Project FOCUS
Best Lessons
FOURTH GRADE

Title of Lesson:
Theme:
Unit Number: **Unit Title:**
Performance Standard(s) Covered (enter codes):

Enduring Standards (objectives of activity):

Habits of Mind

- ☐ **Asks questions**
- ☐ **Uses numbers to quantify**
- ☐ **Works in a group**

- ☐ **Uses tools to measure and view**
- ☐ **Looks at how parts of things are needed**
- ☐ **Describes and compares using physical attributes**
- ☐ **Observes using senses**
- ☐ **Draws and describes observations**

Content (key terms and topics covered):

Investigates materials that do or do not conduct electricity by testing variety of materials. Demonstrates differences between open-closed circuits (switches).

Learning Activity (Description in Steps)

Abstract (limit 100 characters): This activity demonstrates how an electric circuit works, what a switch is (opened/closed circuits),

Details: At the beginning of the class, talk about the important parts of the circuits such as electric source (batteries) and charge carriers (wires). Then demonstrate how the flashlight works by removing light bulb and batteries from it and connecting them with a wire. Set it up like this so it will have the same configuration as it has in the flashlight and will be easier to see the similarities:

Now talk about the switches in the circuit and what their purpose is - how switches are used in the circuit to close and to open it, and therefore the electron flow inside the circuit. Demonstrate this by building a simple circuit like this:

Ask your student how they can figure out if something is a conductor or insulator. Above circuit will also be used to test our materials. First, you will connect the two ends of the particular material by the wires (shown in the doted circle), and then you will check if the light bulb lights up or not. If it does, than your material being tested is an electric conductor; if it doesn't, then your material is an insulator (or very poor electric conductor). Let the student test any personal thing they want to try such as bracelet, earring, books, watch etc.

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Materials Needed (Type and Quantity):

Flashlight Batteries Copper wires (~ 5-10" long)

Small light bulbs (individual Christmas lights can be used)

Materials for conductor/insulator tests:

Aluminum foil

Erasers

Paper clips

Papers

Pencil sharpeners

Pencils (including some mechanical pencils)

Pennies, dimes, nickels, and quarters

Plastic wrappers

Rocks Screws (Almost anything that is small to put between wires can be used)

Notes and Tips (suggested changes, alternative methods, cautions):

Tell your student if they want to repeat this activity at home DO NOT use electricity from the outlets on a wall or bigger batteries such as of car. Even though by using this procedure student will come to the conclusion that skin is an insulator, but in reality, it is a poor conductor,and serious damage can occur if they come into a contact with high voltages of these outlets or batteries.

Questions:

After making the first circuit (reconstructing the flashlight), ask them:

1.What makes a light bulb light up?

Before making a switch, ask them:

2.How does switch

3.What is a conductor? And what is an insulator?

4.How can they figure out if something is a conductor or an insulator?

After testing materials, ask them:

5.Are the wires used in making the circuits are conductors or insulators?

6.What can you tell me about most metals?

7.Why doesn't light bulb light up when insulators are placed in the circuit?

8.If you place paperclip, eraser, and aluminum foil (connected to each other in a chain) in a circuit, will it work? Why?

9.What are the uses of insulators and conductors?

Sources/References:

1)

2)

3)