



Grade Level: Grade 4

Title:

Electrical Current and Charges & Fruits of the Holy Spirit

Denomination: Catholic

Lesson ID: PS-G4-04-CA

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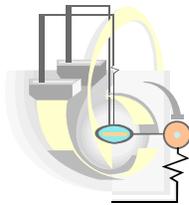
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Note: Web sites referenced in this lesson were valid at time of publication.

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PHYSICAL SCIENCE MODULE – GRADE FOUR - CATHOLIC LESSON 4: Electrical Current and the Fruits of the Holy Spirit

GENERAL CONCEPT: Uses of Energy and the Energy of the Holy Spirit

SCIENCE LESSON CONCEPT

What is electrical current? How do electrical charges affect objects?

GOAL OF SCIENCE LESSON

- Student will learn how objects get an electrical charge.
- Student will learn how electric current flows.

OUTCOME EXPECTED

Student will understand the difference between positive and negative charges.

MATERIALS NEEDED

- Science Journal Page: ELECTRICAL CURRENT
- Two pieces of string

RELIGION LESSON CONCEPT

What effect does the Holy Spirit have on us? What are the Fruits of the Holy Spirit?

GOAL OF RELIGION LESSON

Student will learn that when we are receiving the energy of the Holy Spirit, we exhibit the Fruits of the Holy Spirit.

OUTCOME EXPECTED

Student will be able to give examples of some of the Fruits of the Holy Spirit.

MATERIALS NEEDED

- List of the Fruits of the Holy Spirit
- Magazines to cut pictures

- Two balloons
- A piece of wool cloth
- Safety glasses
- See Science Links for Alternate experiment and materials- very easy
- Energy Hand-out

- Scissors
- Glue
- Lettering
- Markers
- Pen/pencil
- Poster paper
- Writing paper
- Religion Notebook
- Multiple Intelligences (See Links)

SCIENCE METHODOLOGY

- **DISCUSS** how electric charges affect objects.
- **DISCUSS** how electric current moves through a closed circuit.
- **HAVE** the student write and draw the following on the Science Journal Page:

Two pieces of string, two balloons, wool cloth =
 _____ ? _____

- **ASK** the student to predict the outcome on the lines.

RELIGION METHODOLOGY

- **REVIEW** the Gifts of the Holy Spirit.
- **SAY:** If the Holy Spirit is alive then there should be some evidence of that. We can tell that electric current is flowing in your house by completing the circuit by switching on a light. We can tell that the Holy Spirit is alive and flowing in a person by seeing the Fruits of the Holy Spirit in that person.
- **GIVE** the student the list of the Fruits of the Holy Spirit and describe each one.
- **ASK:** Why would this be a sign that God is living in you?

- **DO** the experiment about electrical current and how it moves through a closed circuit. Use the string, balloons and wool cloth.
- **ASK** the student to observe the experiment.
- **ASK:** Was your prediction correct? Why? Why not?
- **ASK:** What did you learn?
- **DO** the alternate experiment in the Links.
- **POSIT:** Current flows from one object to another. Positive and negative charges cause the flow.

- **USE** the multiple intelligences to allow the student to choose a way to demonstrate 3 or 4 of the Fruits of the Holy Spirit. (See Links)
- **DISPLAY** all the projects. ALLOW students time to view the displays.
- **HAVE** the student make a list of three things the student learned from the displays.
- **POSIT:** The Presence of the Holy Spirit can be seen from the life of the person.

RESOURCES, LINKS AND COMPUTER LESSONS

Science Links

(Teacher and Parent) Copy and send home to parent.
www.currentsafe.com/Electrical-Safety-Tips.asp

(Teacher) Glossary of electricity terms
<http://www.eia.doe.gov/kids/glossary/>

(Student) Fun page to read: Electricity for Kids;on-line and printable activities and experiments
<http://inter-county.apogee.net/kids/>

Religious Links

(Student) Pictures alternate with each Fruit of the Holy Spirit
(Teacher and Student) By clicking on each Fruit of the Holy Spirit, the teacher or student can see an animated explanation and story followed by activities and coloring pages.
<http://www.cherbearsden.com/kidsdevos/fos.html>

(Teacher and Student) Puzzle on the Fruits of the Holy Spirit
<http://www.ehministries.com/KidsFruit.html>

(Teacher) Information on Multiple Intelligences
http://www.thomasarmstrong.com/multiple_intelligences.htm

(Teacher and Student) A Multiple Intelligences Survey for Kids
http://www.berghuis.co.nz/abiator/lsi/mi_test.html

Energy Hand-out:

WHAT IS ENERGY? WHAT ARE THE KINDS OF ENERGY?

Scientific Forms of Energy

Materials developed by the National Energy Education Development Project (NEED)

What is energy?

Energy makes change; it does things for us. It moves cars along the road and boats over the water. It bakes a cake in the oven and keeps ice frozen in the freezer. It plays our favorite songs on the radio and lights our homes. Energy makes our bodies grow and allows our minds to think. Scientists define energy as the ability to do work. People have learned how to change energy from one form to another so that we can do work more easily and live more comfortably.

Forms of Energy

Energy is found in different forms, such as light, heat, sound and motion. There are many forms of energy, but they can all be put into two categories: kinetic and potential.

KINETIC ENERGY	POTENTIAL ENERGY
<p>Kinetic energy is motion—of waves, electrons, atoms, molecules, substances, and objects.</p>	<p>Potential energy is stored energy and the energy of position—gravitational energy. There are several forms of potential energy.</p>
<p>Electrical Energy is the movement of electrical charges. Everything is made of particles called atoms. Atoms are made of smaller particles called electrons, protons, and neutrons. Applying a force can make some electrons move. Electrical charges moving through a wire is called electricity. Lightning is another example of electrical energy.</p>	<p>Chemical Energy is energy stored in the bonds of atoms and molecules. It is the energy that holds these particles together. Biomass, petroleum, natural gas, and propane are examples of stored chemical energy.</p>
<p>Radiant Energy is electromagnetic energy.</p>	<p>Stored Mechanical Energy is energy stored in objects by the application of a force. Compressed springs and stretched rubber bands are examples of stored mechanical energy.</p>

travels in transverse waves. Radiant energy includes visible light, x-rays, gamma rays and radio waves. Light is one type of radiant energy. Solar energy is an example of radiant energy.

Thermal Energy, or heat, is the internal energy in substances—the vibration and movement of the atoms and molecules within substances. Geothermal energy is an example of thermal energy.

Motion Energy is the movement of objects and substances from one place to another. Objects and substances move when a force is applied according to Newton's Laws of Motion. Wind is an example of motion energy.

Sound is the movement of energy through substances in longitudinal (compression/rarefaction) waves. Sound is produced when a force causes an object or substance to vibrate—the energy is transferred through the substance in a wave.

energy.

Nuclear Energy is energy stored in the nucleus of an atom—the energy that holds the nucleus together. This energy can be released when the nuclei are combined or split apart. Nuclear power plants split the nuclei of uranium atoms in a process called **fission**. The sun combines the nuclei of hydrogen atoms in a process called **fusion**. Scientists are working on creating fusion energy on earth so that someday there might be fusion power plants.

Gravitational Energy is the energy of position or potential energy. A rock resting at the top of a hill contains gravitational potential energy. Hydropower, such as water in a reservoir behind a dam, is an example of gravitational potential energy.



KEY WORDS
PHYSICAL SCIENCE – GRADE FOUR - LESSON 4 - CA

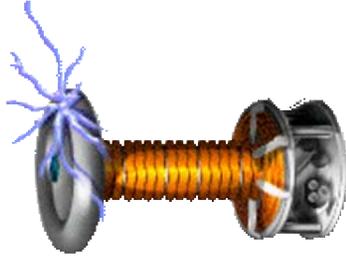


ELECTRICAL CURRENT
CHARGES
FLOW
POSITIVE CHARGE
NEGATIVE CHARGE
POLES
SAFETY GLASSES



FRUITS OF HOLY SPIRIT
SPIRITUAL ENERGY
PATIENCE
LOVE OR CHARITY
PEACE
PATIENCE
KINDNESS
GOODNESS
LONG-SUFFERING
MILDNESS
FAITH
MODESTY
CONTINENCY
CHASTITY

KEY WORDS
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