

TEACHING STRATEGIES:

Discuss how electricity is important in everyday life.

Discuss where our world would be without electricity.

There are two types of electricity. Can you have the class name the 2 basic types and explain the difference? (DC or Direct Current and AC or alternating current).

How do we manufacture electricity? (Through power plants that either burn fuels, harness nuclear reactions, through solar cells, wind power, waves and chemical reactions).

Why can electricity be dangerous? (Can affect the hearts rhythm if shocked).

Why are batteries important to our lives? Think of the items we would not have if we did not have batteries. Such as cell phones, vehicles, computers, radios, televisions.

The ancient Egyptians were thought to have batteries. How did they manufacture them? (It is believed they used a simple cell, using salts and metals to generate a low voltage.)

How many times a day are we using electricity? (All day long. We awake with an alarm clock and go to bed with the lights on. Have someone tell the class how many times a day he/she depends on the electricity. Don't forget the transportation that got them to school, such as a bus. Or the lights in the classroom, or the cooking in the cafeteria).

Discuss how electricity influences our life.

What voltage do common appliances use? (12 volts) Read warning signs on portable appliances to the class to give them some idea how dangerous electricity can be.

Discuss how we can conserve electricity. If we conserve how will it affect our lives?

Discuss the different forms of electricity.

Do we need electricity to live?

CONCEPTS AND TERMS TO LISTEN AND WATCH FOR:

Alternating Current

Alternative Energy

Amperage

Arrhythmia

Battery

Conductor

Current

Direct Current

GFCI

Ground

High Voltage

Lightning

Resistance

Shock

CAREER OPPORTUNITIES FOR THOSE WORKING DIRECTLY WITH ELECTRICITY:

Automotive Technician

Computer technician

Construction Worker

Custodian

Designer

Electrical Engineer

Electrician

Electro-physiologist

Gaffer

Generator Operator

Inventor

Lighting Technician

Lineman

Power Plant Operator

Television Repairman

QUESTIONS FOR THOUGHT, DISCUSSION & FURTHER STUDY:

Is electricity our most important invention? Why?

What are some of the things that spawned from the invention of batteries?

Are there places in the world today that do not use electricity?

Why was Benjamin Franklin interested in lightning?

How does a windmill make electricity?

How does a solar cell make electricity?

How fast can electricity travel? (As fast as the speed of light)

What is an insulator?

What is a conductor?

Can wood be a conductor of electricity?

What is static electricity? Is it harmful?

Why do people get shocked when they touch someone or a door knob ?

Can you make electricity with household items?

What is the chemical reaction that makes a battery?

What type of electricity do you have in your house? Do you know how many volts?

Why can a small amount of electricity kill?

What is a lightning rod?

If you see a downed power pole what should you do?

If you drop a plugged-in hair dryer in a filled sink or bathtub do not grab for it. What should you do?

What is a GFCI?

Is electricity considered a resource?

Do we have an unlimited supply of electricity?

What happens if you touch a negative cell of a battery to a positive cell? (Explosion, Spark fire)

GLOSSARY:

Alternating Current- is an electrical current whose magnitude and direction vary cyclically, as opposed to direct current, whose direction remains constant.

Ampere- The ampere, in practice often shortened to amp, (symbol: A) is a unit of electric current, or amount of electric charge per second.

Anode- An electrode through which (positive) electric current flows into a polarized electrical device.

Battery- One or more electrochemical cells, which store chemical energy and make it available in an electrical form

Cathode- An electrode through which (positive) electric current flows out of a polarized electrical device.

Circuit- An electrical circuit is a network that has a closed loop, giving a return path for the current. A network is a connection of two or more components, and may not necessarily be a circuit.

Conductor- Any material that easily permits the flow of electric current.

Direct Current- Direct current is the constant flow of electric charge. In direct current, the electric charges flow in the same direction, distinguishing it from alternating current (AC). A term formerly used for direct current was Galvanic current.

Electric Current- The flow (movement) of electric charge.

Electric Field- The space surrounding an electric charge or in the presence of a time-varying magnetic field.

Electrical Network- An interconnection of electrical elements such as resistors, inductors, capacitors, transmission lines, voltage sources, current sources, and switches.

Fuel Cell- An electrochemical energy conversion device. It produces electricity from various external quantities of fuel (on the anode side) and oxidant (on the cathode side). These react in the presence of an electrolyte.

GFCI- Ground Fault Circuit Interrupter is an electrical wiring device that disconnects a circuit whenever it detects that the flow of current is not balanced between the phase ("hot") conductor and the neutral conductor.

Ground- Something that is connected to the Earth or at the voltage defined as zero.

Insulator- Is a material that resists the flow of electric current.

Lock Out- A workplace safety system to prevent activation of machinery while a worker may be working with it. A worker places a padlock or other device on the control of a machine to prevent anyone else from operating it and retains the lock's key.

Ohm's Law- States that, in an electrical circuit, the current passing through a conductor between two points is directly proportional to the potential difference (i.e. voltage drop or voltage) across the two points, and inversely proportional to the resistance between them.

Shock- A force caused by contact of a human's body with any source of voltage high enough to cause sufficient current flow through the muscles or hair.

Single-Phase electric power- Refers to the distribution of electric power using a system in which all the voltages of the supply vary in unison. Single-phase distribution is used when loads are mostly lighting and heating, with few large electric motors.

Static Electricity- A build up of electric charges on two objects that have become separated from each other.

Three-Phase Electric Power Systems- Have at least three conductors carrying voltage waveforms.

Volt- A measurement of how well something conducts and disperses electricity.

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Working Around Electricity



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