

Project FOCUS
Best Lessons
SECOND GRADE

Title of Lesson: Electric Circuits

Theme: Physical Science

Unit Number: 3 **Unit Title:** Energy/Pushes and Pulls

Performance Standard(s) Covered (enter code):

S2CS3

S2P2

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):

Electricity and Power

Learning Activity (description in steps)

Abstract (limit 100 characters): Students will build electric circuits and observe the effects of batteries, light bulbs, and other factors on the circuit.

Details: The goal of this experiment is to allow students to build circuits on their own, and then see what would happen if extra items were added to the circuit. I designed this experiment with the intent of having a fun way of teaching students how electric circuits worked. I also tried to use as little "lecturing" as possible so that the students could learn interactively. Ultimately, allow the students to learn the circuits on their own, and try to be the intermediate that helps them in the process

I found that working with about 5-6 circuits work best (any more is difficult to help everyone with). You could either set up 5-6 groups in the classroom for a circuit each, or perform the lesson multiple times with 5-6 students each to do this. For each session, ask the students what an electric circuit is. Try to get them to explain that a circuit sounds like a circle, and is used to power up different objects. Ask what objects can be powered, and try to get them to answer things such as lights, televisions, or even cars.

Once they have answered the basics to circuitry, give each student/group 2 wires, a light bulb, and a battery. Ask them if they can figure out how to power the light bulb. Generally one student will attempt it; let the group watch him/her as they try to assemble the circuit. If they incorrectly build the circuit, try to get other students to find where he/she went wrong. If the circuit is built correctly, try to get the other students to follow suit and build a correct circuit.

Once the students have built their simple circuits, try to challenge the students to build more complex circuits. Give them more light bulbs, batteries, and wires, and see if they can correctly incorporate them into the circuit. At this point, the students will ultimately work on their own and learn

how to build circuits. Your job from this point is to help each student/group with their circuits if they cannot build their complex circuits. Get them to understand how to correctly incorporate an extra bulb/battery into the circuit. Get them to understand that adding more light bulbs in the series will make each bulb dimmer, and that adding more batteries makes the bulbs brighter. If all of the bulbs go out due to too much power, get them to understand that light bulbs can short out.

By the end of the class, they will learn circuits through their own experience, and hopefully have fun in the process. When I did this lesson, many of my students were proud of their circuits they built; one student powered a light bulb using 8 batteries! He was happy, and learned a lot about circuits that day.

Materials Needed (type and quantity): Wires, Batteries, Light bulbs. Preferably simple and easy-to-use so that the students will not have trouble setting up the circuits. Also, bring enough for each student (or group) to make a circuit, and extra to experiment with.

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

Safety: Depending on what types of wires you get, the wires may be sharp. Be sure to mention to students to exercise sharp wires with caution (try to avoid this problem by using gator clamp wires).

General Changes: Understand that for this lesson, the students learn through interactive learning, not by your lecturing. You can give the students information on circuits and how to build them, but it may rob the students of the fun of using their imaginations and trying to work on the circuits themselves.

Cautions: Make sure you understand the different ways circuits can fail (incorrect wiring, defective batteries/light bulbs, not enough power for the bulbs, etc). Students will fail on their circuits, and you will have to quickly help them figure out why.

Modifications: I would try to find other things that the circuit could power, such as miniature fans or sound buzzers. That way students could better understand the many different things circuits can power.

Sources/References:

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