bright, dull, dark, light
Diagrams/information boxes	Drawings of technical equipment, displays, documents, graphs, definitions, and other ideas or objects

Criteria for Selecting Texts Anchor Chart

- The book interests me.
- I can make connections between this book and other texts read, topics explored, or experiences I have had.
- I know many, but not all of the words in the book.
- The book contains some text or images I don't understand, but I am able to get a sense of what the book is mostly about.

Independent Reading Choice Board

Name:

Date:

Title of Independent Reading Book/Author's Name:

_____

After reading independently (silently and/or aloud) for at least 30 minutes, write a response to any ONE question from the board *except* the center square. Complete the center square once you have answered each of the other eight questions.

VISUAL ELEMENTS What visual elements (pictures, text) do you notice in this book? How do the visual elements support your understanding of the text?	CONNECTIONS What connections were you able to make between your independent reading book and other texts, topics explored, or experiences you have had?	STRUCTURE How is this book structured? How does the structure support your understanding of the text?
GENRE What genre is this book? Do you enjoy this genre? Explain.	**Complete this square last.* **What qualities will you look for in the next book you read?** (e.g., same author, similar visual features, same or different genre, etc.)	RECOMMENDATION Would you recommend this book and/or this author to someone else? Explain.
WORDS Which *words* repeat? List them. Why do you think the author chose to repeat these words; why are they important?	READABILITY Is your independent reading book too hard, just right, or too easy? Explain.	INTEREST Do you find this book interesting? Explain.

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 2

Paraphrasing Quotes and Analyzing Visual Elements: *Investigating the Scientific Method with Max Axiom Super Scientist*

Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)
I can quote accurately from a text when explaining what the text says explicitly and when drawing inferences. (RL.5.1) I can paraphrase information in notes and finished work. (W.5.8) I can analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text. (RL.5.7) I can determine the meaning of unknown and multiple-meaning words and phrases based on fifth-grade reading and content, choosing flexibly from a range of strategies. (L.5.4) a. I can use context as a clue to the meaning of a word or phrase. b. I can use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word.

Supporting Learning Targets	Ongoing Assessment
• I can explain the first steps Max Axiom takes to solve a problem by paraphrasing quotes from *Max Axiom*. • I can analyze how visual elements in *Max Axiom* contribute to my understanding of the steps Max Axiom takes to solve a problem. • I can determine the meaning of unknown words and phrases using a variety of strategies.	• Gist statement (in journal) • *Max Axiom*: Details and Visual Elements graphic organizer, page 1 • Vocabulary defined (in journal) • Independent Reading Choice Board response

Agenda	Teaching Notes
1. Opening A. Reviewing Homework and Engaging the Reader (5 minutes) 2. Work Time A. Determining the Gist: *Max Axiom* Section 1: "A World of Questions" (10 minutes) B. Second Read: Explaining Steps Max Axiom Takes to Solve a Problem and Analyzing Visual Elements (20 minutes) C. Vocabulary to Deepen Understanding (20 minutes) 3. Closing and Assessment A. Debrief and Reviewing Learning Targets (5 minutes) 4. Homework A. Complete the task card B. Finish class work. C. Independent reading.	• This lesson is the first of four lessons that follow a similar format. Students identify details and paraphrase information from the text to explain how a scientist uses a process of inquiry to solve a problem. Throughout this graphic novel study, emphasize to students that while Max Axiom engages in a relatively linear process for solving a problem, termed "the scientific method," real-world scientists tend to use a more iterative, less sequential process to arrive at their solutions. The concept of scientific inquiry can and should be reinforced during science instruction. • In this unit, paraphrasing is an introduction to one element of Standard W.5.8, which is not formally assessed in Unit 1. Students' work with paraphrasing serves as a scaffold toward the quoting, paraphrasing, and summarizing work they will do in Units 2 and 3. • In the first half of this unit, students analyze how visual elements contribute to the meaning of a text, which lays the foundation for their final performance task: writing their own graphic novelette about an invention that was developed to meet people's needs (see Performance Task description for details). • Students also build on the vocabulary strategies they learned in Module 1 to determine the meaning of key terms from the text using context clues, morphology (affixes and root words), and reference materials. Students begin a glossary in the back of their journals that they will continue to build on throughout this module. By starting the glossary from the last page, students can continue to build their glossary from back to front without running out of space. • In advance: – Review the Stretch-o-Meter protocol (Work Time A). Briefly describe this protocol to any students who might be physically restricted. Preview the three options from the "Meeting Students' Needs" column and ask them to consider which option they would prefer. – Decide if you will use the Close Readers Do These Things anchor chart from Module 1, or if you will create a new anchor chart with the same title to begin this module (see Work Time A). – Create Quote/Paraphrase" anchor chart and "Vocabulary Strategies anchor chart. – Review the context clues and affixes/root words discussion in Work Time C; prepare to listen for and support students' use of these strategies in determining the meaning of unfamiliar words. – Consider displaying key vocabulary from the text to save time during Work Time C. – Review the Learning Lineup protocol described in the Closing.

Lesson Vocabulary	Materials
explain, steps, paraphrased quotes, analyze, visual elements, contribute, determine, variety, strategies, gutters, construct, defense, (4), scientific method (5), affect (6), effects, fields (7), overwhelming (8), repeating (9)	• *Investigating the Scientific Method with Max Axiom* (book; one per student) • Journals (students' own, begun in Lesson 1) • Document camera • Group Norms anchor chart (from Lesson 1) • Close Readers Do These Things anchor chart (from Module 1, Unit 1, Lesson 1; or create a new one based on guidance in Work Time A) • *Max Axiom*: Details and Visual Elements graphic organizer, page 1 (one per student) • Quote/Paraphrase anchor chart (new; teacher-created) • Visual Elements of a Graphic Novel reference page (from Lesson 1, taped into journals) • *Max Axiom*: Details and Visual Elements graphic organizer, page 1 (answers, for teacher reference) • Vocabulary Strategies anchor chart (new; co-created with students during Work Time C) • Index cards (one per student)

Opening	Meeting Students' Needs
A. Reviewing Homework and Engaging the Reader (5 minutes) • As an entry task for today's lesson, ask students to take out the Independent Reading Choice Board response from Lesson 1 homework. Review these responses to determine students' ability to use close reading strategies as they read independently. Say something like: "Let's review the guiding questions revealed in the last lesson. Guiding questions help guide our inquiry throughout a module and help us discover the big ideas. Remember, the goal of learning isn't only to memorize facts, but also to develop a deep understanding of critical concepts. Big ideas are the understandings that will stick with you long after you have taken your assessments and finished fifth grade." • Refer students to the guiding questions as you or volunteers read them aloud: * "How do new or improved technologies meet societal needs?" * "How do authors structure text and use visual elements to engage and support readers' understanding of complex ideas?" • Ask students to think about and briefly discuss with a nearby partner what they notice about the guiding questions. After 1 minute, invite students to share their thinking whole class. Listen for: – "I notice we will be learning about visual elements, text structure, inventors, improved technologies, and complex ideas." – "I notice we will be thinking about how new technologies are developed to meet people's needs," or similar ideas. • Acknowledge the things students notice and then help them see how the work they do today will relate. Say something like: "The performance task for this module will be to write your own graphic novel about how an invention was developed to meet the needs of society. Today our focus is on the second guiding question as we study the visual elements the author uses in *Max Axiom* to support our understanding of the first steps Max takes to solve a problem. Paying attention to visual elements now will help build a greater conceptual understanding of the techniques graphic novelists use to convey important ideas, so you will have a foundation of expertise to draw from when it's time to write your own."	• To support visual learners, consider displaying the guiding questions on a chart to revisit during the module.

Work Time	Meeting Students' Needs
A. Determining the Gist: *Max Axiom* Section 1: "A World of Questions" (10 minutes) • Ask students to locate their ***Investigating the Scientific Method with Max Axiom*** book and their **journals** then sit with their small group members from Lesson 1. • Display and briefly review the **Group Norms anchor chart** with students. Remind students to refer to these norms as they work with group members to master today's learning targets. • Display the **Close Readers Do These Things anchor chart** and ask students to remember the close reading they did in Module 1 around the Universal Declaration of Human Rights and *Esperanza Rising*. Tell them to discuss with their groups then share out whole class important things that close readers do. • After 1 minute, cold call a few students to share out. Listen for: – Read the text slowly at least twice. – Get the gist of what a text is about. – Circle words you aren't sure of and try to figure them out. – Reread, annotate, and underline key vocabulary. – Use the text to answer questions. – Gather evidence (quotes) from the text. – Talk with each other about what you think it means. – Read again to summarize or answer specific questions. • Explain that today's first read is for gist. Pose the question: * "What do you remember from Module 1 about determining the gist?" • Listen for students to suggest that a gist is a really broad statement about what the text or section of text is generally about and there can be more than one correct answer.	

Work Time (continued)	Meeting Students' Needs

• Ask students to open their books to page 4 and silently read Section 1. Remind them to consider the gist as they read.
• After giving students 4-5 minutes to read independently, ask them to turn to their group members and discuss:
  * "What is the gist of Section 1: "A World of Questions"?"
• Give students 1 minute to discuss the gist in groups. Then, cold call a student from each group to share out. Listen for something like:
  * "A scientist named Max has a problem to solve for the mayor and he's going to show us how he solves it using a process called the scientific method."
• Ask students to record the gist of *Max Axiom* Section 1: "A World of Questions" on a blank page of their journal.
• Refer students to the prediction they recorded in their journal during Lesson 1. Ask students to consider:
  * "Does your prediction match your gist?"
• Then, tell students they are about to participate in a Stretch-o-Meter protocol to indicate how closely their prediction and gist statement match.
  – Model the protocol for students by stretching as tall as you can get, fingers almost touching the sky, and explain this would mean an almost exact match of prediction and gist.
  – Model sitting on the floor, and explain this would mean their prediction was really far off from the actual gist.
  – Model a few variations between sitting and completely stretched to show how students could indicate how close they believe their prediction to be to the actual gist.
• Invite students to indicate with a stretch how much their gist matched their prediction from the previous lesson.
• Ask students who were stretched tall to share any strategies they had for predicting. Honor all strategies that lead to logical predictions and listen for students to note the title of the section as a means of predicting. Remind students of the titles of chapters in *Esperanza Rising*. Often, the titles in *Esperanza Rising* provided clues as to what the chapter might be about. Encourage students to attend to the titles of sections in *Max Axiom* to help them predict what they will read about.
	• As you read pages 4 and 5 aloud, display them under a document camera and point to each part to support visual learners and students who are hearing impaired.
	• For students who struggle to determine the gist of longer passages, encourage them to find the gist of facing pages and to keep track of this as they continue reading. This will make it more manageable to determine the gist of the entire section.
	• Students confined to a wheelchair or otherwise physically restricted from participating in this protocol can stretch just their arms, use just their pointer finger, or you or an aide can be a proxy. Make sure to represent the students' beliefs about the closeness of the gist to their prediction, not your own assessment.

Work Time (continued)	Meeting Students' Needs

B. Second Read: Explaining Steps Max Axiom Takes to Solve a Problem and Analyzing Visual Elements (20 minutes)
• Say: "Let's review the first two learning targets to help focus our attention as we read even more closely." Read the first target aloud or invite a volunteer to do so:
  * "I can explain the first steps Max Axiom takes to solve a problem using paraphrased quotes from *Max Axiom*."
• Invite students to share the meaning of the word *explain*. Listen for responses such as:
  – "Explain means to describe with details or to teach others."
• Direct students' attention to the word *steps* and ask them to determine the meaning of that word based on how it's used in the context of this target. Invite a volunteer to share out. Listen for students to make the distinction that this word is not the same as "steps leading up to another floor in a house or building." Rather, in this particular context, the word "steps" means "stages or phases in a process, like steps to follow to complete a recipe."
• Circle *paraphrased quotes*. Invite students to share ideas about what it means to paraphrase quotes from the text. Listen for them to suggest that paraphrasing means restating what the text says in your own words. If students are not familiar with what it means to paraphrase quotes, define for them.
• Read the second target aloud, or invite a volunteer to do so:
  * "I can analyze how visual elements in *Max Axiom* contribute to my understanding of the steps Max Axiom takes to solve a problem."'
• Ask students to consider the meaning of the words *analyze*, *visual elements*, and *contribute*. Invite volunteers to share their thinking. Listen for:
  – "Analyze means to study carefully."
  – "Visual elements are things the author does with text or pictures to draw our attention to specific information."
  – "Contribute means to add to or support."
• Help students synthesize their understanding of this new vocabulary by inviting volunteers to read each learning target aloud, replacing key words with synonyms generated from the discussion.
• Distribute the **Max Axiom: Details and Visual Elements graphic organizer, page 1**. Orient students to the format of the graphic organizer by pointing out the two largest boxes: "Asking a Question" and "Gathering Information." Tell students they will paraphrase quotes from the text to explain how to ask scientific questions and gather information on the two bulleted lines provided in each box.
	• To support visual learners and ELL students, display a drawing, picture from the Internet, or familiar synonym above or below key words in learning targets.

Work Time (continued)	Meeting Students' Needs
• Say something like: "Let's clarify what it means to paraphrase quotes by practicing." Display the **Quote/Paraphrase anchor chart.** Ask students to discuss the difference between a quote and a paraphrased detail. Listen for: – "Quotes are exactly what's said in the text, so you need to place quotation marks around the phrase or sentence when you add it to your notes to show they are someone else's words." – "When you paraphrase, you put the idea into your own words; if it's in my own words, I don't need to use quotation marks around the sentence or phrase," or similar ideas. • Ask students to think about when it would be important to quote directly from the text and when it would be better to paraphrase. Listen for: "You would paraphrase when you just need to express an idea that is similar to what you read," or "If you want to prove something, or support your ideas with exact information from a text you would quote exactly." • Reveal the first two quotes from *Max Axiom*. Ask students to talk in their groups about how to paraphrase these two quotes. • After about 2 minutes, invite a member from each group to share out whole class. Record strong student examples of paraphrased versions of the two quotes. Ask students to discuss with group members: * "How do you know you have paraphrased a quote well?" • Listen for: "Good paraphrasing restates the quote in a way that sounds natural and expresses the same idea." • Refocus students' attention on their *Max Axiom*: Detail and Visual Elements graphic organizer. Remind them to use paraphrasing skills as they complete the "details" section of each box. Focus students' attention on the second half of each box highlighting the visual elements. Tell students they will analyze the ways these visual elements support their understanding of the first two steps of the scientific method and record their thinking. Remind students to refer to the **Visual Elements of a Graphic Novel reference page** they taped into their journals in Lesson 1 to find the descriptions of "information box" and "gutters." • Point out the two boxes on the graphic organizer for recording "Key Terms (academic)" and "Key Terms (scientific)." Tell students they will examine key words more closely and fill in those boxes during Work Time C. • Ask students to work with their groups for 10 minutes to read Section 1 of *Max Axiom* a second time and complete the assigned portion of the *Max Axiom*: Details and Visual Elements graphic organizer. Circulate to provide support. • Refocus whole group. Ask students to share out the paraphrased quotes from the text that explain how to ask scientific questions and gather information. See ***Max Axiom*: Details and Visual Elements graphic organizer, page 1, (answers, for teacher reference)**.	• To support visual learners, consider allowing students from each group to display the example of the visual element (information box or gutters) under the document camera.

Work Time (continued)	Meeting Students' Needs
• Refer students to the descriptions of "information box" and "gutters" on the Visual Elements of a Graphic Novel reference page. • Cold call students from different groups to share new examples of each visual element they located. Examples of information boxes could include: – "Definition: levee" (page 5) – "Steps of the Scientific Method" (page 5) – "Yes-or-No vs. Open-Ended Question" (page 7) – "The Internet: NET acronym" (page 9) • Examples of gutters could include: – Between each of the six frames on page 3. – Between the top frame and the rest of the page on page 6. – Between each of the three frames on page 7. • Invite a student from each group to share their responses to the following questions from the graphic organizer: * "How does an information box support your understanding of the first step of the scientific method?" * "How do gutters support your understanding of the second step of the scientific method?" See *Max Axiom*: Details and Visual Elements Graphic Organizer, page 1 (answers, for teacher reference). • Ask students to take 2 minutes to reflect in their groups, supporting their answers with details and visual elements: * "After reading this section of *Max Axiom*, what do you think might help a scientist generate a scientific question?" • Invite a few students to share their thinking whole group. Listen for comments such as: – "It might help if they try to create a thoughtful question that doesn't have a yes-or-no answer, because on page 7 Max says that yes-or-no questions 'don't require much research' and the information box says open-ended questions are better." – "A scientific question needs to be one that you can answer with research and experiments because in the text Max goes to the library to research his question." • Ask students to record their response to the reflection question on the next blank page in their journals.	• For students who struggle with the physical act of writing, allow them to type their responses on a computer or word processor, or dictate their analysis paragraph to an aide or a peer acting as a scribe.

Work Time (continued)	Meeting Students' Needs
C. Vocabulary to Deepen Understanding (20 minutes) • Introduce the third learning target: – "I can determine the meaning of unknown words and phrases using a variety of strategies." • Focus students on the words *determine*, *variety*, and *strategies* and ask them to offer a synonym or definition based on how they are used in this target. Listen for: "Determine means to find out," "Variety means a mixture of different items," and "Strategies are plans or techniques used to accomplish a goal," or similar responses. • Ask students to be metacognitive about the strategies they use to determine the meaning of those words from the target. Listen for: – "When thinking about the word 'determine,' I tried the phrase 'find out' and that still made sense in the sentence." – "When I read the word 'variety,' I looked at the words before and after and realized that it means something like different." • Display the **Vocabulary Strategies anchor chart**, then invite students to draw on what they remember from Module 1 about vocabulary strategies they used to determine the meaning of new words. Invite several students to share their thinking aloud. Listen for things such as: – "Read words and phrases before and after the word for hints." – "Think about parts of the word that I already know (prefix, suffix, root)." – "Think about what kind of word it is (noun, verb, adjective, etc.)." – "Substitute another word that would make sense," and similar responses. • Add student responses to the Vocabulary Strategies anchor chart and keep this chart displayed for student reference throughout the module. Remind students that the purpose of defining new and key words in text is to help deepen understanding of the text. • Remind students that informational texts often have a glossary, or a place that lists words and definitions. Explain to students that they will be creating their own glossaries to keep track of words that will help them become better readers. • Explain that they will build this glossary backwards in their journals in order to maximize pages for other things in the front of their journal. Ask students to turn to the very last page in their journals. Tell them this is where they will begin a glossary of new words that they will add to throughout the module.	• To support visual learners and ELL students, display a drawing, image from the internet, or a familiar synonym above or below key words in the learning target. • Consider using a think-aloud strategy, either whole class or with a small group, to model using vocabulary strategies for the first several terms. • Consider modeling, either whole class or with a small group, how to complete the four-column chart with the first two terms. • For student reference, display a working definition of "academic vocabulary," or "words found in a variety of genres and subjects unrelated to science"; and "scientific vocabulary," or "words unique to science concepts."

Work Time (continued)	Meeting Students' Needs
• Tell students they are encouraged to use these words in their own speaking and writing, and that this glossary can serve as a reference material when they need to check the spelling or meaning of a word. • Model as you instruct students to set up a four-column chart on their first glossary page: – Column 1: Word – Column 2: Synonym – Column 3: Definition – Column 4: Picture • Say something like: "Let's explore the first vocabulary term, *construct*, together." • Display the following terms: – construct – construction – structure – destruction – infrastructure – obstruct • Ask students what they notice about these terms. Listen for: – "The words sound kind of similar." – "They all have '-struct' in them." – "All of the words have the same root," or similar suggestions. • Confirm or explain that these terms share the same Latin root, "stru-" or "struct-" meaning "build."	

Work Time (continued)	Meeting Students' Needs
• Say something like: "The root of a word is its base. If you know the meaning of the root, it is much easier to determine the meaning of the whole term. Root words often have affixes, or letters attached to the beginning or ending of a root word to change or add to the meaning. A prefix is attached at the beginning of a word; a suffix is attached at the end. Now I want you to look closely at our first term, 'construct.' This word is made up of two parts: the root, '-struct' and a prefix, 'con-.'" As you are discussing the term, draw students' attention to the root and the prefix by underlining one and circling the other. Explain that the prefix "con-" means "with" or "together" and invite a few students to use this knowledge to determine the meaning of "construct." Listen for: – "Construct means to build together or put together," or a similar suggestion. • Direct students to work in their groups to locate the word "construct" on page 4 of *Max Axiom* and use context clues to determine if their definition makes sense. • After 1 or 2 minutes, invite several students to share their thinking whole class. Listen for: – "I notice in panel 2 it says the problem is that the river is going to flood and it seems like constructing a levee will keep the water out. I think it makes sense that they would build something to keep the water out." – "I noticed that it says they are going to 'construct an earthen levee' and in panel 5 it says, 'the levee needs to be built.' That made me think that our definition for construct as 'to build or put together' is correct," or similar suggestions. • Ask students to quickly add the term "construct" to their four-column charts. • Say something like: "Now you have a chance to review this section of the book a little more deeply to focus on determining the meaning of unknown words. Independently read pages 4–9 again. This time as you read, use your strategies to determine the meaning of the following words and record your thinking in your glossary." • Display the following key terms where all students can see them: *defense*, *scientific method*, *affect*, *effects*, *fields*, *overwhelming*, and *repeating*" • Ask students to work with group members to complete a four-column chart for each word and use a variety of strategies to determine the meaning. • Allow students 5 to 6 minutes to read and discuss in groups the meaning of each term. • Circulate to provide support. Consider building on student knowledge of roots and affixes by sharing some or all of the following: – One meaning of the prefix "de-" is "completely." – "Fend" is the root of the word "defense," which means "to ward off or protect."	

Work Time (continued)	Meeting Students' Needs
– The meaning of "over-" as a prefix is "excessive or too much." – The root "-whelm" means "to submerge completely." – The meaning of "re-" is "back or again." – "Petere," which means "to demand or seek," is the root of the word "repeating," so repeating is "seeking or demanding again." • After 5 or 6 minutes, invite a few students to share out the meaning of each word. Listen for: – "I think defense is like guard because the text said 'study which material is the best defense' and guard would work in that sentence, too." – "I think the scientific method is a process used to solve problems because on page 5, Max Axiom says, 'Come on. I'll take you through the scientific way to find answers,'" or similar responses. • Pause after one or two students have shared a definition for "scientific method" and direct their attention to the frame/panel in the upper right-hand corner of page 5, "Steps of the Scientific Method." Then read aloud the uppermost speech bubble in the frame/panel below, "The order or number of these steps can always change, but scientists often rely on these basic methods to organize information." • Ask students to think about then discuss in groups: – "What do you think Max means by saying the order or number of these steps can always change?" • After 1 or 2 minutes, invite a few students to share their thinking aloud with the class. Listen for ideas such as: – "I think he means that sometimes you might have to repeat a step or use steps in a different order than how they are listed on the tablet. For example, if you ask a question and then gather information, you might find that you have more questions you need to ask then you'll need to gather more information," or similar ideas. • Take a moment to emphasize to students that while Max Axiom's tablet lists the steps of the scientific method in a specific order, what he is trying to tell us here is that the scientific way to find answers is not something that needs to be done in a specific order with a specific number of steps. • Continue to cold call students to share out definitions for the remaining key terms. Listen for: – "I think affect means to impact or make a difference because it is used as a verb in that sentence and to impact and make a difference are verbs meaning similar things in the sentence 'Does the number of boats impact the amount of pollution of the river?'"	

Work Time (continued)	Meeting Students' Needs
– "I think effects means impacts or influence because it is used as a noun in that sentence and impacts and influence are nouns with similar meanings." – "I think fields means subject because Max said, 'scientists work in many fields' and I don't think it's fields like soccer or football fields. It's like things you can study." – "I think overwhelming means impossible to handle or too much because the text said something like the amount of information can be overwhelming. Too much to handle or impossible would work in that sentence, too." • Ask students: * "Were you able to figure out the meaning of any of these words by using context clues? If so, what other words and/or sentences helped you determine what the word meant?" * "Were you able to figure out the meaning of any of these words by thinking about the parts you know, like roots and affixes? If so, which roots or affixes do you know that helped you determine what the word meant?" • Direct students' attention to the key word boxes on their *Max Axiom*: Details and Visual Elements graphic organizer. Note that there is an academic key word box and a scientific key word box. • Explain to students that in this module they will focus on two different types of words: scientific (words about science) and academic (words they will see in a variety of texts, which have varied meanings depending on the context). • Suggest to students that they mark academic words with a capital "A" next to the word in their four-column chart and scientific words with a capital "S." • Give students 2 minutes to discuss with their group to determine whether each word is academic or scientific. • Then, refocus whole group. Invite a volunteer to share whether his or her group believes the word construct is academic or scientific. Encourage the group speaker to explain the reasoning for his or her group's decision. Continue by calling on a member of another group to share their thinking about the word defense. Repeat until all groups have shared at least once and all words have been addressed. • After hearing students' thoughts, reveal the actual sorting of academic and scientific words by saying: "Construct, defense, affect, effects, fields, overwhelming, and repeating are academic key words because you will encounter them in a variety of texts, not just when you're reading about science." Tell students to quickly record each of these terms in the "Key Words (academic)" box on their graphic organizers. As time allows, encourage students to think about, discuss, and share out other times they might see the words "affects," "effects," "fields" and "overwhelming."	

Work Time (continued)	Meeting Students' Needs
• Tell students to add the term "scientific method" to the "Key Words (scientific)" box on their graphic organizers. Explain that this is an example of scientific vocabulary because the only time this term is likely to be featured is in a scientific context. • Say: "The reason we work with vocabulary so intentionally as readers is because understanding words helps us deepen our understanding of what we read. Now that you have a clear understanding of key vocabulary from this section, you are invited to go back to your graphic organizer and revise the details you paraphrased from the text to explain how to ask scientific questions or gather information, as well as your thinking about how information boxes and gutters support your understanding of the first two steps in the scientific method." • After 1 or 2 minutes, invite students to share out some revisions made to their graphic organizer to reflect their deeper understanding of key terms. • Celebrate students' ability to paraphrase quotes from a text when describing the first steps of the scientific method and their ability to analyze how visual elements contribute to the meaning of what they read.	

Closing and Assessment	Meeting Students' Needs
A. Debrief and Reviewing Learning Targets (5 minutes) • Tell students that they will use Learning Lineup protocol to review the learning targets. • Designate one end of the room where students will stand if they feel they are experts (completely understand and can apply understanding); and an opposite end of the room where students will stand if they feel they are beginners (still not quite understanding the target). Explain that they will stand somewhere in the middle of expert and beginner if they feel they are practitioners (getting the idea about the learning target). • Read through each target and pause to ask students to line up to indicate their mastery of the target. Invite one or two students to share out the reason for their self-assessment after each target. • Distribute one **index card** to each student. Have them create a task card by recording the following prompt on their index card: * "Describe one close reading strategy you used while reading independently. Explain how you used the strategy to support your understanding of the text."	• For struggling writers, write the task on an index card in advance.
Homework	**Meeting Students' Needs**
• Complete your task card and bring to class as an entry task for the next lesson. • If you didn't finish in class, complete a four-column chart for each of the eight vocabulary words from this lesson in your journal glossary. • Read your independent reading book for at least 30 minutes and write a response to a second question from your Independent Reading Choice Board (from Lesson 1).	• Allow struggling writers to dictate their response to the task and choice board to someone at home to scribe for them, or to record their responses into a recording device. • Consider providing a recording of the text for struggling readers.

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 2

Supporting Materials

Max Axiom: Details and Visual Elements Graphic Organizer, Page 1

How do authors structure text and use visual elements to engage and support readers' understanding of complex ideas?

SECTION 1: "A WORLD OF QUESTIONS"

Step 1: Ask Questions

Details that explain *how* to ask scientific questions:

_____

_____

_____

_____

_____

Visual Element Focus: "Information Box"
How does an information box support your understanding of the first step Max Axiom takes to solve a problem?

Key Terms (scientific)

Step 2: Gather Information

Details that explain *how* to gather information:

_____

_____

_____

_____

_____

Visual Element Focus: "Gutters"
How do gutters support your understanding of the next step Max Axiom takes to solve a problem?

Key Terms (academic)

Quote/Paraphrase Anchor Chart
(For Teacher Reference)

Quote	Paraphrase
Sample 1 "Come on. I'll take you through the scientific way to solve a problem."	**Sample 1** Example: I'll show you how to solve a problem the scientific way. Bad Example: ~~Come on. To solve a problem, I'll show you the way that's scientific.~~
Sample 2 "With more than 100 million web sites, the Internet is an information gold mine."	**Sample 2** Example: The internet is another great resource with tons of information. Bad Example: There are over 100 million web sites. (this is not a great representation of the same idea)

Quote/Paraphrase Anchor Chart
(For Teacher Reference)

Quote	Paraphrase
Possible direct quotes to describe asking questions: *"First, choose a topic that interests you."*	Possible paraphrased quotes to describe asking questions: *Think about a topic you're interested in.*
"Form open-ended questions that can be answered with a thoughtful statement."	*Stay away from questions that can be answered with "Yes" or "No."*
"Consider the amount of time available and the cost involved."	*Think about how much time and money you have to spend on this question*
Possible direct quotes to describe gathering information: *"Librarians are great resources for finding the information you need."*	Possible paraphrased quotes to describe gathering information: *A great resource for finding information is the librarian.*
"Take notes, and record the book, article, or Web site where you found the information."	*If you record the book or article where you find information, you can find it again if you need it.*
"Teachers, engineers, or other scientists can provide details not available in books or on the Web."	*Experts like scientists and teachers can teach you things you may not find in books.*

Max Axiom: Details and Visual Elements Graphic Organizer, Page 1
(Answers, for Teacher Reference)

How do authors structure text and use visual elements to engage and support readers' understanding of complex ideas?

SECTION 1: "A WORLD OF QUESTIONS"

Step 1: Ask Questions
Details that explain *how* to ask scientific questions:

- **Find a topic that's interesting to you.**
- **Use open-ended questions that you can answer with a thoughtful statement.**
- **You have to think about how much time you have and what the costs will be.**

Visual Element Focus: "Information Box"
How does an information box support your understanding of the first step Max Axiom takes to solve a problem?
***The open-ended question information box helped me understand how to select a good question because it gave an example of a yes-or-no question and an open-ended question. If I hadn't looked at that box, I might not understand the difference as well.**

Key Terms (academic)
construct, defense, affect, effects, fields, overwhelming, and repeating

Key Terms (scientific)
scientific method

Step 2: Gather Information

Details that explain *how* to gather information:

- **Librarians can help you find important information.**
- **Write down the information you find, and record the name of the book or Web site where you found it.**
- **If you can't find the information in books, you can ask teachers, engineers, or scientists.**

Visual Element Focus: "Gutters"
How do gutters support your understanding of the next step Max Axiom takes to solve a problem?
***The gutters on page 8 help me see the separate scenes at the library. I see Max outside and then inside talking to the librarian, which is separate from the scene that shows him walking through the library. These separate scenes help me understand how much the library has to offer when gathering information.**

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 3

Paraphrasing Quotes and Analyzing Visual Elements, Part 2: *Investigating the Scientific Method with Max Axiom Super Scientist*

Paraphrasing Quotes and Analyzing Visual Elements, Part 2:

Investigating the Scientific Method with Max Axiom Super Scientist

Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)
I can paraphrase information in notes and finished work. (W.5.8) I can analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text. (RL.5.7) I can determine the meaning of unknown and multiple-meaning words and phrases based on fifth-grade reading and content, choosing flexibly from a range of strategies. (L.5.4) a. I can use context as a clue to the meaning of a word or phrase. 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.

Supporting Learning Targets	Ongoing Assessment
• I can explain the next steps Max Axiom takes to solve a problem by paraphrasing quotes from *Max Axiom*. • I can analyze how visual elements in *Max Axiom* contribute to my understanding of the steps Max Axiom takes to solve a problem. • I can use context clues and reference materials to determine the meaning of key words and phrases.	• Entry task (from Lesson 2 homework) • Gist (in journal) • *Max Axiom*: Details and Visual Elements graphic organizer, page 2 • Vocabulary defined (in journal) • Independent Reading Choice Board response

Agenda	Teaching Notes
1. Opening A. Reviewing Homework and Engaging the Reader (5 minutes) 2. Work Time A. Determining the Gist: *Max Axiom*, Section 2: "Searching for Answers" (15 minutes) B. Second Read: Explaining Steps Max Axiom Takes to Solve a Problem and Analyzing Visual Elements (20 minutes) C. Vocabulary to Deepen Understanding (15 minutes) 3. Closing and Assessment A. Debrief and Reviewing Learning Targets (5 minutes) 4. Homework A. Reread Section 2 of *Max Axiom*. B. Finish class work C. Independent reading.	• This lesson follows a format similar to Lesson 2. In this lesson, students read closely to analyze details and visual elements that explain complex ideas associated with the next steps Max Axiom takes to solve a problem: forming a hypothesis and designing an experiment. Continue emphasizing that these are steps used during the process of scientific inquiry, and that real world scientists and inventors do not typically arrive at solutions by following as sequential a process as Max does in this graphic novel. As students identify key details, they practice paraphrasing ideas from the text. Students' work with paraphrasing will be expanded and assessed in Units 2 and 3. • As students determine the meaning of unknown and key vocabulary in this lesson, they focus on specific vocabulary strategies related to using context clues and reference materials. Based on the needs of your class, Work Time C may run longer than 15 minutes; preview the part of the lesson and adjust accordingly. • In advance: – Display the Close Readers do These Things, Quote/Paraphrase, and Vocabulary Strategies anchor charts from Lesson 2. – Review Popcorn Read and Fist to Five (see Appendix). – Review and familiarize yourself with *Max Axiom*: Details and Visual Elements graphic organizer, page 2 (answers, for teacher reference) to prepare to support students as they identify and analyze key details and visual elements in Work Time B. – Review the discussion and reference materials in Work Time C to prepare to offer support as students analyze the word "variable" and determine the meaning of other key terms. – Collect a variety of reference materials for student to use as they define key terms (such as print and online dictionaries). – Consider displaying key vocabulary from the text to save time during Work Time C.

Lesson Vocabulary	Materials
explain, steps, analyze, visual elements, contribute, context clues, reference materials, determine, hypothesis, evidence (10), variable (12), (in)dependent variable, controlled variable, accurate (13), procedure (14), reproduce (15)	• Close Readers Do These Things anchor chart (from Lesson 2) • Document camera • *Investigating the Scientific Method with Max Axiom Super Scientist* (book; one per student) • Journal (students' own, begun in Lesson 1) • Quote/Paraphrase anchor chart (from Lesson 2) • *Max Axiom*: Details and Visual Elements graphic organizer, page 2 (one per student) • Visual Elements of a Graphic Novel reference page (from Lesson 1, taped into journals) • *Max Axiom*: Details and Visual Elements graphic organizer, page 2 (answers, for teacher reference) • Vocabulary Strategies anchor chart (from Lesson 2) • Dictionaries (print; at least one per group)

Opening	Meeting Students' Needs

A. Reviewing Homework and Engaging the Reader (5 minutes)
• Ask students to take out the entry task they completed for homework.
• Then ask them to turn and share with a nearby partner:
  * "What is one close reading strategy you used while reading your independent reading book?"
  * "Why did you choose to focus on that strategy?"
  * "How did using this strategy help you to better understand the text?"
• Cold call a few students to share ideas they heard from their partners.
• Direct students' attention to the **Close Readers Do These Things anchor chart**, posted on the **document camera**.
• Review Popcorn Read protocol with students, and clarify as necessary. Remind students that sometimes when a point is very meaningful, it will be shared more than one time during a popcorn read.
• Ask one student to begin by reading aloud one strategy he or she finds to be particularly helpful from the Close Readers Do These Things anchor chart.
• Once all students share or the popcorn read reaches a natural conclusion, explain that students will begin today's close read by reading for gist.
	• Provide sentence starters to support student discussions: "One close reading strategy I used is _____," "I chose to focus on this strategy because _____," or "This strategy helped me understand the text because _____."

Work Time	Meeting Students' Needs

A. Determining the Gist: *Max Axiom*, Section 2: "Searching for Answers" (15 minutes)
• Ask students to locate their ***Investigating the Scientific Method with Max Axiom Super Scientist*** books and their **journals** and sit in their small groups.
• Review the group norms established in Lesson 1. Ask students to consider the work their group has done over the past two lessons and use Fist to Five to share how successfully their group is meeting the norms. If several groups are showing three or fewer fingers, consider revisiting group norms with the whole class. If a small number of students are showing three or fewer fingers, consider providing them with additional support during group discussions in today's lesson.
• Tell students that in today's first read, they will work in their groups to read and determine the gist. Ask students to consider and then take 1 or 2 minutes to discuss the following question:
  * "How does reading for gist help us become close readers?"
• Cold call several students to share their ideas. Listen for comments such as:
  – "I think reading for the gist is helpful, because once I know the gist it's easier to think about the details."
  – "Reading for the gist can help close readers learn about the main points so they know what to focus on when they do their second read," or similar suggestions.
• Ask students to open to page 10 of *Max Axiom*, and take 5 minutes to silently read Section 2: "Searching for Answers." Remind them to consider the gist as they read.
• Refocus whole class and ask students to take 1 or 2 minutes to discuss the following question with their group:
  * "What is the gist of Section 2: 'Searching for Answers'?"
• After 1 or 2 minutes, cold call a student from each group to share out. Listen for:
  – "Max is thinking of a hypothesis and planning his experiment."
  – "Max is explaining about all the things you need to consider as you make a hypothesis and decide how to test it," or similar responses.
• Give students 1 minute to record their gist statements on the same page in their journal where they recorded the gist of Section 1 during Lesson 2.
	• For students who struggle to determine the gist of longer passages, encourage them to find the gist of facing pages to keep track as they go and make it more manageable to determine the gist of the entire section.
	• Allow struggling writers to dictate their gist statement to a peer or aide.

Work Time (continued)	Meeting Students' Needs

B. Second Read: Explaining Steps Max Axiom Takes to Solve a Problem and Analyzing Visual Elements (20 minutes)
• Ask the class to read aloud the first learning target:
  * "I can explain the next steps Max Axiom takes to solve a problem by paraphrasing information from *Max Axiom*."
• Draw students' attention to the terms *explains, steps,* and "paraphrased," discussed in previous lessons. Ask students to consider the meaning of these terms as they think about how to rephrase the learning target.
• Invite several students to think about and share out a paraphrased version of the learning target.
• Read the second target aloud, or invite a volunteer to read it aloud:
  * "I can analyze how visual elements in *Max Axiom* contribute to my understanding of the next steps Max Axiom takes to solve a problem.'"
• Ask students to recall from previous lessons and discuss the meaning of the words *analyze*, *visual elements*, and *contribute*.
• Cold call a few students to share out whole group. Listen for:
  – "Analyze means to study carefully."
  – "Visual elements are things the author does with text or pictures to draw our attention to specific information."
  – "Contribute means to add to or support."
• Invite several students to think about and share out a paraphrased version of the second learning target.
• Then, say something like: "We had similar targets in Lesson 2. As we read each section of *Max Axiom*, we will practice paraphrasing details and analyzing visual elements so that we can deepen our understanding of these strategies and the complex ideas presented in the text."
• Display the **Quote/Paraphrase anchor chart** and tell students that before they begin their analysis, it may be helpful to revisit this chart. Ask students to think about then discuss the following questions in groups:
  * "What is the difference between quoting and paraphrasing?"
  * "When is it useful to paraphrase?"
  * "How do you know if you paraphrased accurately?"
	• To support visual learners and ELL students, display a drawing, picture from the internet, or familiar synonym above or below key words in learning targets.
	• To support visual learners, consider allowing students from each group to display an example of the visual element (speech bubbles or images) under the document camera.
	• For students who struggle with the physical act of writing, allow them to type their responses on a computer or word processor, or dictate to an aide or a peer acting as a scribe.

Work Time (continued)	Meeting Students' Needs
• Cold call a few students to share out whole class. Listen for: – "Quotes are exactly what's said in the text with quote marks around them; when you paraphrase, you put the idea into your own words and you don't need quotation marks." – "Paraphrasing is helpful when you want to communicate an idea from the text but you don't need to prove a specific point." – "An accurately paraphrased quote restates the quote in a way that still sounds natural and expresses the same idea," or similar suggestions. • Distribute ***Max Axiom*: Details and Visual Elements graphic organizer, page 2** to students. • Orient students to the format of the graphic organizer by pointing out the two largest boxes: "Form a Hypothesis" and "Design an Experiment." Tell students they will paraphrase quotes from the text as they did in Lesson 2 to explain the next steps Max Axiom takes to solve a problem. • Refocus students' attention on *Max Axiom*: Detail and Visual Elements graphic organizer, page 2. Remind them to paraphrase quotes from the text to complete the "details" section of each box. • Then, ask students to look at the lower half of each box, which highlights the visual elements: speech bubbles and images. Remind students that in this section they will explain how the visual element supports their understanding of the steps Max Axiom takes to solve a problem. • Ask students where they could look if they would like to review the meaning of each visual element. Listen for students to refer to the **Visual Elements of a Graphic Novel reference page** they taped into their journal in Lesson 1. • Tell students they will have an opportunity to examine key vocabulary from the text more closely to define and sort them into the "scientific" or "academic" key word boxes on their graphic organizers during Work Time C. • Assign students to work collaboratively with their group to read Section 2 a second time and complete the assigned portions of *Max Axiom*: Details and Visual Elements graphic organizer, page 2. • After about 10 minutes, refocus whole group. Ask students to share out the paraphrased quotes they recorded onto their graphic organizers to explain how to form a hypothesis. Refer to ***Max Axiom*: Details and Visual Elements graphic organizer, page 2 (answers, for teacher reference)** as needed. • Invite students to share how the speech bubbles their group identified supported their understating of how to form a hypothesis.	

Work Time (continued)	Meeting Students' Needs

• Ask students to share out the paraphrased quotes they recorded to explain how to design an experiment.
• Invite students to share how the images their group identified supported their understating of how to design an experiment.
• Acknowledge students' ability to identify and paraphrase key details, as well as their analysis of how visual elements support their understanding of the ideas conveyed in Section 2 of *Max Axiom*.
• Ask students to consider the information they recorded on their graphic organizers, as well as other specific details from the text to help them answer the following question:
  * "Why do you think it's important for scientists to form a hypothesis?"
• Give students 2 minutes to discuss the reflection question and details to from the text that support their thinking in groups.
• Ask a few students to share out whole group. Encourage students to use specific details from the text or their graphic organizer to support their response. Listen for:
  – "I think scientists need to create a hypothesis because it helps them focus their experiment. I think this because on page 11 Max says that his record of the hypothesis 'helps maintain a clear direction during the project.'"
  – "I think the hypothesis is important because it helps the scientist decide how to design an experiment that is connected to the research. On page 10, Max says that he used his research to create the hypothesis. Then, on page 11 Max says, 'the main purpose of an experiment is to show whether the data you collect supports the hypothesis,' so the hypothesis really helps connect the different steps Max Axiom uses, like the research and data," or similar responses.
• Give students 1 or 2 minutes to record their response to the question, plus supporting details, on a new page in their journals.	

Work Time (continued)	Meeting Students' Needs

C. Vocabulary to Deepen Understanding (15 minutes)
• Refer to the **Vocabulary Strategies anchor chart**, then say something like: "As we take a close look at some key terms from Section 2 of *Max Axiom*, we are going to focus on two strategies in particular."
• Introduce the third learning target:
  * "I can use context clues and reference materials to determine the meaning of key words and phrases."
• Underline the terms *context clues*, *reference materials*, and *determine*. Ask students to consider and then discuss the meaning of these terms with group members.
• After 1–2 minutes, invite several students to share possible definitions. Listen for:
  – "Context clues are details in the text that help you understand what an unfamiliar word means."
  – "Reference means something that shares information; reference materials are the resources you might look at to collect information."
  – "When studying vocabulary, reference materials include dictionaries, glossaries, and the internet."
  – "Determine means to find out," or similar suggestions.
• Invite a few students to paraphrase the learning target based on their understanding of key terms.
• Tell students that this learning target will be particularly helpful for determining the meaning of words in Section 2 of *Max Axiom*. As they determine the meaning of unfamiliar terms from the text today, encourage students to continue building the glossary they began in Lesson 2.
• Ask students to turn to page 12 in *Max Axiom* and search for the term *variable* or *variables*. Call on students to hold up their books and point out where they see this term on page 12.
• Say something like: "Some words can be used in multiple ways, and if the definitions are very similar, it can be tricky to determine exactly which definition is intended. The term 'variable' is used frequently on pages 12 and 13 because it is very important to understanding how to design an experiment, but it is also a tricky word to fully understand because it can be used in a variety of contexts. To help us analyze how the term is used in the context of *Max Axiom*, we are going to consult a reference material."
• Ensure all students can see a **dictionary** and guide them to locate the word 'variable.' Post this word for all students to see.
• Explain that dictionaries, glossaries, thesauri, and the internet are all useful reference materials students have likely used before, but today they will look closely at a page from a dictionary.
	• To support visual learners and ELL students, display a drawing, image from the internet, or familiar synonym above or below key words in the learning target.
	• Consider using a think-aloud strategy, either whole class or with a small group, to model using vocabulary strategies for the first several terms.
	• Consider modeling with a small group or individual students, how to complete the four-column chart with the first two terms.
	• For student reference, display a working definition of "academic vocabulary," or "words found in a variety of genres and subjects unrelated to science," and "scientific vocabulary," or "words unique to science concepts."

Work Time (continued)	Meeting Students' Needs
• Ask students to briefly think about and discuss in groups: * "What do you notice about the dictionary page that the word 'variable' is on?" • After 1 minute, cold call a few students to share out and listen for responses such as (these may vary depending on the dictionary students use): – "I notice the words are in alphabetical order." – "I notice that there are words at the top of the page that list the first and last vocabulary terms on the page." – "I notice that many of these words have multiple meanings." – "I notice that variable is on this page and that some of the other words on the page sound similar to variable." – "I notice that under each term, it shows how to pronounce the word, the part of speech, and the definition." • Ask students to discuss in groups: * "What can you learn about the term variable from looking at this resource?" • After 1 minute, invite students to share out. Listen for ideas such as: – "Variable can be an adjective and a noun." – "Variable can mean 'not having a pattern, an element that is likely to change,' or 'a factor represented by a symbol that has an unknown or changing value.'" – "All the definitions of variable have something to do with change, but they are each a little different." – "'Changeable,' 'fickle,' and 'unsteady' are synonyms for variable." – "Variable is related to the word 'vary' because vary means change. I think they have the same root." • If students do not identify the connection between variable and other terms on the page with the same root, bring that to their attention as a way to build on their knowledge of root words from Lesson 2. • Ask students to look at page 12 of *Max Axiom*. Read aloud the first speech bubble, "Welcome aboard, Max. Looks like variable winds for the flight. We should arrive in 30 minutes." • Ask students to think about and discuss in groups the meaning of the term "variable" in the context of this speech bubble. Encourage students to refer to the dictionary page and any context clues from the first panel as they discuss.	

Work Time (continued)	Meeting Students' Needs
• After 1 minute, invite several students to share their definition as well as how their group determined the meaning of the word. Listen for: – "We think that variable means 'not consistent or likely to change' because we know that in this sentence variable is describing the winds so it is an adjective." – "We decided that in this sentence, variable means 'changeable' because we looked at the synonyms for variable and found one that made the most sense in the sentence," or similar suggestions. • If students to not identify the part of speech, bring this to their attention. Remind students that knowing how the word is used in the sentence can help them understand what it might mean. • Ask students to consider and discuss the term variable as it is used in the next panel. Remind them to refer to the dictionary page and any clues they can find in the panel as they discuss. • After 1 or 2 minutes, cold call several students to share their definitions as well as how their group determined the meaning of variable in this context. Listen for: – "We decided that here the word variables refers to things, so the word is a noun. We didn't see anything about a symbol in the text, so we think variable means an element or factor that is likely to change," or similar ideas. • Explain that sometimes the term variable is used in conjunction with other words to refer to something very specific. Direct students' attention to the third panel on page 12. Read aloud the second speech bubble, "The independent variables of an experiment are parts the scientist changes to test the hypothesis." • Ask students what they notice about the phrase "independent variables." Listen for: – "I notice it still has to do with change, but now it means specific parts of an experiment that a scientist changes." – "I notice that the independent variables help the scientist test the hypothesis," or similar suggestions. • Ask students to discuss with their group members: * "Do you think the term variable is academic or scientific as it is used in the context of *Max Axiom*?" • After 1 minute, cold call students to share. Listen for: – "I think variable is scientific in this context because an independent variable is a very specific part of a science experiment; however, outside of a science context it could be academic," or similar suggestions.	

Work Time (continued)	Meeting Students' Needs
• Confirm or explain that depending on the context, variable can be academic or scientific. • Direct students to add the terms "variable," *independent variable*, *dependent variable*, and *controlled variable* to their glossaries using the four-column chart they started in the previous lesson. • After 1-2 minutes, refocus whole class. Explain that in addition to variable, there are many other key terms in Section 2 of *Max Axiom*. Explain that as they continue to work with group members, they should: 1. Consult reference materials and use other vocabulary strategies to identify the meaning of the terms *hypothesis*, *evidence*, *accurate*, *procedure*, and *reproduce*. 2. Add each term to the four-column chart in your glossary. 3. Write an "A" next to words you believe are academic and an "S" next to words you think are scientific. • Clarify directions as needed. Circulate to offer support. • After 4-5 minutes, refocus whole class and invite students to share a synonym or definition for each key term and explain if the word is academic or scientific in this context. Listen for ideas such as: – "A hypothesis is a prediction based on evidence; it is scientific because it is a specific step scientists use to solve a problem." – "Evidence means the details or information that prove if something is true or false; it is academic because it can be used in a variety of contexts to describe how to prove something, such as in an argument." – "Accurate means correct; it is academic because it used in contexts other than science." – "Procedure means steps or plan used to compete a task; it is academic because it is a word that can be used in a variety of contexts." – "Reproduce means to produce or create again; it is academic because it is used in a variety of contexts where it has a similar or different meanings," or similar suggestions. • Ask students to record academic and scientific terms in the key word boxes on their graphic organizers. Remind them that the purpose for defining key words is to help them deepen their understanding of important ideas conveyed through the text. • Give students 1 or 2 minutes to revise the paraphrased details on their *Max Axiom*: Details and Visual Elements graphic organizer based on new understandings about key vocabulary. • If students are not able to complete the vocabulary sort or revision of graphic organizers in the time allotted, allow them to complete for homework.	

Closing and Assessment	Meeting Students' Needs
A. Debrief and Reviewing Learning Targets (5 minutes) • Ask students to turn and talk with a nearby partner who is not in their regular group: ∗ "Which close reading strategy most helped you understand the next steps Max Axiom took to solve a problem?" • Give partners 2 minutes to discuss, then cold call several students to share out the strategies they used. Listen for: – "It helped me to gather quotes from the text before I paraphrased and when we were answering the question about why a hypothesis is important." – "Rereading the text helped me because there were some complex words I didn't really understand the first time." • Read each of the learning targets aloud and ask students to show a thumbs-up or thumbs-down to indicate their mastery. Note students who show a thumbs-down, as they may need more support.	• Provide a sentence frame to support students during their discussions: "The close reading strategy that helped me understand steps 3 and 4 of the scientific method is _____, because ¬¬¬¬_____."

Homework	Meeting Students' Needs
• Reread Section 2 of *Max Axiom*. Add to or revise at least one area of your *Max Axiom*: Details and Visual Elements graphic organizer, based on new insights from your reread of the text or new understandings about key terms. • If not finished in class, complete the four-column chart for each vocabulary word from this lesson, and sort key terms into the "academic" or "scientific" key word boxes on your graphic organizer. • Read your independent reading book for at least 30 minutes and write a response to a third question from your Independent Reading Choice Board (from Lesson 1).	• Allow struggling writers to dictate their responses to someone at home. • Consider providing a recording of the text for struggling readers.

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 3
Supporting Materials

Max Axiom: Details and Visual Elements Graphic Organizer, Page 2

How do authors structure text and use visual elements to engage and support readers' understanding of complex ideas?

SECTION 2: "SEARCHING FOR ANSWERS"

Step 3: Form a Hypothesis

Details that explain *how* to form a hypothesis

_____

_____

Visual Element Focus: "Speech Bubbles/Thought Bubbles"
How do speech bubbles or thought bubbles support your understanding of the third step Max Axiom takes to solve a problem?

Key Terms (scientific)

Step 4: Design an Experiment

Details that explain *how* to design an experiment

_____

_____

Visual Element Focus: "Images/Photos"
How do images and photos support your understanding of the fourth step Max Axiom takes to solve a problem?

Key Terms (academic)

Max Axiom: Details and Visual Elements Graphic Organizer, Page 2
(Answers, for Teacher Reference)

How do authors structure text and use visual elements to engage and support readers' understanding of complex ideas?

SECTION 2: "SEARCHING FOR ANSWERS"

Step 3: Form a Hypothesis
Details that explain *how* to form a hypothesis

- **Use the information you collected in your research to make a prediction about what will happen.**
- **You have to use evidence to make a hypothesis.**
- **You should write your hypothesis down because it won't change during the experiment.**

Visual Element Focus: "Speech Bubbles/Thought Bubbles"
How do speech bubbles or thought bubbles support your understanding of the third step Max Axiom takes to solve a problem?

In the speech bubbles, Max explains what a hypothesis is and that you have to use evidence. By reading the thought bubbles on the bottom of page 10, I learned how Max made his hypothesis.

Key Terms (scientific)

hypothesis, controlled variable, independent variable

Max Axiom: Details and Visual Elements Graphic Organizer, Page 2
(Answers, for Teacher Reference)

How do authors structure text and use visual elements to engage and support readers' understanding of complex ideas?

SECTION 2: "SEARCHING FOR ANSWERS"

Step 4: Design an Experiment
Details that explain *how* to design an experiment

- **You have to pick the parts of the experiment you want to change to test the hypothesis. They are called the independent variables.**
- **You need to decide what part you will measure to see how it changes with the independent variable. The part you measure is called the dependent variable.**
- **You have to think about the controlled variables so you know which parts of the experiment will stay the same.**
- **Scientists use procedures or plans that include a materials list when they design an experiment.**

Visual Element Focus: "Images/Photos"
How do Images and Photos support your understanding of the fourth step Max Axiom takes to solve a problem?

The images on page 13 help me understand the difference between independent and dependent variables and how they are used in experiments.

Key Terms
(academic)

evidence, variable, (in)dependent, controlled, accurate, procedure, reproduce

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 4

Paraphrasing Quotes and Analyzing Visual Elements, Part 3: *Investigating the Scientific Method with Max Axiom Super Scientist*

Paraphrasing Quotes and Analyzing Visual Elements, Part 3:

Investigating the Scientific Method with Max Axiom Super Scientist

Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)
I can quote accurately from a text when explaining what the text says explicitly and when drawing inferences. (RL.5.1) I can paraphrase information in notes and finished work. (W.5.8) I can analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text. (RL.5.7) I can determine the meaning of unknown and multiple-meaning words and phrases based on fifth-grade reading and content, choosing flexibly from a range of strategies. (L.5.4) a. I can use context as a clue to the meaning of a word or phrase. 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.

Supporting Learning Targets	Ongoing Assessment
• I can explain the next steps Max Axiom takes to solve a problem by paraphrasing quotes from *Max Axiom*. • I can analyze how visual elements in Max Axiom contribute to my understanding of the steps Max Axiom takes to solve a problem. • I can determine the meaning of unknown words and phrases using a variety of strategies.	• Gist (in journal) • *Max Axiom*: Details and Visual Elements graphic organizer, page 3 • Response to reflection questions (in journal) • Vocabulary defined (in journal) • Independent Reading Choice Board response

Agenda	Teaching Notes
1. Opening A. Reviewing Homework and Engaging the Reader (5 minutes) 2. Work Time A. Determining the Gist: *Max Axiom*, Section 3: "Conducting the Experiment" (15 minutes) B. Second Read: Explaining Steps Max Axiom Takes to Solve a Problem and Analyzing Visual Elements (20 minutes) C. Vocabulary to Deepen Understanding (15 minutes) 3. Closing and Assessment A. Debrief and Reviewing Learning Targets (5 minutes) 4. Homework A. Graphic Novel Template B. Finish Classwork C. Independent Reading	• This lesson follows a format similar to Lessons 2 and 3. Students refer to relevant information from *Investigating the Scientific Method with Max Axiom Super Scientist* to explain complex ideas associated with the fifth and sixth steps Max Axiom takes to solve a problem: collecting data and analyzing data and drawing conclusions. Reiterate to students that the process of scientific inquiry is not as linear a process as it is presented in this graphic novel. Rather, students should understand that real inventors and scientists engage in scientific inquiry using a much less structured approach to develop their solutions. The concept of scientific inquiry as iterative can and should be reinforced during additional science instruction in other parts of the school day. • After identifying key details about steps 5 and 6 of the scientific method, students paraphrase quotes. Paraphrasing is not formally assessed in Unit 1. However, note that paraphrasing involves both reading and writing, so RI.5.1 and W.5.8 are working in concert in this lesson. • Students also analyze the way visual elements impact the meaning of complex ideas in *Max Axiom*. Students will apply understanding gained from this analysis for homework: they create a graphic novel version of one event from their independent reading text. Both the classwork and homework task provide scaffolding to prepare students for their performance task, which is writing a graphic novelette. • At the end of Work Time B, students respond to reflection questions that serve three purposes: to synthesize their thinking about this section of text, to continue to develop their ability to make inferences based on information from the text, and to prepare them to use multiple sources to explain what is stated explicitly or inferred in the text, a skill assessed the Mid-Unit 1 Assessment. • In advance: – Display Group Norms and Vocabulary Strategies anchor charts (from Lessons 1 and 2). – Review and familiarize yourself with *Max Axiom*: Details and Visual Elements graphic organizer, page 3 (answers, for teacher reference) to be prepared to support students as they identify and analyze key details and visual elements in Work Time B. – Consider displaying key vocabulary to save time during Work Time C. – Collect a variety of reference materials for students to use as they define key terms (such as print and digital dictionaries found online).

Lesson Vocabulary	Materials
explain, steps, paraphrasing, analyze, visual elements, contribute, determine, variety, strategies, gather, develop (16), observations (17), data, draw (18), contents (19), conclusion (20), findings (21)	• *Investigating the Scientific Method with Max Axiom Super Scientist* (book; one per student) • Journals (students' own, begun in Lesson 1) • Group Norms anchor chart (from Lesson 1) • Document camera • *Max Axiom*: Details and Visual Elements graphic organizer, page 3 (one per student) • Visual Elements of a Graphic Novel reference page (from Lesson 1, taped into journals) • *Max Axiom*: Details and Visual Elements graphic organizer, page 3 (answers, for teacher reference) • Vocabulary Strategies anchor chart (from Lesson 2) • Internet reference page (one per student) • Dictionaries (print and digital dictionaries; at least one per group) • Graphic Novel Templates A, B, and C (one per student, enough copies so each student can select one version of the template)

Opening	Meeting Students' Needs

A. Reviewing Homework and Engaging the Reader (5 minutes)
• Ask students to turn and talk about the questions and response they completed on their Independent Reading Choice Board for Lesson 3 homework.
• After 1 or 2 minutes, invite a few students to share out whole group.
• Ask students to consider and discuss:
  * "What connections are you able to make between the content of your independent reading book and the ideas expressed in *Max Axiom*?"
  * "How does making connections between different texts support your ability to understand complex ideas?"
• After 1 or 2 minutes, invite students to share their thinking. Answers will vary, but listen for students to make specific connections between the content of their independent reading books and details from *Max Axiom*.
• Positively reinforce students' ability both to make text-to-text connections and to recognize their significance. Reiterate to students that making connections while reading, both in class and independently, can help deepen their understanding of similar complex ideas that are presented in different contexts.
• Then, explain that today's work will focus primarily on the second guiding question:
  * "How do authors use visual elements and organizational structure to engage and support readers' understanding of complex ideas?"
• Ask students to think about and then discuss:
  * "Which work from Lessons 2 and 3 help you answer this guiding question?"
• Invite a few students to share their ideas. Listen for them to mention how their analysis of information boxes, gutters, speech bubbles, and images supported their understanding of the steps Max Axiom takes to solve a problem.
• Explain that in today's lesson, students will analyze details and visual elements in Section 3 of *Max Axiom* using methods similar to those used in Lessons 2 and 3.
	• Provide sentence starters to support student discussions: "The connection I was able to make between my independent reading book and *Max Axiom* is _____," "Making connections between different texts supports my understanding of ideas because _____," "Working on _____ in Lessons 2 and 3 helped me answer the guiding question because _____."
	• To support visual learners, consider displaying and circling or otherwise highlighting the guiding question.

Work Time	Meeting Students' Needs

A. Determining the Gist: *Max Axiom*, Section 3: "Conducting the Experiment" (15 minutes)
• Ask students to locate their copies ***Investigating the Scientific Method with Max Axiom Super Scientist*** and their **journals** then sit in their groups.
• Display the **Group Norms anchor chart** using the **document camera** and review the group norms established in Lesson 1. Ask students to think about and discuss the following questions as a group:
  * "Which group norm is your group best at and why?"
  * "Which group norm can you focus on today to further improve your group work?"
• Cold call a student from each group to share their group's successes and goals. Listen for:
  – "We are good at using specific details from the text to support our ideas, but we need to work on helping everyone in our group to participate. Today we are going to try to ask questions like, 'What do you think?' or 'Would you like to add to that idea?' to make sure everyone is talking."
  – "Our group thinks that we are good at making sure everyone takes turn talking, but we could work on asking questions to make sure we really understand our group members' ideas," or similar suggestions.
• Encourage students to work on their group norm goal as they read and determine the gist of Section 3 together.
• Ask students to open their books to page 16. Direct them to read Section 3 as a group by reading alternating panels aloud. While one student is reading a panel aloud, other group members should follow along in their own text. Remind students to consider and discuss the gist as they work.
• After 6 to 7 minutes, cold call a student from each group to share the gist. Listen for:
  – "Max is explaining his experiment and what he did with his results."
  – "Max is showing how to collect and organize information from an experiment," or similar responses.
• Give students 1 minute to record their gist statements on the same page in their journal where they recorded the gist of Sections 1 and 2.
	• Provide sentence frames to support student discussions about group norms: "We are best at using the norm _____ because we _____," or "We can focus on improving our group work by using the norm _____."
	• For students who struggle to determine the gist of longer passages, encourage them to find the gist of facing pages to keep track as they go and make it more manageable to determine the gist of the entire section.
	• Allow struggling writers to dictate their gist statement to a peer or aide acting as a scribe.

Work Time (continued)	Meeting Students' Needs

B. Second Read: Explaining the Steps Max Axiom Takes to Solve a Problem and Analyzing Visual Elements (20 minutes)
• Say something like: "Now that we have identified the gist of Section 3, we can return to the text to deepen our understanding of the next steps Max Axiom uses to solve a problem. Let's discuss the learning targets that help us focus our second read."
• Read the first two learning targets aloud:
  * "I can explain the next steps Max Axiom uses to solve a problem by paraphrasing information from *Max Axiom*."
  * "I can analyze how visual elements in *Max Axiom* contribute to my understanding of the steps Max Axiom uses to solve a problem."
• Focus students on the terms: *explain*, *steps*, *paraphrasing*, *analyze*, *visual elements*, and *contribute*. Say something like: "We have seen these terms over the past few lessons, and they should seem more familiar. Consider these terms as you think about how you might restate the learning targets." Invite a few students to paraphrase the learning targets.
• Explain that today's second read follows a pattern similar to Lessons 2 and 3 with a focus on the fifth and sixth steps Max Axiom uses to solve a problem. Direct students to look at the image of Max's tablet on page 5 of *Max Axiom*. Ask:
  * "What steps do you think Max will take next? Why do you think so?"
• After 1 minute, cold call a few students to share their thinking whole group. Listen for comments such as:
"I think he will collect and analyze data and draw conclusions because he has already asked a question, gathered information, formed a hypothesis, and designed an experiment; these seem like the next steps he would take."
• Reiterate that while Max Axiom uses these steps in a sequential order, he also points out on page 5 that the order and number of these steps can change. Emphasize to students that real world scientists and inventors engage in a process of scientific inquiry that is rarely tidy or linear. For real scientists and inventors, these steps are fluid, meaning they will revisit steps, revise their thinking, and conduct experiments using a much less linear approach than Max.
• Distribute ***Max Axiom*: Details and Visual Elements graphic organizer, page 3** and display using a document camera. This graphic organizer is similar to those used in previous lessons; invite several students to explain how to complete each section. Listen for the following details:
  – "We find details in the text that explain how to collect data and analyze data and draw conclusions. Then we paraphrase, or say in our own words, the details we found and record them next to the bullet points."
  – "To paraphrase, we restate the ideas in our own words, but make sure it still sounds natural and means the same thing."
	• To support visual learners and ELL students, display a drawing, picture from the internet, or familiar synonym above or below key words in learning targets.
	• To support visual learners, consider allowing students from each group to display an example of the visual element (colors or diagrams/information boxes) under the document camera.
	• For students who struggle with the physical act of writing, allow them to type their responses on a computer or word processor, or dictate their analysis paragraph to an aide or a peer acting as a scribe.

Work Time (continued)	Meeting Students' Needs
– "We read the visual element focus and think about how that visual element helps us understand the steps Max Axiom uses to solve a problem. We discuss our ideas with our group. Then we record our thoughts under the question on the graphic organizer." – "We can use our **Visual Elements of a Graphic Novel reference page** taped into our journals to help us learn more about the visual elements." – "We don't have to worry about the vocabulary section until later." • If students do not independently express these ideas, ask targeted questions to remind them. • Direct students to work collaboratively with their group to read Section 3 a second time and complete all but the key word boxes of *Max Axiom*: Details and Visual Elements graphic organizer. Remind students to continue working on their group norms goal as they analyze the text. • After about 10 minutes, refocus whole group. Ask students to share out their paraphrased quotes from the text that explain how to design an experiment and collect data. Refer to ***Max Axiom*: Details and Visual Elements graphic organizer, page 3 (answers, for teacher reference)** as needed. • Cold call several students from different groups to share examples of colors and images their group discussed. Encourage students to offer an example that hasn't yet been shared by another group. Examples of colors and images could include: – The colors of rock, soil, and clay (page 16) – Color and image of the water in three different parts of the experiment (page 17) – Images of Max taking notes (pages 16, 17) • Invite a student from each group to share their response to the following questions from their graphic organizers: * "How do colors and images support your understanding of what it means to collect scientific data?" • See *Max Axiom*: Details and Visual Elements graphic organizer, page 3 (answers, for teacher reference) for possible responses. • Cold call several students from different groups to share examples of diagrams/information boxes their group discussed. Encourage students to offer different examples each time. Examples of diagrams/information boxes could include:	

Work Time (continued)	Meeting Students' Needs
– Line graph (page 18) – Bar graph (page 19) – Information box about averages (page 19) – All of the graphs together (page 20) • Ask students to consider and discuss with group members: * "How do the diagrams and information boxes you discussed support your understanding of what it means to analyze data and draw conclusions?" • See *Max Axiom*: Details and Visual Elements graphic organizer, page 3 (answers, for teacher reference) for possible student responses. (Note: in Work Time C students will have an opportunity to revise these graphic organizers to reflect a deeper understanding after they work with key vocabulary terms.) • Display the following questions for student reflection and clarify vocabulary as needed: * "After reading this section of *Max Axiom*, what do you think scientists should consider to ensure they are collecting relevant data?" * "What might help a scientist to analyze data and draw conclusions?" • Ask students to include specific details from the text, paraphrased information from their graphic organizers, and ideas gleaned from visual elements to support their answers. Tell students to discuss their thinking and supporting details with group members then record their responses on a clean page in their journal. • After 2–3 minutes, cold call several students to share out whole group. Listen for: – "On page 17, Max says that he needs to 'measure the dependent variable of water leaking through the levees.' This makes me think that scientists need to consider what changes from one experiment to the next, especially the dependent variable because that will show them what the different independent variables do to the experiment." – "To draw a conclusion, I think scientists need to consider all of the observations and notes they made to see if anything supports their hypothesis, because in most of the images Max is looking at the experiments and data very carefully. It looks like he is thinking and taking lots of notes. Then, on page 20 he says, 'A conclusion explains whether or not the original hypothesis was correct.'"	

Work Time (continued)	Meeting Students' Needs
– "It might help a scientist if they organize the data so it's easier to compare. They could use visuals or graphs, and they could find the average. Max uses a line graphs and a bar graph to draw conclusions, and the information box on page 19 says that averages are helpful too." – "I think when scientists are analyzing the data they have to think about how their data is related to the hypothesis. Our group noticed that Max had to organize the data into graphs, and on page 20 Max says, 'But analyzing the data isn't enough. Scientists study the trends of the data to develop a final conclusion.' Then he starts talking about how the conclusion should be related to the hypothesis," or similar suggestions. • Praise students for their ability to use details, visual elements, and paraphrased quotes from the text when explaining what the text says explicitly and when drawing inferences. Explain they will now take a closer look at key vocabulary to further support their analysis of the text. Then, they will have an opportunity to further revise their work.	
C. Vocabulary to Deepen Understanding (15 minutes) • Introduce the third learning target: – "I can determine the meaning of unknown words and phrases using a variety of strategies." • Draw students' attention to the terms *determine*, *variety*, and *strategies*, discussed in previous lessons. Ask students to discuss the meaning of these terms in their groups then think about how they could restate the target in their own words. • After 1 minute, cold call a few students to paraphrase the learning target. Listen for: – "I can use many different techniques to find out the meaning of new words," or similar responses. • Invite students to share strategies they have used in previous lessons. Listen for students to mention roots and affixes, context clues, and reference materials. Refer to the **Vocabulary Strategies anchor chart** to affirm student responses and add new strategies as needed. • Remind the class that in the last lesson they used a dictionary page to help them determine the specific meaning of a complex term. Invite a few students to share what they recall about the term "variable." Listen for comments like: – "Variable has multiple meanings" – "The word variable has the same root as the term vary, and they both have to do with change." – "Variable can be both an adjective and a noun." – "Independent variables, dependent variables, and controlled variables are important parts of science experiments."	• To support visual learners and ELL students, display a drawing, image from the internet, or familiar synonym above or below key words in the learning target. • Consider using a think-aloud strategy, either whole class or with a small group, to model using vocabulary strategies for the first several terms.

Work Time (continued)	Meeting Students' Needs

• Say something like: "Sometimes a dictionary or other reference tool can be really helpful when you stumble across a complicated term like variable. Now let's think about the meaning of a word that may seem more familiar to you."
  * "What does the word *draw* mean?"
• Invite several students to share definitions. Listen for: "to create a picture" or similar suggestions.
• Say something like: "Let's take a moment to consult a reference material. Here is an example of what you might find if you searched for a definition of the word draw on the internet."
• Distribute the **internet reference page** and ask:
  * "What do you notice about the meaning of the word draw?"
• Cold call several students to share out and listen for:
  – "I notice it has a lot more definitions than I thought."
  – "I notice that draw can mean to pull or move something."
  – "I notice that draw can be used as a verb and a noun," or similar suggestions.
• Say something like: "Sometimes words that seem very simple can have multiple meanings and figuring out what those words mean can be just as tricky as defining a complex term. Using reference materials and context clues together can help you determine the correct meaning of a word with more than one definition. Let's look at the way draw is used in *Max Axiom*."
• Have students open their books to page 18. Instruct them to listen as you read the first speech bubble aloud, "The information gathered is known as data. Scientists use data to draw conclusions about an experiment."
• Ask students to think about and discuss the following question in their groups:
  * "What do you think the word draw means in the context of page 18 of *Max Axiom*?"
• After 1 minute, cold call several students to share out whole group. Encourage students to refer to the specific details from the text to explain how they made their decision. Listen for:
  – "I think draw means to reach a conclusion, because Max said 'scientists use data to draw conclusions' and in the definition it says that draw can mean to reach a conclusion by using information."
  – "I think draw means to reach an idea or conclusion, because the other definitions, like moving something, filling a bath or taking a breath really wouldn't make sense in this sentence. To reach an idea or conclusion makes sense."
	• For student reference, display a working definition of "academic vocabulary," or "words found in a variety of genres and subjects unrelated to science," and "scientific vocabulary," or "words unique to science concepts."

Work Time (continued)	Meeting Students' Needs
– "I think draw mean to reach an idea or conclusion by using information to make an inference because I notice that the example from *Max Axiom* is very similar to the example on the internet reference page. Both of the examples say, 'draw a conclusion,'" or similar suggestions. • Recognize students for their ability to use multiple strategies to determine the meaning of the term. Encourage them to continue selecting and using appropriate vocabulary strategies as they complete their vocabulary task today. • Say something like: "Now you have a chance to reread this section of the book a little more deeply to focus on key words. Independently read pages 16–21 again. This time as you read, use vocabulary strategies to determine the meaning of the words *gather*, *develop*, *observations*, *data*, draw, *contents*, *conclusion*, and *findings*. Remember to record your thinking in the four-column chart of your journal glossary." • Clarify as needed, then distribute a **dictionary** to each group. Ask students to use a variety of strategies to determine the meaning of key terms and complete the four-column chart for each word. Circulate to offer support. • After 5 minutes of group work, invite students to share out the meaning of each word. Encourage students to explain the vocabulary strategies they used to determine the meaning of each term. Listen for: – "Gather means to collect because in section 2 Max collected information from the library and on page 16 he says 'Gather information. Check!' Also, I replaced the word gathered with collected and it made sense." – "Develop means to create because in the text is says develop a hypothesis and in section 2, Max created a hypothesis." – "Observations means information you collect from looking closely because I know that observe means to look closely and Max is looking closely at the experiments on pages 16 and 17." – "Data means the information you gathered because that is what it says in the text on page 18." – "Draw means to reach a conclusion, which I learned from my internet reference sheet." – "Contents are the materials held inside the container because on page 19, Max says the rock levee lost most of its contents and I know that it lost most of the water it was holding." – "Conclusion means a summary of the analysis or results because I looked at the context clues and you have to use all the information to make a conclusion and Max's conclusion is like a summary of his experiment." – "Findings are results because Max is going to present his results," or similar ideas. If students do not arrive at these definitions themselves, provide definitions for them. • Give students 1-2 minutes to work with group members to determine whether each word is academic or scientific.	

Work Time (continued)	Meeting Students' Needs
• After 1-2 minutes, refocus students whole group. Cold call students to share their thoughts. • After hearing students' ideas, reveal the actual sorting of academic and scientific words as seen on *Max Axiom*: Details and Visual Elements graphic organizer, page 3 (answers, for teacher reference). Have students add the key terms to the appropriate box on their graphic organizers. • Ask students to briefly go back to their graphic organizers from Work Time B to revise their thinking, based on new understandings about key terms. • As time allows, invite students to share out the revisions they made to their graphic organizers. Refer again to the Max Axiom: Details and Visual Elements Graphic Organizer, page 3 (answers, for teacher reference). • Celebrate students' ability to use details, visual elements, and key vocabulary to contribute to their understanding of a complex idea like steps a scientist can use to solve a problem.	

Closing and Assessment	Meeting Students' Needs
A. Debrief and Reviewing Learning Targets (5 minutes) • Focus students on the splash page of *Max Axiom* (pages 4 and 5). Say something like: "The splash page is often where the author introduces the main character(s.)." Ask students to review the panels on the splash page and discuss in groups: ∗ "What can you learn about Max Axiom's character traits by looking at the splash page?" ∗ "What can you learn about Max Axiom by examining his appearance, including his clothing and possessions?" • After 1 or 2 minutes, cold call several students to share their thinking. Listen for: – "I can tell that Max Axiom is a scientist because he is wearing a lab coat." – "The expression on Max Axiom's face on page 4 makes me think he is very serious." – "I learned that Max Axiom is very helpful because he is going to help the mayor solve the problem so the city doesn't flood and he is going to teach us about steps that can be used to solve a problem." – "I think Max Axiom is adventurous because he rides a motorcycle," or similar suggestions. • Tell students they will get to introduce a character from their independent reading by creating their own graphic novel page for homework. Have each student select one **Graphic Novel Template A, B, or C**. • Ask students to follow along as you reread each learning target. Then, instruct students to quickly find a classmate who is not in their group and discuss: ∗ "Which learning target was most challenging for you today?" ∗ "What strategies did you use to work on that learning target?" • If time allows, invite a few partners to share their thinking whole group.	• Provide a sentence frame to support students during their discussions: "We did/did not meet our group goal because _____," "The learning target that was most challenging to me was _____ because _____," or "Strategies I used to work on the learning target are _____."

Homework	Meeting Students' Needs
• Read at least five pages from your independent reading text to complete your Graphic Novel Template. Bring your completed template to class to use in our entry task for the next lesson. • If you did not finish in class, complete your four-column chart for each of the vocabulary words and sort into the appropriate key word boxes on your graphic organizer. • Read your independent reading book for at least another 15–20 minutes and write a response to another one of the questions on your Independent Reading Choice Board.	• Allow struggling writers to dictate their responses to someone at home. • Allow students to use images from other sources such as the internet, magazines, etc. to paste onto their templates. • Consider providing a recording of the text for struggling readers.

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 4
Supporting Materials

Max Axiom: Details and Visual Elements Graphic Organizer, Page 3

How do authors structure text and use visual elements to engage and support readers' understanding of complex ideas?

SECTION 3: *"CONDUCTING THE EXPERIMENT"*

Step 5: Conduct the Experiment

Details that explain *how* to conduct an experiment

- _____
- _____
- _____

Visual Element Focus: "Colors"
How do colors support your understanding of the fifth step Max Axiom takes to solve a problem?

Max Axiom: Details and Visual Elements Graphic Organizer, Page 3

Step 6: Analyzing Data and Drawing a Conclusion

Details that explain *how* to analyze data and draw a conclusion

- _____
- _____
- _____

Visual Element Focus: "Diagrams/Information Boxes"
How do diagrams and information boxes support your understanding of the sixth step Max Axiom uses to solve a problem?

Key Terms (scientific)

Key Terms (academic)

Max Axiom: Details and Visual Elements Graphic Organizer, Page 3
(Answers, for Teacher Reference)

How do authors structure text and use visual elements to engage and support readers' understanding of complex ideas?

SECTION 3: *"CONDUCTING THE EXPERIMENT"*

Step 5: Conduct the Experiment

Details that explain *how* to conduct an experiment

- **It's important to keep each trial as similar as possible. Pay attention to the controlled variables.**
- **You have to measure the dependent variable so you know what is different in each trial.**
- **You should record any information you collect or observations you make.**

Visual Element Focus: "Colors"

How do colors support your understanding of the fifth step Max Axiom takes to solve a problem?

Looking at the colors helps me understand Max's experiment because I can see the color of the levee is the only thing that changes. The color of the water helps me see how the dependent variable changed with each levee material. In the images, Max is taking a lot of notes. This helps me understand that it's important to record your data and observations.

Max Axiom: Details and Visual Elements Graphic Organizer, Page 3
(Answers, for Teacher Reference)

Step 6: Analyzing Data and Drawing a Conclusion

Details that explain *how* to analyze data and draw a conclusion

- **Charts and graphs can help you organize your data so you can understand the information.**
- **Averages can help you analyze numbers.**
- **Scientists look for trends, or patterns, to help them draw conclusions.**
- **The conclusion says if the hypothesis was right or wrong.**

Visual Element Focus: "Diagrams/Information Boxes"
How do diagrams and information boxes support your understanding of the sixth step Max Axiom uses to solve a problem?

The graphs on pages 18 and 19 help me see how Max used graphs to analyze his raw data and draw conclusions. The information box on page 19 helps me understand how to use averages to analyze numbers.

Key Terms (scientific)
data, findings

Key Terms (academic)
gather, develop, observations, draw, contents, conclusion

Internet Reference Page

Learning Target: I can consult reference materials, both print and digital, to find the pronunciation and determine or clarify the meaning of key words and phrases

INTERNET SEARCH TERMS **Define Draw**

Search: **Draw**

Search Results

draw
draw /druː/
VERB
(past tense **drew**; past participle **drawn**)

1. To create a picture or diagram by making lines and marks on paper
   Examples: *She decided to draw a map to show him where to go.*

   The boy drew a picture of a dog.
2. To pull or move something
   Examples: *I drew back the curtains to let in the sunlight.*

   He drew his sword.
3. To move somewhere in a slow and steady way
   Example: *The train drew into the station.*
4. To fill a bath
   Example: *The mother drew a bath for the baby.*
5. To take in (a breath):
   Example: *The teacher drew a long breath.*
6. To direct or attract
   Examples: *The girl drew her mother's attention to the problem.*

   The museum draws many visitors each day.
7. To reach (an idea or conclusion) by using information to make an inference

   Example: *He had looked at several resources and was ready to draw his conclusion.*
8. (draw on) to use ones experience or skills as a resource
   Example: *He was able to draw on past experiences to help make the decision.*

Internet Reference Page

NOUN

1. The act of selecting names randomly for a lottery or sporting event.
   Example: *They made the draw for this year's tournament.*
2. A competition that ends in a tie
   Example: *He scored twice to force a draw.*
3. A person or thing that is very attractive or interesting
   Example: *The circus was a major draw for the community.*

Graphic Novel Template A

Name:

Date:

Directions:

1. Select one of the main characters from your independent reading text.
2. Use the frames/panels below to create a graphic novel page that introduces the character you selected. Consider including: identifying features of physical appearance and dress, as well as a representation of at least two defining character traits.
3. Incorporate both text and visual elements into your graphic novel page.
4. Bring your completed template to class to share at the start of our next lesson.

Graphic Novel Template B

Name:

Date:

Directions:

1. Select one of the main characters from your independent reading text.
2. Use the frames/panels below to create a graphic novel page that introduces the character you selected. Consider including: identifying features of physical appearance and dress, as well as a representation of at least two defining character traits.
3. Incorporate both text and visual elements into your graphic novel page.
4. Bring your completed template to class to share at the start of our next lesson.

Graphic Novel Template C

Name:

Date:

Directions:

1. Select one of the main characters from your independent reading text.
2. Use the frames/panels below to create a graphic novel page that introduces the character you selected. Consider including: identifying features of physical appearance and dress, as well as a representation of at least two defining character traits.
3. Incorporate both text and visual elements into your graphic novel page.
4. Bring your completed template to class to share at the start of our next lesson.

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 5

Paraphrasing Quotes and Analyzing Visual Elements, Part 4: *Investigating the Scientific Method with Max Axiom Super Scientist*

Paraphrasing Quotes and Analyzing Visual Elements, Part 4:

Investigating the Scientific Method with Max Axiom Super Scientist

Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)	
I can quote accurately from a text when explaining what the text says explicitly and when drawing inferences. (RL.5.1) I can paraphrase information in notes and finished work. (W.5.8) I can analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text. (RL.5.7) I can draw evidence from literary texts to support analysis, reflection, and research. (W.5.9)	
Supporting Learning Targets	**Ongoing Assessment**
• I can explain the last step Max Axiom takes to solve a problem by paraphrasing quotes from *Max Axiom*. • I can analyze how visual elements in *Max Axiom* contribute to my understanding of the last step Max Axiom takes to solve a problem. • I can draw evidence from the text and visual elements in *Max Axiom* to support my analysis of how Max Axiom used a process to solve a problem.	• Graphic Novel Template A, B, or C (from homework) • Gist (in journal) • *Max Axiom*: Details and Visual Elements graphic organizer, page 4 • Response to reflection questions (in journal) • Open Response task card • Independent Reading Choice Board response

Agenda	Teaching Notes
1. Opening A. Reviewing Homework and Engaging the Reader (5 minutes) 2. Work Time A. Determining the Gist: *Max Axiom*, Section 4: "Sharing the Findings" (10 minutes) B. Second Read: Explaining the Last Step Max Axiom Takes to Solve a Problem and Analyzing Visual Elements (20 minutes) C. Writing Prompt: Drawing on Evidence and Visual Elements in Text to Support Analysis (20 minutes) 3. Closing and Assessment A. Debrief and Reviewing Learning Targets (5 minutes) 4. Homework A. Reread *Max Axiom*: Section 4 B. Finish Classwork C. Independent Reading	• This lesson serves to familiarize students with the final step Max Axiom takes to solve a problem and the remaining visual elements found in a graphic novel. It also gives students an opportunity to synthesize their learning from Lessons 2–4 in preparation for the mid-unit assessment they take in the next lesson. • Aside from paraphrasing quotes, analyzing visual elements, and determining the meaning of key terms to support their understanding of the final step Max Axiom takes to solve a problem, students are asked to respond to a writing prompt that requires them synthesize their learning about Max Axiom's process for solving a problem. Then, students are asked to refer back to specific pages from the text to consider and discuss how real world scientists might engage in a process of scientific inquiry that is different from the process Max Axiom uses. Emphasize to students that the process real world scientists use to develop solutions is not typically sequential, as it requires going back to repeat various stages of the experiment to refine their thinking until they are able to arrive at an accurate conclusion. This work not only prepares students to respond to similar questions on the mid-unit assessment, but also serves as a scaffold toward the final performance task: the creation of a graphic novelette to explain how an invention was developed to meet societal needs. • Note that today's vocabulary work is incorporated into Work Time B to provide students with more time to analyze the text and respond to the synthesis question during Work Time C. • Be sure students do not read past page 23 during this lesson, since they will read pages 24–27 for the Mid-Unit 1 Assessment in Lesson 6. • In advance: – Display Vocabulary Strategies anchor chart (from Lesson 2). – Familiarize yourself with *Max Axiom*: Details and Visual Elements graphic organizer, page 4 (answers, for teacher reference) to be prepared to support students as they identify and analyze key details and visual elements in Work Time B. – Consider displaying the writing prompt to save time during Work Time C. – Review Fist to Five (see Appendix).

Lesson Vocabulary	Materials
explain, steps, quotes, analyze, visual elements, contribute, evidence, process, communicate, results, account, display (22), common, traits, abstract, unraveling (23)	• *Investigating the Scientific Method with Max Axiom Super Scientist* (book; one per student) • Journals (students' own, begun in Lesson 1) • *Max Axiom*: Details and Visual Elements graphic organizer, page 4 (one per student) • Visual Elements of a Graphic Novel reference page (from Lesson 1, taped into journals) • Vocabulary Strategies anchor chart (from Lesson 2; one for display) • *Max Axiom*: Details and Visual Elements graphic organizer, page 4 (answers, for teacher reference)

Opening	Meeting Students' Needs

A. Reviewing Homework and Engaging The Reader (5 minutes)
• Have students share their completed Graphic Novel Template, A, B, or C with a classmate. Ask them to discuss the following questions:
  * "Which visual elements did you incorporate to emphasize key details about a main character(s) from your independent reading?"
  * "How do these visual elements help communicate the ideas on your template?"
• After 2 or 3 minutes, cold call several students to share how their partners used visual elements to communicate ideas. Encourage students to explain how the visual elements supported key understanding about the event described on the template. Answers will vary.
• Tell students that today they will explore the remaining visual elements and how they support their understanding of the final step Max Axiom takes to solve a problem. Remind students that their homework task and analysis of the information presented in *Max Axiom* will help them prepare for planning and creating their own graphic novelette in Unit 3 .
	• Provide sentence starters to support student discussions: "The visual elements I used are _____," or "These visual elements communicate the ideas on my template because _____."

Work Time	Meeting Students' Needs
A. Determining the Gist: *Max Axiom*, Section 4: "Sharing the Findings" (10 minutes) • Ask students to locate their text ***Investigating the Scientific Method with Max Axiom Super Scientist*** and their **journals** then join their small groups from Lessons 1–4. • Explain that in today's lesson, students will closely read only a part of Section 4 of *Max Axiom* as a group to analyze the text for understanding of the final step in the scientific method (ensure students do not read past page 23, as they will read pages 24–27 for the Mid-Unit 1 Assessment in Lesson 6). • Give students an opportunity to check in with their group members about the group norm goal they created in the last lesson. If students struggled with meeting their previous goal, they should identify strategies to continue working on it today. If, as a group they feel they achieved their goal, ask them to create a new goal for today's work. • After 2 to 3 minutes, cold call a student from each group to share out with the class. Listen for examples such as: – "We are going to keep asking questions like, 'What do you think?' or 'Do you have anything to add to my idea?' to encourage all of our group members to share." – "We think we did a good job with our goal about asking for clarity, but we are going to keep working on it today because it really helped our discussion." – "We created a new goal that everyone in our group will try to share equally because last time some people were talking most of the time, and we want to make sure everyone gets to participate." • Give students specific positive feedback for ways in which they are recognizing the needs of the diverse members of their group and developing strategies to help improve the discussion for everyone. • Tell students that, just as in prior lessons from this unit, today's first read will be for gist. Cold call a few students to explain reading for gist. Listen for: – "The gist is a really broad statement about what the text or the section of text is generally about." – "There could be more than one right answer for the gist." – "Reading for gist helps you understand the general meaning of the text so you can focus on understanding the deeper meaning when you read a second time," or similar responses. • Ask students to open their books to page 22. Direct them to read <u>only</u> pages 22 and 23 as a group (see Teaching Note). Ask them to alternate panels they read aloud. While one student is reading a panel aloud, other group members should follow along silently in their own text. Remind students to consider and discuss the gist as they work.	• Provide sentence frames to support student discussions about group norms: "We struggled with _____ norm, so we will continue to work on it by _____," or "We mastered our last norm so we are going to work on _____ today because our group needs to practice _____ to work better together." • For students who struggle to determine the gist of longer passages, encourage them to find the gist of facing pages to keep track as they go and make it more manageable to determine the gist of the entire section. • Allow struggling writers to dictate their gist statement to a peer or aide acting as a scribe.

Work Time (continued)	Meeting Students' Needs
• After 4 or 5 minutes, or as groups seem to complete the task, cold call a student from each group to share the gist. Listen for: – "Max is sharing his results with the mayor and her team." – "Max is explaining how to share the results of a scientific experiment," or similar responses. • Give students 1 minute to record their gist statements on the same page in their journal where they recorded their previous gist statements.	
B. Second Read: Explaining the Last Step Max Axiom Takes to Solve a Problem and Analyzing Visual Elements (20 minutes) • Say: "Now that we understand the gist of these pages, let's review the first two learning targets to help focus our attention as we read even more closely." • Read the learning targets aloud or invite volunteers to read them aloud: * "I can explain the last step Max Axiom takes to solve a problem by paraphrasing information from *Max Axiom*." * "I can analyze how visual elements in *Max Axiom* contribute to my understanding of the last step Max Axiom takes to solve a problem." • Draw students' attention to the following key vocabulary they are familiar with from previous lessons: *explain*, *steps*, "paraphrasing," *analyze*, *visual elements*, and *contribute*. • Remind students that while challenging, the terms should seem more familiar now. Encourage them to quickly review the meaning of terms in their groups. • After 1 or 2 minutes, cold call several students to share definitions for each term. Listen for: – "Explain means to describe with details or to teach others." – "Steps means stages or phases in a process, like steps to follow to complete a recipe." – "Paraphrasing means restating in your own words." – "Analyze means to study carefully." – "Visual elements are things the author does with text or pictures to draw our attention." – "Contribute means to add to or support," or similar responses. • Point out that the learning targets for this lesson are very similar to the targets they've been working on over the past few days.	• To support visual learners and ELL students, display a drawing, picture from the internet, or familiar synonym above or below key words in learning targets. • To support visual learners, consider allowing students from each group to display an example of the visual element (ambient sounds or text type) under the document camera. • For students who struggle with the physical act of writing, allow them to type their responses on a computer or word processor, or dictate to an aide or peer acting as a scribe.

Work Time (continued)	Meeting Students' Needs
• Distribute ***Max Axiom*: Details and Visual Elements graphic organizer, page 4**. Remind students that this graphic organizer helps them capture their thinking as they work toward today's targets. Invite several students to explain the steps for completing the graphic organizer. Listen for the following details. If students do not independently express these ideas, ask targeted questions to remind them: – "We find details in the text that explain how to collect data and analyze data and draw conclusions. Then we paraphrase, or say in our own words, the details we found and record them next to the bullet points." – "To paraphrase we restate the ideas in our own words, but make sure it still sounds natural and means the same thing." – "We read the visual element focus and think about how that visual element helps us understand these steps Max Axiom takes to solve a problem. We discuss our ideas with our group. Then we record our thoughts under the question on the graphic organizer." – "We can use the **Visual Elements of a Graphic Novel reference page** taped into our journals to help us learn more about the visual elements." • Direct students to look at the key terms located at the top of their *Max Axiom*: Details and Visual Elements graphic organizer, page 4. Read each term aloud then explain that in today's lesson, students must consider the key vocabulary as they complete the graphic organizer. Refer to the posted **Vocabulary Strategies anchor chart** and remind students to select and apply strategies that help them determine the meaning of each word to help them make sense of the text. Encourage students to work as a group to complete the four-column chart in their glossaries and sort the terms on their graphic organizers after they record paraphrased quotes and analyze the visual elements. • Ask students to consider and discuss how the graphic organizer will help them meet today's learning targets. • After 1 to 2 minutes, cold call a few students to share their thoughts. Listen for: – "When we record the details next to the bullet point, it helps us work on the first target because we have to paraphrase information about the last step Max Axiom takes to solve a problem." – "The question on the bottom of the panel in our graphic organizer makes us think about the visual elements and how they help us understand the ideas better. That helps us work on the second target," or similar responses. • Direct students to collaborate with their group to read pages 22 and 23 a second time and complete the graphic organizer. • After 7 or 8 minutes, refocus whole group. Ask students to share out their paraphrased quotes from the text that explain how to design an experiment and collect data. Refer to ***Max Axiom*: Details and Visual Elements graphic organizer, page 4 (answers, for teacher reference)** as needed.	

Work Time (continued)	Meeting Students' Needs
• Cold call several students from different groups to share examples of each of the visual elements they found. Listen for: – The example of "ambient sounds" is: "Wwhirrrrrrr" (page 22) – Examples of "text type" could include: • Color, size, and font of "Conference Room" (page 22) • Size and font of "Project Report" (page 22) • Color and font of "Data, Journal, Abstract, and Model" (page 23) • Invite a student from each group to share their response to the following question from their graphic organizers: * "How do ambient sounds and text type support your understanding of the last step Max Axiom takes to solve a problem?" • Give students 4 or 5 more minutes to determine and record the meaning of key terms listed at the top of their graphic organizers: *communicate*, *results*, *account*, *display*, *common*, *traits*, *abstract*, AND *unraveling*. If time allows, ask students to sort each term into the appropriate key word box on their graphic organizer. • After 4 to 5 minutes, ask students from each group to help define the key terms. Listen for: – "Communicate means to share or tell." – "Results are conclusions, answers." – "Account means a record, like the notes you keep." – "Display means to show." – "Common means shared or something that is the same." – "Traits are characteristics or qualities." – "Abstract in this context means a short summary of the scientific findings." • "Unraveling in this context means making something understandable," or similar responses. • Congratulate students on their in-depth analysis of information and visual elements found in *Max Axiom* over the past few lessons. Explain that this analysis not only helps them develop their understanding of a complex topic, such as how scientists use a process of scientific inquiry to solve problems, but it also supports their learning through the rest of this module as they study real inventions that were developed to meet people's needs. In particular, their work over the past few lessons is an important part of their understanding of how to create their own graphic novelettes in Unit 3.	

Work Time (continued)	Meeting Students' Needs

C. Writing Prompt: Drawing on Evidence and Visual Elements in Text to Support Analysis (20 minutes)
• Read the last learning target aloud:
  * "I can draw evidence from the text and visual elements in *Max Axiom* to support my analysis of how Max Axiom used a process to solve a problem."
• Focus students on these familiar terms: "evidence," "visual elements," "support," and "analysis". Remind students they have worked with these terms quite a bit, and that these words are used in a new target in this lesson. Then ask:
  * "In this target, what do you think the word 'process' means?"
• After 1 minute, invite a few students to share their thinking whole group. Listen for:
  – "I think a process is a method, course of action, or series of steps, because Max Axiom took several steps to develop a solution to the mayor's problem." If students are not able to define "process" accurately, define it for them. Continue to reinforce that the scientific method or process is more iterative than linear.
• Next, ask students to take a moment to think about the meaning of each key term in the context of this new target and discuss their thinking with group members.
• After 1 or 2 minutes, ask students to consider and discuss:
  * "What does this learning target really mean?"
• After 1 or 2 minutes, invite students to share their ideas. Listen for:
  – "It means we need to use information we learned and visual elements in *Max Axiom* to explain how Max solved a problem," or similar responses.
• Remind students that after completing each page of their *Max Axiom*: Details and Visual Elements graphic organizer, they responded to a reflection question, using information from the text to support their ideas. Tell them that now that they have learned about the final step Max Axiom took to solve a problem, they get to synthesize their learning.
• Display the following writing prompt:
  * "How did Max Axiom use a scientific process to solve a problem? Use details from the text and visual elements to explain your thinking." Clarify terms as needed.
• Ask students to discuss their thinking in groups then respond to the writing prompt on a new blank page in their journals.
	• To support visual learners and ELL students, display a drawing, image from the internet, or familiar synonym above or below key words in the learning target.
	• Consider using Think-aloud protocol, either whole class or with a small group, to model using vocabulary strategies for the first several terms.
	• For student reference, display a working definition of "academic vocabulary," or "words found in a variety of genres and subjects unrelated to science," and "scientific vocabulary," or "words unique to science concepts."
	• Provide sentence frames to support struggling writers: "Max Axiom used solved the problem by _____," or "The visual elements that most helped me understand how scientists could use the scientific method to solve problems are _____ because _____."

Work Time (continued)	Meeting Students' Needs
• After 7 to 8 minutes, invite several students to share their ideas with the class. A possible student response could be: – "Max Axiom used various steps to help him determine which material is best for building a levee so he could save the city from flooding. On the splash page, Max learned that they needed to build the strongest levee possible to prevent river water from seeping into the city. The process he used helped him organize his ideas and figure out how to solve the problem and build the best levee. He developed a question and then used information he collected from the library to make a hypothesis and design his experiment. The data he collected helped him learn that the clay levee held back more water than the rock or soil levees. His hypothesis was correct! He shared the information with the mayor so she could build a strong levee and the city wouldn't flood." • Next, ask students to look back to page 5 of the text and focus on the upper-most speech bubble in the lower right-hand frame/panel, "The order or number of these steps can always change, but scientists often rely on these basic methods to organize information." • Pose the following question for students to consider and discuss with group members: – "How might real world scientists engage in a process of scientific inquiry that is different from the process Max describes throughout the novel?" • Encourage students to go back to the text, particularly pages 9, 11, 19, 21, 22, and 23, to help them formulate a response to the question. Provide clarification as necessary, then circulate to offer support and guidance. • After 3 or 4 minutes, invite students from each group to share their thinking with the class. Remind them to support their ideas with information from the text. Listen for: – "One way a scientist's process may differ from Max Axiom's is that they will repeat steps. I think this because on page 9 Max says '… repeating the original research can never hurt.'" – "On page 11, Max says, 'don't worry about the hypothesis being correct …,' so I think that once scientists gather more data they may go back and revise their original hypothesis before continuing or repeating other steps of the process. I think scientists will organize their data differently, and not use all the types of graphs shown in the graphic novel because on page 19 Max points out that 'Not every type of chart or graph is needed for every project.'" – "I think that some scientists will repeat their experiments to double-check how correct their results are because on page 21, Max explains, 'If there's time, scientists double-check the accuracy of the conclusion by repeating the experiment.'" – "I think scientists will present their information in different ways because on pages 22 and 23, Max describes many different ways that scientists can communicate their results like publishing a report, presenting to teachers, students, or judges, and building different types of science project displays," and similar suggestions.	• For student reference, write the question and the page numbers they are encouraged to review on the board or a piece of chart paper.

Work Time (continued)	Meeting Students' Needs
• Reiterate to students that the process of scientific inquiry is not linear, but rather it requires scientists to go back to various stages of their process to refine their thinking and try different things to arrive at an accurate conclusion. • Praise students for their ability to draw evidence from the text to support their analysis of how Max Axiom and real world scientists use various processes to develop solutions that meet the needs of society.	

Closing and Assessment	Meeting Students' Needs

A. Debrief and Reviewing Learning Targets (5 minutes)
• Ask students to consider and discuss:
  * "Which visual elements did you find most helpful for learning about the process Max Axiom used to solve a problem?"
• After 1 or 2 minutes, invite several students to share out whole class. Listen for students to offer comments such as:
  – "The visual element that supported my understanding the most was the splash page. The splash page really helped me understand the problem. It especially helped to see the close-up image of the mayor's eye because it helped me to realize that this was a very big problem for the city. The splash page also helped me learn steps that scientists can take to develop solutions to a problem."
  – "The images on the splash page supported my understanding, but so did the other images. The images of Max rushing to the helicopter, entering the conference room, and presenting his results helped me understand that if scientists communicate their results, the information can be used to solve problems before they become disastrous."
• Read or invite students to read each of the learning targets aloud.
• Remind students of their previous conversation about how *Max Axiom*: Details and Visual Elements graphic organizer helped them capture their thinking as they worked toward mastery of each target. Direct students to take a few moments to look through all four pages of their graphic organizer and consider their progress toward meeting the learning targets.
• After 2 minutes, have students use Fist to Five to show how they feel about their progress. If any students showed fewer than three fingers, consider providing ways to revisit the content before the Mid-Unit 1 Assessment.
• Inform students they will take the Mid-Unit 1 Assessment in the next lesson.
	• Display the learning targets for student reference.

Homework	Meeting Students' Needs
• Reread only pages 22–23 of *Max Axiom*. Add to or revise at least one area of your *Max Axiom*: Details and Visual Elements graphic organizer based on new insights from your reread of the text or new understandings about key terms. • If not finished in class, complete the four-column chart for each vocabulary word from this lesson, and sort key terms into the academic or scientific key word boxes on your graphic organizer. • Read your independent reading book for at least 20–30 minutes, and write a response to a fourth question from your Independent Reading Choice Board (from Lesson 1).	• Allow struggling writers to dictate their responses to someone at home. • Consider providing a recording of the text for struggling readers.

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 5
Supporting Materials

Max Axiom: Details and Visual Elements Graphic Organizer, Page 4

How do authors structure text and use visual elements to engage and support readers' understanding of complex ideas?

Key Terms: communicate, results, account, display, common, traits, abstract, unraveling

SECTION 4: "SHARING THE FINDINGS"

Step 7: Communicate Results

Details that explain *how* to communicate results

- _____
- _____

Visual Elements Focus: "Ambient Sounds" and "Text Type"

How do ambient sounds and text type support your understanding of the final step Max Axiom takes to solve a problem?

Key Terms (scientific)

Key Terms (academic)

Max Axiom: Details and Visual Elements Graphic Organizer, Page 4
(Answers, for Teacher Reference)

How do authors structure text and use visual elements to engage and support readers' understanding of complex ideas?

Key Terms: communicate, results, account, display, common, traits, abstract, unraveling

SECTION 4: "SHARING THE FINDINGS"

Step 7: Communicate Results

Details that explain *how* to communicate results

- **You could write a project report or create a presentation to share with teachers, students, or judges.**
- **A presentation frequently includes data, a detailed account of the experiment, an abstract, and a model.**

Visual Elements Focus: "Ambient Sounds" and "Text Type"

How do ambient sounds and text type support your understanding of the final step Max Axiom takes to solve a problem?

The "wwhirrrrrrr" from the plane helped me realize that it's very important to communicate ideas quickly. The different font and colors for "Conference Room," "Project Report," "Data," "Journal," "Abstract," and "Model" help me understand important ways a scientist can communicate results.

Key Terms (scientific)

abstract

Key Terms (academic)
communicate, results, account, display, common, traits, unraveling

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 6

Mid-Unit Assessment: Analyzing Visual Elements in a Graphic Novel

Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)	
I can analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text. (RL.5.7) I can draw evidence from literary texts to support analysis, reflection, and research. (W.5.9) I can determine or clarify the meaning of unknown and multiple-meaning words and phrases based on fifth-grade reading and content, choosing flexibly from a range of strategies. (L.5.4)	
Supporting Learning Targets	**Ongoing Assessment**
• I can explain how visual elements add meaning to the description of the scientific problem Max Axiom will encounter next. • I can determine the meaning of unfamiliar words and phrases using a variety of strategies. • I can reflect on my learning about how visual elements add meaning to the text and use a variety of strategies to determine the meaning of unfamiliar words and phrases.	• Mid-Unit 1 Assessment: Analyzing Visual Elements in a Graphic Novel • Tracking My Progress: Mid-Unit 1 recording form

Agenda	Teaching Notes
1. Opening A. Reviewing Homework and Engaging the Reader (5 minutes) B. Reviewing Learning Targets (5 minutes) 2. Work Time A. Mid-Unit 1 Assessment: Analyzing Visual Elements in a Graphic Novel (35 minutes) B. Tracking My Progress: Reflecting on Learning (10 minutes) 3. Closing and Assessment A. Debrief: Sharing Reflections on Learning Targets (5 minutes) 4. Homework A. Reread final section of *Max Axiom* B. Independent reading	• Review the Mid-Unit 1 Assessment: Analyzing Visual Elements in a Graphic Novel and the final section of *Max Axiom*, pages 24–27. This assessment begins with a series of text-dependent questions that require students to determine the meaning of unknown words using various vocabulary strategies, including context clues. • Students are asked to identify visual elements from the text, which is a scaffold that supports their ability to analyze text features in order to address Standard W.5.7, and draw evidence from the text to support their analysis on the final assessment question to address Standard W.5.9. • In advance: – Ensure that all students have access to their own text of *Investigating the Scientific Method with Max Axiom Super Scientist* as well as their notes from Lessons 1–5, including the Visual Elements of a Graphic Novel reference page in their journals. – Display the Close Readers Do These Things anchor chart and the Vocabulary Strategies anchor chart from Lessons 1–5 for student reference during the assessment. – Review Milling to Music in Checking for Understanding Techniques (see Appendix).

Lesson Vocabulary	Materials
visual elements, problem, encounter, analyze, variety, strategies	• Journals (students' own, begun in Lesson 1) • *Max Axiom*: Details and Visual Elements graphic organizer, pages 1–4 (students' own, from Lessons 2–5) • Visual Elements of Graphic Novels reference page (from Lesson 1, taped into journals) • *Investigating the Scientific Method with Max Axiom Super Scientist* (book; one per student) • Close Readers Do These Things anchor chart (from Lesson 1) • Vocabulary Strategies anchor chart (from Lesson 2) • Mid-Unit 1 Assessment: Analyzing Visual Elements in a Graphic Novel (one per student) • Mid-Unit 1 Assessment: Analyzing Visual Elements in a Graphic Novel (answers, for teacher reference) • Tracking My Progress: Mid-Unit 1 recording form (one per student)

Opening	Meeting Students' Needs
A. Reviewing Homework and Engaging the Reader (5 minutes) • Ask students to take out their Independent Reading Choice Boards then gather whole group • Review the procedure for Milling to Music with students. Provide clarification as needed. • Ask students to quickly mill to find a partner who is not a member of their regular group. Once students are paired up, ask them to share the question and response they completed on their choice boards for homework. • After 2 or 3 minutes, invite several students to share out interesting ideas they heard from their partner. • Then say something like: "Today you will complete the Mid-Unit 1 Assessment by reading the last four pages of *Max Axiom*, and answering some questions that allow you to show what you have learned about visual elements and how they contribute to the overall meaning of the ideas presented in a graphic novel. You will also get to flex your vocabulary muscles during today's assessment and demonstrate your ability to use a variety of strategies to figure out the meaning of new words."	

Opening (continued)	Meeting Students' Needs

B. Reviewing Learning Targets
• Display and read or invite volunteers to read each learning target aloud. Ask students to pay attention to familiar vocabulary words from the target and be ready to share the meaning.
  * "I can explain how visual elements add meaning to the description of the scientific problem Max Axiom will encounter next."
  * "I can determine the meaning of new words using a variety of strategies."
• Ask students to discuss with group members the important vocabulary from the targets that they recognize.
• Invite a volunteer from each group to share at least one word and its meaning.
• If not mentioned in the discussion, bring the words *visual elements*, *problem*, *encounter*, *analyze*, *variety*, and *strategies* to students' attention. Listen for students to offer definitions such as:
  – "Visual elements are what I can see in the book, such as pictures, colors, and text."
  – "A problem is a difficulty, trouble, or dilemma."
  – "Encounter is a verb meaning to meet or face."
  – "Analyze means to examine or study closely."
  – "Variety means a mixture or assortment."
  – "Strategies are plans or approaches to challenges."
	• To support students' understanding of the first target, model the process of viewing an image and thinking of a hint.
	• To support ELL students, consider drawing a picture or locating an image from the Internet to show the meaning of each key term.

Work Time	Meeting Students' Needs
A. Mid-Unit 1 Assessment: Analyzing Visual Elements in a Graphic Novel (35 minutes) • Give students an appropriate amount of time and support to locate the materials needed to complete the mid-unit assessment: – **Journals** – ***Max Axiom*: Details and Visual Elements graphic organizer, pages 1–4** – **Visual Elements of Graphic Novels reference page** – ***Investigating the Scientific Method with Max Axiom Super Scientist*** • Also make sure the **Close Readers Do These Things** and **Vocabulary Strategies anchor charts** are posted for student reference during the assessment. • Distribute the **Mid-Unit 1 Assessment: Analyzing Visual Elements in a Graphic Novel**. Give students a minute to quickly scan the assessment. • Be sure students notice the pages they will be reading for the assessment. All questions on this assessment can be answered by reading only pages 24–27 of *Max Axiom*. • Address any clarifying questions. • Give students approximately 30 minutes to work independently to complete the assessment questions. • Circulate to supervise; since this is a formal, on-demand assessment, do not provide support other than formally approved accommodations. • If students finish the assessment early, they may do the following: – Reread the entire graphic novel. – Work on completing the glossary in their journals by adding new words from the final section of *Max Axiom* that they just read for the Mid-Unit 1 Assessment, or add synonyms, phrases, and/or pictures to any words they have not had time to complete.	• ELLs receive extended time as an accommodation on New York State assessments.

Work Time (continued)	Meeting Students' Needs

B. Tracking My Progress: Reflecting on Learning (10 minutes)
• Introduce the learning target:
  * "I can reflect on my learning about how visual elements add meaning to the text and use a variety of strategies to determine the meaning of unfamiliar words and phrases."
• Focus students on the word "reflect." Ask for suggestions about what this word means. Listen for students to share:
  – "It means to look back at my work to think about what I did," "how I did," "what I am having trouble with," "what I am doing well," or similar responses.
• Distribute the **Tracking My Progress: Mid-Unit 1 recording form**. Explain that this is a self-assessment for students to use to reflect on their progress toward each of the learning targets. Read through the tracker and provide clarification as necessary.
• Ask students to independently complete their Tracking My Progress form. Ask them to hold on to this sheet to refer to during the debrief.
	• Consider allowing students who struggle with written language to dictate their reflections to a partner or the teacher. This allows all students to participate in the self-reflection in a meaningful way.

Closing and Assessment	Meeting Students' Needs
A. Debrief: Sharing Reflections on Learning Targets (10 minutes) • Pair students up. Ask them to share their reflections from the Tracking My Progress form. • Invite several students to share out whole group. • Collect students' Mid-Unit 1 Assessments and Tracking My Progress for review.	• Consider providing a sentence starter to ensure all students have access to the conversation: "On the _____ (first, second, third) target, I circled _____ because _____."

Homework	Meeting Students' Needs
• Reread the final four pages (24–27) of *Max Axiom* aloud to someone at home or to yourself. • Discuss with someone which visual elements prompt you to read some parts differently than others (i.e., with excitement, with concern, like a professor lecturing to an audience). • Read your independent reading book for at least 30 minutes and write a response to a fifth question from your Independent Reading Choice Board (from Lesson 1). *Note: Be prepared to return students' Mid-Unit 1 Assessments by Lesson 9.*	• Some students will benefit from having a "Phonics Phone" to use while reading aloud to more easily hear the inflection (or lack of) in their voice. Encourage students to continue practicing reading aloud until they are fluent enough to engage an audience with their reading. • Allow struggling writers to dictate their responses to someone at home. • Consider providing a recording of the text for struggling readers.

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 6

Supporting Materials

Mid-Unit 1 Assessment: Analyzing Visual Elements in a Graphic Novel

Name:

Date:

Learning Targets Assessed:

- I can analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text. (RL.5.7)
- I can draw evidence from literary texts to support analysis, reflection, and research. (W.5.9)
- I can determine or clarify the meaning of unknown and multiple-meaning words and phrases based on fifth-grade reading and content, choosing flexibly from a range of strategies. (L.5.4)

Directions:

- Read pages 24–27 of *Investigating the Scientific Method with Max Axiom Super Scientist*: "Sharing the Findings" to determine what this section is mainly about.
- Review the questions below.
- Refer to pages 24–27, other sections of the graphic novel, and your notes from Lessons 2–5 to help you answer each question.

1. On page 24, Mrs. Mayor praises Max, "Well done. With these *findings* the safety of the city can be restored." What does the word *findings* mean in this sentence?

   - ☐ a conclusion reached at the end of a court trial
   - ☐ a research result that comes from a scientific investigation
   - ☐ small tools used in making crafts
   - ☐ locating an item after it has been lost

Mid-Unit 1 Assessment: Analyzing Visual Elements in a Graphic Novel

2. On page 25, Max Axiom says, "They test and retest results before accepting the conclusion?"

a. What does the word retest mean in this sentence?

- ☐ do something over and over
- ☐ remake
- ☐ adjust
- ☐ test again

b. What part of the word *retest* helped you to determine the meaning in 2a, and why?

_____

c. Read the two dictionary definitions for the word *approach* below, and determine which is the correct definition based on how the word is used on page 26, "Each experiment is different, and each experiment requires a slightly different approach."

- ☐ Approach (verb): move closer
- ☐ Approach (noun): method

Mid-Unit 1 Assessment: Analyzing Visual Elements in a Graphic Novel

3. Look closely at pages 24–27.

a. Locate and name one example of each of the following visual elements:

Ambient sounds	
Speech bubbles	
Font size, color, style	
Images	
Colors	
Information boxes	

b. Write a 2–3 sentence statement to analyze how at least two of the above visual elements help you understand that Max Axiom has a new problem to solve. Be sure to support your thinking with examples and evidence from the text.

_____

_____

_____

_____

Mid-Unit 1 Assessment: Analyzing Visual Elements in a Graphic Novel
(Answers, for Teacher Reference)

Learning Targets Assessed:

- I can analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text. (RL.5.7)
- I can draw evidence from literary texts to support analysis, reflection, and research. (W.5.9)
- I can determine or clarify the meaning of unknown and multiple-meaning words and phrases based on fifth-grade reading and content, choosing flexibly from a range of strategies. (L.5.4)

1. On page 24, Mrs. Mayor praises Max, "Well done. With these *findings* the safety of the city can be restored." What does the word *findings* mean in this sentence? **(L.5.4a)**

- ☐ a conclusion reached at the end of a court trial
- ☑ a research result that comes from a scientific investigation
- ☐ small tools used in making crafts
- ☐ locating an item after it has been lost

Mid-Unit 1 Assessment: Analyzing Visual Elements in a Graphic Novel
(Answers, for Teacher Reference)

2. On page 25, Max Axiom says, "They test and retest results before accepting the conclusion?"

a. What does the word retest mean in this sentence? **(L.5.4b)**

- ☐ do something over and over
- ☐ remake
- ☐ adjust
- ☑ test again

b. What part of the word *retest* helped you to determine the meaning in 2a, and why?

"re-" because it means to do again or go back to

c. Read the two dictionary definitions for the word *approach* below, and determine which is the correct definition based on how the word is used on page 26, "Each experiment is different, and each experiment requires a slightly different approach." **(L.5.4a, c)**

- ☐ Approach (verb): move closer
- ☑ Approach (noun): method

Mid-Unit 1 Assessment: Analyzing Visual Elements in a Graphic Novel
(Answers, for Teacher Reference)

Ambient sounds	**"BEEP!"**
Speech bubbles	**"Looks like we have another problem on our hands" (or any other example from pages 24–27)**
Font size, color, style	**steps of the scientific method in purple, larger, and different font "WHAT'S A THEORY?" in green and all capitals, also in yellow and lowercase, definition in white, different font than rest of page**
Images	**close-up of Max's face as he looks out of helicopter; zoom in on Max's finger pressing the "Play" button; lines shooting out over Max's head; giant frogs on screen**
Colors	**bright red button on panel; grey/purplish background; blue/gray, green, and orange buttons on panel**
Information boxes	**"What's a Theory?" and "Steps of the Scientific Method"**

b. Write a 2–3 sentence statement to analyze how at least two of the above visual elements help you understand that Max Axiom has a new problem to solve. Be sure to support your thinking with examples and evidence from the text.

Look for students to mention and describe two of the following examples:

- **The ambient sound "beep" made me wonder if another problem was coming to Max because at the beginning of the book, the beep came from Mayor Richardson telling him about the flood problem.**
- **The speech bubble where Mayor Richardson is saying, "Looks like we've got another problem on our hands" confirmed my thinking.**
- **I can see there's a problem with frogs because of the images of giant frogs on Max's screen.**
- **The red button flashing makes me think there is an emergency, some kind of alert.**
- **The lines above Max's head while he holds it with his hands show he is worried, confused, or concerned about a problem**

Tracking My Progress Mid-Unit 1

Name:

Date:

Learning Target: I can explain how visual elements add meaning to the description of the scientific problem Max Axiom will encounter next.

1. The target in my own words is:

_____

_____

_____

_____

2. How am I doing? Circle one.

I need more help to learn this

I understand some of this

I am on my way!

3.The evidence to support my self-assessment is:

_____

_____

_____

_____

Tracking My Progress Mid-Unit 1

Name:

Date:

Learning Target: I can determine the meaning of unfamiliar words and phrases using a variety of strategies.

1. The target in my own words is:

_____

_____

_____

_____

2. How am I doing? Circle one.

I need more help to learn this

I understand some of this

I am on my way!

3.The evidence to support my self-assessment is:

_____

_____

_____

_____

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 7

Using Quotes to Explain Relationships: The Invention of the Electric Motor

Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)	
I can quote accurately from a text when explaining what the text says explicitly. (RI.5.1) I can determine the meaning of general academic and domain-specific words and phrases. (RI.5.4) I can explain the relationship between two or more individuals, events, ideas, or concepts in a scientific text based on specific information in the text. (RI.5.3)	
Supporting Learning Targets	**Ongoing Assessment**
• I can explain how the electric motor meets societal needs using quotes from the text. • I can determine the meaning of unfamiliar words and phrases from context. • I can identify the relationships between electricity and the electric motor based on information from the text.	• Independent Reading Choice Board response (from homework) • Gist statement (in journal) • Cause and Effect note-catcher: "The Electric Motor" • Vocabulary (in glossary) • Answers to text-dependent questions: "The Electric Motor"

Agenda	Teaching Notes
1. Opening A. Reviewing Homework and Engaging the Reader (5 minutes) 2. Work Time A. Determining the Gist: "The Electric Motor" (10 minutes) B. Second Read: Using Quotes to Explain How the Electric Motor was Developed to Meet Societal Needs (30 minutes) C. Identifying Relationships: Text-Dependent Questions (10 minutes) 3. Closing and Assessment A. Debrief and Reviewing Learning Targets (5 minutes) 4. Homework A. Reread "The Electric Motor" B. Finish Classwork C. Independent Reading	• In this lesson, students shift their focus from reading literature to reading purely informational text. Rather than analyzing visual elements and making inferences about complex ideas presented through literature, students are asked to quote accurately to explain ideas presented in informational texts about how new or improved technologies are developed to meet societal needs. Students also revisit their understandings from fourth grade about the ways informational text is structured to support readers' comprehension. • Students read the article "The Electric Motor," which specifically uses a cause and effect structure to relay information about the development of the electric motor. • During their second read, students capture information from the article onto a Cause and Effect note-catcher in the form of direct quotes from the text. Students are given a note-catcher for each of four different text structures they learn about during the second half of this unit, in order to meet the demands of standard RI.5.5, comparing and contrasting the structure of two or more texts. Students' work with various text structures and the note-catchers in Lessons 7 through 9 serves several purposes. It provides a concrete model of how authors organize information in order to convey their ideas. It also serves as a scaffold toward students' ability to compare and contrast the overall structures of texts they read in order to consider how structure supports their understanding of complex ideas. Students will compare and contrast text structures in Lesson 9, before taking the End of Unit Assessment in Lesson 10, during which their progress toward RI.5.5 will be formally assessed Additionally, students are asked to complete a chart using evidence from the article in the form of direct quotes, to demonstrate their enduring understanding of how new or improved technologies were developed to meet people's needs. • Students determine the meaning of key terms from context to deepen their understanding of the text. Then they go back and revise or add quotes to their note-catchers and/or chart, based on their new understanding of vocabulary. Note that students are no longer asked to sort scientific and academic vocabulary on the note-catcher as they did during the first half of the unit. This routine is being changed because the vast majority of terms that students are now working with are academic and because students are asked to define a large number of unfamiliar words throughout this module. Therefore, the goal of the glossary is to become a singular resource for students to refer back to. They can use their glossaries both as a tool for comprehension and as a reference for infusing key terms from the texts into their own writing. • If students need more time for the text-dependent questions, consider shortening the debrief.

Agenda	Teaching Notes (continued)
	• In Work Time C, students look back to the text, their notes, and key terms to answer three multiple-choice, text-dependent questions about the relationships between ideas and individuals who developed new or improved technologies, and how those technologies meet societal demands. In order to meet the demands of RI.5.3, students must be able to recognize the relationships between people and ideas. Therefore, each question asks students to identify more than one possible correct answer. This format of more than one correct answer is not typical of what students will encounter on many state assessments. But it gives students a chance to think about how they can locate more than one piece of information within a text that supports their understanding of the ideas presented. • In advance: – Review the five structures of informational text (see Text Structure resource page). – Post Close Readers Do These Things, Group Norms, and Vocabulary Strategies anchor charts.

Lesson Vocabulary	Materials
explain, societal needs, quotes, cause, effect, determine, unfamiliar, context, identify, relationship, devices, depend, source, afford, generating, (power) plant, access, advancements	• Journals (students' own, begun in Lesson 1) • "The Electric Motor" (article; one per student) • Close Readers Do These Things anchor chart (from Lesson 2) • Document camera • Text Structure resource page (one per student and one for display) • Tape, glue, or staples (for each student) • Cause and Effect note-catcher: "The Electric Motor" (one per student) • Cause and Effect note-catcher: "The Electric Motor" (answers, for teacher reference) • Vocabulary Strategies anchor chart (from Lesson 2) • Text-dependent questions: "The Electric Motor" (one per student) • Text-dependent questions: "The Electric Motor" (answers, for teacher reference) • Graphic Novel Templates, A, B, and C (from Lesson 4; one per student; enough copies to allow for students to select one version of the template)

Opening	Meeting Students' Needs

A. Reviewing Homework and Engaging the Reader (5 minutes)
• Congratulate students on their close read and analysis of the visual elements of the graphic novel *Investigating the Scientific Method with Max Axiom Super Scientist*, as well as their thoughtful responses to the Mid-Unit 1 Assessment questions during the previous lesson.
• Then, ask students to take out their Independent Reading Choice Board with the additional response they completed for homework and join their regular small groups (from Lessons 1–5).
• Give students 30 seconds each (2 minutes total) to share the question and response they completed on their boards.
• After 2 minutes, invite a few students to share out their thinking whole group (answers will vary).
• Refocus whole group, then cold call a few students to read each of the guiding questions aloud:
  * "How do new or improved technologies meet societal needs?"
  * "How do authors structure text and use visual elements to engage and support readers' understanding of complex ideas?"
• Tell students that in the second half of this unit, their focus will shift from reading literature (in the form of a graphic novel) to reading purely informational texts about how new or improved technologies are developed to meet people's needs. As a part of this, they will revisit a fourth-grade standard about the ways informational text is structured to help readers understand complex ideas.
• Build up the excitement for the real-life inventions and inventors they will get to learn about: how the windshield wiper and the game of basketball came to be invented. Today, they will read an article about the development of the electric motor.
	• To support visual learners, consider displaying and circling, or otherwise highlighting the guiding questions.

Work Time	Meeting Students' Needs

A. Determining the Gist: "The Electric Motor" (10 minutes)
• Ask students to take out their **journals** and remain with their small groups.
• Distribute the article "**The Electric Motor**." Display the **Close Readers Do These Things anchor chart** posted on the **document camera**. Ask students to consider and then discuss in groups:
  * "Why is our first read often for gist?"
• After 1 minute, cold call members from each group to share their thinking aloud. Listen for ideas such as:
  – "Determining the gist allows us to get an overall sense of the ideas presented in the text before reading more closely for details."
  – "It allows us to capture our initial thinking about the article."
  – "It gives us an initial sense of how the text flows, moves from one idea to another, or how ideas are connected more generally," or similar responses.
• Give students 5 to 6 minutes to read the article independently and discuss the gist with their group members. Circulate to support as needed.
• After 5 or 6 minutes, cold call several students to share their ideas about the gist whole class. Listen for:
  – "This article is about how electric motors are found in many devices."
  – "It's about how the electric motor was developed."
  – "It's about why scientists wanted to find a new form of electricity," and similar suggestions.
• Tell students to turn to a new page in their journals to quickly record a gist statement.
	• When reviewing the graphic organizers or recording forms, consider using a document camera to display the document for students who struggle with auditory processing.
	• Providing models of work expectations supports all students, especially supports challenged learners.

Work Time (continued)	Meeting Students' Needs

B. Second Read: Using Quotes to Explain How the Electric Motor was Developed to Meet Societal Needs (30 minutes)
• Refocus whole group and direct students' attention to the first learning target:
  * "I can explain how the electric motor meets societal needs using quotes from the text."
• Underline the key terms in this target: *explain*, *societal needs*, and *quotes*. Point out to students that these are words they are familiar with from the first half of the unit. Ask students to think about and briefly discuss in groups how they could restate the target in their own words, based on their understanding of these key terms.
• After 1 minute, cold call a few students to share their thinking with the class.
• Then, display and distribute the **Text Structure resource page**. Ask students to quickly **tape, glue** or **staple** this resource onto a blank page in their journals.
• Ask students to recall from previous grades that informational articles are often structured differently than novels. Explain that authors of shorter informational pieces do not typically include a table of contents, chapter or section titles, or a glossary with the text. Instead, these authors use specific structures to organize their ideas in a clear pattern so readers can identify how the information and ideas that are presented fit together to convey an overall message to the audience. Remind students that they learned about each of the five structure types listed on their resource page in fourth grade. Then read just the name of each structure type listed: "Descriptive," "Sequential," "Compare/Contrast," "Cause and Effect," and "Problem and Solution."
• Then focus students' attention on the row titled "Cause and Effect" and quickly read the description aloud. Tell students that the article "Electric Motors" presents information using a *cause* and *effect* structure. Ask students to think about and discuss in groups what they know about the terms cause and effect. After a minute, invite several students to share out whole group. Listen for students to share ideas like:
  – "A cause is a reason something happens."
  – "Effects are what results from something happening," or similar suggestions.
	• To support visual learners and ELL students, display a drawing, picture from the internet, or familiar synonym above or below key words in learning targets.
	• Cause and effect can be a difficult concept for students to grasp. Consider supporting students' understanding of cause and effect with a concrete model or demonstration, such as dropping an object and listening to the resulting "thud."
	• For students who struggle with the physical act of writing, allow them to type their responses on a computer or word processor, or dictate to an aide or a peer acting as a scribe.

Work Time (continued)	Meeting Students' Needs
• Distribute the **Cause and Effect note-catcher: "The Electric Motor"** to students. Then ask them to complete the following in groups: 1. Independently reread the second paragraph of the article to locate details that explain a societal need: the "cause." 2. Briefly discuss your thinking with group members. 3. Then, record exact words or phrases from the second paragraph of the article into the "Cause" box on the note-catcher to explain the societal need. Make sure to place quotation marks around the text you add to your note-catcher. • Give students 2-3 minutes to work in groups to identify, discuss, and record a cause in their note-catchers. Circulate to offer support. 1. Once students record a cause, cold call several students to share out whole group. Listen for: "… batteries cost a lot of money so many people could not afford to have electricity in their homes." 2. Next, give students 1-2 minutes to reread the second paragraph of the article to identify and underline what happened because many people were not able to afford to have electricity in their homes (Effect 1). 3. Ask students to show the text they underlined to group members and briefly explain why they believe it is "Effect 1." • Provide support as needed. • After 2 minutes, cold call members from each group to quickly share out the quote they underlined in the text that is "Effect 1." Listen for: – "This led scientists to begin experimenting with other ways to create electricity." • Direct students to record this quote in the box titled "Effect 1." • Then ask students to do the following: 1. Independently reread paragraphs 3 and 4 of the article to identify and underline two more effects of society's need for new forms of electricity. 2. Share your quotes and discuss your thinking with group members. 3. Record two more effects, using exact words or phrases from the article, in the "Effect 2" and "Effect 3" boxes on your graphic organizer. Make sure to place quotation marks around the text you write down to indicate you are quoting exact sentences or phrases from the text.	

Work Time (continued)	Meeting Students' Needs
• After 5 or 6 minutes, refocus whole group. Cold call members from each group to share out exact quotes from the articles that explain the effects of society's need for alternate forms of electricity. Refer to **Cause and Effect note-catcher: "The Electric Motor" (answers, for teacher reference)** as needed. • Draw students' attention to the "Enduring Understanding" question and chart at the bottom of their note-catchers. Then invite students to read the question aloud, "How did scientists develop new or improved technologies to meet people's needs?" Ask a few students to restate the question in their own words. • Ask students to complete the following: 1. Refer to the article and your notes to locate three quotes from the text that explain how scientists developed new or improved technologies to meet people's needs 2. Briefly discuss your thinking with one of your group members. 3. Record three quotes in the chart to explain how scientists develop new or improved technologies to meet people's needs. Make sure to place quotation marks around the text to indicate exact quotes. • Circulate to offer support and guidance as needed. • After 2-3 minutes, refocus whole group. Cold call individual students to share out their ideas with the class. • Ask students to quickly add their note-catchers to the next blank page in their journals using glue, tape, or staples. • Then, read the second learning target aloud: * "I can determine the meaning of unfamiliar words and phrases from context." • Focus students' attention on the posted **Vocabulary Strategies anchor chart**. Point out that using context clues to determine the meaning of unfamiliar words and phrases is one of the strategies they used in previous lessons and in Module 1. Ask students to think about and briefly discuss in groups: * "How can you use context clues to help you determine the meaning of unfamiliar terms?" • After a minute, cold call several students to share out. Listen for: – "I can look to words and phrases I'm already familiar with to help me understand unfamiliar terms." – "I can read the text before and after the word or phrase to help me determine meaning," and similar suggestions. • Write the following terms where all students can see them: *devices*, *depend*, *source*, *afford*, *generating*, *plant*, *access*, and *advancements*. Then give students 1-2 minutes to locate and circle each term in "The Electric Motor" article.	

Work Time (continued)	Meeting Students' Needs
• Then, provide directions for a guided practice to reinforce students' understanding of how to use context clues to determine the meaning of the word "devices." Ask students to do the following: 1. In the first paragraph of the text, circle the word "devices." 2. With group members, read parts of the sentence before and after the word "devices." 3. Discuss, "What do you think devices are? How do these parts of the sentence help you understand what devices are or what they do?" 4. With group members, read the remaining sentences in the first paragraph. 5. Discuss, "Now what do you think devices are? How do these sentences build your understanding of what devices are?" • Once students have completed each step, cold call a few students to share out what they think "devices" are and explain what specific words or phrases from the text helped them determine the meaning. Listen for: – "Devices are different types of machines, tools, or gadgets." – "The text that helped me determine the meaning of devices is 'devices are used every day' and the examples of devices such as 'alarm clocks' and 'tools,'" or similar suggestions. • Next, direct students to do the following: 1. Work with group members to determine the meaning of each of the remaining key terms from context. 2. Add each word to the first column of your four-column glossary page. 3. Write a synonym for each word in the second column, a definition for each word in the third column, and draw a picture to show the meaning of each word in the fourth column. • Give students 5 minutes to add and define key vocabulary terms in their glossaries. Circulate to offer support. • Once students have added and defined the words in their glossary, cold call members from each group to share out their synonyms, definitions or drawings whole group. Listen for: – "Depend means need, use regularly." – "Source means supply, where something comes from." – "Afford means have enough money, be able to pay for."	

Work Time (continued)	Meeting Students' Needs
– "Generating means making, producing, creating." – "Plant in this context refers to a 'power plant' which is a large building or structure that generates or provides electricity for many people." – "I drew a picture of a large building with a lightning bolt in the center to show the meaning of 'plant' in this context." – "Access means the right or ability to use something." – "Advancements are improvements, progress," and similar suggestions. • Allow students 1-2 minutes to revise or add information to their note-catchers and enduring understanding response from Work Time B, based on new understandings about key terms. • As time allows, invite a few students to share out changes they made to their note-catchers.	

Work Time (continued)	Meeting Students' Needs
C. Identifying Relationships: Text-Dependent Questions (10 minutes) • Read the final learning target aloud: * "I can identify the relationships between electricity and the electric motor based on information from the text." • Ask students to focus on the words *identify* and *relationships*. Then, consider and discuss in groups the meaning of each term in the context of this target. • After 1 or 2 minutes, invite a few students to share their thinking aloud. Listen for: – "Identify means to name, determine." – "Relationships in this context means how things are connected, how they are related to one another," or similar ideas. • Distribute the **Text-Dependent Questions: "The Electric Motor"** to students. Tell students to: 1. Read through each of the questions. 2. Refer to the article, the information recorded on your note-catchers, and key terms to help you identify the answer(s) to each question. 3. Discuss your thinking with group members. 4. Circle one or more correct answers from the multiple choices provided. • Clarify as needed then circulate to offer support. • After 4-5 minutes, cold call members from each group to share their response(s) to the first question. If students have conflicting responses, use it as an opportunity to ask probing questions such as: * "Which quotes from the text support your thinking?" * "What details from the text helped you make that connection or recognize that relationship?" • After students share out, collect their text-dependent question sheets. Review students' responses to determine their mastery toward the targets. Refer to **Text-Dependent Questions: "The Electric Motor" (answers, for teacher reference)**.	

Closing and Assessment	Meeting Students' Needs
A. Debrief and Reviewing Learning Targets (5 minutes) • Ask students to gather whole group. Pose the following question for students to think about then discuss with a nearby partner: * "How did the cause and effect structure of 'The Electric Motor' article help you understand the ways technology is developed to meet people's needs?" • After 2 minutes, invite a few students to share their ideas whole group. • Read each of the learning targets aloud. Ask students to show a thumbs-up or thumbs-down to indicate their mastery toward each target. Notice students who show a thumbs-down as they may need more support using quotes from the text to support their ideas or determining the meaning of unfamiliar words and phrases in context. • Have students select one **Graphic Novel Template A**, **B**, or **C** for their homework.	• Provide a sentence starter to support students during their discussions: "The cause and effect structure helped me understand that the electric motor helped people by _____."

Homework	Meeting Students' Needs
• Reread "The Electric Motor" article. Add to or revise at least one detail on your Cause and Effect note-catcher. Use details (paraphrased or exact quotes) from "The Electric Motor" article to complete your chosen Graphic Novel Template. Bring your completed template to class as to use in our entry task for the next lesson. • If you did not finish in class, complete your four-column chart for each of the key vocabulary words. • Read your independent reading book for at least 20–30 minutes and write a response to another one of the questions on your Independent Reading Choice Board.	• Allow struggling writers to dictate their responses to someone at home to record for them. • Allow students to use images from other sources such as the internet, magazines, etc. to paste onto their templates. • Consider providing a recording of the text for struggling readers.

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 7
Supporting Materials

"The Electric Motor"

Written by Expeditionary Learning for instructional purposes.

You may not know it, but electric motors are everywhere! They are found in hundreds of devices that are used by people every day. Some alarm clocks use an electric motor. Refrigerators also run on an electric motor. Parts of the windshield wipers on cars, power tools, and computers all contain electric motors. Given how much we depend on the electric motor today, it's hard to even imagine what life was like before it was invented.

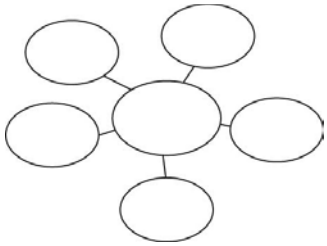
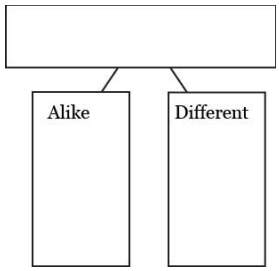
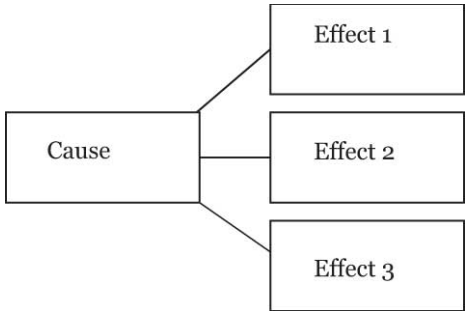
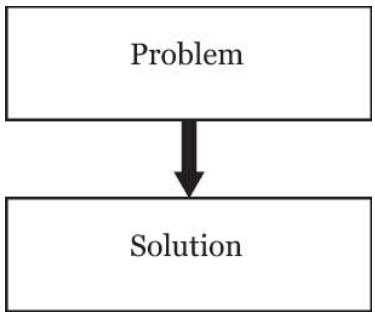
In the early 1800s, the main source for electricity was batteries. However, batteries cost a lot of money, so many people could not afford to have electricity in their homes. This led scientists to begin experimenting with other ways to create electricity.

It was 1821 when an English chemist named Michael Faraday designed an experiment in which he attached a magnet to the bottom of a wire. He hung the wire with the magnet from a hook and placed it directly over a bowl of liquid. He then connected a battery partway up the wire, between the magnet and where the wire met the hook. When Faraday turned the battery on, the wire began to spin. This experiment became the first example of a machine capable of generating electricity better than a battery. Faraday called it the electric motor.

Faraday's electric motor eventually led to Thomas Edison's construction of an electric power plant in New York City in 1882. Edison used the idea of the electric motor to figure out a way to generate electricity that people could buy. Edison's massive plant provided enough electricity to power 1,200 light bulbs, essentially allowing everyone to have access to reasonably priced electricity.

Many scientists continued to improve on these earlier versions of the electric motor, and the ongoing advancements have undoubtedly made our lives much simpler. So the next time you turn on the lights, dry your hair, or use a CD player, think about how lucky you are that the electric motor was invented!

Text Structure Resource Page

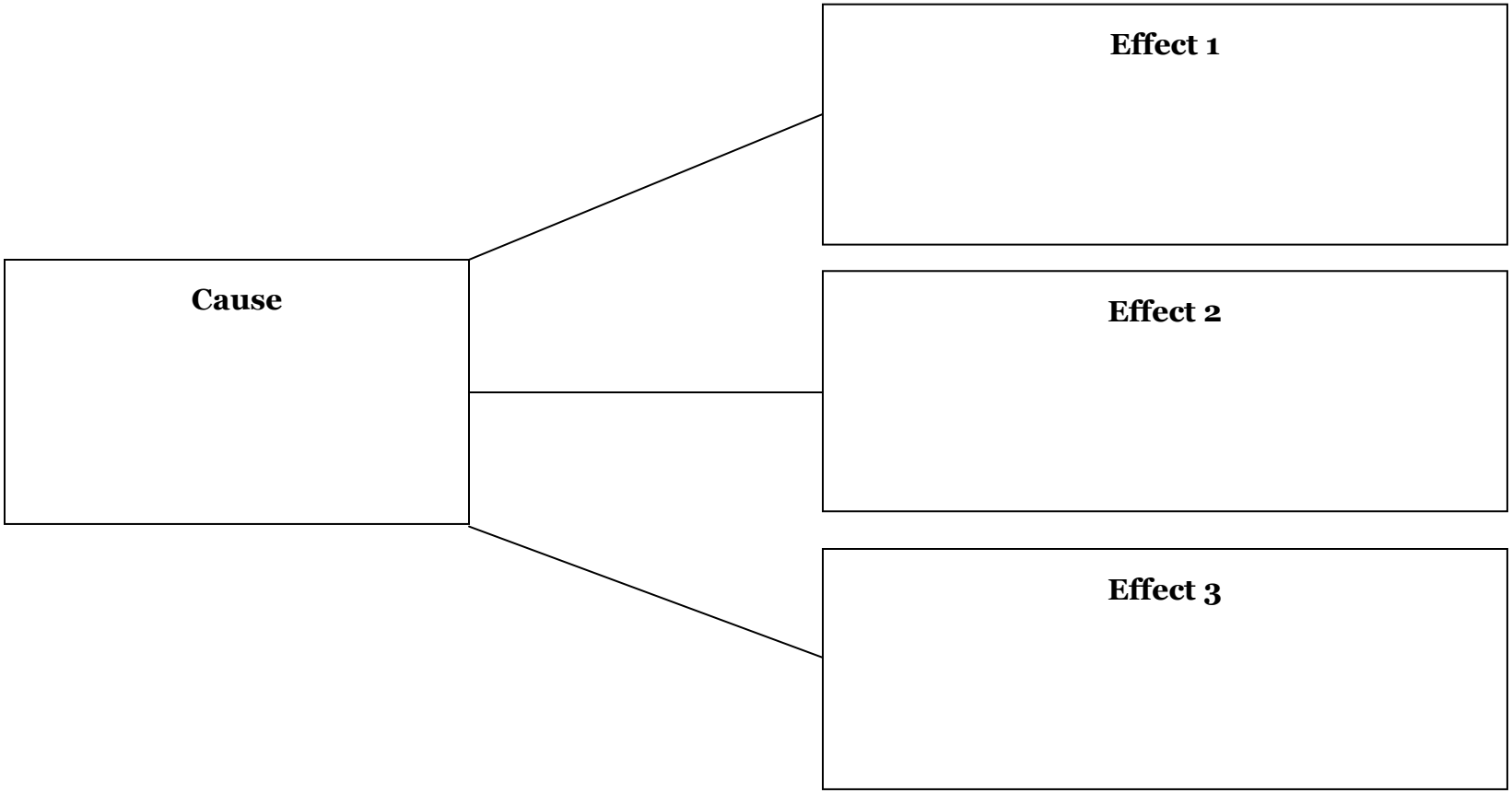
Structure	Description	Graphic Organization
Descriptive	The author describes a topic by providing features, characteristics, and/or examples.	
Sequential	The author describes an event chronologically or in numerical sequence. The order of events can be obvious or implied.	1._____ First,_____ 2._____ Second,_____ 3._____ Third, _____ 4._____ Next, _____ 5._____ Finally,_
Compare/Contrast	The author describes the similarities and differences between two or more topics, people, or concepts	
Cause and Effect	An author tells about an idea, event, or series of events as effects that happen as a result of, or are caused by another event.	
Problem and Solution	The author presents a problem and at least one solution to the problem.	

Cause and Effect Note-catcher: "The Electric Motor"

Name:

Date:

***How does the way a text is structured support our understanding of complex ideas?**



Cause and Effect Note-catcher: "The Electric Motor"

Enduring Understanding: How did scientists develop new or improved technologies to meet people's needs?

Fill in the chart using *three* quotes from the text to show how scientists developed new or improved technologies to meet people's needs.

Scientists develop new or improved technologies to meet people's needs.
EVIDENCE (quote from text)

Cause and Effect Note-catcher: "The Electric Motor"
(Answers, for Teacher Reference)

Cause
"... batteries cost a lot of money so many people could not afford to have electricity in their homes."

Effect 1
"This led scientists to begin experimenting with other ways to create electricity."

Effect 2
"... the first example of a machine capable of generating electricity better than a battery ... the electric motor."

Effect 3
"Thomas Edison ... came up with the idea to construct an electric power plant ... essentially allowing everyone to have access to reasonably priced electricity."

Cause and Effect Note-catcher: "The Electric Motor"
(Answers, for Teacher Reference)

Enduring Understanding: How did scientists develop new or improved technologies to meet people's needs?

Fill in the chart using *three* quotes from the text to show how scientists developed new or improved technologies to meet people's needs.

Scientists develop new or improved technologies to meet people's needs.
EVIDENCE (quote from text)
"... the first example of a machine capable of generating electricity better than a battery. Faraday called it the electric motor."
"Faraday's electric motor eventually led to Thomas Edison's construction of an electric power plant in New York City in 1882."
"Edison used the idea of the electric motor to figure out a way to generate electricity that people could buy."
"Edison's massive plant provided enough electricity to power 1,200 light bulbs, essentially allowing everyone to have access to reasonably priced electricity."

Text-Dependent Questions: "The Electric Motor"

Name:

Date:

Refer to the text and your notes to help you answer the following questions.

*Some questions have more than one correct response. Mark all that apply.

1. Why did scientists begin developing other ways to generate electricity?
    a. Batteries were the only source for electricity in the early 1800s.
    b. People didn't like batteries.
    c. Many people could not afford batteries.
    d. Batteries took too long to make.

2. How did the invention of the electric motor influence the development of the first power plant?
    a. The electric motor generated electricity better than batteries.
    b. Thomas Edison created the first power plant based on Michael Faraday's invention of the electric motor.
    c. The first power plant was able to supply enough electricity for 1,200 light bulbs.
    d. Many people had access to affordable electricity after the first power plant was built.

3. How are electric motors used to meet people's needs?
    a. They are found in devices that people depend on.
    b. They generate electricity better than batteries.
    c. They are in light bulbs.
    d. They are built using a magnet and a battery.

Text-Dependent Questions: "The Electric Motor"
(Answers, for Teacher Reference)

Correct responses are in **bold**.

1. Why did scientists begin developing other ways to generate electricity? (RI.5.3)
   a. **Batteries were the only source for electricity in the early 1800s.**
   b. People didn't like batteries.
   c. **Many people could not afford batteries.**
   d. Batteries took too long to make.

2. How did the invention of the electric motor influence the development of the first power plant? (RI.5.3)
   a. The electric motor generated electricity better than batteries.
   b. **Thomas Edison created the first power plant based on Michael Faraday's invention of the electric motor.**
   c. The first power plant was able to supply enough electricity for 1,200 light bulbs.
   d. Many people had access to affordable electricity after the first power plant was built.

3. How are electric motors used to meet people's needs? (RI.5.1)
   a. **They are found in devices that people depend on.**
   b. **They generate electricity better than batteries.**
   c. They are in light bulbs.
   d. They are built using a magnet and a battery.

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 8

Using Quotes and Opinion Writing: Ingenious Inventions by Women

Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)
I can quote accurately from a text when explaining what the text says explicitly. (RI.5.1) I can determine the meaning of general academic and domain-specific words and phrases. (RI.5.4) I can write opinion pieces supporting a point of view with reasons and information. (W.5.1) a. I can introduce a topic clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support my purpose. b. I can provide logically ordered reasons that are supported by facts and details.

Supporting Learning Targets	Ongoing Assessment
• I can explain how the windshield wiper and paper bag machine met societal needs using quotes from the text. • I can determine the meaning of unfamiliar words and phrases from context. • With peers, I can write an opinion paragraph about which invention meets a greater societal need.	• Graphic Novel Template A, B, or C (from homework) • Gist statement (in journal) • Compare and Contrast note-catcher • Vocabulary (in journal) • Group opinion paragraph (on chart paper) • Independent Reading Choice Board response

Agenda	Teaching Notes
1. Opening A. Reviewing Homework and Engaging the Reader (5 minutes) 2. Work Time A. Determining the Gist: "Ingenious Inventions by Women: The Windshield Wiper and Paper Bag Machine" (10 minutes) B. Second Read: Using Quotes and Key Vocabulary to Explain How the Windshield Wiper and Paper Bag Machine were Developed to Meet Societal Needs (20 minutes) C. Opinion Writing: Which Invention Meets a Greater Societal Need? (20 minutes) 3. Closing and Assessment A. Gallery Walk and Reviewing Learning Targets (5 minutes) 4. Homework A. Reread the article "Ingenious Inventions by Women: The Windshield Wiper and Paper Bag Machine" and write response on index card B. Finish Classwork C. Independent Reading	• This lesson follows a similar pattern to Lesson 7. Students work with a new informational text, "Ingenious Inventions by Women: The Windshield Wiper and Paper Bag Machine" to continue building their understanding of how informational texts are structured and how technologies are developed to meet societal needs. The structure focus in this lesson is compare and contrast. Because the text is above grade-level, reading the text aloud first allows all students, particularly struggling readers, to develop an initial understanding of the ideas presented, building background knowledge that will scaffold later independent reading. The read-aloud also models the fluent reading skills students are working on (appropriate rate, accuracy, and expression). • Work Time C familiarizes students with how to introduce a topic, form an opinion based on information gathered through research, and support an opinion with reasons and evidence directly from the text. Students work with group members to form an opinion about which invention meets a greater societal need, the windshield wiper or the paper bag machine. Students support their opinion with a reason and evidence from the article in the form of quotes. It is important to note that this is a cursory introduction to opinion writing. This activity serves as a scaffold toward the longer opinion pieces students are expected to write in Modules 3 and 4. • In advance: – Post all Close Readers Do These Things, Group Norms, and Vocabulary Strategies anchor charts. – Review Milling to Music and Glass, Bugs, Mud in Checking for Understanding Techniques (see Appendix). – Create a new Opinion Paragraph anchor chart (see supporting materials).

Lesson Vocabulary	Materials
explain, societal needs, quotes, compare, contrast, determine, context, opinion, reasons, evidence, credible, rely, struggled, realized, set (out to), transport, led, value	• Journals (students' own, begun in Lesson 1) • "Ingenious Inventions by Women: The Windshield Wiper and Paper Bag Machine" (one per student) • Document camera • Close Readers Do These Things anchor chart (from Lesson 2) • Text Structure resource page (from Lesson 7; one to display) • Compare and Contrast note-catcher: "Ingenious Inventions by Women" (one per student) • Compare and Contrast note-catcher: "Ingenious Inventions by Women" (answers, for teacher reference) • Vocabulary Strategies anchor chart (from Lesson 2) • Tape, glue, or staples (for each student) • Opinion Paragraph anchor chart (new; teacher created) • Chart paper (one sheet per group) • Markers (one per group) • Index cards (one per student)

Opening	Meeting Students' Needs
A. Reviewing Homework and Engaging the Reader (5 minutes) • Ask students to take out the Graphic Novel Template they completed for homework. • Review the Milling to Music technique and provide clarification as needed. • Give students 3 minutes to do the following: 1. Briefly mill to locate a partner who is not a part of your regular small group. 2. Share the Graphic Novel Template you completed for homework and quickly explain why you chose to add specific details from the text to the template. • After 3 minutes, refocus whole group. Invite a few students to share interesting ideas they heard from their partner (answers will vary, but listen for students to share specific details from the text and explain why they felt certain details were important to add to the template). • Say something like: "Today, we are continuing to build knowledge around our guiding questions, 'How do new or improved technologies meet societal needs?' and 'How do authors structure text to support our understanding of complex ideas?' In this lesson, we are expanding our knowledge about new developments that meet people's needs as we read about how two women who were considered neither scientists nor engineers created solutions to make our lives both safer and simpler."	• Provide sentence starters to support student discussions: "The visual elements I used are _____," or "These visual elements communicate the ideas on my template because _____."

Work Time	Meeting Students' Needs
A. Determining the Gist: "Ingenious Inventions by Women: The Windshield Wiper and Paper Bag machine" (10 minutes) • Ask students to take out their **journals** and join their regular small groups. • Distribute the article **"Ingenious Inventions by Women: The Windshield Wiper and Paper Bag Machine."** Then explain to students that the first read will be aloud. • Refer to the **Close Readers Do These Things anchor chart** posted on the **document camera** and cold call a few students to share out what they typically do when they encounter an unfamiliar text. Listen for: "Read for the gist to get the flow of the article," "determine what the article is about," or similar responses. • Tell students to follow along silently to determine the gist as you read the text aloud. • After the article has been read aloud, ask: * "What is the gist of this informational article?" • Give students 1 or 2 minutes to discuss their thinking in groups. Then cold call members of each group to share out with the class. Listen for suggestions like: "The gist of this article is that Mary Anderson and Margaret E. Knight invented things that made people's lives safer and easier," "this article is about women inventors," or similar ideas. • Direct students to record a gist statement on the same page in their journal where they recorded the gist of "The Electric Motor" article during the previous lesson.	• For students who struggle to determine the gist of longer passages, encourage them to find the gist of facing pages to keep track as they go to make it more manageable to determine the gist of the entire section. • Allow struggling writers to dictate their gist statement to a peer or aide acting as a scribe.

Work Time (continued)	Meeting Students' Needs

B. Second Read: Using Quotes and Key Vocabulary to Explain How the Windshield Wiper and Paper Bag Machine were Developed to Meet Societal Needs (20 minutes)
• Read the first learning target aloud:
  * "I can explain how the windshield wiper and paper bag machine met societal needs using quotes from the text."
• Point out the key terms in this target that students are familiar with from the previous lesson: *explain*, *societal needs*, and *quotes*. Then ask students to quickly think about and discuss in groups how they could restate the target in their own words.
• Cold call a few students to share their thinking whole group.
• Display and ask students to turn to the page in their journals where they attached the **Text Structure resource page**. Focus students' attention on the row titled "Compare/Contrast," then read the description aloud. Ask students to think about and discuss in groups what the words *compare* and *contrast* mean.
• After 1 minute, invite a few students to share their definition of these terms. Listen for:
  – "Compare means to identify ways different things are similar, alike, or the same."
  – "Contrast means to identify ways things are different," or similar suggestions.
• Distribute the **Compare and Contrast note-catcher: "Ingenious Inventions by Women."** Direct students' attention to the top box, "Who or what is being compared and contrasted?"
• Tell students to read the first paragraph of the article. Then ask them to take a few minutes to discuss:
  * "Who or what do you believe is being compared and contrasted in this article?"
• Cold call members from each group to share out their thinking with the class. Listen for: "The inventors Mary Anderson and Margaret E. Knight."
• Ask students to record this idea in the top box of their note-catchers.
	• To support visual learners and ELL students, display a drawing, picture from the internet, or familiar synonym above or below key words in learning target.
	• For students who struggle with the physical act of writing, allow them to type their responses on a computer or word processor, or dictate their analysis paragraph to an aide or a peer acting as a scribe.
	• Consider using a think-aloud strategy, either with small groups or individual students, to model using context clues to determine the meaning of the first several terms.

Work Time (continued)	Meeting Students' Needs
• Ask students to complete the following: 1. Reread all but the first paragraph of the article to determine and underline text that explains at least two ways Mary Anderson and Margaret E. Knight are alike and at least two ways they are different. 2. Discuss the quotes you underlined with your group members, and explain your thinking. 3. After discussing your ideas with group members, record at least two exact quotes from the article into each of the lower boxes on your graphic organizer to explain how Mary Anderson and Margaret E. Knight were alike and different. Make sure to place quotation marks around the text you add to your note-catcher, to indicate the information is exactly what is stated in the article. • Circulate to support. • After 7 or 8 minutes, cold call students from each group to share out quotes they added to their note-catchers that indicate likenesses and differences between the two women. Refer to the **Compare and Contrast note-catcher: Ingenious Inventions by Women (answers, for teacher reference)** as needed. • Read the second learning target aloud: * "I can determine the meaning of unfamiliar words and phrases from context." • Underline the words *determine* and *context*. Ask students to revisit their understandings about each term then quickly think about and discuss with group members how they could restate the target in their own words. • After 1 minute, cold call a few students to share out with the class. • Write the following key terms where all students can see them: *rely*, *struggled*, *realized*, *set*, *transport*, *led*, and *value*. Then focus students on the posted **Vocabulary Strategies anchor chart**. Ask students to discuss in groups: * "How can you use context clues to help you determine the meaning of unfamiliar words or phrases?" • After 1 minute, invite a few students to share out with the class. Listen for: – "I can use words and phrases I'm already familiar with to give me a clue about unfamiliar terms." – "I can read sentences before and after the word to help me figure out the meaning," or similar ideas. • Ask students to locate and circle the word "rely" in the first paragraph of the article, then underline words and phrases around the word that help them determine the meaning. Direct students to briefly discuss their thinking with group members. Invite a few students to share out what they believe the word "rely" means and explain how specific words or phrases from the text support their understanding of the word. Listen for:	

Work Time (continued)	Meeting Students' Needs
– "Rely means to depend on, use or need." – "The phrase 'These brilliant women developed devices that we still rely on so much today helped me understand the word rely because it means they invented things that people still use." – "To make the sentence make sense, I can substitute the words 'use' or 'depend on' for rely, so rely probably means 'use' or 'depend on.'" – "Because I am familiar with the words 'developed' and 'devices' from the previous lesson, I know developed means invented or built upon and devices are tools we use," or similar ideas. • Next, tell students to: 1. Work with group members to determine the meaning of each of the remaining key terms from context. 2. Add each word to the first column of your four-column glossary page. 3. Write a synonym for each word in the second column, a definition for each word in the third column, and draw a picture to show the meaning of each word in the fourth column. • Give students 5 or 6 minutes to define. Circulate to support as needed. • Once students have added and defined the words in their glossary, cold call members from each group to share out whole group. Listen for: – "Struggled means fought, worked hard, tried." – "Realized means understood, appreciated, recognized." – "Set in this context means got started on, began." – "Transport means move, bring, carry." – "Led means caused, made something possible." – "Value means the worth of something," or similar ideas. • Give students a moment to add quotes or revise their note-catchers, based on their new understanding of vocabulary. • Draw students' attention to the "Enduring Understanding" question and chart at the bottom of their note-catchers. Then invite students to chorally read the question aloud, "How did women develop new or improved technologies to meet people's needs?" Ask a few students to restate the question in their own words.	

Work Time (continued)	Meeting Students' Needs
• Ask students to complete the following: 1. Refer to the article and your notes to locate three quotes from the text that explain how Mary Anderson and Margaret E. Knight developed new or improved technologies to meet people's needs 2. Briefly discuss your thinking with one member of your group. 3. Record three quotes in the chart to explain how women develop new or improved technologies to meet people's needs. Make sure to place quotation marks around the text to indicate exact quotes. • Circulate to offer support and guidance as needed. • After 3-4 minutes, refocus whole group. Cold call students from each group to share their thinking with the class. • After a whole group discussion, ask students to use **tape**, **glue**, or **staples** to add their note-catchers to the next blank page in their journals.	
C. Opinion Writing: Which Invention Meets a Greater Societal Need? (20 minutes) • Read the final learning target aloud: * "With peers, I can write an opinion paragraph about which invention meets a greater societal need." • Underline the word *opinion* in this target. Then ask students to discuss in groups what they know about forming an opinion. After 1 minute, invite a few students to share out whole group. Listen for: – "An opinion is what I believe." – "Other people may not agree with my opinion, or may have a different opinion," or similar ideas. • Explain that it is important to have reasons and evidence to support an opinion, and it is also important to be able to explain the reasoning behind your opinions to others. Tell students that for the end of unit assessment in Lesson 10, they will need to write a paragraph to share their opinions about which one of the inventions they have learned about met a greater societal need. So during this final part of Work Time, they are going to learn about the parts of a basic opinion paragraph and practice writing one with their group members. • Display the **Opinion Paragraph anchor chart**. Then distribute one piece of **chart paper** and one **marker** to each group.	• To support visual learners and ELL students, display a drawing, picture from the internet, or familiar synonym above or below key words in the learning target.

Work Time (continued)	Meeting Students' Needs
• Tell students they will work with their group members to write a complete paragraph to express an opinion about whether the windshield wiper or the paper bag machine met a greater societal need. Explain to students that their opinion paragraphs will have five parts: – A sentence that briefly introduces the topic. – An opinion statement that includes key terms from the question. – A reason to support the opinion. – Two pieces of evidence from the text to support the opinion and reason. – A conclusion that restates the opinion. • Remind students that writers form opinions after conducting research on a topic. Tell them that they've collected information about two female inventors and thought about how each woman's invention met a societal need. Now they get to use that information to help form an opinion and write a paragraph to support that view. • Read the focus question from the top of the anchor chart aloud to students, "Did the invention of the windshield wiper or the paper bag machine meet a greater societal need?" • Focus students on the first line of the anchor chart, "brief introduction to the topic." Ask them to discuss in groups: * "What kind of sentence could you write to let a reader know what your paragraph will be about?" * "How can you include key terms from the focus question and the text in your introductory sentence?" • After 1 minute, invite a member from each group to share their thinking aloud. Listen for students to share ideas such as: – "Mary Anderson and Margaret E. Knight invented devices we still use today." – "Inventions like the windshield wiper and paper bag machine have made our lives simpler and safer." – "Female inventors developed ideas to make our lives better," or similar responses. • Once each group has shared out, ask students to do the following: 1. Confer with group members to craft a sentence that briefly introduces the topic of your opinion paragraph. 2. Have one member of your group write the agreed upon introduction sentence at the top of your group's chart paper (remember to indent the first sentence of a paragraph).	• Provide sentence starters or frames to support students during their discussions about a topic sentence, opinion statement, reason, evidence, or conclusion: "A sentence that describes what this paragraph will mostly be about is _____," In my opinion _____ meets a greater societal need because _____," "The reason I believe _____ meets a greater societal need is because _____," "The reason I believe this is because in the text it says _____," "The article also states _____," "One way I could restate the opinion is by saying _____."

Work Time (continued)	Meeting Students' Needs
• After 1 or 2 minutes, focus students' attention on the second line of the anchor chart, "opinion statement that includes key terms from the question." Ask students to think about then discuss in groups: * "What key words or phrases are in the focus question?" • Invite a few students to share out their thinking with the class. Listen for students to share examples like: "invention," "windshield wiper or paper bag machine," "greater," or "societal need." • If students do not mention the above key words and phrases, draw their to and underline each term on the anchor chart. • Give students 2 minutes to discuss with group members and then come to a consensus about which invention met a greater societal need. Encourage them to incorporate key terms from the question in their opinion statement. • After 2 minutes, invite a member from each group to share out the group opinion. Listen for ideas such as: – "The invention of the windshield wiper met a greater societal need than the paper bag machine." – "The paper bag machine is one of the greatest inventions of all time," or similar ideas. Reinforce students' use of key terms from the focus question and clearly stated opinions. • Allow students 1 to 2 minutes to do the following: 1. With group members, craft an opinion statement that contains key terms from the focus question. 2. Have one member of your group write the opinion statement after the introductory sentence on the group's chart paper. • Focus students on the third line of the anchor chart, "reason why you believe the opinion." Ask groups to discuss: * "What kind of sentence could you write to explain why you believe the opinion?" • After 1 or 2 minutes, invite students to share their ideas with the class. Listen for suggestions such as: – "Windshield wipers not only made our lives better, they made our lives safer." – "The paper bag machine made it possible for everyone to afford flat-bottomed bags, so transporting groceries from store to home became much easier for people," or similar responses. Draw attention to and reinforce group examples that use examples from the text and clearly support the opinion recorded on the group chart. • Then, give students 2 or 3 minutes to: 1. With group members, discuss and determine a reason that clearly supports the opinion you recorded onto your chart paper. 2. Have one member of your group write the reason after the opinion statement on the group's chart paper.	

Work Time (continued)	Meeting Students' Needs
• Focus students on the fourth and fifth lines of the anchor chart, "evidence/quote to support the opinion and reason." Then explain: "Evidence from research is used to support an opinion. Integrating direct quotes into your evidence sentences is a good way to support your opinion because information from a reliable source, such as the article you read today, lends credibility to your opinion. When something is *credible* it means that it is trustworthy, reliable, or believable. If you want people to agree with your opinion, it is important to support your opinion with clear reasons and credible evidence." • Briefly model for students how to include quotes from the text in their evidence sentences. Say something like: "If my opinion is that the windshield wiper met a greater societal need and I support that with a reason such as 'they made our lives safer.' I could further support my opinion and reason with an evidence sentence such as, 'The article states "we can all be grateful to Mary Anderson for this ingenious invention because it helps us see where we're going, even in the most inclement weather."' The quote from the article that I included in my evidence sentence directly connects to both my opinion that the windshield wiper met a greater societal need and my reason that it made our lives safer by allowing us to see where we are going in bad weather." • Provide additional examples as necessary to support students' understanding of how to incorporate quotes from the article into their evidence sentences. • Tell students to take 5 to 6 minutes work with group members to: 1. Refer to the article and quotes you recorded on your note-catcher to identify evidence that supports your opinion and connects to your reason. 2. Discuss and decide which quotes from the text you will use in your two evidence sentences. 3. Record two more sentences after the reason that contain evidence from the text to support your opinion and connect to your reason (make sure to place quotation marks around exact phrases from the text). • Circulate to offer support and provide guidance as needed. • Draw students' attention to the last line on the anchor chart, "conclusion that restates the opinion." Then ask students to think about and discuss in groups: * "What kind of concluding statement could you write to restate the opinion?"	

Work Time (continued)	Meeting Students' Needs
• After 1 or 2 minutes, invite a few students to share out their thinking with the class. Listen for ideas such as: – "The paper bag machine is undoubtedly the greater invention." – "Windshield wipers made people's lives much better," or similar suggestions. • Allow students 1 or 2 minutes to: 1. With group members, develop a concluding statement that restates the opinion. 2. Have one member of your group write the conclusion after the last evidence sentence, on the group's chart paper. • Tell students to leave their anchor charts posted for a brief gallery walk during the Closing.	

Closing and Assessment	Meeting Students' Needs
A. Gallery Walk and Reviewing Learning Targets (5 minutes) • Ask students to do the following: 1. With your group members, quickly move to another group's Opinion Paragraph chart. 2. Read the paragraph and discuss one "star" (a specific and positive comment) about the paragraph, related to the introduction, opinion, reason, or evidence. 3. Be prepared to share your thinking whole class. • After 2 to 3 minutes, invite groups to share out the comments they have about their peers' opinion paragraphs. Encourage students to be specific with their praise. • Quickly read through each learning target and ask students to use Glass, Bugs, Mud Checking for Understanding technique to indicate their mastery. Note students who show bugs or mud as they may need more support. • Distribute one **index card** to each student, for homework. Ask students to write the following question on their index card: * "How did the compare and contrast structure of the article help you form an opinion about which invention met a greater societal need?"	• Provide a sentence frame to support students during group discussions about opinion paragraphs: "One piece of this opinion paragraph that is really clear/strong is _____ because _____." • Consider writing the question on index cards in advance to support struggling writers.

Homework	Meeting Students' Needs
• Reread the article "Ingenious Inventions by Women: The Windshield Wiper and Paper Bag Machine" to someone at home or aloud to yourself. • Think about and then write a statement on your index card to explain, "How did the compare and contrast structure of the article help you form an opinion about which invention met a greater societal need?" Bring your index card to class as an entry task for the next lesson. • If you did not finish in class, complete your four-column chart for each of the key vocabulary words. • Read your independent reading book for at least 20–30 minutes and write a response to another one of the questions on your Independent Reading Choice Board.	• Some students will benefit from using a "Phonics Phone" while reading aloud to more easily hear the inflection (or lack of) in their voice. Encourage students to practicing reading aloud until fluent enough to engage an audience. • Allow struggling writers to dictate their responses to someone at home. • Consider providing a recording of the text for struggling readers.

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 8

Supporting Materials

"Ingenious Inventions by Women: The Windshield Wiper and the Paper Bag Machine"

Written by Expeditionary Learning for instructional purposes

Mary Anderson and Margaret E. Knight are two inventors you have probably never heard of. However, their ingenious ideas have made our lives both safer and simpler. Read on to learn more about how and why each of these brilliant women developed devices that we still rely on so much today.

Mary Anderson

Where does the idea for a great invention come from? Well, in the case of Mary Anderson it was developed purely from the desire to make people's lives safer.

It was the year 1902 when Mary Anderson traveled far from her home in Alabama and boarded a New York City streetcar. The snow and sleet pelted the car mercilessly. The driver struggled to see the road in front of him through the frost-caked glass. It was because Mary felt sorry for the driver and realized the potential danger to her fellow passengers that she was inspired to create a device that would make people's lives better. That invention was the windshield wiper.

At the time, the best option available was a split windshield. During bad weather, drivers would swing open their front window in the hopes that debris would slide off to clear their view. However, this design did not work very well. So Mary thought, "Why not create a device to remove the snow and ice completely?" Immediately, she began to draw up plans in her notebook.

Mary's final sketch became what we refer to today as "windshield wipers." Or, as she described in her patent application, "… an improvement in window-cleaning devices in which a radially-swinging arm is actuated by a handle from inside of a car-vestibule," which is just another way of saying there would be a lever inside the car that made an arm move across the glass of the windshield.

Unfortunately, manufacturers did not see the value of her idea and she allowed the patent to expire. Several years later, someone else saw Mary's idea. That person patented and sold the invention of windshield wipers to car companies far and wide. Today, we can all be grateful to Mary Anderson for this ingenious invention because it helps us see where we're going, even in the most inclement weather.

"Ingenious Inventions by Women: The Windshield Wiper and the Paper Bag Machine"

Margaret E. Knight

Whereas Mary Anderson's goal was to make people's lives safer, another inventor, Margaret E. Knight, set out to make people's lives easier. In the mid-1800s, Margaret Knight worked at the Columbia Paper Bag Company. Her job was to tie together stacks of handmade, flat-bottomed bags. Flat-bottomed bags took a long time to make, so they cost more than most people could afford. At the time, most people could only afford large wooden crates or poorly crafted envelope-shaped bags to transport their goods from the grocery store to their homes. So when Margaret had been on the job only a week she wondered, "Why can't flat-bottomed bags be made with a machine so they would take less time to put together and cost less money? Then everyone could afford them." Similar to Mary, Margaret's question led her to create a device that would improve people's lives.

Margaret was neither a scientist nor an engineer. However, because she had worked with machines most of her life, she understood how they worked and how to build them. She began sketching ideas for a new paper bag machine that would fold square-bottomed bags. Her next step was constructing and testing the various parts of her machine. Within a year, Margaret had built a complete and working model of her invention. Once her wooden model was complete, she hired a machinist to build one out of iron. She submitted an application for a patent along with the newest version of her "Paper Feeding Machine" in 1868.

Unlike Mary's idea, the value of Margaret's machine was recognized almost immediately. When a man named Charles Annan saw Mary's paper bag machine being cast in iron at the machinist's shop, he tried to steal the idea. Annan copied Margaret's invention and tried to file a patent. He claimed he invented it first. Margaret fought Charles Annan's claim. She traveled to Washington, D.C. to fight him in court. After days of presenting evidence, Margaret received credit for being the first person to develop the paper-folding device. She was awarded the patent for her invention in 1870.

Margaret spent her life developing new and useful inventions. Eventually, she held the rights to 27 patents. In fact, reporters referred to her as "Lady Edison" because of her many discoveries. Nevertheless, it was her first invention of the paper-bag machine that continues to make our lives simpler, even in today's modern world.

Compare and Contrast Note-catcher: "Ingenious Inventions by Women"

***How does the way a text is structured support our understanding of complex ideas?**

Who is being compared and contrasted?

Alike	Different

Compare and Contrast Note-catcher: "Ingenious Inventions by Women"

Enduring Understanding: How did female inventors develop new or improved technologies to meet people's needs?

Fill in the chart using *three* quotes from the text to show how women developed new or improved technologies to meet people's needs.

Female inventors have developed new or improved technologies to meet people's needs.
EVIDENCE (quote from text)

Compare and Contrast Note-catcher: "Ingenious Inventions by Women"

(Answers, for Teacher reference)

Who is being compared and contrasted?
Mary Anderson and Margaret E. Knight

Alike

- **"Mary Anderson and Margaret E. Knight are inventors ..."**
- **"... each of these brilliant women developed devices that we still rely on so much today."**
- **"Similar to Mary, Margaret's question led her to create a device that would improve people's lives."**

Different

- **"Whereas Mary Anderson's goal was to make people's lives safer ... Margaret E. Knight set out to make people's lives easier."**
- **"Unlike Mary's idea, the value of Margaret's machine was recognized almost immediately."**

Compare and Contrast Note-catcher: "Ingenious Inventions by Women"

(Answers, for Teacher reference)

Enduring Understanding: How did female inventors develop new or improved technologies to meet people's needs? (RI.5.1, RI.5.3)

Female inventors have developed new or improved technologies to meet people's needs.
EVIDENCE (quote from text)
"... because Mary felt sorry for the driver and realized the potential danger to her fellow passengers that she was inspired to create a device that would make people's lives better. That invention was the windshield wiper."
" Today we can all be grateful to Mary Anderson for this ingenious invention because it helps us see where we're going, even in the most inclement weather."
"... it was her first invention of the paper-bag machine that continues to make our lives simpler, even in today's modern world."

Opinion Paragraph Anchor Chart

Focus question: Did the invention of the windshield wiper or the paper bag machine meet a greater societal need?

_____ (brief *introduction* to the topic)

_____ (*opinion* statement that includes *key terms* from the question)

_____ (*reason why* you believe the opinion)

_____ (*evidence/quote* to support the opinion and reason)

_____ (*evidence/quote* to support the opinion and reason)

_____ (*conclusion* that restates the opinion)

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 9

Using Quotes and Comparing and Contrasting Structure: The Invention of Basketball

Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)	
I can quote accurately from a text when explaining what the text says explicitly. (RI.5.1) I can compare and contrast the structure of information in two or more texts. (RI.5.5)	
Supporting Learning Targets	**Ongoing Assessment**
• I can explain how the game of basketball was developed to meet societal needs using quotes from the text. • I can compare and contrast the structure of two articles that explain the invention of basketball. • I can explain how comparing and contrasting the structure of what I read supports my understanding of the ideas presented in informational texts.	• Entry task (Lesson 8 homework) • Problem and Solution note-catcher: "Dr. James Naismith, Inventor of Basketball" • Sequential note-catcher: "First College Basketball Game" • Venn diagram • Synthesis questions (responses in journal) • Independent Reading Choice Board response

Agenda	Teaching Notes
1. Opening A. Reviewing Homework and Engaging the Reader (5 minutes) 2. Work Time A. Determining the Gist: The Invention of Basketball (10 minutes) B. Second Read: Using Quotes to Explain How Basketball was Developed to Meet Societal Needs (25 minutes) C. Comparing and Contrasting How Information is Structured to Support Understanding (15 minutes) 3. Closing and Assessment A. Debrief and Reviewing Learning Targets (5 minutes) 4. Homework A. Reread the articles "Dr. James Naismith, Inventor of Basketball" and "First College Basketball Game" B. Finish Classwork C. Independent Reading	• This lesson follows a pattern similar to Lessons 7 and 8. Students work with two new informational texts, "Dr. James Naismith, Inventor of Basketball" and "First College Basketball Game" to continue building their understanding of how informational texts are structured and inventions are developed to meet societal needs. The structures focused on in this lesson are "Problem and Solution" and "Sequential." • During students' second read, they are asked to locate and record quotes from the article "Dr. James Naismith, Inventor of Basketball" on the Problem and Solution note-catcher to explain why and how the game of basketball was invented. Then students locate and record quotes from the article "First College Basketball Game" on the Sequential note-catcher to explain how basketball was developed over time. The "Enduring Understanding" question is added only to the Sequential note-catcher, so students are able to use details from both articles to craft a thorough response to the question. • In Work Time C, students use a Venn diagram to consider and record their thinking about the similarities and differences in the ways information is presented in both articles. Then, students write a response to a synthesis question about how the structure of text supports their understanding of ideas presented in informational articles. This helps students prepare for the End of Unit 1 Assessment. • In advance: – Be ready to return students' Mid-Unit 1 Assessments (from Lesson 6) today with your feedback. – Make sure all anchor charts are posted: Close Readers Do These Things, Group Norms, and Vocabulary Strategies. – Ensure that students have a variety of print and digital resources available to locate the meaning of key terms during Work Time B. – Review Back-to-Back, Face-to-Face protocol (see Appendix).

Lesson Vocabulary	Materials
explain, developed, quotes, problem, solution, criteria, sequential, compare, contrast, structure, presented (from "Dr. James Naismith, Inventor of Basketball"); faced, problem, suitable, skill, relied, relatively (from "First College Basketball Game"); replaced, open-ended, broadcast, ranked	• Journals (students' own, begun in Lesson 1) • Close Readers Do These Things anchor chart (from Lesson 2) • Document camera or projector • "Dr. James Naismith, Inventor of Basketball" (one per student) • "First College Basketball Game" (one per student) • Text Structure resource page (from Lesson 7; one to display) • Problem and Solution note-catcher: "Dr. James Naismith, Inventor of Basketball" (one per student) • Second read task card: "The Invention of Basketball" (one per student and one to display) • Vocabulary Strategies anchor chart (from Lesson 2) • Various reference materials (print and digital; for each group) • Problem and Solution note-catcher: "Dr. James Naismith, Inventor of Basketball" (answers, for teacher reference) • Tape, glue, or staples (for each student) • Sequential note-catcher: "First College Basketball Game" (one per student) • Sequential note-catcher: "First College Basketball Game" (answers, for teacher reference) • Venn diagram: comparing and contrasting structure (one per student) • Venn diagram: comparing and contrasting structure (answers, for teacher reference) • Synthesis questions (one to display)

Opening	Meeting Students' Needs

A. Homework Review and Engaging the Reader (5 minutes)
• Ask students to take out the entry task (on an index card) they completed for homework.
• Review Back-to-Back, Face-to-Face protocol, then ask students to quickly find a partner they have not yet worked with during this unit (or haven't worked with recently).
• Ask students to pair up back-to-back, and then read the homework question aloud:
  * "How did the compare and contrast structure of the article help you form an opinion about which invention was more important?"
• Give students 2 minutes to refer to their entry task, think about a response to the question, then turn face-to-face to discuss their ideas with partners. Cold call several pairs to share their thinking whole group and listen for:
  – "Details about how Mary Anderson and Margaret Knight had different reasons for developing technologies helped me make a judgment about whose invention was more important to people."
  – "Based on the article's description of how Mary's idea wasn't popular at first but Margaret Knight's was, I decided that Margaret's invention must have met a greater need," or similar suggestions.
• Collect students' entry task to review and determine their understanding of how text structure supported their ability to make a judgment about which invention met a greater societal need.
• Refocus whole group. Remind students that they have been focusing both on technologies that have been developed to meet societal needs, and how information about those inventions is structured to support our understanding of why and how new or improved technologies were developed to meet people's needs. Tell them that today they will read two articles about the invention of the game of basketball, then consider how the structure of each article organizes information similarly and differently to help the reader understand how basketball was developed to meet the needs of society.
	• Provide a sentence starter to support student discussions: "The compare and contrast structure helped me form an opinion about which invention was most important because it described _____."

Work Time	Meeting Students' Needs

A. Determining the Gist: The Invention of Basketball (10 minutes)
• Ask students to take out their **journals** and join their regular small groups (from Lessons 1–8.)
• Direct students' attention to the **Close Readers Do These Things anchor chart** posted on the **document camera** and ask them to collectively share out what they typically do when they begin work with a new text. Listen for: "read for the gist," or similar ideas.
• Distribute the article **"Dr. James Naismith, Inventor of Basketball."** Then explain to students that the first read will be aloud, as this article is above grade-level and may contain unfamiliar terms that will interfere with their initial comprehension of the text.
• Tell students to follow along silently as you read the text read aloud. After the article has been read aloud, ask:
  * "What is the gist of this article?"
• Give students 1 or 2 minutes to discuss their thinking in groups, then record a gist statement on the page in their journal where they recorded gist statements in Lessons 7 and 8. Then cold call a few students to share out whole group. Listen for:
  – "Dr. Naismith invented basketball so his students would have a sport to play inside during the cold winter."
  – "Dr. Naismith wanted to invent a game of skill that could be played inside," and similar suggestions.
  Tell students that now they will hear a second short text about the invention of basketball read aloud.
• Distribute the text **"First College Basketball Game"** and ask students to follow along silently once again as you read aloud.
• After the read-aloud, ask students to consider:
  * "What is the gist of the second article?"
• Once again, allow students 1 or 2 minutes to discuss their thinking in groups then record a gist statement. Cold call several students to share out whole group. Listen for: "This article is about how the game of basketball changed over time," "how basketball became popular," or similar ideas.
• Say something along the lines of: "Based on the gist statements you shared, we can safely say that both texts provide information about the invention of basketball. However, we can also say that each article presents somewhat different information about why and how basketball was developed to meet people's needs. During the next part of Work Time, you will work with your group members to reread each article, then locate and record quotes to support your understanding of the ideas each author is trying to convey."
	• For students who struggle to determine the gist of longer passages, encourage them to find the gist of facing pages to keep track as they go and make it more manageable to determine the gist of the entire section.
	• Allow struggling writers to dictate their gist statement to a peer or aide acting as a scribe.

Work Time (continued)	Meeting Students' Needs

B. Second Read: Using Quotes to Explain How Basketball was Developed to Meet Societal Needs (25 minutes)
• Ask students to set aside "First College Basketball Game," as they will work with the "Dr. James Naismith, Inventor of Basketball" text first.
• Then, read the first learning target aloud:
  * "I can explain how the game of basketball was developed to meet societal needs using quotes from the text."
• Remind students they worked with similar targets during the previous two lessons, then ask them to think about how they could restate the target in their own words. Cold call several students to share their thinking whole group.
• Display and ask students to turn to the page in their journals where they attached the **Text Structure resource page**. Focus students' attention on the row titled "Problem and Solution," then read the description aloud. Ask students to think about and discuss in groups what the words *problem* and *solution* mean.
• After 1 or 2 minutes, cold call members from each group to share their thinking with the class. Listen for examples such as:
  – "A problem is a difficulty, a dilemma."
  – "A solution is an answer to the problem," or similar ideas.
• Next, distribute the **Problem and Solution note-catcher: "Dr. James Naismith, Inventor of Basketball."** Then display and distribute the **second read task card: "The Invention of Basketball."**
• Direct students to focus on just Part I directions for their work with the Dr. James Naismith article. Read each direction aloud, pausing on direction 2. Direct students' attention to the **Vocabulary Strategies anchor chart**, and remind them they have worked on determining the meaning of unfamiliar terms from context, various reference materials, and their understanding of roots, affixes, prefixes, and suffixes over this unit. Ask students to think then discuss in groups:
  * "How can you use various strategies to help you determine the meaning of unfamiliar words and phrases?"
	• To support visual learners and ELL students, display a drawing, picture from the internet, or familiar synonym above or below key words in learning target.
	• For students who struggle with the physical act of writing, allow them to type their responses on a computer or word processor, or dictate their analysis paragraph to an aide or a peer acting as a scribe.
	• Consider using a think-aloud strategy, either with small groups or individual students, to model using context clues to determine the meaning of the first several terms.

Work Time (continued)	Meeting Students' Needs
• After 1 or 2 minutes, cold call a few students to share out whole class. Listen for: – "I can use context such as words and phrases that surround an unfamiliar term to give me a clue about unfamiliar terms." – "I can read sentences before and after the word to help me figure out the meaning." – "I can substitute a synonym for the word and read to determine if the sentence makes sense with the new word." – "I can use print and online reference materials to locate the meaning of the word." – "I can use my understanding about parts of the word to help me figure out what it means," or similar ideas. • Continue reading the directions aloud, pausing on 5. Ask students to focus on the word *criteria* in this direction. Ask students to think about and discuss with group members what the word "criteria" means in the context of this direction. After 1 or 2 minutes, invite students to share their thinking whole group. Listen for ideas such as: "Criteria in this context means qualities Dr. Naismith wanted to include," "the standards he had for creating the game," "the principles that guided his creation of the game," or similar suggestions. If students are not able to determine the meaning of criteria as it is used in this context, provide a definition and examples for them. • Clarify directions as needed. Make **various reference materials** available to students as they work. • Give students 6 to 7 minutes to reread the second paragraph of the article and record quotes in their note-catchers to explain the problem, solution, and criteria for developing the solution. Circulate to offer support and guidance as needed. • Refocus whole group. Cold call members from each group to share out quotes they recorded to explain the problem, solution, and criteria Dr. Naismith had for inventing the game of basketball. Refer to **Problem and Solution note-catcher: "Dr. James Naismith, Inventor of Basketball" (answers, for teacher reference)** as needed. • Then focus students on the key terms listed at the top of their note-catchers and in the Part I directions: *faced*, *suitable*, *skill*, *relied*, and *relatively*. Invite students to share out a synonym or short definition for each word. Listen for: – "Faced in this context means he was dealing with a problem, he came upon a problem." – "Suitable means appropriate, the right solution for a problem." – "Skill in this context means ability, talent." – "Relied means depended on." – "Relatively means as compared to," or similar ideas.	

Work Time (continued)	Meeting Students' Needs
• Give students 2 minutes to revise or add to their note-catchers based on understandings about key vocabulary. • Then, ask students to **tape**, **glue**, or **staple** their Problem and Solution note-catchers onto the next blank page in their journals. • Ask students to set aside the Dr. Naismith article and take out the "First College Basketball Game" text. Distribute the **Sequential note-catcher: "First College Basketball Game,"** then display and ask students to refer once again to their Text Structure resource page. Direct students' attention to the row titled "Sequential" and read the description aloud. Ask students to think about and discuss in groups what the word *sequential* means. • After 1 or 2 minutes, cold call a few students to share out their thinking whole group. Listen for: – "Sequential means the order in which something happens." – "Chronological, in order of time, earliest to latest or most recent," and similar ideas. • Direct students to refer back to the second read task card, and focus on the directions for Part II. Read each step aloud, pausing on Step 2 to reiterate that students should try to determine the meaning of key words and phrases in the text as they reread. • Give students 6 to 7 minutes to reread the second and third paragraphs of the article and record quotes in their note-catchers to explain how basketball developed over time. Circulate to support and offer guidance to individuals and small groups as needed. • Refocus whole group. Cold call several students to share aloud the quotes they recorded to explain how basketball was developed over time. Refer to the **Sequential note-catcher: "First College Basketball Game" (answers, for teacher reference)** as needed. • Once again, focus students' attention on the key words listed at the top of their note-catchers and in the Part II directions: *replaced*, *open-ended*, *broadcast*, and *ranked*. Invite members from each group to share out a synonym or short definition for each term. Listen for: – "Replaced means substituted, changed, used instead." – "Open-ended in this context means there was a hole in both ends of the basket." – "Broadcast means it was shown on television, filmed." – "Ranked means how important something is, how it is rated," or similar suggestions.	

Work Time (continued)	Meeting Students' Needs
• Give students 2 minutes to add to or revise the quotes they added to their Sequential note-catchers, based on new understandings about key words. • Then, focus students' attention on Part III of the second read task card. Read the directions aloud and provide clarification as needed. • Give students 4 or 5 minutes to complete the "Enduring Understanding" chart at the bottom of their Sequential note-catchers. Circulate to support. • Cold call a few students to share the quotes they added to the chart whole group. • Then ask students to tape, glue, or staple their Sequential note-catchers onto the next blank page in their journals.	

C. Comparing and Contrasting How Information is Structured to Support Understanding (15 minutes)
• Read the second learning target aloud:
  * "I can compare and contrast the structure of two articles that explain the invention of basketball."
• Ask students to recall what they know about the meaning of the key words in this target: *compare*, *contrast*, *structure*, and *explain*. Then ask students to think about and discuss with group members:
  * "How could you restate this target in your own words?"
• After 1 or 2 minutes, cold call several students to share their thinking with the class. Listen for ideas like:
  – "I can explain how the information in each article is similar and different," or similar suggestions.
• Distribute the **Venn diagram: comparing and contrasting structure**. If students are unfamiliar with a Venn diagram, take a moment to explain that information from the articles that is different should be written in the outer left- and right-hand sides of the circles. Information that is similar should be written in the central area, where the two circles overlap.
• Read the directions aloud and tell students they should write general statements about the information contained in each article, rather than direct quotes to compare and contrast the information. Clarify directions or model by providing one example of a similarity and one example of a difference. See **Venn diagram: comparing and contrasting structure (answers, for teacher reference)** for ideas.
	• To support visual learners and ELL students, display a drawing, picture from the internet, or familiar synonym above or below key words in the learning targets.
	• For students who struggle with the physical act of writing, allow them to dictate similarities and difference they notice and/or responses to the synthesis questions to an aide or peer acting as a scribe.

Work Time (continued)	Meeting Students' Needs
• Give students 7 to 8 minutes to: 1. Refer to the articles and your note-catchers to determine similarities and differences between the information presented in each article. 2. Discuss your thinking with group members. • Record your ideas in the Venn diagram. • As students work in groups, circulate throughout the room to offer support and guidance as needed. • After 7 or 8 minutes, refocus whole group and cold call several students to share out with the class what they added to their Venn diagrams. • Ask students to tape, glue, or staple the Venn diagram onto the next blank page in their journals. • Then, ask students to turn to a new blank page in their journals and display the **synthesis questions** where all students can see them. Read the synthesis questions aloud and provide clarification if needed. • Give students 3 or 4 minutes to complete the following: 1. Refer to the articles "Dr. James Naismith, Inventor of Basketball," "First College Basketball Game," your note-catchers, and the Venn diagram to help you formulate responses to the synthesis questions. 2. Discuss your thinking with group members. 3. Record a response to each synthesis question in your journal. • As students work in groups, circulate to offer support as needed. • Tell students they will share their synthesis responses during the debrief.	

Closing and Assessment	Meeting Students' Needs
A. Debrief and Reviewing Learning Targets (5 minutes) • Bring students together whole group. • Then ask students to share with a nearby partner who is not a member of their regular small group their responses to the synthesis questions from Work Time C. • Give students 2 or 3 minutes to discuss their thinking with partners. Then, invite students to share their thinking whole group. Listen for ideas such as: – "The Dr. Naismith article is structured as problem and solution; the purpose of the article is to explain why basketball was developed and how it met people's needs." – "The College Basketball article is structured in a sequential order; the purpose of the article is to explain how basketball has developed or changed over time." – "The problem and solution structure helped me understand that people needed a sport to play inside during wintertime in Massachusetts, whereas the sequential structure helped me understand how basketball changed over time to appeal to players, to appeal to fans," or similar suggestions. • Redirect students' attention to the learning targets. Read each target aloud and ask students to show a thumbs-up or thumbs-down to demonstrate their mastery toward each target. Note students who show a thumbs-down, as they may need more support locating quotes to explain or determining how structure supports their understanding of complex idea presented in informational texts. • Inform students they will take the End of Unit 1 Assessment in the next lesson.	

Homework	Meeting Students' Needs
• Reread the articles "Dr. James Naismith, Inventor of Basketball" and "First College Basketball Game" aloud independently or to someone at home to practice your fluency skills. • Revise or add to your Problem and Solution and/or Sequential note-catchers based on new understandings. • If you did not finish in class, complete your four-column chart for each of the key vocabulary words. • Read your independent reading book for at least 15–20 minutes and write a response to the final (center square) question on your Independent Reading Choice Board. Be prepared to discuss the qualities you are looking for in the next independent reading book you choose.	• Allow struggling writers to dictate their responses to someone at home. • Consider providing a recording of the text for struggling readers.

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 9

Supporting Materials

" Inventor of Basketball"

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"First College Basketball Game"

January 18, 1896

When you are out on the court playing basketball, or watching it on TV, have you ever wondered who invented the game? The first ever college basketball game was played on January 18, 1896, when the University of Iowa invited student athletes from the new University of Chicago for an experimental game. Final score: Chicago 15, Iowa 12, a bit different from the 100-point scores of today.

In December 1891, Canadian-born James Naismith, a physical education teacher at the YMCA (Young Men's Christian Association) training school, took a soccer ball and a peach basket in the gym and invented basketball. In 1893, he replaced the peach basket with iron hoops and a hammock-style basket. Ten years later came the open-ended nets of today. Before that, you had to retrieve your ball from the basket every time you scored.

In 1963, college games were first broadcast on national TV, but it wasn't until the 1980s that sports fans ranked basketball up there with football and baseball. It's a popular neighborhood sport, too. The next time you shoot hoops with your family or friends, you can tell them how it all got started.

"First College Basketball Game." First College Basketball Game. 10 Dec. 2013. <http://www.americaslibrary.gov/jb/progres

Problem and Solution Note-catcher: "Dr. James Naismith, Inventor of Basketball"

***How does the way a text is structured support our understanding of complex ideas?**

Key Terms: *faced, suitable, skill, relied, relatively*

PROBLEM

SOLUTION

_____

Quotes that explain at least two of Dr. Naismith's *criteria* for developing a solution:

Second Read Task Card: The Invention of Basketball

Part I: *Problem and Solution note-catcher*

1. Independently reread *only* the second paragraph of the article "Dr. James Naismith, Inventor of Basketball."
2. As you read, circle the key words: *faced*, *suitable*, *skill*, *relied*, and *relatively*. Try to determine the meaning of each word by using a variety of strategies, including context, reference materials, and your understanding about parts of words. Be sure to discuss your thinking with group members.
3. Locate a quote that explains the problem Dr. Naismith was trying to solve. Discuss your thinking with group members, then record the quote in the "PROBLEM" box.
4. Locate a quote from the article that explains what Dr. Naismith invented to solve the problem. Discuss your thinking with group members, then record the quote on the line in the top part of the "SOLUTION" box.
5. Locate at least two quotes that describe Dr. Naismith's *criteria* for developing a solution. Discuss your thinking with group members, then record the quotes in the lower half of the "SOLUTION" box.

Part II: *Sequential note-catcher*

1. Independently reread *only* the second and third paragraphs of the article "First College Basketball Game."
2. As you read, circle the key words: *replaced*, *open-ended*, *broadcast*, and *ranked*. Try to determine the meaning of each word by using a variety of strategies, including context, reference materials, and your understanding about parts of words. Be sure to discuss your thinking with group members.
3. Locate three to five quotes that explain how *the game of basketball was developed over time*. Discuss your thinking with group members, then record the quotes in *sequential* order.

Part III: *Enduring Understanding*

1. Read the "Enduring Understanding" question at the bottom of the Sequential note-catcher.
2. Refer to the text and quotes you recorded into BOTH note-catchers to help you think of an answer to the question.
3. Discuss your thinking with group members.
4. Fill in the chart using quotes from **both** texts to show how the invention of basketball met people's needs.

Problem and Solution Note-catcher: "Dr. James Naismith, Inventor of Basketball"

(Answers, for Teacher Reference)

PROBLEM

"Naismith was faced with the problem of finding a sport that was suitable for play inside during the Massachusetts winter (for the students at the School for Christian Workers)."

↓

SOLUTION

"... the sport of basketball was born."

Quotes that explain at least two of Dr. Naismith's *criteria* for developing a solution:

1. **"... a game of skill for the students instead of one that relied solely on strength."**
2. **"... a game that could be played indoors in a relatively small space."**
3. **"The first game was played with a soccer ball and two peach baskets used as goals."**

Sequential Note-catcher: "First College Basketball Game"

How does the way a text is structured support our understanding of complex ideas?

Key Terms: replaced, open-ended, broadcast, ranked

List three to five events that explain the development of basketball, in the order in which they occurred:

1st Event	
2nd Event	
3rd Event	
4th Event	
5th Event	

Sequential Note-catcher: "First College Basketball Game"

Enduring understanding: How did the invention of basketball meet societal needs?

Fill in the chart below using evidence from the text to show how the invention of basketball met the needs of society. Use quotes from **both** texts in your response.

The invention of basketball met societal needs.	
EVIDENCE (quote from text)	SOURCE (name of article)

Sequential Note-catcher: "First College Basketball Game"
(Answers, for Teacher Reference)

1st Event	**"In December 1891, Canadian-born James Naismith ... took a soccer ball and a peach basket in the gym and invented basketball."**
2nd Event	**"In 1893, he replaced the peach basket with iron hoops and a hammock-style basket."**
3rd Event	**"Ten years later came the open-ended nets of today. Before that, you had to retrieve your ball from the basket every time you scored."**
4th Event	**"In 1963, college games were first broadcast on national TV ... "**
5th Event	**"... it wasn't until the 1980s that sports fans ranked basketball up there with football and baseball."**

Sequential Note-catcher: "First College Basketball Game"
(Answers, for Teacher Reference)

Enduring understanding: How did the invention of basketball meet societal needs?

Fill in the chart below using evidence from the text to show how the invention of basketball met the needs of society. Use quotes from **both** texts in your response.

The invention of basketball met societal needs.	
EVIDENCE (quote from text)	SOURCE (name of article)
"... a sport that was suitable for play inside during the Massachusetts winter ..."	**"Dr. James Naismith, Inventor of Basketball"**
"... a game of skill for the students instead of one that relied solely on strength."	**"Dr. James Naismith, Inventor of Basketball"**
"... a game that could be played indoors in a relatively small space."	**"Dr. James Naismith, Inventor of Basketball"**
"Ten years later came the open-ended nets of today. Before that, you had to retrieve your ball from the basket every time you scored."	**"First College Basketball Game"**

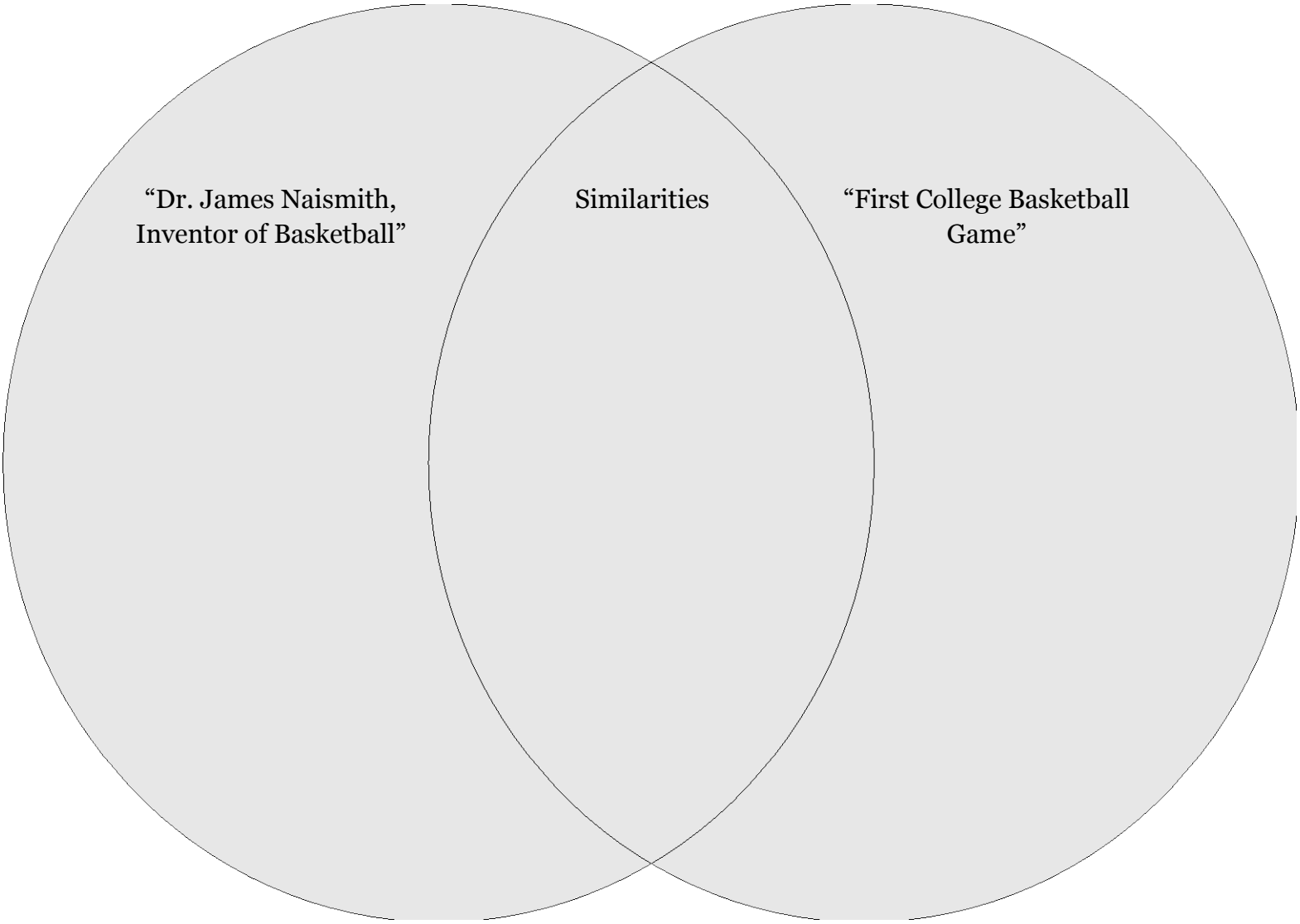
Venn Diagram: Comparing and Contrasting Structure

Name:

Date:

Refer to the articles and your note-catcher to complete the Venn diagram below.

- In your own words, explain at least two ways the information about the invention of basketball is *similar* in the two articles.
- In your own words, explain at least two ways the information about the invention of basketball is *different* in the two articles.



Venn Diagram: Comparing and Contrasting Structure
(Answers, for Teacher Reference)

Below are sample answers. Accept any student responses that are supported by details from the text.

"Dr. James Naismith, Inventor of Basketball"

- **Explains how Dr. Naismith invented basketball so students could have a game to play inside during the winter (the problem).**
- **Gives details about criteria Dr. Naismith used to invent the game of basketball**

Similarities

- **Both articles state basketball was invented by Dr. James Naismith in 1891.**
- **Both articles explain how basketball met people's needs (a game to play in winter and popular with sports fans).**

"First College Basketball Game"

- **Explains how basketball changed over time.**
- **Lists dates when changes were made to basketball and describes the specific changes made each time.**
- **Explains how basketball is popular with sports fans.**

Synthesis Questions

What is the structure of the article "Dr. James Naismith, Inventor of Basketball"? What is the purpose of the article?

What is the structure of the article "The First College Basketball Game"? What is the purpose of the article?

How did reading two different types of articles help you better understand the invention of the game of basketball?

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 10

End of Unit Assessment: Using Quotes to Explain Relationships and Support an Opinion

End of Unit Assessment:
Using Quotes to Explain Relationships and Support an Opinion

Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)
I can determine the meaning of words and phrases as they are used in a text, including figurative language such as metaphors and similes. (RI.5.4) I can quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (RI.5.1) 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) I can compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts. (RI.5.5) I can write opinion pieces on topics or texts, supporting a point of view with reasons and information. (W.5.1) a. Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer's purpose. b. Provide logically ordered reasons that are supported by facts and details.

Supporting Learning Targets	Ongoing Assessment
• I can determine the meaning of unfamiliar words and phrases using a variety of strategies. • I can analyze the way text is structured to support readers' understanding of complex ideas. • I can write an opinion paragraph to explain which invention has been most important to people. • I can reflect on my learning about how new or improved technologies are developed to meet societal needs.	• End of Unit 1 Assessment: Using Quotes to Explain Relationships and Support an Opinion • Tracking My Progress: End of Unit 1 recording form • Independent Reading Choice Board response

Agenda	Teaching Notes
1. Opening A. Reviewing Homework and Engaging the Reader (5 minutes) B. Reviewing Learning Targets (5 minutes) 2. Work Time A. End of Unit 1 Assessment: Using Quotes to Explain Relationships and Support an Opinion (35 minutes) B. Tracking My Progress: Reflecting on Learning (10 minutes) 3. Closing and Assessment A. Debrief: Sharing Reflections on Learning Targets and Exit Ticket (5 minutes) 4. Homework A. Fluency Practice	• The end of unit assessment is "open book": Students may use all of their texts, notes, and other written resources. However, they must work independently unless otherwise indicated by an IEP or other formal learning plan. • Students should also have completed the last square on their Independent Reading Choice Boards (from Lesson 1), "What qualities will you look for in the next book you read?" Find time during the day to meet with individual students to discuss their reflections. Students will have an opportunity to choose a new independent reading text in Unit 2, Lesson 1. For students who are not finished reading their first text, ask them if they would like to continue reading the book or if there may be a better choice for them, based on their responses to questions from the choice board. If students would like to continue, consider assigning an alternate task such as ways to build fluency skills related to accuracy, rate, and expression. • In advance: – Review the End of Unit 1 Assessment: Using Quotes to Explain Relationships and Support an Opinion and the assessment texts "Big Thinkers" and "Steve Jobs." – Be sure students have access to their own version of the articles "The Electric Motor," "Dr. Naismith, Inventor of Basketball," and "First College Basketball Game." – Display the following anchor charts from Lessons 1–9 for student reference during the assessment: Close Readers Do These Things and Vocabulary Strategies. – Review Four Corners protocol (see Appendix).

Lesson Vocabulary	Materials
determine, variety, strategies, analyze, structured, complex, opinion, invention	• Four Corners sheets (post each one in a different area of the room) • Journals (students' own, begun in Lesson 1) • "The Electric Motor" (from Lesson 7; one per student) • "Dr. Naismith, Inventor of Basketball" (from Lesson 9; one per student) • "First College Basketball Game" (from Lesson 9; one per student) • Close Readers Do These Things anchor chart (from Lesson 1) • Vocabulary Strategies anchor chart (from Lesson 2) • "Big Thinkers: Was Steve Jobs This Generation's Thomas Edison?" (assessment text; one per student) • "Steve Jobs" (assessment text; one per student) • End of Unit 1 Assessment: Using Quotes to Explain Relationships and Support an Opinion (one per student) • Tracking My Progress: End of Unit 1 recording form (one per student) • Index cards (one per student) • Independent Reading Choice Board (one per student)

Opening	Meeting Students' Needs
A. Reviewing Homework and Engaging the Reader (5 minutes) • Review the Four Corners protocol with students. Provide clarification as needed. • Then, focus students' attention on each of the **Four Corners sheets**: – "Basketball met the greatest societal need." – "Windshield wipers met the greatest societal need." – "The paper bag machine met the greatest societal need." – "The electric motor met the greatest societal need." • Ask students to think about the articles they read about each of these inventions, and then determine which invention met the greatest societal need. • Once students have made a decision, direct them to stand near the Four Corners sheet that reflects their choice. • Give students 2 or 3 minutes to discuss with other students at the same sheet why they believe that particular invention met the greatest societal need. Encourage students to refer to direct quotes from the articles they have read to justify their opinion. Circulate to listen in on group conversations and offer guidance as needed. • After 2 to 3 minutes, invite a member from each of the four groups to share the group's thinking aloud. Answers will vary, but listen for students to justify their ideas with information from the texts they have read. • Then, explain to students that today they will take the End of Unit 1 Assessment to demonstrate their mastery toward the targets they have focused on in the second half of this unit: determining the meaning of key terms from context; comparing, contrasting, and explaining how text structure supports their understanding of complex ideas; and sharing an opinion about which invention meets the greatest societal need.	• Provide sentence frames to support students during group discussions: "I think _____ is most important because the article about _____ says _____."

Opening (continued)	Meeting Students' Needs

B. Reviewing Learning Targets (5 minutes)
• Display and read aloud the first three learning targets, or invite volunteers to read them aloud. Ask students to pay attention to familiar vocabulary words from the target and be ready to share the meaning.
  * "I can determine the meaning of unfamiliar words and phrases using a variety of strategies."
  * "I can analyze the way text is structured to support readers' understanding of complex ideas."
  * "I can write an opinion paragraph to explain which invention has been most important to people."
• Ask students to discuss with their group mates the important vocabulary from the targets. Important vocabulary may be new or repeated from previous lessons.
• Invite a volunteer from each group to share at least one word and the meaning in their own words.
• If not mentioned in the discussion, bring the words *determine*, *variety*, *strategies*, *opinion*, *invention*, *society*, *analyze*, *structured*, and *complex* to students' attention. Listen for students to offer definitions such as:
  – "Determine means to find out, define."
  – "Variety mean a mixture or assortment."
  – "Strategies are plans or approaches to challenges."
  – "Analyze means to examine or study closely."
  – "Structured means organized, arranged, or set up."
  – "Complex means complicated or difficult to understand."
  – "An opinion is a view, judgment, or belief."
  – "Invention means the creation of a new technology or device."
• To allow for synthesis of the vocabulary review, allow students 1 minute to discuss in groups ways to restate these targets in their own words. Invite a member from each group to share.
	• Display student-generated synonyms above or below key words in the learning targets to support ELLs and other students who may struggle with vocabulary.

Work Time	Meeting Students' Needs
A. End of Unit 1 Assessment: Using Quotes to Explain Relationships and Support an Opinion (35 minutes) • Tell students that today they will read two new pieces of informational text about inventions and their impact on society. Then they will respond to some questions about these texts, as well as the other informational texts they have read throughout the second half of this unit. • Tell students that this is an "open book" assessment, which means they may use their resources but must work on their own. They may use their journal notes, other texts, and all anchor charts to support their responses to questions and writing prompts. Give students time and support to locate and gather materials from prior lessons that they will need: – **Journals** – **"The Electric Motor"** – **"Dr. James Naismith, Inventor of Basketball"** – **"First College Basketball Game"** • Make sure the **Close Readers Do These Things** and **Vocabulary Strategies anchor charts** are posted for student reference. • Distribute the assessment texts, **"Big Thinkers: Was Steve Jobs This Generation's Thomas Edison?"** and **"Steve Jobs"** as well as the **End of Unit 1 Assessment: Using Quotes to Explain Relationships and Support an Opinion**. • Give students 1 minute to quickly scan the assessment and then address any clarifying questions students may have. • Give students approximately 30 minutes to independently complete the assessment. • Circulate to supervise; since this is a formal, on-demand assessment, do not provide support other than formally approved accommodations.	• ELLs receive extended time as an accommodation on New York State assessments.

Work Time (continued)	Meeting Students' Needs
B. Tracking My Progress: Reflecting on Learning (10 minutes) • Introduce the learning target: ∗ "I can reflect on my learning about how new or improved technologies are developed to meet societal needs." • Focus on the word "reflect." Ask students for suggestions about what this term means. Listen for students to share ideas such as: "look back at my work to think about what I did," "how I did," "what I am having trouble with," "what I am doing well," and similar suggestions. • Distribute the **Tracking My Progress: End of Unit 1 recording form**. Explain that this is a self-assessment, and is very much like the self-assessment they completed for the mid-unit assessment. They will reflect on their progress toward each of the three learning targets. Read through the tracker and provide clarification as necessary. • After several minutes, invite students to share their self-assessment of these targets with a partner by referring to their Tracking My Progress recording form. Invite several students to share aloud with the group. • Collect students' End of Unit 1 Assessments to formally assess, and their Tracking My Progress forms to review.	• Allow students who struggle with written language to dictate their reflections on learning targets to a partner or a teacher. This allows all students to participate in a meaningful way. • Consider providing a sentence frame to ensure all students have access to the conversation: "On the _____ (first, second, third) target, I circled _____ because _____."

Closing and Assessment	Meeting Students' Needs
A. Debrief: Sharing Reflections on Learning Targets and Exit Ticket (5 minutes) • Refocus whole group and congratulate students on their thoughtful responses to the assessment questions as well as their ability to show what they know about determining the meaning of unfamiliar words from context, analyzing how text structure supports readers' understanding, and expressing their opinions through writing. • Then distribute one **index card** to each student to use as an exit ticket. Pose the following question: * "Imagine you could meet one of the inventors we have read about. Who would you choose? What would you tell him or her about how this invention has impacted society?" • Give students 2 to 3 minutes to record a response on their exit ticket cards and then share their thinking with a nearby partner. • Invite several students to share their thinking whole group, then collect students' exit tickets for review. Distribute new **Independent Reading Choice Boards** to each student for homework.	• Allow students who struggle with written language to dictate their exit ticket to a partner or a teacher.
Homework	**Meeting Students' Needs**
• Reread either the "Big Thinkers: Was Steve Jobs the Next Thomas Edison?" or "Steve Jobs" article aloud to someone at home or in front of the mirror, to practice fluency skills.	• To support students who struggle with fluency, consider providing an audio recording of the articles for students to read along with.

EXPEDITIONARY LEARNING

Grade 5: Module 2B: Unit 1: Lesson 10

Supporting Materials

Four Corners Sheets

"Basketball met the greatest societal need."

"Windshield wipers met the greatest societal need."

Four Corners Sheets

"The paper bag machine met the greatest societal need."

"The electric motor met the greatest societal need."

"Big Thinkers: Was Steve Jobs This Generation's Thomas Edison"

Tech

BIG THINKERS

Was Steve Jobs this generation's Thomas Edison?

When Steve Jobs, co-founder of Apple, died on October 5 at age 56, countless tributes cited his achievements. Many put his name alongside that of another great achiever. One obituary said of Jobs, "The 20th century's Thomas Edison has stepped from the stage." Is the comparison an apt one?

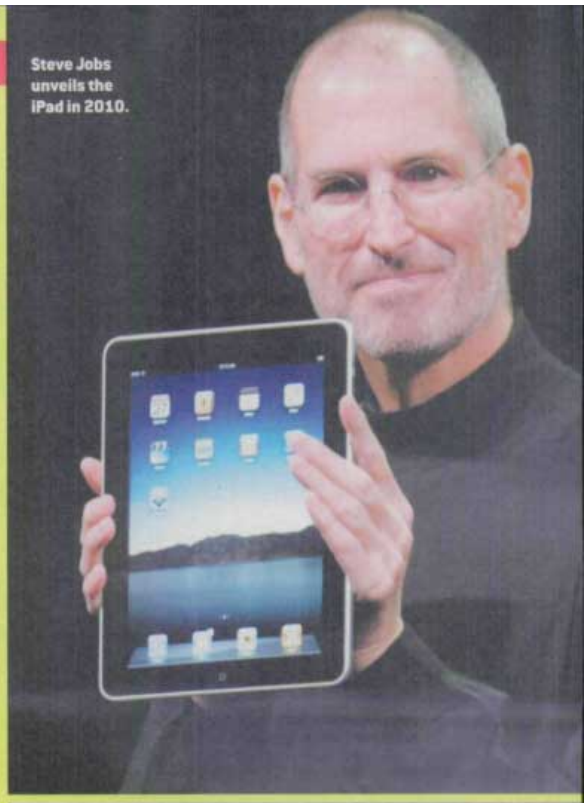
Thomas Alva Edison (1847-1931), the world's most famous inventor, created or improved devices that revolutionized the way people lived. His work brought electricity and electric-powered devices into people's homes and everyday lives for the first time.

Jobs is cited as the inventor or co-inventor on 313 U.S. patents. By contrast, Edison's name is on 1,093.

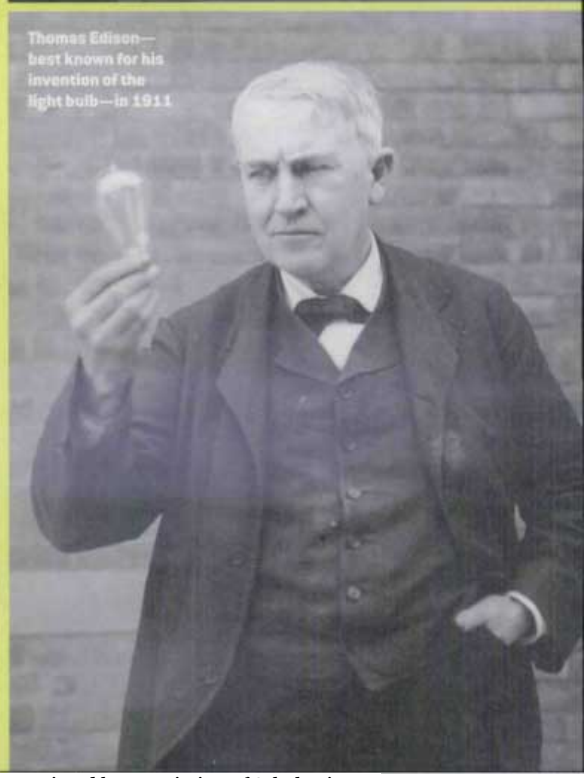
Though he may not be Edison's equal in terms of patents, Jobs is clearly one of the world's great innovators. Other people invented the computer mouse and the MP3 player; Jobs found ways to make such devices sleeker, more versatile, and easier to use.

Jobs founded Apple Computer in 1976 with a high school friend. "We worked hard," he told students at Stanford University in 2005, "and in 10 years Apple had grown from just the two of us in a garage into a $2 billion company with over 4,000 employees."

In 1984, Apple introduced the Macintosh. Macs were the first "user-friendly" computers. They let people do what we now take for granted: interact with computers with on-screen images and a mouse rather than by typing in long, tedious commands. Other popular Apple innovations include the iPhone, the first touch-screen cell phone; the iPad, the leading touch-screen tablet; and iTunes, a cheap—and legal—way to buy music online. "A lot of times," Jobs once said, "people don't know what they want until you show it to them."



Steve Jobs unveils the iPad in 2010.



Thomas Edison—best known for his invention of the light bulb—in 1911

"Steve Jobs"

TFK 2011 Person of the Year Nominee
December 2, 2011
By TIME For Kids Staff

For a quarter of a century, Apple cofounder Steve Jobs pushed and helped define the boundaries of computing technology. In October, Jobs died from a rare form of cancer. Millions of people mourned his death, creating monuments to his memory at Apple stores across the country. Throughout his illness, he never stopped innovating. In fact, he helped push through groundbreaking new products just weeks before he died.

Apple's first big success was the Apple II personal computer in 1977.

Ten years ago, Jobs introduced the world to a new MP3 player, the now well-known iPod. The company introduced the iTunes Music Store in 2003, allowing consumers to purchase and download music with the touch of a button.

A true breakthrough happened in 2007, when Apple first showed off its iPhone. The product, more than merely a gadget, is essentially a computer that can be carried in your pocket. Consumers agreed that it was a revolutionary product. Many camped out in front of Apple stores to be the first to buy the new device. By 2011, the iPhone was selling more than 220,000 units a day.

In 2010, Apple broke into the tablet computer industry with the iPad. The company sold 14.8 million iPads in 2010, which was well beyond what industry analysts predicted.

End of Unit 1 Assessment:
Using Quotes to Explain Relationships and Support an Opinion

Learning Targets Assessed:
I can determine the meaning of words and phrases as they are used in a text, including figurative language such as metaphors and similes. (RI.5.4)
I can quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (RI.5.1)
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)
I can compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts. (RI.5.5)
I can write opinion pieces on topics or texts, supporting a point of view with reasons and information. (W.5.1)

a. Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer's purpose.

b. Provide logically ordered reasons that are supported by facts and details.

Directions

- Read the articles "Big Thinkers" and "Steve Jobs."
- Consider the gist of the articles—what are they mostly about?
- Skim the assessment questions below.
- Reread the texts in chunks to help you think about the answers to the assessment questions.
- Answer short-response questions in complete sentences.
- Be sure to cite evidence from the text to support your thinking.
- Be sure to include key words and phrases from the texts in your short-answer responses.

End of Unit 1 Assessment:
Using Quotes to Explain Relationships and Support an Opinion

1. Read the following paragraph from the article "Big Thinkers," then answer the questions that follow.

"Though he may not be Edison's equal in terms of patents, Jobs is clearly one of the world's great ***innovators***. Other people invented the computer mouse and MP3 player; Jobs found ways to make such devices sleeker, more versatile, and easier to use."

Part A:
What does the word *innovators* mean in this paragraph?

a. a trendsetter
b. an inventor
c. a person who resists change
d. a person who improves or makes changes to the design of existing inventions

Part B:
Which of the following phrases from the article best helps the reader understand the meaning of the word *innovator*?

a. "Other people invented the computer mouse and MP3 player; Jobs found ways to make such devices sleeker, more versatile, and easier to use."

b. "We worked hard."

c. "Macs were the first user-friendly computers."

d. "Other popular Apple innovations include the iPhone ..."

2. According to the "Big Thinkers" article, how are Thomas Edison and Steve Jobs similar?

a. They both created or improved technologies that changed people's lives.

b. They have both patented more than 1,000 new or improved technologies.

c. They both said, "People don't know what they want until you show it to them."

End of Unit 1 Assessment:
Using Quotes to Explain Relationships and Support an Opinion

3. Structure of Informational Texts

Part A: How are the first three paragraphs of the "Big Thinkers" article structured?
(choose one)

a. Cause and Effect
b. Problem-Solution
c. Sequential
d. Descriptive
e. Compare and Contrast

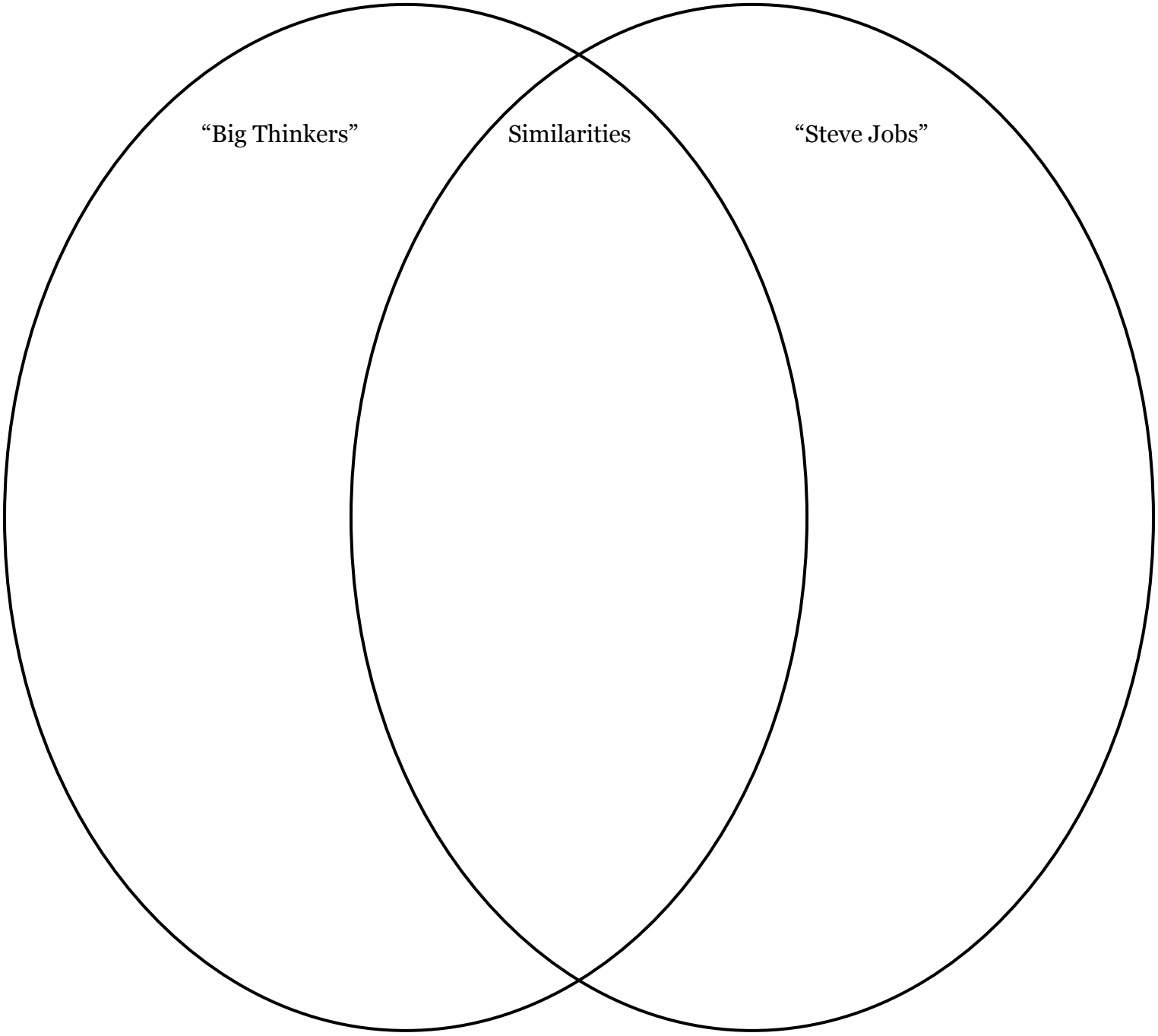
How is the "Steve Jobs" article structured?
(choose one)

a. Cause and Effect
b. Problem-Solution
c. Sequential
d. Descriptive
e. Compare and Contrast

End of Unit 1 Assessment:
Using Quotes to Explain Relationships and Support an Opinion

Part B. Complete the Venn diagram to show:

- At least two ways "Big Thinkers" and "Steve Jobs" convey *similar* information about Steve Jobs.
- At least two ways "Big Thinkers" and "Steve Jobs" convey *different* information about Steve Jobs.



End of Unit 1 Assessment:
Using Quotes to Explain Relationships and Support an Opinion

Part C: Short Constructed Response

What were you able to understand about Steve Jobs from the "Big Thinkers" and "Steve Jobs" articles? Provide at least one specific example from each article as well as key words and phrases from the texts in your response.

End of Unit 1 Assessment:
Using Quotes to Explain Relationships and Support an Opinion

4. Opinion Writing
   Think about the following three inventions you have read about in this unit:

- ***The electric motor***
- ***The game of basketball***
- ***Apple computers***

Given what you know about how each of these inventions met people's needs, which one of the three do you think has been the most important to people?

Refer to the articles "The Invention of the Electric Motor," "Dr. James Naismith, Inventor of Basketball," "First College Basketball Game," "Big Thinkers," and "Steve Jobs" as well as your Cause and Effect, Problem and Solution, and Sequential note-catchers (from Lessons 7 and 9) to help you form your opinion.

Write a four or five sentence paragraph that includes:

- A brief introduction to the topic
- An opinion statement
- A reason that explains why you believe the opinion
- Two pieces of evidence to support the reason and opinion
- A conclusion that restates the opinion
- Clearly organized ideas
- Key words and phrases from the texts

_____

_____

_____

_____

_____

_____

_____

_____

End of Unit 1 Assessment:
Using Quotes to Explain Relationships and Support an Opinion
(Answers, for Teacher Reference)

Learning Targets Assessed:
I can determine the meaning of words and phrases as they are used in a text, including figurative language such as metaphors and similes. (RI.5.4)
I can quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (RI.5.1)
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)
I can compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts. (RI.5.5)
I can write opinion pieces on topics or texts, supporting a point of view with reasons and information. (W.5.1)

a. Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer's purpose.

b. Provide logically ordered reasons that are supported by facts and details.

*Answers are in **bold.**

1. Read the following paragraph from the article "Big Thinkers," then answer the questions that follow. **(RI.5.4)**

"Though he may not be Edison's equal in terms of patents, Jobs is clearly one of the world's great ***innovators***. Other people invented the computer mouse and MP3 player; Jobs found ways to make such devices sleeker, more versatile, and easier to use."

Part A:
What does the word *innovators* mean in this paragraph?

a. a trendsetter
b. an inventor
c. a person who resists change
d. a person who improves or makes changes to the design of existing inventions

End of Unit 1 Assessment:
Using Quotes to Explain Relationships and Support an Opinion
(Answers, for Teacher Reference)

Part B:
Which of the following phrases from the article best helps the reader understand the meaning of the word *innovator*?

a. "Other people invented the computer mouse and MP3 player; Jobs found ways to make such devices sleeker, more versatile, and easier to use."

b. "We worked hard."

c. "Macs were the first user-friendly computers."

d. "Other popular Apple innovations include the iPhone ..."

2. According to the "Big Thinkers" article, how are Thomas Edison and Steve Jobs similar? ? **(RI.5.3)**

a. They both created or improved technologies that changed people's lives.

b. They have both patented more than 1,000 new or improved technologies.

c. They both said, "People don't know what they want until you show it to them."

3. Structure of Informational Texts **(RI.5.5)**

Part A: How are the first three paragraphs of the "Big Thinkers" article structured?
(choose one)

a. Cause and Effect

b. Problem-Solution

c. Sequential

d. Descriptive

e. Compare and Contrast

End of Unit 1 Assessment:
Using Quotes to Explain Relationships and Support an Opinion
(Answers, for Teacher Reference)

How is the "Steve Jobs" article structured?
(choose one)

a. Cause and Effect

b. Problem-Solution

c. Sequential

d. Descriptive

e. Compare and Contrast

End of Unit 1 Assessment:
Using Quotes to Explain Relationships and Support an Opinion
(Answers, for Teacher Reference)

Part B. Complete the Venn diagram to show:

- At least two ways "Big Thinkers" and "Steve Jobs" convey *similar* information about Steve Jobs.
- At least two ways "Big Thinkers" and "Steve Jobs" convey *different* information about Steve Jobs.

"Big Thinkers"

- **Compares and contrasts Steve Jobs's achievements to Thomas Edison's**
- **Describes both Steve Jobs's and Thomas Edison's inventions/ innovations.**
- **Describes Jobs and Edison as inventors.**

Similarities

- **Most of the information is about Steve Jobs and his inventions/ innovations.**
- **Both articles explain how Steve Jobs's inventions/ innovations met people's needs/ made technology available to most people.**
- **Both articles mention his death near the beginning of the article.**

"Steve Jobs"

- **Lists Jobs's inventions/ innovations in order by date (earlier to later).**
- **Describes/focuses only on the accomplishments of Steve Jobs.**

End of Unit 1 Assessment:
Using Quotes to Explain Relationships and Support an Opinion
(Answers, for Teacher Reference)

Part C: Short Constructed Response

What were you able to understand about Steve Jobs from the "Big Thinkers" and "Steve Jobs" articles? Provide at least one specific example from each article as well as key words and phrases from the texts in your response.

Comparing and contrasting Steve Jobs's achievements and inventions to those of a famous inventor like Thomas Edison helped me understand how Steve Jobs's invention of Apple computers and other technology met people's needs just as much as Thomas Edison's invention of the light bulb. Describing Steve Jobs's accomplishments/inventions in sequential order helped me understand how he developed more/newer/better ideas to meet people's needs over a (long/extended) period of time.

End of Unit 1 Assessment:
Using Quotes to Explain Relationships and Support an Opinion
(Answers, for Teacher Reference)

4. Opinion Writing **(RI.5.1 and W.5.1 a, b)**
Think about the following three inventions you have read about in this unit:

- ***The electric motor***
- ***The game of basketball***
- ***Apple computers***

Given what you know about how each of these inventions met people's needs, which one of the three do you think has been the most important to people?

Refer to the articles "The Invention of the Electric Motor," "Dr. James Naismith, Inventor of Basketball," "First College Basketball Game," "Big Thinkers," and "Steve Jobs" as well as your Cause and Effect, Problem and Solution, and Sequential note-catchers (from Lessons 7 and 9) to help you form your opinion.

Write a four or five sentence paragraph that includes:

- A brief introduction to the topic
- An opinion statement
- A reason that explains why you believe the opinion
- Two pieces of evidence to support the reason and opinion
- A conclusion that restates the opinion
- Clearly organized ideas
- Key words and phrases from the texts

(sample response frame)

There have been many inventions that have made life better for people (topic). I think the most important invention is the _____(opinion). Before the invention of the _____ life was much more difficult (reason). People had to _____(evidence/quote), but now people can _____(evidence/quote). That is why I believe the _____ has most met peoples' needs (conclusion.)

2-Point Rubric: Writing from Sources/Short Response1

(For Teacher Reference)

Use the below rubric for determining scores on short answers in this assessment.

2-point Response	The features of a 2-point response are:
	• Valid inferences and/or claims from the text where required by the prompt • Evidence of analysis of the text where required by the prompt • Relevant facts, definitions, concrete details, and/or other information from the text to develop response according to the requirements of the prompt • Sufficient number of facts, definitions, concrete details, and/or other information from the text as required by the prompt • Complete sentences where errors do not impact readability

1-point Response	The features of a 1-point response are:
	• A mostly literal recounting of events or details from the text as required by the prompt • Some relevant facts, definitions, concrete details, and/or other information from the text to develop response according to the requirements of the prompt • Incomplete sentences or bullets

0-point Response	The features of a 0-point response are:
	• A response that does not address any of the requirements of the prompt or is totally inaccurate • No response (blank answer) • A response that is not written in English • A response that is unintelligible or indecipherable

[1]From New York State Department of Education, October 6, 2012.

Tracking My Progress End of Unit 1

Name:

Date:

Learning Target: I can determine the meaning of new words using a variety of strategies.

1. The target in my own words is:

_____

_____

_____

_____

2. How am I doing? Circle one.

I need more help to learn this

I understand some of this

I am on my way!

3.The evidence to support my self-assessment is:

_____

_____

_____

_____

Tracking My Progress End of Unit 1

Name:

Date:

Learning Target: I can analyze the way text is structured to support readers' understanding of complex ideas.

1. The target in my own words is:

2. How am I doing? Circle one.

I need more help to learn this

I understand some of this

I am on my way!

3.The evidence to support my self-assessment is:

Tracking My Progress End of Unit 1

Name:

Date:

Learning Target: I can write an opinion paragraph to explain which invention has been most important to people.

1. The target in my own words is:

_____

_____

_____

_____

2. How am I doing? Circle one.

I need more help to learn this

I understand some of this

I am on my way!

3.The evidence to support my self-assessment is:

_____

_____

_____

_____

Independent Reading Choice Board

Name:

Date:

Title of Independent Reading Book/Author's Name:

After reading independently (silently and/or aloud) for at least 30 minutes, write a response to any ONE question from the board *except* the center square. Complete the center square once you have answered each of the other eight questions.

VISUAL ELEMENTS What visual elements (pictures, text) do you notice in this book? How do the visual elements support your understanding of the text?	CONNECTIONS What connections were you able to make between your independent reading book and other texts, topics explored, or experiences you have had?	STRUCTURE How is this book structured? How does the structure support your understanding of the text?
GENRE What genre is this book? Do you enjoy this genre? Explain.	**Complete this square last.* **What qualities will you look for in the next book you read?** (e.g., same author, similar visual features, same or different genre, etc.)	RECOMMENDATION Would you recommend this book and/or this author to someone else? Explain.
WORDS Which *words* repeat? List them. Why do you think the author chose to repeat these words; why are they important?	READABILITY Is your independent reading book too hard, just right, or too easy? Explain.	INTEREST Do you find this book interesting? Explain.