

Connect with Electricity

How LEDs Work



CONNECT WITH
ELECTRICITY

Reading Level: Grade 5

Subject: Science

Materials

- Books for each student
- Whiteboard or chart paper
- Paper
- Pencils or pens
- Venn Diagram: LEDs and Incandescent Bulbs handout (p. 3 of this guide)

Lesson Standards

- **CCSS.ELA-LITERACY.RI.5.3:** 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.

Targeted Reading Strategy/Objective

Compare and contrast

Academic Vocabulary: anode, cathode, incandescent lightbulb, light-emitting diode, semiconductor

Before Reading

Building Background Knowledge

- Ask students to think about some of the devices they might use regularly, like digital clocks, computers and tablets, and flat-screen TVs. Have they ever wondered how these devices give off light, when it's clear that they don't have traditional lightbulbs included in their structure? Inform them that they will be reading about how these and other devices use LEDs, or light-emitting diodes, to produce light.
- Introduce students to the text by quickly skimming the book as a group. Identify the front cover, table of contents, glossary, index, notes, and bibliography. Ask students to identify how they will use these text features to help them read and understand the book.

Skill Introduction

- Inform students that they will be working on using informational text to compare and contrast ideas. Explain that authors of informational text often organize information about two ideas or concepts in a way that highlights their similarities and differences. Focusing on how these similarities and differences are organized can help readers better understand informational text. Inform students that they will be using a Venn diagram to keep track of the information the author uses to compare and contrast LEDs and traditional incandescent lightbulbs.
- Pass out copies of the Venn Diagram: LEDs and Incandescent Bulbs handout (p. 3 of this guide). Before reading the book's Introduction and Chapter 1 ("What Are LEDs?") as a group, demonstrate how to use the Venn diagram to organize information with a think-aloud:

Think Aloud: *I'm going to be using this Venn diagram to show similarities and differences between LED lights and incandescent lightbulbs. I'm going to place information about LEDs in the left circle of the diagram, and I'll put information about incandescent lightbulbs in the right circle. But when I come across information that shows how these two types of lights are similar, I'm going to put it in the center, where the two circles intersect.*

- Demonstrate filling out the Venn diagram using information from the Introduction and Chapter 1.

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During Reading

Check for Understanding

- Ask students to read Chapter 2 (“What Are LEDs?”) and Chapter 3 (“Different Types of LEDs”) independently. Inform them that as they continue to read, they should be looking for information to add to their Venn diagrams. Students should try to find at least one piece of information to include in each section of the diagram from this chapter. While students are working independently, circulate the room, offering help when needed.
- When all students have finished reading Chapters 2 and 3, ask for volunteers to share pieces of information they included in their Venn diagrams. Refocus and re-teach if it appears that students are struggling to correctly compare and contrast information.
- Have students read the remainder of the book independently, continuing to fill out their Venn diagrams as they read.

After Reading

Response to Text

- After students have read the entire book, bring the group together to discuss what they have learned. Use questions like the following to lead the discussion:
 - If you had to choose, what would you say is the most important piece of information you learned in this book?
 - How has learning more about LEDs changed the way you think about electricity?
 - What do you think is the most interesting way that LEDs could be used in the future?

Word Work

- Inform students that they will be looking for examples of adjectives throughout *How LEDs Work*. Explain that adjectives are words that describe people, places, or things. As they find adjectives in the book, they should also be able to indicate what word is being described by each adjective they find. As examples, write these adjective/noun pairs on the board or on chart paper, and discuss them with the class.
 - giant screens (p. 5)
 - glass bulb (p. 7)
 - empty spaces (p. 9)
- Give students time to find other adjective/noun pairs.

Extend the Reading

- If time allows, experiment with LEDs by following the “Battle of the Bulbs” experiment instructions on page 34 of the book.



Name: _____

LEDs and Incandescent Bulbs

Venn Diagram

Use the diagram below to compare and contrast the two types of lights discussed in the book.

LEDs

Incandescent Bulbs

