Please start seating 5 minutes before the start of the show!

Big Energy Show
Study Materials for Grades 4-8

www.letsgoscienceshow.com

The Big Energy Show Goals:

Have fun learning about science.
Increase your students' science vocabulary.
Learn several physics concepts.
Have students grasp the scientific method.
Encourage kids to study science.

FOR THE TEACHER

BEFORE THE SHOW

- Introduce the following science vocabulary words (60 minutes).
- Please remind students about good audience behavior; no talking to their neighbors, hands to themselves, and participate.
- Have fun discovering how things work and get ready for a great show!

ENJOY THE SHOW!

AFTER THE SHOW

- Review Vocabulary. Ask students which words relate to each demonstration.
- Review science demos with class and have them pick 3 to do.
- Point your students to the following websites & books then have them report back to their classmates.
- Evaluate the science show and turn in the attached form to the office.

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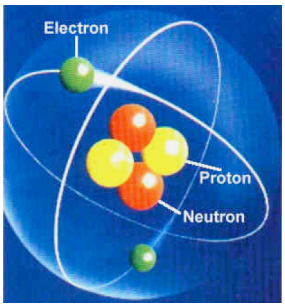
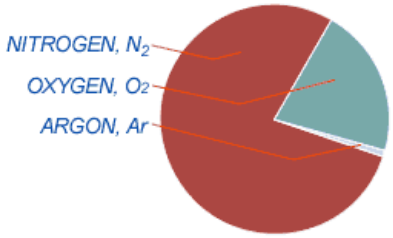
VOCABULARY

(60 Minutes)



Atom: The basic unit of a chemical element, consisting of a proton, neutron, and electron. Example: A person weighing approximately 150 pounds is made up of about 7,000,000,000,000,000,000,000,000,000 or 7×10^{27} atoms.



Atmosphere: The mixture of gasses that surrounds the earth and other planets.
Example: Earth´s atmosphere is made up of 78% nitrogen, 20.95% oxygen, 0.93% argon, 0.038% carbon dioxide, and trace amounts of other gases.

Attract: To pull or draw someone or something toward oneself.
Example: A magnet is attracted to objects with iron in them.

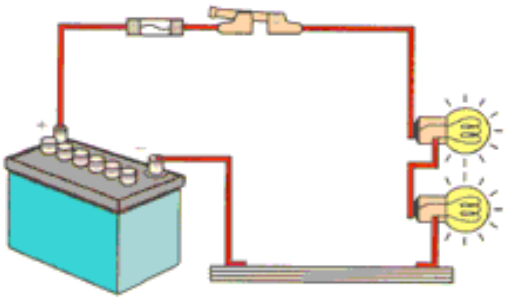
Balance: The point where two things are equal in weight or force.
Example: Two teams pulling on a rope with equal force.

Center of Gravity: The center of mass of an object or thing. Also known as the point where gravity can be said to act.
Example: In the human body the center of gravity is an imaginary point that would exist if you crushed your body down to a single, centrally located point, this point lies behind, and just below, the navel.

Chemical: Compounds or substances that have been purified or prepared.
Example: Some common chemicals found in our kitchens at home are sodium chloride (salt), sodium bicarbonate (baking soda), sucrose (sugar), and acetic acid (vinegar).

Chemical Energy: Energy that is created by the interaction of two or more chemicals.
Example: The human body converts the chemical energy from food you eat into mechanical energy and body heat so you can run and jump and keep warm. When you eat food, you are eating energy to keep your body running.

Circuit: A path that ends at the beginning. A path where electrical current can flow in a circle.



Column: An upright shaft or pillar, or a vertical cylindrical object or thing.
Example: A great column of smoke.

Data: A collection of facts and statistics collected together for reference or analysis.
Example: Numbers, words, images, measurements, variables, or observations.

Demonstrate: To clearly show something and explain how it works, by giving proof or evidence.

Effort: The physical or mental energy needed to accomplish a task.

Electrical: Operating by or producing electricity.

Electrical Energy: The movement of charged particles, negative (-) and positive (+).
Example: Power plants burn fuel to make electricity which is then sent to homes and businesses through wires. The computers, printers, and video games in your houses account for 13% of the electrical energy used in your house. Are your computers, games, and adapters on while you are at school?

Electrons: Electrons orbit the positively charged nuclei of atoms and are responsible for binding atoms together in molecules and for the electrical, thermal, optical, and magnetic properties of solids. Electric currents in metal and in semiconductors consist of a flow of electrons and light.
Example: Radio waves, x-rays and heat radiation are all produced by accelerating and decelerating electrons.

Energy: The ability to do work or provide power.
Example: There are many types of energy that we use in our everyday lives. We use energy to light our houses and cook our food. Energy can be made from burning gasoline, coal or natural gas to make heat or electricity. In the United States we use about 33% of our energy for factories, 27% for transportation, 20% for our homes and 20% for our businesses.

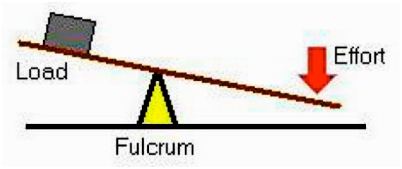
Equalize: To make things equal or the same.

Experiment: A test done using the scientific method in order to learn or discover whether something works or is true.

Force: A push or pull capable of moving an object.
Example: Racing dragsters leave the starting line of a race with a force nearly five times that of gravity. The same force is used by the space shuttle when it leaves the launching pad at Cape Canaveral.

Frequency: The number of times that a wave is produced within a particular period of time, typically measured per second.

Fulcrum: The point at which a bar or object is balanced or supported.
Example: The pivot point on a see saw.



Gas: The state in which a substance does not have a definite shape or volume.
Example: Air, helium, natural gas. Did you know that helium is lighter then air? That is why a balloon filled with helium floats but a balloon that you blow up with air falls to the ground.

Generating: To produce or create as in energy or electricity.
Example: The United States has over 16,500 power plants that can generate energy. Together these plants generate an output of over 1,000,000 megawatts of energy in the winter and over 950,000 megawatts in the summer.

Gram: A unit of measurement equal to 1 thousandth of a kilogram.
Example: There are 453.59 grams per pound. That means that a person weighing 150 pounds would weigh 68,038.5 grams or 68 kilograms. A regular paperclip weighs 1 gram.

Hypothesis: An idea or explanation that is based on facts but has not yet been proven.
Example: A guess as to why or how something happens.

Imagination: The ability to form mental images, or the ability to spontaneously generate images within one's own mind.

Inclined Plane: A plane surface set at an angle that is used to raise a load.
Example: A load can be raised up an inclined plain by applying a smaller force over a longer distance, rather than lifting the load straight up.

Inertia: A physical property of all things or matter: Objects in motion stay in motion, and objects at rest stay at rest unless forces act on the objects.
Example: Your parents sleeping on the couch.

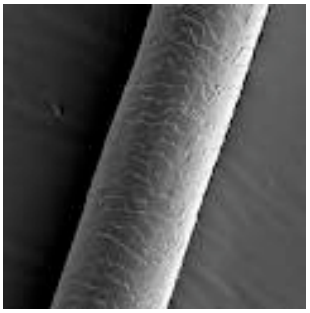
Inventor: A person who has invented something that no one else has.
Examples: Thomas Edison invented the common light bulbs that we use in our houses.

- *Ellen Ochoa* invented optical analysis systems and was also the first Hispanic female astronaut for NASA. Read more about Ellen Ochoa at: http://inventors.about.com/library/inventors/blochoa.htm
- *Dr. Patricia Bath* (an African American woman) invented a method for treating cataracts with laser surgery. To read more about Dr. Patricia Bath go to: http://inventors.about.com/library/inventors/blPatricia_Bath.htm
- *Dr.Meredith Gourine* (an African American man from Harlem in NYC), engineered a technique for dispersing smoke and fog. He has over 40 patents and built a multi-million dollar corporation. He was also blind. To read more about Dr. Meredith Gourine go to: http://inventors.about.com/library/inventors/blgourdine.htm

- *Victor Celorio* born in Mexico City in 1957 was an author, entrepreneur, and inventor. He developed a technology called "Books on Demand". Using this technology, he founded his company Instabook Corporation. To learn more about Instabook go to http://www.instabook-corporation.com

Kinetic Energy: Energy that pushes or pulls.
Example: Sound, motion, heat, and electricity are all examples of kinetic energy. Water boiling is an example of heat kinetic energy.

Laws of Motion: Otherwise known as Newton's laws of motion. Three physical laws that describe the relationship between an object, forces working on the object and the motion of the object.



Newtons Three laws of motion are:
1. Every object in steady motion tends to remain in that state of motion unless an external force is applied to it.
2. Acceleration is produced when a force acts on a mass. The greater the mass of the object being accelerated the greater the amount of force needed to accelerate the object.
3. For every action there is an equal and opposite reaction.

Lens: A piece of glass or transparent substance with curved sides for concentrating or dispersing light.
Example: A magnifying glass, camera lens, or telescope lens. Also, the part of the eye behind the pupil that focuses light into the retina so you can see.

Lever: A simple machine consisting of a rigid bar pivoted on a fixed point (**Fulcrum**) and used to move an object or thing.
Example: The great pyramid of Giza was built in 2575 BC. It was over 50 stories tall. Levers were used to lift the stones to the top of the structure. These blocks weighed 1.5 tons to 80 tons or up to 160,000 pounds.

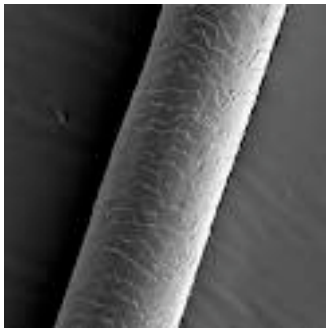
Leverage: To use a lever to exert force on an object.

Machine: Any device that transmits or modifies energy.
Example: Some of the simplest machines are inclined planes, wheels and axles, levers, pulleys, wedges, and screws.

Magnetic: Having the properties of a magnet.
Example: Magnets have two ends that are called poles, one attracts iron and the other pushes iron away. The Earth is magnetic. It has two magnetic poles, one near the north pole and the other near the south pole. The Earth's magnetic field, called the magnetosphere, can be felt far into space.

Mass: The quantity of matter that any body contains.
Example: On Earth we weigh our mass against the forces of the Earth´s gravity.

Massive: Very large in amount, size, or number.
Example: The tallest mountain in the world is Mount Everest. It is so massive it measures 29,035 feet tall.



Microscope: A machine that is used to make small objects look bigger.
Example: This is how a human hair would look under a microscope.

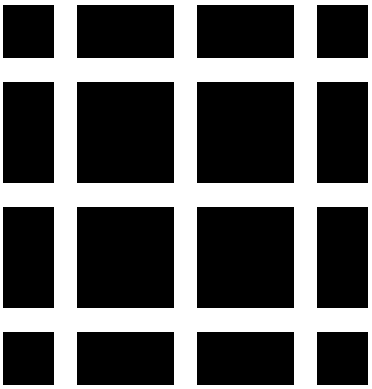
Nuclear: The part of an atom relating to the nucleus

Nuclear Energy: The energy produced when the nucleus of one atom is divided or joined to another nucleus.
Example: In the United States there are over 100 nuclear power plants that generate 20% of the domestic electricity consumed.

Optic Nerve: The set of nerves that runs from the eyeball into the brain that tells your brain what you see.

Optical: Referring to light or the ability to see.

Optical Illusion: Something you think you see, but you really don't.
Example: Look at the image below. Dark patches appear where the white lines meet, except the ones which you are directly looking at. Cover up the black patches and the dark patches disappear. For more great optical illusions, go to:
http://www.eyetricks.com/illusions.htm
http://www.exploratorium.edu/exhibits/f_exhibits.html
http://www.echalk.co.uk/amusements/OpticalIllusions/illusions.htm

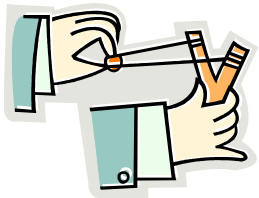


Particle: A very tiny piece of matter.
Example: The rings around Saturn are not solid. They are made up of particles, some of which are as tiny as sand and some that are as large as a skyscraper.

Physics: The study of matter and energy and how they interact.
For a tour through the history physics and how we use physics in everyday life go to:
http://www.colorado.edu/physics/2000/index.pl
http://www.physics4kids.com/

Potential: The ability to build or store up something without using it.

Potential Energy: Energy that has built up or stored up but has not yet been used.
Example: Chemical, nuclear, stored mechanical, and gravitational energy are examples of potential energy. A sling shot pulled back about to be let go is an example of stored mechanical energy.



Pound: A unit to measure weight. Example: One pound equals 16 ounces or 453.6 grams.

Pressure: The force used when something pushes against something else.
Examples: Steam engines use the pressure from vaporizing water to produce energy that is used to move the object.

Properties: A quality or description of an item or thing.
Example: Gold is shiny and has a golden, butter yellow, metallic color.

Prove: To show a particular result by demonstrating or testing it.

Quantify: To measure the size or amount of a thing or an activity.
Example: You can quantify and compare two objects by measuring their action, temperature, speed, and size.

Repel: To push someone or something away from oneself.
Example: Skunks repel animals that are attacking them by spraying a foul odor from scent glands on their bodies. This keeps them from getting eaten by larger animals. Also, magnets repel each other and will not stick together.

Research: A systematic study or investigation of sources and materials in order establish facts and reach new conclusions.
Example: Medical scientists are studying and researching cures for cancer with the hope that someday lives will be saved.

Resistance: A force that makes a thing move slower or stop.
Example: A parachute is deployed on a drag race car to slow it down. The parachute creates air resistance that causes the vehicle to slow down.

Scientific Method: The method by which scientific experiments are conducted. Usually consisting of a theory, hypothesis, designed experiments, and a conclusion statement.

Scientist: A person who studies science.
Example: Albert Einstein, Benjamin Franklin, Aristotle, Galileo, Benjamin Banneker and Marie Currie are all famous scientists. Their studies and discoveries are still considered the basics of modern science. Here are some web sites of famous women in science:
www.iwaswondering.org
www.women-inventors.com
www.astronautix.com/articles/womspace.htm

Screws: A rod usually made of steel that has an inclined (slanted) plane wrapped around it.

Skills: Having the ability or expertise to do something well.
Example: Tiger Woods has excellent golfing skills.

Solar: Relating or referring to the sun. The sun is a star with a diameter of approximately 864,000 miles (1,390,000 kilometers), about 109 times the diameter of Earth.

Solar Energy: Energy radiated from the sun in the form heat and light. Example: The sun that we see has a temperature of about 5500 degrees C (10,000 degrees F). Scientists have been able utilize the solar energy the sun produces and use it as an alternative to fossil fuels to light homes and heat water.

Sound: Vibrations that travel through the air or other medium and can be heard by an ear. Example: Sound moves at about 340 meters per second in the air. This is much slower then sound traveling in the ocean. In the ocean sound moves at about 1500 meters (15 football fields end-to-end per second).

State: A physical condition that describes an object.
Examples: Words like solid, liquid, and gas can be used to describe the state of an object.

Static: Without movement, action, or change.
Example: When you pause a movie the image remains static on the screen.

Static Electricity: The electrical charge that collects on the surface of an object of thing. Example: When you rub a balloon on your hair the electrons that are on your hair jump to the balloon and stick, making your hair stand on end.

Subatomic: A particle that is smaller in size then an atom.
Example: Protons, neutrons, and electrons are subatomic particles.

Surface: The top or outer part of an object of thing.
Example: The surface of the earth where we live.

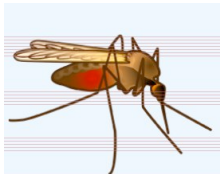
Theory: A broad, detailed explanation for the results of an experiment.
Example: Isaac Newton devised the theory that if you drop an apple from a tree, it would fall to the ground. When he actually dropped the apple out of the tree it fell to the ground proving his theory about gravity was correct.

Transmit: To pass an object or thing from one place or person to another.
Example: To avoid crashes, the monorail at Disneyland uses transmitters to send electrical signals through the track. When the train is on the track, the electrical signal is blocked and the location of the train is revealed.

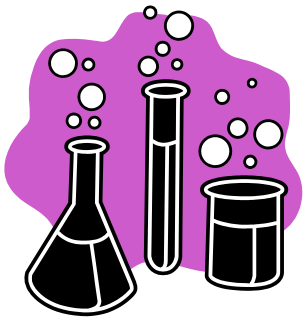
Waves: The pattern that some types of energy use to travel.
Examples: Sound, heat & light travel in waves. Visible light waves are waves we can see. We see these waves as the colors of the rainbow. Each color has a different wavelength. Red has the longest wavelength and violet has the shortest wavelength. When all the waves are seen together, they make white light. Other examples of waves include sound waves, ocean waves, and waving "hi" to your friends.

Weight: The measure of the force by which the earth attracts an object or thing.
Example: The scale in your bathroom measures the force of the earth´s gravity on your body. The force of gravity that pulls you to the earth is proportionate to your weight. The smaller the force of gravity, the less something weighs. There is no place in the universe that is not affected by gravity, even if you are in outer space millions of miles from any planet.

Wings: The part of an object used for flying.
Example: Insects flap their wings to fly. Mosquitoes beat their wings 450 to 600 times per second to stay in the air. Aircraft wings have air pushed over and under them by propellors and jet engines to give the aircraft lift.



In Class Science Demos



#1 - OPEN AND CLOSED CIRCUITS (20 minutes)

Description: Discover how open, closed, and short circuits affect the flow of electricity.

Materials:

- -9V Battery
- -Small Light Bulb
- -Wire Cutter
- -Bare Wire (not insulated or covered with anything)

Procedure:

1. Cut three pieces of wire about 5"-7" long.
2. Connect two wires from the battery terminals to the light bulb. What happens?
3. Take the third piece of wire and drop it across the two bare wires attached to the battery terminals. What happens?
4. Remove the third wire. What happens?
5. Now take the wire clippers and cut one of the wires between the connection on the battery and the light bulb. What happens?

Discussion:

Connecting the wires from the battery to the light bulb creates a "closed circuit", causing the light bulb to light up. A closed circuit is a circuit that provides an uninterrupted endless path for the flow of electrical current. By laying the wire across the two connecting wires a "short circuit" was created. A short circuit allows a current to flow along a different path then the path originally intended. The short circuit redirected the path of electricity away from the light bulb and the light went out. Cutting the wire creates an "open circuit". An open circuit is an incomplete electrical circuit in which no current flows. The open circuit you created interrupts the flow of electricity to the light bulb and the light goes out.

#2 - SUCKING AN EGG INTO A BOTTLE (30 minutes)

Description: Watch as a whole hard-boiled egg is sucked into a bottle then pops back out.

Materials:

- Wide Mouth Glass Bottle (Sobe Juice bottles work well)
- Hard-Boiled-Egg, Peeled
- 3" Strips of Paper, Twisted Together Tightly
- Matches or Lighter

Procedure:

1. Place the egg on top of the bottle. Does it fit inside the bottle?
2. Remove the egg.
3. Light the piece of paper with the matches (or lighter) and drop it quickly into the bottle.
4. Place the egg back on top of the bottle. What happens?
5. Now turn the bottle upside down. Does the egg come out?
6. Shake out any loose burnt paper.
7. For this step, being careful not inhale any burnt paper. Blow into the bottle with your mouth creating a seal around the top of the bottle, and turn the bottle upside down letting the egg slip down to the opening. What Happens?

Discussion: The air pressure outside and inside the empty bottle starts out at atmospheric pressure. By lighting a match and dropping it into the bottle you made the air inside the bottle hotter then the air outside the bottle. The hot air inside the bottle expanded and some of it escaped out through the opening. When the flame went out (because the egg was not allowing air and oxygen inside the bottle) the atmospheric pressure inside the bottle decreased quickly, creating a vacuum that pulled the egg into the bottle.

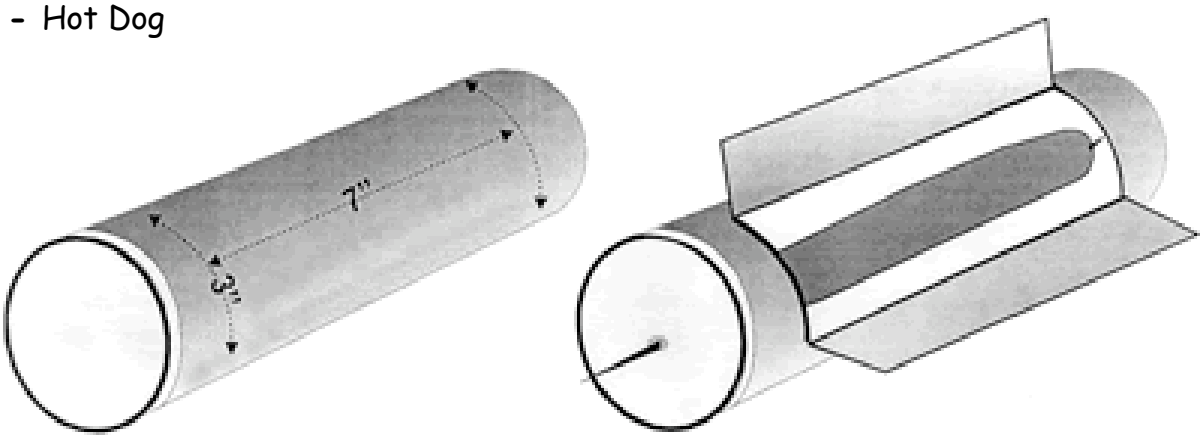
By blowing into the bottle, the pressure inside the bottle is increased greater than the atmospheric pressure outside the bottle, allowing the egg to come back out of the bottle.

#3 - PRINGLE® CAN SOLAR HOT DOG COOKER (90-120 minutes)

Description: Make your own hot dog cooker using solar energy from the sun.

Materials:

- Pringles Can (you can also use a cardboard box lined with aluminum foil), see:http://www.energyquest.ca.gov/projects/solardogs.html
- Tape
- Wooden Skewer (about 12" long)
- Transparency Film
- Scissors, or Exacto Knife
- Hot Dog



Procedure:

1. Cut a line lengthwise down the Pringles can to about 2"' from the top and 2" from the bottom.
2. Cut a line across the top and bottom of the first cut extending 1-1/2" on either side of the long line.
3. Open both sides of the can out, making a window to the interior of the can.
4. Tape a piece of transparency film inside the can to complete the window.
5. Make a small hole in the top and the bottom of the Pringles can.
6. Insert the wooden skewer through the hole at the bottom of the can.
7. Thread the hot dog onto the wooden skewer.
8. Insert the other end of the wooden skewer (with the hot dog on it) through the hole at the top of the Pringles can.
9. Place the can in the sun for cooking. On bright sunny day with little breeze, it can take 60-90 minutes to cook the hot dog.

Discussion:

The shiny flaps of the Pringles can capture and reflect the energy from the sun onto the transparency film taped on the inside of the can. The transparency film captures the light and turns it into heat. The heat stays inside the can. The can acts as an oven retaining the solar energy (heat) that is reflected into it and cooks the hot dog. Enjoy!

Note: On a sunny day, the inside of a parked car gets very hot, just like the inside of the Pringles can. The light from the sun enters the car through the windows and the light energy turns into heat energy.

#4 - IMPLODING SODA CAN (30 minutes)

Description: Crush an empty soda can using only water.

Materials:

- 1 Empty Aluminum Soda Can
- Stove Top Burner (or Bunsen Burner)
- Oven Mitt or other Hand Protection
- Cold Tap Water
- Bowl or Sink (the deeper the better)

Procedure:

1. Fill the bowl or sink with cold tap water.
2. Put about two tablespoons of water into the aluminum can.
3. Set the aluminum can onto the burner.
4. Turn on the burner.
5. Leave the can on the burner until you see lots of steam coming out of the aluminum can.
6. Put on the oven mitt.
7. Carefully lift the can and put it into the bowl of water with the opening in the can facing downward. What happens?

Discussion:

By placing a small amount of water in the soda can and boiling it, you are causing the molecules of air and steam inside the can to heat up. However, the pressure inside and outside of the can stay constant or in equilibrium because there is a hole in the top of the can and some of the hot steam and air molecules escape. The air molecules that remain are hot and moving more quickly then the air and water outside the can.

By inverting the soda can in the water bath you are quickly reducing the temperature of both the can and the air inside the can. When the air inside the can cools, the air molecules move slower, reducing the pressure inside the can. The lower pressure inside the can creates a vacuum. The pressure outside of the can is now greater then the pressure inside the can so the wall of the can implodes, crushing the can.

#5 - LEMON BATTERY (40 minutes)

Description: Make a voltaic battery using citric acid from a lemon.

Materials:

- -Copper Wire (18 gauge is stiffer and works best)
- -Wire Clippers
- -Steel Paper Clip
- -Sand Paper
- -Lemon

Procedure:

1. Clip off 2" of the copper wire with the clippers.
2. If the wire is insulated, strip off the insulation. Have an adult help if needed.
2. Straighten out the paper clip and cut off a 2" piece.
3. Using the sand paper, smooth out any rough spots or burrs on the ends of the wires.
4. Roll the lemon on the desk top to soften it and make it juicier inside, being careful not break the lemon's skin.
5. Push the copper wire and the paper clip wire into the lemon, getting them as close together as you can without them touching each other.
6. Moisten your tongue with saliva. Touch the tip of your wet tongue to the ends of both wires. What happens?

Discussion:

You should feel a slight tingle and taste something metallic when you place your tongue on the wires. This is because you have made a battery out of the lemon! The lemon battery is called a voltaic battery. Voltaic batteries change chemical energy into electrical energy.

The lemon battery is made up of two different metals (the copper wire and the steel paperclip). These wires act as the electrodes. The electrodes are the part of the battery where electrical current enters or leaves the battery. The electrodes are placed in an electrolyte solution; which is the citric acid in the lemon. An electrolyte is a substance that forms ions (electrically charged atoms and molecules) in a water solution and has the ability to conduct electricity. Excess electrons from the electrolyte solution collect on the end of one electrode, while at the same time, electrons are lost from the other electrode.

Touching the electrodes to your tongue creates a "closed circuit" and allows a small electrical current to flow between the two electrodes. The tingle felt in your tongue and the metallic taste is due to the movement of electrons through the saliva onto your tongue.

A single lemon produces about 7/10 of a volt of electricity. If you were to connect two lemon batteries together you could power a simple digital watch or a tiny light bulb!

#6 - SEEING SOUND WAVES (30 minutes)

Description: Watch as sound waves causes grains of salt to jump.
Materials:
- -Bowl (about 10" in diameter)
- -Plastic Kitchen Wrap
- -1 Tablespoon Salt
- -Metal Pot & Spoon

Procedure:
1. Cover the top of the bowl with the plastic wrap.
2. Sprinkle some salt on top of the plastic wrap.
3. Using the spoon, bang on the bottom of the pot to get a short but loud sound. What happens?
4. Now try yelling loudly next to the bowl. Can you get the salt to move?

Discussion:
As you strike the pot it vibrates. The vibrations transmit sound waves through the air that cause the plastic wrap vibrate. The plastic wrap vibrating causes the salt to jump. When you yell, your vocal cords vibrate, creating sound waves, and if you yell loud enough the vibrations also cause the plastic wrap to vibrate and the salt to jump.

Vibrations creating sound waves are what is transmitted through the air as the sounds that you hear with your ears. Your eardrums act like the plastic wrap, and vibrate when sound waves enter your ears

#7 - SOUND WAVES UNDERWATER (40 minutes)

Description: Do sound waves travel faster through the air or under water?
Materials:
- -Plastic Tub
- -Empty 2-Liter Plastic Bottle
- -Water
- -Scissors
- -2 Rocks

Procedure:
1. Working in pairs, carefully cut the bottom off of the 2-liter bottle using scissors.
2. Fill the plastic tub 2/3rd full of water.
3. Have one person place their ear on the top of the bottle at the opening.
4. Have the second person bang the two stones together under the water, near the bottle, but not touching it.
5. Switch places with your partner and repeat steps 3 and 4.
6. Now try removing the bottle from the water, creating an air space of a few inches between the bottle and the water. Repeat steps 3 and 4 with the air-space.

Discussion:

Does sound travel faster in air or water? The denser the object the sound wave is moving through the faster the sound wave travels. The faster the sound wave travels, the quicker our ears hear the sound. Sound travels faster through water then it does through air because air is less dense then water.

The sound waves created by banging the rocks together underwater travel quickly through the dense water and to the bottle that is underwater. From there it travels to your ear where you hear the banging sound of the rocks almost immediately. When the bottle is removed from the water, the sound travels quickly thru the dense water, but slows down when it gets to the less dense air. Therefore, it takes longer for the sound waves to reach your ear so it takes longer to hear the banging of the rocks.

Reading List

101 Physics Tricks
Cash, Terry 530.078

Fascinating Experiments in Physics
Cherrier, Francois 530

Physics Lab in the Home
Friedhoffer, Robert 621

Science Lab in a Supermarket
Friedhoffer, Robert 540.78

Famous Experiments You Can Do
Gardner, Robert 530

Measuring Weight and Time
King, Andrew 530.8

Science School
Manning, Mick 530.078

A Physics Lab of Your Own
Mark, Steven 530

Adventures With a Cardboard Tube
Milgram, Harry 500

Have a Ball
Stone, A Harris 530

The Heat's On
Stone, A. Harris 536

Science on a Shoestring
Strongin, Herb 372.35

Be a Kid Scientist
Wellnitz, William 530.078

Way Cool Web Sites

EnergyQuest
http://www.energyquest.ca.gov/
Learn about all types of energy and how energy is used in our world.

Energy Kids Page
http://www.eia.doe.gov/kids/
A fun place to review the history of energy, play games, and discover new facts.

PHYSICS4KIDS
http://www.physics4kids.com/
Motion, heat, electricity, light and much more.

Kids Saving Energy
http://www.eere.energy.gov/kids/
US Department of Energy web site for kids. Energy facts and games for kids.

NASA Kids Club Page
http://www.nasa.gov/audience/forstudents/k-4/index.html
NASA - (National Aeronautics and Space Administration) website just for kids.

CHEM4KIDS
http://www.chem4kids.com/
Learn about atoms, matter, chemical reactions and much more!

University of Maryland
http://www.physics.umd.edu/deptinfo/facilities/lecdem/services/demos/mainindex.htm
The BEST index of hundreds of science demonstrations with pictures and brief explanations.

Let's Go Science Show
http://www.letsgoscienceshow.com
Professor Smart's and Dr. Knowitall's home page.

Professor Smart's Big Energy Show Evaluation Sheet

Your chance to grade the Professor and Ms. Knowitall:

School Name:_____ Time of Show:_____ Grade:_____

1= Poor 5= Average 10 =Outstanding

1) Did you and your students enjoy the show?

1 2 3 4 5 6 7 8 9 10

2) Were there direct correlations between your school's science curriculum and the subjects covered in the show?

1 2 3 4 5 6 7 8 9 10

3) Could you and your students see and hear the show clearly?

1 2 3 4 5 6 7 8 9 10

4) Was the material presented in a clear and understandable manner?

1 2 3 4 5 6 7 8 9 10

5) Was the show age appropriate?

1 2 3 4 5 6 7 8 9 10

6) Were the study materials helpful?

1 2 3 4 5 6 7 8 9 10

7) Was the vocabulary used during the show grade level appropriate?

1 2 3 4 5 6 7 8 9 10

8) How many hours a week do you spend on science in your class?

0 1 2 3 4 5 6 7 8 9 10

9) Is there anything that you think the show could add? _____

_____

_____

10) Was there anything the show could have left out?_____

_____

_____

Additional Comments: _____

_____

_____

Please return to your school office secretary.

Please mail to:

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Santa Rosa, CA 95401

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