

Electrifying Personalities

NAVIGATOR TEACHER'S GUIDE

Skills & Strategies

Anchor Comprehension Strategies

- Identify sequence of events

Comprehension

- Make inferences
- Identify cause and effect
- Use text features to locate information

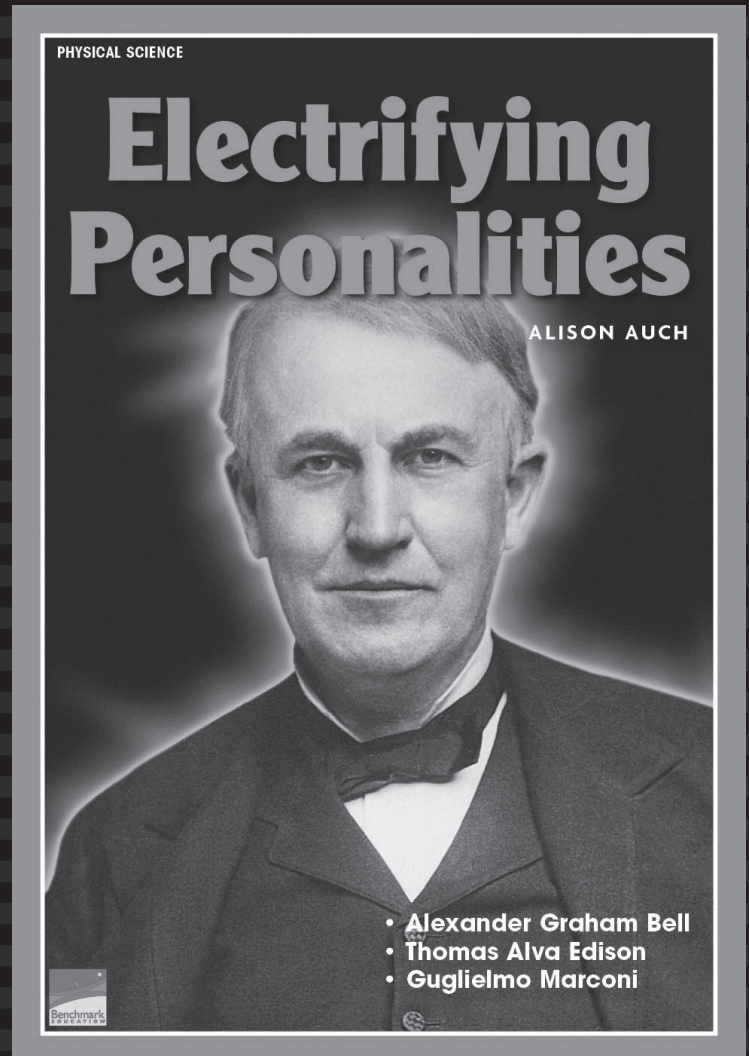
Word Study/Vocabulary

- Use context clues to determine word meaning

Science Big Idea

- The modern information, technology, and communications revolutions have roots in the contributions of significant inventors and their inventions.

Science



Themes

- Invention and Discovery
- Building on Prior Knowledge
- Technological Advancement

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Sample Lesson Planning Guide

Navigators Lesson Guides provide flexible options to meet a variety of instructional needs. Here is one way to structure this lesson.

Day	Activities		
1	Build background: activate prior knowledge about science experiments	Introduce/preview the book: skim chapters, pictures	
2	Model metacognitive strategy: make inferences	Model comprehension strategy: sequence of events	Use context clues to determine word meaning: definitions
3	Apply metacognitive strategy: make inferences	Guide comprehension strategy: sequence of events	Use context clues to determine word meaning: definitions
4	Apply metacognitive strategy: make inferences	Apply comprehension strategy: sequence of events	Use text features to locate information: captions
5	Cause and effect: identify cause-and-effect relationships for each scientist		

Additional Related Resources

Notable Trade Books for Read-Aloud

- Birch, Beverley. *Guglielmo Marconi: Radio Pioneer*. Blackbirch Marketing, 2001.
- MacLeod, Elizabeth. *Alexander Graham Bell: An Inventive Life*. Kids Can Press, 1999.
- Sullivan, George. *Thomas Edison*. Scholastic, 2002.

Web Site for Content Information

- National Inventors Hall of Fame
http://www.invent.org/hall_of_fame/1_1_search.asp
The National Inventors Hall of Fame provides students and teachers with a searchable database on inventors, biographies, and patent information.

Before Reading

Build Background

- Activate prior knowledge by posing these questions: *Have you ever conducted a science experiment? Were the results what you thought they would be?* Have students work in groups to share their responses. Encourage students to describe what experiments they did and the steps they followed.
- Say: *All scientists, including student scientists, have a sequence to follow to complete an experiment. The experiment is just one step a scientist completes in the invention process.*
- Draw a T-chart as shown. Write the headings Sequence of Steps in an Experiment and Sequence of Steps to Invent Something. Have students share some of the steps they discussed when talking about their experiments in their groups. List them on the chart.
- Continue the discussion by brainstorming steps an inventor might follow. List responses on the chart. Discuss the importance of following the steps in order.

Introduce the Book

- Give students a copy of the book. Have them read the title and skim through the book.
- Ask: *What will this book be about? How do you know? What pictures help you determine what the book will be about?* (It will be about people who had something to do with electricity. I can tell from the pictures, captions, and title.)
- Explain that *Electrifying Personalities* is about three scientists who worked in the field of electricity and how their inventions changed the way people live.
- Ask students to name some ways they use electricity in their lives every day.

Administer Preassessment

- Have students take Ongoing Assessment #19 on page 74 in the *Comprehension Strategy Assessment Handbook* (Grade 5).
- Score assessments and use the results to determine instruction.
- Keep group assessments in a small-group reading folder. For in-depth analysis, discuss responses with individual students.

Sequence of Steps in an Experiment	Sequence of Steps to Invent Something
1. form a hypothesis (guess what will happen) 2. test the hypothesis 3. record results 4. check hypothesis	1. think of something to invent 2. research the need for the invention 3. research other studies 4. design the invention 5. do experiments to see if the design works 6. make needed changes—re-design 7. sell the invention



Informal Assessment Tips

1. Use pages 4 and 5 of the book to assess students' ability to predict what the book will be about.
2. Document informal observations in a folder or notebook.
3. Keep the folder or notebook at the small-group reading table for handy reference.
4. For students who need more help, point out the three pictures and captions on page 4. Ask: *What information do you learn from the pictures and captions?* (the names of the three men shown) *How do these pictures and the title of the book help you predict what the book is probably about?* (Possible answer: These are probably the "electrifying personalities" that the book is about.)

During Reading: Introduction–Chapter 1



Content Information

Years before the inventions of Bell, Edison, and Marconi, scientists were working on the inventions that would eventually lead up to the understanding of electricity and of wireless communication.

- In 1820, Danish physicist Christian Oersted discovered electromagnetism. This was essential to the development of electrical power.
- In 1821, Michael Faraday discovered induction, which would lead to his building the world's first electric generator.
- In 1830, Professor Joseph Henry transmitted the first electrical signal, which showed that electromagnetism could "communicate."



Minds-On/ Hands-On Activity

1. Distribute electronics catalogs to pairs of students.
2. Have partners choose one product in the catalog that they think needs improving.
3. Have partners work together on a new version of the product they chose.
4. Partners then can make an advertisement for their inventions, including pictures and text about what their invention is and what it does.

Model Metacognitive Strategy: Make Inferences

Good readers make inferences while they read. Making inferences, or "reading between the line," keeps the reader engaged with the text and enhances understanding of what is read. Readers infer using quotes or pictures from books. They take specific sentences or ideas from a book and interpret, or infer, what might be happening. Good readers write their inferences in a journal or on self-stick notes.

- Use a real-life example of making inferences. Say: *Good readers make inferences as they read. They "read between the lines." That means that, as they read, they interpret what might be happening based on pictures, words, and what they know. Inferences are not directly stated in the text. When I make inferences, I write them on self-stick notes or in my journal. For example, when I read a news article about a police officer who helped to stop a crime, I make inferences about the kind of person the officer is. I know that stopping a crime is dangerous. Therefore, I can infer that someone who is willing to risk danger for others is probably brave and caring. I can make this same inference about the police officer I read about. You can do the same thing when you read. Think about the information and what inferences you can make. Remember, inferences are not directly stated.*
- Read the caption under the picture on page 3 while students follow along and look at the picture.
- Say: *The text and picture show that many cities had no electricity in the blackout. Since you know what we use electricity for, you can make inferences, "reading between the lines" about the problems the blackout may have caused. Some of the problems I can infer are that people couldn't travel by train and that since traffic lights were out, driving was dangerous. I was able to make these inferences because of the clues the author gave me. I wonder what other problems were caused by the blackout. I bet food spoiled. What problems can you think of? (The streets were probably crowded with people leaving work and trying to get home. Restaurants closed.)*
- Continue reading aloud pages 4–5 and demonstrate how to make inferences as you go. For example, say: *Bell was probably a competitive person since he was determined to be the first to transmit a human voice.*

Set a Purpose for Reading

- Ask students to read pages 6–11 silently to see what they can find out about the important contributions Alexander Graham Bell made to science. As they read, they should jot down in their journals or notebooks any inferences they make about Bell and about life during the time period in which he lived. Remind them that they can make inferences from the pictures and captions, too.

Discuss the Reading

- Ask students to share inferences they made about Bell and the time period in which he lived.
- Have students tell what part of the text or which pictures each inference is based on.
- Ask: *Which of Bell's accomplishments do you think were most important and why? Do you think Bell's family helped him become the inventor he was? Why or why not?* (Answers will vary.)

Model Comprehension Strategy: Sequence of Events

- Remind students that authors organize their writing in different ways. Some writing compares and contrasts ideas. Some writing presents a main idea, then gives supporting details.
- Say: *In this book the author tells about the lives of three important scientists. A sensible way to organize the events of a person's life is to present them in time-order, or sequence. To sequence a person's life well, I don't have to include every little event. I want to identify the events that have an impact on the person or on history. Keep that in mind when we work on sequencing.*
- Pass out the graphic organizer **Identify Sequence of Events** (blackline master, page 14 of this guide.)
- Explain that as students read, they will complete the first column together. The last two columns will be completed independently.
- Tell students that one way to identify sequence of events is to read the date of each event. Have students follow along as you locate important events in chapter 1 and list them in order. Write the information on the graphic organizer as you find it. (You may want to make a chart-size copy of the graphic organizer or use a transparency.) Read the first paragraph on page 6 aloud and say: *This paragraph tells the date Alexander Bell was born. This is certainly an important event. I'll put the date and event in the first box in my Sequence of Events chart.*



Informal Assessment Tips

1. Occasionally, stop students as they read to make inferences.
2. In a folder or notebook, jot down students' responses.
3. Students should be able to make inferences about the people, time period, and inventions they read about. Document students who are and are not using this meta-cognitive strategy.
4. If students are not able to make inferences, remind them to use prior knowledge and experiences to help them. Encourage them to ask themselves questions that elicit inferences based on their own knowledge, such as: What other successful people have I read about or do I know? How did their life experiences help them? How did Bell's?

Identify Sequence of Events

Alexander Bell	Thomas Edison	Guglielmo Marconi
1847: Born in Edinburgh, Scotland		
↓	↓	↓
↓	↓	↓
↓	↓	↓
↓	↓	↓

Introduction-Chapter 1 (continued)

Identify Sequence of Events		
Alexander Bell	Thomas Edison	Guglielmo Marconi
1847: born in Edinburgh, Scotland		
↓	↓	↓
1863: Bell and brothers built a speaking machine.		
↓	↓	↓
1873: became a professor at Boston University		
↓	↓	↓
1875: transmitted his first words over the telephone to Watson		
↓	↓	↓
1890: founded American Association to Promote the Teaching of Speech to the Deaf		

- Read page 7. Say: *This paragraph tells me about the first time Alexander Bell invented something. This is another important event in his life and the date is given. I'll put this as the next important date and event on my chart.*
- Continue to read chapter 1 and identify the important events and their dates. Write these in the correct order in the chart.
- Ask: *How do you order events in sequence?* (write them in the time-order that they happened)

Use Context Clues to Determine Word Meaning: Definitions

- Remind students that sometimes they can figure out the meaning of unfamiliar words by reading other words or sentences nearby. Have students find the word **electrons** on page 3. Say: *This is a science word that is unfamiliar to me. I will try to use context clues to figure out what it means. I will first read the whole sentence containing the word **electrons**.* Read the sentence aloud. Say: *This sentence gives me a definition for the word **electrons**.* Point out the word **called** in the sentence as a clue to connect the word **electrons** to its definition. Ask: *What does **electrons** mean?* (tiny particles related to electricity) *How can you tell?* (Possible answer: The sentence says "Tiny particles called electrons.")
- Ask students to find the word **circuit** on page 3. Ask: *What is the first thing I can do to figure out the meaning of **circuit**?* (read the whole sentence it is in) Read the sentence aloud. Ask: *What does the word **circuit** mean?* (a closed loop electrons flow through) *How do you know?* (The word **called** signals a definition.)
- Explain that sometimes you may need to read the sentences before or after the word you are trying to figure out. Ask students to find the words **Morse Code** on page 9. Have students read the sentence before and the sentence with the words **Morse Code**. Ask: *What is the definition for **Morse Code**?* *How can you tell it is the definition?* (a message sent in code from a telegraph machine; the next sentence says this was called Morse Code)

Chapter 2

Apply Metacognitive Strategy: Make Inferences

- Remind students that making inferences means reading between the lines, or interpreting what might happen. Inferences are not directly stated.
- Say: *Often, when you read about a person's life, you can make inferences about what that person was like even though the author may not directly describe the person. Let's make inferences about Thomas Edison based on what the author tells us.*
- Draw a two-column chart on the board with headings Facts and Inferences.
- Have a volunteer read the first paragraph on page 12 and fill in the chart. (Possible answer: Fact: To help his family, Edison sold newspapers and refreshments on a train. Inference: He was generous, helpful, and cared a great deal about his family.)
- Remind students to use what they know and what the author tells them to make inferences. Continue listing facts and inferences on the chart. Keep the chart for use with chapter 3.

Set a Purpose for Reading

- Ask students to read chapter 2 silently to learn about the contributions Thomas Edison made to science. Remind them to use context clues to help them understand the meanings of unfamiliar words. Tell students to continue to make inferences about Edison, his life, and the times as they read. Encourage them to look for the answers to this question: *How might Edison's childhood have helped him to become a successful inventor?*

Discuss the Reading

- Ask students to share inferences they made about Thomas Edison and the time period in which he lived.
- Ask students to share their responses as to how Edison's childhood affected his life as an inventor. (Possible response: His mother took him out of school and taught him at home, giving him the chance to conduct experiments without getting into trouble.)
- Ask: *How was life different after 1882? Why?* (Possible answer: People could work longer and read later into the night because they now had electric lights.)



Content Information

Here is some background information on how electricity works:

- Electricity is the flow of electrons. The electrons are the negatively charged particles that surround the nucleus of an atom.
- When the balance between protons and electrons is upset by an outside force, the atom may lose an electron. When this occurs, the free movement of these electrons is what makes an electric current.
- Electricity is a form of energy that is obtained from the conversion of energy from primary sources of energy such as coal, natural gas, oil, and nuclear power.



Minds-On/ Hands-On Activity

1. Write the following question on the board: Which was more important: the invention of the light bulb or the start of the first electric company?
2. Have students work in pairs to discuss their responses and ideas. Explain that they need to give reasons to support their opinions.
3. Have partners share their opinions with the class.
4. Record the results and make a graph showing how many students chose the light bulb and how many chose the electric company.

Chapter 2 (continued)

Identify Sequence of Events		
Alexander Bell	Thomas Edison	Guglielmo Marconi
1847: born in Edinburgh, Scotland	1847: born in Milan, Ohio	
1863: Bell and brothers built a speaking machine.	1874: invented telegraph that could send four messages	
1873: became a professor at Boston University	1877: invented transmitter that improved the telephone	
1875: transmitted his first words over the telephone to Watson	1879: invented the light bulb	
1890: founded American Association to Promote the Teaching of Speech to the Deaf	1882: built a generator to start the Edison Electrical Light Company	

Informal Assessment Tips

1. Watch students as they help complete the sequence of events chart.
2. In your folder, jot down what you see the students doing as they complete the activity with you.
3. Ask yourself: Are students having problems identifying the events to list? If so, remind them to look for events with dates and decide if the event is related to the contributions to science made by Edison.
4. For struggling students, review the strategy using the comprehension strategy poster. Use both sides of the poster if needed.

Guide Comprehension Strategy: Sequence of Events

- Review sequence of events by reviewing the graphic organizer. Explain that as a group you are going to revisit chapter 2 to identify and list important events in their correct sequence.
- Ask students to skim page 12 to locate an important event. Write the date and event.
- Follow the same procedure for pages 13 through 19.

Use Context Clues to Determine Word Meaning: Definitions

- Remind students about the direct definition lesson from Chapter 1.
- Have students find **phonograph** on page 15. Ask them what they could do if they did not know the meaning of the word.
- Ask: *What does **phonograph** mean?* (a machine that records the human voice) *How do you know?* (Possible answer: I read the sentence and saw that the definition was in the text. The word **called** was a clue.)
- Have students find **generator** on page 17. Point out that the author used a comma to separate the word from the definition. Ask them what the word means. (a device that made electricity)
- Say: *In addition to using **called** or a comma, authors may provide direct definitions in other ways.* Discuss examples such as using **or** (He made a generator, or a device that made electricity.) or using dashes. (He built a generator—a device that made electricity.)
- For more practice, have students complete the blackline master **Use Context Clues: Definitions** on page 15 of this guide. Students can do this during small-group reading or at their desks.

1. tramp telegrapher (page 13) _____ He traveled throughout the country looking for the highest-paying telegraph work he could find.
2. stock tickers (page 14) _____ These machines transmitted the latest stock prices by telegraph and printed them on long strips of paper tape.
3. speaking telegraph (page 15) _____ There he found himself in a race with Alexander Graham Bell to perfect the "speaking telegraph," or telephone.
4. electric power station (page 17) _____ He and his team worked out a way to supply electricity to a large area.
5. kinetoscope (page 19) _____ It was the first example of "motion pictures."
6. talkies (page 19) _____ By putting his kinetoscope and phonograph together, Edison created the first machine for making motion pictures with sound.

Chapter 3–Conclusion

Apply Metacognitive Strategy: Make Inferences

- Have students recall the chart they made for the last chapter.
- Say: *Today we're going to add facts and inferences to the chart for chapter 3.*
- Read the last sentence on page 21 aloud. Write the sentence in the Facts column of the chart.
- Ask: *What inference could you make about life in the late 1800s based on this fact? Explain your thinking.* (Possible answer: People could not communicate quickly with people in other parts of the world. They had to write to each other, which took a long time. This inference is based on the fact that Marconi started to think about the idea of a worldwide communication system, so this probably did not exist at that time.)
- List students' inferences in the second column of the chart.
- Encourage students to record other facts and inferences about Marconi and about how life changed because of his inventions as they finish reading the book.

Set a Purpose for Reading

- Remind students that most inventions are based on experiments and discoveries of previous scientists. Have students read chapter 3 to find out what major contributions Marconi made to science and how his discoveries were related to those made by Bell and Edison. Tell them to write any inferences they make in their journals or notebooks. Emphasize that they should write the facts their inferences are based on as well.

Discuss the Reading

- Have students share facts and inferences they made about the information they read in chapter 3. Be sure students explain how the facts they read support each inference they make.
- Refer the students to the first paragraph on page 23. Ask: *What does this fact suggest about Marconi?* (Possible answer: He is creative, inventive, and an original thinker.)
- Check students' understanding of the text by asking them to make inferences about how the three inventors they read about are alike. (Possible answers: None of them liked the structure of school, and all were curious, determined, and intelligent.)



Content Information

Students might be interested in these additional facts about the scientists presented in this book:

- Alexander Bell introduced his telephone to the world at the Centennial Exhibition in Philadelphia in 1876.
- The first president to install a phone in the White House was Rutherford B. Hayes in 1878.
- Thomas Alva Edison patented 1,093 inventions.
- Upon hearing about Marconi's first wireless transmission, Alexander Bell said, "I doubt Marconi did that. It's an impossibility."
- A reporter asked Thomas Edison if he thought Marconi was telling the truth. "Huh?" asked Edison. "What paper are you with, young man? If Marconi says it's true, it's true."



Minds-On/ Hands-On Activity

1. Have students work in teams to brainstorm a list of wireless machines we use to communicate today.
2. Use a stopwatch or clock to time the teams, giving them five minutes to make their lists.
3. After five minutes, have teams share and compare lists to see who had more items.
4. Items students might list include radios, cell phones, computers, television, palm pilots, and walk-ie-talkies. After comparing lists, discuss which items involve one-way communication and which are capable of two-way communication.

Chapter 3–Conclusion

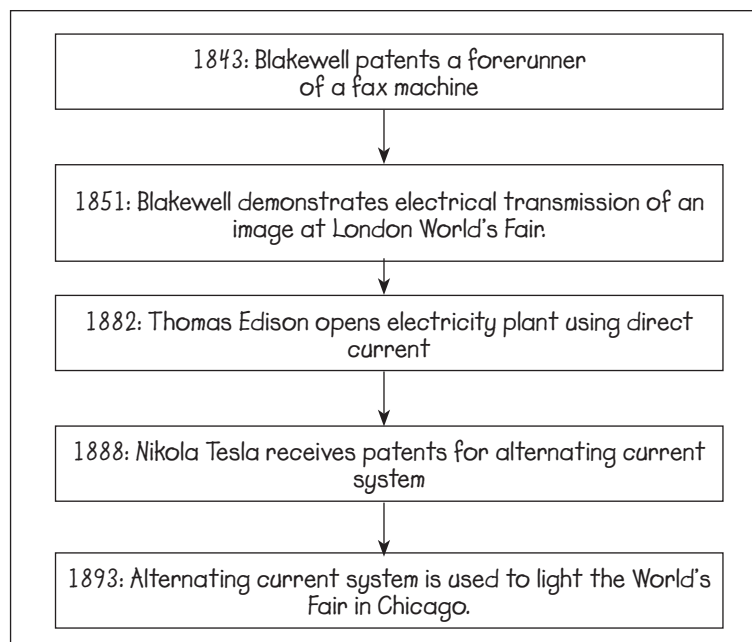
Identify Sequence of Events		
Alexander Bell	Thomas Edison	Guglielmo Marconi
1847: born in Edinburgh, Scotland	1847: born in Milan, Ohio	1874: born in Bologna, Italy
1863: Bell and brothers built a speaking machine.	1874: invented telegraph that could send four messages	1896: demonstrated his wireless system
1873: became a professor at Boston University	1877: invented transmitter that improved the telephone	1901: transmitted a message across the Atlantic Ocean
1875: transmitted his first words over the telephone to Watson	1879: invented the light bulb	1909: won Nobel Prize for Physics
1890: founded American Association to Promote the Teaching of Speech to the Deaf	1882: built a generator to start the Edison Electrical Light Company	1919: continued experiments in his floating lab on a yacht

✓ Informal Assessment Tips

1. Watch students as they make inferences. Ask yourself: *How have the students progressed with making inferences? What problems are they still having? What questions pop into my mind about what I see them doing?*
2. Watch students as they complete the graphic organizer independently. Ask yourself: *Who is still struggling with this strategy? What are they doing or not doing that makes me think they are struggling? How can I help them?*
3. Jot down your thoughts in your folder or notebook.

Apply Comprehension Strategy: Sequence of Events

- Review the graphic organizer with students and explain that you want them to list the sequence of events in chapter 3 (pages 20–29) independently.
- Ask whether they have any questions about determining which events to list and how to order them before they begin.
- Monitor their work and intervene if they are having difficulty completing the graphic organizer.
- Discuss students' responses together.
- For more practice, have students complete the blackline master **Sequence of Events** on page 16 of this guide.



Use Text Features to Locate Information: Captions

- Have students look at the picture on page 20. Explain that the caption, which are the words below this picture, helps the reader understand what is being shown. Point out that without the caption readers would not be able to interpret the information shown in the picture.
- Have students look at and read the captions for the pictures on pages 21–23 as further demonstrations of added information provided by captions.

After Reading

Administer Posttest

- Have students take Ongoing Assessment #20 on page 76 in the *Comprehension Strategy Assessment Handbook* (Grade 5).

Synthesize Information: Cause and Effect

- Review cause-and-effect relationships. Say: *Science articles often contain information about what happens in our world and why it happens. This is an example of a cause-and-effect relationship. Experiments are full of cause-and-effect relationships.*
- Have students identify a cause-and-effect relationship in the chapter about each of the scientists in this book. Have students copy the chart below to show the relationships.

Scientist	Cause	Effect
Alexander Bell	One of the parts of the transmitter Bell was fixing vibrated.	It sent a sound to the receiver, which was the beginning of the telephone.
Thomas Edison		
Guglielmo Marconi		

- Model how to identify cause and effect using the information in the first row of the chart. Have students read the last paragraph on page 9. Ask: *What important event happened when Bell was fixing the transmitter with Watson?* (A sound was sent to Watson at the receiver.) *What caused this event to occur?* (One of the parts of the transmitter vibrated.)
- Write the cause and effect in the chart. Then have students complete the chart in pairs.
- Have students share and compare their charts. Check for accurate cause-and-effect relationships.

Informal Assessment Tips

1. Score assessments and determine if more instruction is needed for this strategy.
2. Keep group assessments in a small-group reading folder.
3. Look closely at students' responses. Ask yourself: *Why might this student have answered the question in this manner?* For in-depth analysis, discuss responses with individual students.
4. Use posttests to document growth over time, for parent/teacher conferences, or for your own records.

Writing Workshop



Teaching Tips: Process Writing Steps

1. Have students independently write a first draft using the sequence of events text structure.
2. After students complete their paragraphs, have them revise and edit with the help of a classroom buddy.
3. Conference with each student following the first revision and editing.
4. Have students make any additional changes and create a final copy of their paragraphs.
5. Finally, invite students to share their paragraphs with a group of other students.



Informal Assessment Tips

1. Observe students as they participate in the writing project. Identify those who might need additional assistance during the various stages of the writing process. Jot down notes in your journal.
2. During conferences, keep notes on each student's writing behaviors. Ask yourself: *What evidence do I have to support the conclusion that this student is writing well or poorly? What can I do about it?*
3. For struggling students, begin with an oral exercise that puts familiar events in correct sequence. You might, for example, ask them to tell about the events of a typical school day in correct sequence.

Model the Writing Process: Write a Sequence Paragraph

- Remind students that throughout the book *Electrifying Personalities*, they read about events that occurred over long periods of time. Knowing the sequence of the events helped students understand and remember what happened.
- On chart paper or the board, create a sequence of events frame like the one below, showing some important events in the life of Nikola Tesla.
- Use the writing model to show how the information from the frame can be used to write a paragraph that uses sequence of events organization. Remind students that this paragraph is a brief biography, or a short account of Tesla's life. As you model the writing, focus on signal words used to show the order of the events, in addition to the dates. Those words include **next**, **then**, **finally**.
- Have students work in teams to brainstorm names of other inventors they might want to learn about, or list the names of other inventors related to electricity or communication, such as Michael Faraday, Alessandro Volta, and Charles Babbage.
- Have each student choose an inventor. Have them research the inventor's life in a book or on the Internet, then write a paragraph about the inventors' life.
- Before students write, encourage them to make a frame similar to the one shown. This will help them to organize their paragraph in correct sequence. As they write, remind them to use signal words such as **next**, **then**, and **finally**.
- Provide class time for students to share their paragraphs.

Nikola Tesla
1856: born in Smiljan, Croatia
1883: made his first induction motor
1888: received patent for alternating current system, which in 1893 was used to light the World's Exposition in Chicago
1898: invented remote-control boat
1917: received the Edison Medal from the American Institute of Electrical Engineers.
1943: died in New York City

Writing Model

Nikola Tesla

Nikola Tesla was born in Smiljan, Croatia, in 1856. He was to become a great scientist and inventor. In 1883, Tesla made his first induction motor. That was just the beginning of his career. Next, in 1888, he received a patent for his alternating current system. This system was used to light the 1893 World Exposition in Chicago. Then, in 1898, as he continued his work, he invented a remote-control boat. Finally, in 1917, Nikola Tesla was honored by the American Institute of Electrical Engineers, which awarded him the Edison Award. Finally, Nikola Tesla died in New York City in 1943.

Name _____

Date _____

Identify Sequence of Events

Alexander Bell	Thomas Edison	Guglielmo Marconi
↓	↓	↓
↓	↓	↓
↓	↓	↓
↓	↓	↓

Name _____

Date _____

Use Context Clues: Definitions

Directions: Find the terms on the pages indicated.

Write the sentence that gives the definition of each term.

1. tramp telegrapher (page 13) _____

2. stock tickers (page 14) _____

3. speaking telegraph (page 15) _____

4. electric power station (page 17) _____

5. kinetoscope (page 19) _____

6. talkies (page 19) _____

Name _____

Date _____

Sequence of Events

Directions: Read the passage. Complete the sequence of events chart.

A Brief History of Electric Power

Scientists often build their inventions on the experiments and discoveries of those who came before them. For example, Thomas Edison opened an electricity generating plant in New York City in 1882. This plant used direct current generators. Direct current traveled through long wires and lost much energy in just warming the wires. An engineer who worked for Edison for a short time realized that an alternating current might be better to use to distribute electricity to distant places. So Nikola Tesla applied for and received patents for a system of alternating currents in 1888. By 1893, his system was used to light the World's Fair in Chicago.

Even today's fax machines are based on experiments and discoveries from long ago. In 1843, Frederick Blakewell patented what would be the forerunner of today's fax machines. He first demonstrated the electrical transmission of an image in 1851 at the London World's Fair.

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graph TD; A[ ] --> B[ ]; B --> C[ ]; C --> D[ ]; D --> E[ ]
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