

Grade 5: Module 2B: Unit 1: Lesson 7 Using Quotes to Explain Relationships: The Invention of the Electric Motor





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"



Using Quotes to Explain Relationships:

Agenda	Teaching Notes
 Opening A. Reviewing Homework and Engaging the Reader (5 minutes) 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) Closing and Assessment A. Debrief and Reviewing Learning Targets (5 minutes) 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



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

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.



Using Quotes to Explain Relationships:

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)



Using Quotes to Explain Relationships:

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 <i>Investigating the Scientific Method with Max Axiom Super Scientist</i>, as well as their thoughtful responses to the Mid-Unit 1 Assessment questions during the previous lesson. 	To support visual learners, consider displaying and circling, or otherwise highlighting the guiding questions.
• 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.	



Using Quotes to Explain Relationships:

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.



Using Quotes to Explain Relationships:

The Invention of the Electric Motor

Work Time (continued)

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.

Meeting Students' Needs

- 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.



Using Quotes to Explain Relationships:

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:	
 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.	



Using Quotes to Explain Relationships:

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:	
 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: <i>devices</i> , <i>depend</i> , <i>source</i> , <i>afford</i> , <i>generating</i> , <i>plant</i> , <i>access</i> , and <i>advancements</i> . Then give students 1-2 minutes to locate and circle each term in "The Electric Motor" article.	



Using Quotes to Explain Relationships:

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."	



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

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.	



Using Quotes to Explain Relationships:

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 <i>identify</i> and <i>relationships</i> . 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) .	



Using Quotes to Explain Relationships:

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 Craphic Novel Tamplate 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"
Have students select one Graphic Novel Template A , B , or C for their homework.	
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.	Allow struggling writers to dictate their responses to someone at home to record for them.
 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 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.



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!



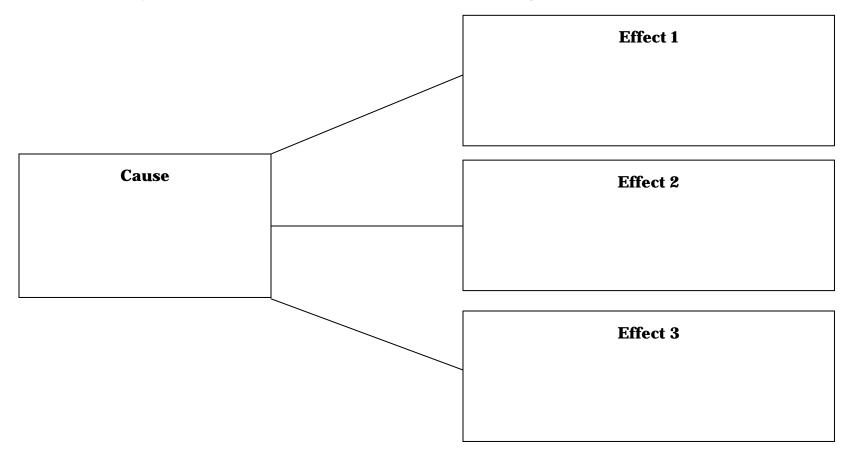
Text Structure Resource Page

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.	1First, 2Second, 3Third, 4Next, 5Finally,	
Compare/Contrast	The author describes the similarities and differences between two or more topics, people, or concepts	Alike Different	
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.	Cause Effect 2 Effect 3	
Problem and Solution	The author presents a problem and at least one solution to the problem.	Problem	



Cause a	nd 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)

Effect 1

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

Cause

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

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."



kt-Dependen	t Question:	s: The	Electric	MOTO
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.