

Lesson Plan

Grade Level: Second Grade

Title of Lesson: I Can Build An Electric Circuit, Can You?

Unit Title: Physical Science

Performance Standard(s) Covered:

S2CS3: Students will use tools and instruments for observing, measuring, and manipulating objectives in scientific activities

S2P2: Students will identify sources of energy and how the energy is used

Essential Questions: Are students able to use materials given to them to create different types of circuits? Are students able to identify batteries as the source of chemical energy, and understand the flow of energy through the creation of these circuits? Do students understand that circuits can be created in many different ways? Can students test the conductivity of various materials using circuits?

Objective: The goal of this lesson is to have the students create circuits using batteries, light bulbs, and various objects so that they can understand how energy is used, and test the conductivity of various objects.

Key Words and Terms:

Electricity, chemical energy, batteries, circuits, conductivity, etc.

Learning Activity

Abstract (limit 100 characters):

Students will be briefly taught the basics regarding the creation of circuits. The students will be divided into teams of two. Each team will be asked to create various types of circuits using light bulbs, wires, batteries and various other materials. After each group successfully completes a circuit, they will then be asked to draw that particular type of circuit, and describe the flow of energy in their journals. In addition, each team will test the conductivity of different materials using the simple circuit that they initially created.

Materials Needed:

- Wires
- Batteries
- Battery holders
- Miniature light bulbs

- Light bulb holders
- Different types of materials for the conductivity test (coins, paper clips, rubber bands, etc.)
- Enough materials should be brought for each group and some extra to compensate for used up batteries or burnt out light bulbs
- Materials can either be purchased at the store or rented from the supply room at Aderhold Hall

Safety Concerns: As far as safety goes, the wires used could be relatively sharp. Try to use gator clamp wires, if possible. Also, light bulbs can get slightly hot. Advise students to exercise caution when using these materials. Other than that, activity is relatively safe.

Procedure:

- Briefly review with the students the basics of creating circuits. Make sure the students understand that it is the chemical energy of the battery that drives the electrical energy in the circuit to power the light bulbs.
- Divide the students into groups of two, and have each group complete a specific type of circuit given a certain amount of materials.
 - First Circuit: Have students create a circuit using one battery, one light bulb, and two sets of wires, using the light bulb and battery holders accordingly. Have the students draw the circuit in their journals, and describe the flow of energy. Then, have the students test the conductivity of the various materials (paper clips, coins, etc.) using the simple circuit just created, and have the students separate the conductors and non-conductors. Also, have the students record their observations, and explain the possible reasons as to why certain materials conduct over others.
 - Second Circuit: Have the students create a circuit using two light bulbs but only one battery, using as many wires as needed. Have the students draw the circuit in their journals, and describe the flow of energy.
 - Third Circuit: Have the students create a circuit using one battery, one light bulb, but only one wire. Have students draw the circuit and describe the flow of energy.
 - Fourth and Fifth Circuits: Have the students create series and parallel circuits using as much batteries, light bulbs, and wires needed. Have the students draw the circuit, and describe the flow of energy.
- If a particular group cannot create the circuit, then work with the group to help them figure out what went wrong, and maybe have other groups that successfully completely the circuit teach this group.

Notes and Tips:

- Overall, the goal for this activity is that it should be fun and interactive for the students.
- Emphasis should be placed on the interactive learning aspect of this activity through the actual creation of these circuits
- Circuits can fail, and this can be due to faulty wires, defective batteries, and burnt out light bulbs. To compensate for these potential issues, always have extra materials on hand.
- An improvement to this lesson would be to see how these circuits can power other objects such as miniature fans.

References:

<https://www.georgiastandards.org/standards/Georgia%20Performance%20Standards/SecondGradeApproved7-12-2004.pdf>