

ELECTRICITY

Synopsis

Students in grades 5 through 8 join Walt Disney Imagineer Asa Kalama on an E-ticket ride into the world of imagination, inspiration, and science—the science of electricity. Asa travels to Disney’s theme parks to show students how Disney Imagineers put electricity to work as they design and build amazing attractions, such as the Spectromagic Parade, Finding Nemo Submarine Voyage, and Test Track. In this Educator’s Guide, you’ll find activity ideas that allow students to apply and extend what they’ve learned about electricity.

Objectives

Students will be introduced to the following concepts in the DVD:

- Electricity is the flow of electrical charge when electrons move through matter.
- Conductors are materials that easily transmit electrical energy from atom to atom.
- Insulators are materials with tightly bound electrons that don’t transmit electrical energy easily.
- Voltage is the amount of energy needed to move electric charge from one point to another. Lower voltage means fewer flowing electrons.
- Current, measured in amperes, is how much and how quickly electric charge passes by a certain point in a conductor.
- To make use of electrons you need an energy source, like a battery or power company.
- A circuit is a closed loop of flowing electricity; it has an energy source, a conductor, and a load all connected together. A load is the work that the electrons are doing.
- Resistance is the slowing down and reduction of electrons flowing through a circuit.
- Electrons travel along the same path in a series circuit, but different paths in parallel circuits.
- A watt is a unit of power that measures how quickly energy is being used in a circuit.
- Batteries send electrons in only one direction through a direct current; power companies use alternating current, which means the direction that electrons flow alternates.
- Inductive power transfer uses magnetism to deliver electricity.
- Static electricity is the temporary storage of electrical charges on a surface. Lightning is a type of static electricity.



Activities in this Educator’s Guide allow students to:

- Develop and present an idea for a theme park attraction and describe the role of electricity in it.
- Develop, illustrate, and present an idea for a new electric device.
- Write a script for a segment of a talk show about electricity.
- Create a wiki about people who made important discoveries about electricity.
- Write a blog about electrical safety.

DVD or Activity		Arts Education (Natl. Arts Education Assns.)	Language Arts (NCTE)	Science (NSTA)	Social Studies (NCSS)
DVD Content		None addressed.	None addressed.	B. Physical Science G. History and Nature of Science	None addressed.
Activity	An Electric Story	Visual Arts 1. Understanding and applying media, techniques, and processes Visual Arts 3. Choosing and evaluating a range of subject matter, symbols, and ideas	4. Students adjust their use of spoken, written, and visual language... 5. Students employ a wide range of strategies as they write... 6. Students apply knowledge of language structure... 11. Students participate as knowledgeable, reflective, creative, and critical members...	B. Physical Science	None addressed.
	Welcome to My Workspace	Visual Arts 1. Understanding and applying media, techniques, and processes Visual Arts 3. Choosing and evaluating a range of subject matter, symbols, and ideas	4. Students adjust their use of spoken, written, and visual language... 5. Students employ a wide range of strategies as they write... 6. Students apply knowledge of language structure... 11. Students participate as knowledgeable, reflective, creative, and critical members...	B. Physical Science	None addressed.
	Interview with an Electron	Theater 1: Script writing by the creation of improvisations and scripted scenes based on personal experience and heritage, imagination, literature, and history	4. Students adjust their use of spoken, written, and visual language... 5. Students employ a wide range of strategies as they write... 6. Students apply knowledge of language structure... 11. Students participate as knowledgeable, reflective, creative, and critical members...	B. Physical Science	None addressed.
	Electric Personalities	None addressed.	1. Read a wide range of print and nonprint... 2. Students read a wide range of literature... 3. Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. 4. Students adjust their use of spoken, written, and visual language... 5. Students employ a wide range of strategies as they write... 6. Students apply knowledge of language structure... 7. Students conduct research... 8. Students use a variety of technological and informational resources...	B. Physical Science G. History and Nature of Science	II. Time, Continuity, and Change
	Blogging About Safety	None addressed.	4. Students adjust their use of spoken, written, and visual language... 5. Students employ a wide range of strategies as they write... 6. Students apply knowledge of language structure... 11. Students participate as knowledgeable, reflective, creative, and critical members...	B. Physical Science F. Science in Personal and Social Perspectives	None addressed.

Preview Questions

1. What do you think of when you hear the word 'electricity'?
2. In what ways do you use electricity in everyday life?
3. What is a watt?
4. What electrical safety tips do you know?

Postviewing Questions

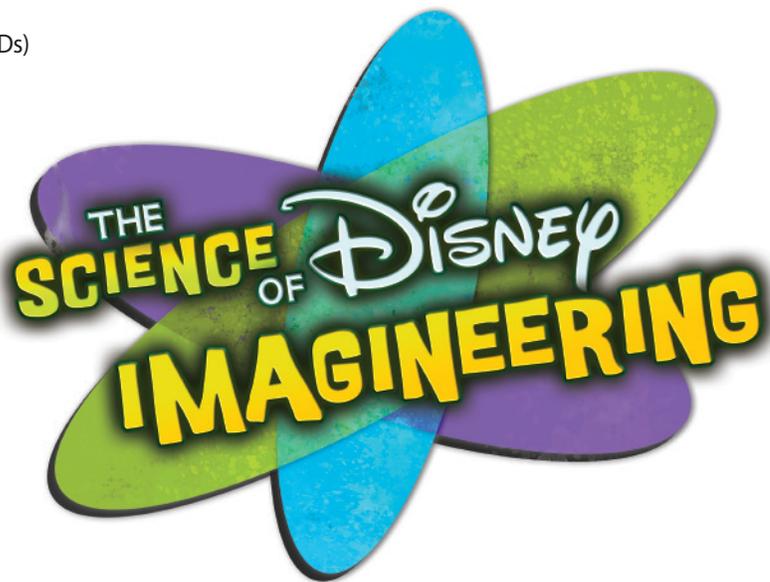
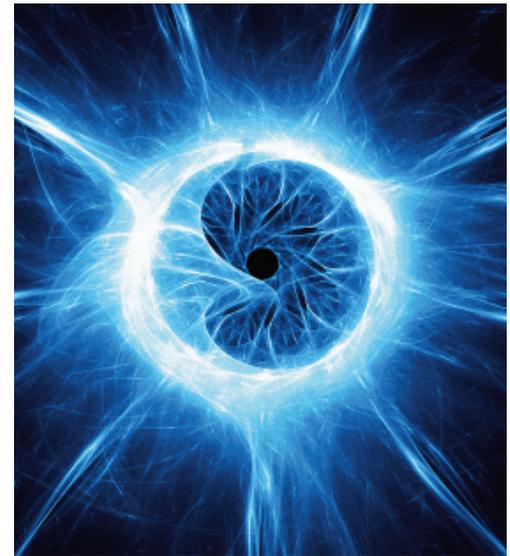
1. What is electricity?
2. What is electrical current?
3. What are the components of an electric circuit?
4. What materials conduct electricity well? What materials conduct electricity poorly?

Suggested Classroom Activities

Try It Yourself: Fun Food Conductors

This DVD contains an interactive activity that allows students to put what they've learned into practice. The activity can be located in the Bonus Materials section of the DVD. Below is a list of items needed to complete the activity.

- Four 9-volt batteries
- Three short electrical wires
- Two longer electrical wires with alligator clips
- Five or more multicolored light emitting diodes (LEDs)
- Two cheap metal forks
- Wax paper
- One pickle
- One candy bar
- One glob of mayonnaise
- Any other foods you'd like your class to test



PREVIEW ONLY

This is a preview of the Educator's Guide on *The Science of Disney Imagineering: Electricity* DVD. The complete Educator's Guide with all activities and resources can be downloaded directly from the DVD.