



Science Virtual Learning

4th Grade
Current Electricity

April 8, 2020



4th Grade Science

Lesson 13: April 8, 2020

Learning Target:

Students will tell the difference between direct currents and alternating currents.

Students will understand the how energy is transferred through electric currents.

BACKGROUND KNOWLEDGE:

Review these important vocabulary words before beginning your lesson.

- **Energy:** the ability to do work
- **Electricity:** a form of energy resulting from the existence of charged particles (such as electrons or protons)
- **Electric Current:** a flow of electricity through a conductor
- **Circuit:** a path through which electric current can flow

LET'S GET STARTED!

Watch this Video from our fabulous 4th Grade teachers. Then proceed to the next slide to click on the BrainPop video.

The screenshot shows a video player interface for a lesson titled "Fourth Grade Science - Lesson 13". The main content area displays a grid of interactive options for the "Current Electricity" topic. On the left, there is a cartoon character (BrainPop) in a workshop setting. The grid includes buttons for "Movie", "Quiz", "Make-a-Map", "Make-a-Movie", "Creative Coding", "Related Reading", "Vocabulary", and "Games". A video player window in the bottom right corner shows a teacher speaking. The video player controls at the bottom indicate the video is at 0:07 / 0:55.

Fourth Grade Science - Lesson 13

Current Electricity

Movie Quiz Make-a-Map

Make-a-Movie Creative Coding Related Reading

Vocabulary Games

What do fuel cells, batteries and solar cells have in common? How are alternating currents and direct currents similar and different? How does electricity travel from power plants to your house? What is a source of mechanical energy?

Exit full screen (f)

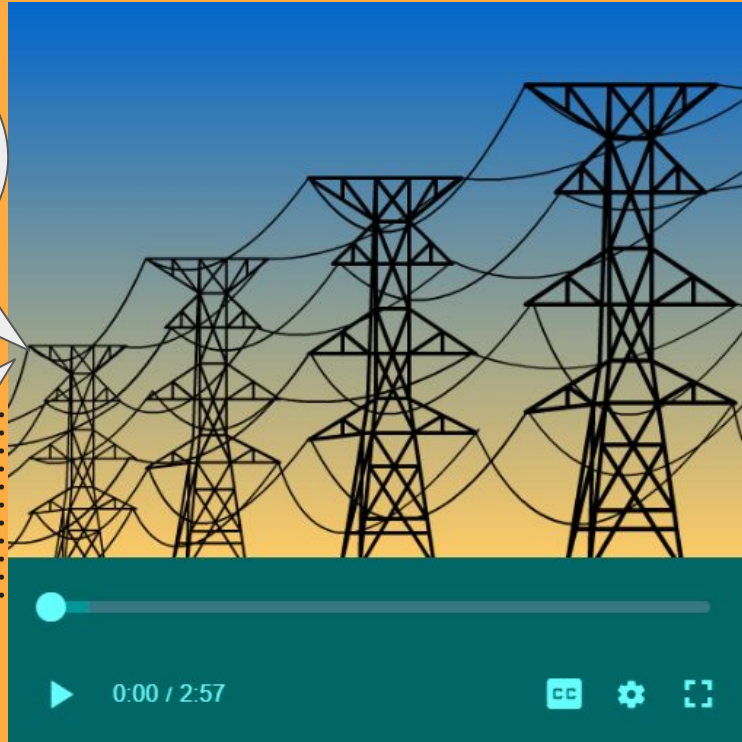
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BRAINPOP VIDEO: CURRENT ELECTRICITY

Click on the picture to start watching the BrainPop video about Current Electricity.
Think about these questions as you watch and listen.

What do fuel cells, battery cells, and solar cells have in common?

How does electricity travel from power plants to your home?



How are direct currents and alternating currents alike and different?

What is a source of mechanical energy?

DID YOU FIND THE ANSWER TO YOUR QUESTIONS?

If not, go back to the video and see if you find an answer to each of the questions on the previous slide. Then go check your answers on the next slide.

REMEMBER!

A fuel cell is something that chemically changes fuel into a electricity.

Examples of alternating currents: generators and transmission wires

A power plant is a place where generators are used to create electrically energy

Examples of direct currents: fuel cells, batteries, and solar cells.

CHECK YOUR THINKING!

Look below to see if your answers were correct!

1. What do fuel cells, battery cells, and solar cells have in common?

They are all examples of direct currents.

2. How are direct currents and alternating currents alike and different?

Alike: Both direct and alternating currents produce a form of energy.

Different: In a direct current, the flow of electricity goes in one direction. In alternating currents, the flow of electricity goes in one direction then switches in the other direction.

3. How does electricity travel from power plants to your home?

They are all examples of direct currents.

4. What is a source of mechanical energy?

Mechanical energy uses different sources, like water, wind, or fossil fuels, to create energy. Usually generators change mechanical energy into electrical energy.

VOCABULARY PRACTICE:

Create your own flashcards!

OPTION 1:

1. Find a piece of paper and cut it into eighths (or 8 equal pieces).
2. List the following terms on 6 of the cards, leaving 2 blank.
Direct current, alternating current, power plants, generators,
transformer, and transmission wire
3. Write your own definition for each term on the back of the cards.
4. Choose two other terms from the video to write on the last two cards. Then have someone close quiz you on the definitions.

OPTION 2: Click on the link below and create digital flashcards.

[BrainPop Digital Flashcards](#)

Real Life

The afternoon of August 14, 2003 was brutally hot throughout eastern North America. People ran air conditioners and electric fans to try and beat the heat, stressing power lines everywhere. At around 3:00 p.m., several important power transmission cables in Ohio shorted out when the sagging cables, burdened by the heavy electric loads they were carrying, brushed up against untrimmed tree branches.



The loss of these cables caused power to be re-routed to other transmission cables—but the extra cables were already carrying the full amount of power they could carry. Since they couldn't handle the overload, one by one, transmission lines and electrical generators in the region shut down to avoid the damage that such an overload would cause. The local power company wasn't prepared to handle this crisis, and the overloads began spreading in an out-of-control fashion.

Heavily loaded lines in neighboring Kentucky, Michigan, Ontario, began shutting down. By 4:30 p.m., more than 263 power plants in the U.S. and Canada had shut down, and 50 million people from Toronto (pictured) to New York City were without power; that's one-seventh the population of the United States, and one-third the population of Canada! It was easily the biggest blackout in North American history. Fortunately, much of the power grid returned online by that evening, and power was fully restored to just about everyone by August 16.

REAL-LIFE APPLICATION:

Read the article “Real Life” and think about all of the examples of alternating currents and how they affect our lives.

1. List all of the examples of alternating currents.
2. How did the power outage affect people's lives on that day?
3. What would you do if you had a power outage for a day or two?

Current Sort:

Walk around your house and write down all of the items in or around your house that use electrical currents. Then sort these items into direct or alternating currents.

Direct Currents:	Alternating Currents:

SELF CHECK:

Click on the picture below to take the graded quiz on BrainPop.
Record your score to share with your teacher when you return!

