

HUMAN CIRCUIT GAME

SUMMARY:

This is a simple 10 minute game that students engage in an interactive "hot potato" demonstration to gain an appreciation for the flow of electrons through a circuit. Students role play the different parts of a simple circuit and send small items representing electrons (paper or fruit) through the circuit.

LEARNING OBJECTIVES:

After this activity, students should be able to:

- Explain how a simple circuit works.
- Describe the functions of a switch and light bulb as resistors in a circuit.
- List several products that use electrical energy.

RESOURCES:

Print out of Human Circuit components to share.

BACKGROUND:

This is a game to help understand the principles of an electrical circuit. A circuit is a complete path of electrical energy. Electrical energy is all about charge. Charge is the positive or negative force of an atom or how much electrical energy is in an atom.

THERE ARE THREE MAIN VOCABULARY WORDS WHEN TALKING ABOUT ELECTRICAL ENERGY:

Voltage is the amount of energy that can be produced by a charge.

Current is the flow of charge (electrons)

Resistance is anything that keeps the current from flowing.

Remember that a circuit is the complete path of electrical energy.

In a simple circuit with a light bulb, wire and battery, the battery provides the voltage and the light bulb gives us resistance, by slowing down the flow of charge and changing it into light. The current flows through the battery, the light bulb and the wires.

KEY QUESTIONS:

- What might happen if we disconnect the battery?
- What do you think happens if we add more voltage or another battery?
- Why is the light bulb brighter when two batteries are used instead of one?
- What things can you think of that use a circuit?

THE GAME.

1. Group form a human circuit by standing in a circle.
2. Give one person the picture of a battery, (negative should be on their right for true accuracy)
3. Give one person the picture of a bulb, they stand up when they "glow" or are "on".
4. Give one person the picture of a switch, they stand up when they are "closed" or "on".
5. All the other members of the circle are wires, and are given an image of an electron.
6. Everyone passes their electron to the person on their right, so the electrons start to slowly travel around the circuit. Even the bulbs, switches and batteries help move the electrons.
7. Once the exercise is in process, point out how the current of electrons flows around and around the circuit as long as the switch is on (and there is a closed circuit).
8. Next, have the student who is the switch occasionally to "switch off" by sitting down. This action breaks the circuit and the electrons must stop moving around the circle.
9. When the switch goes off, the flow of electrons stops, so the current stops. When this happens, the "light bulb" person stops glowing and also sits down. When the "switch" changes back to "on," by standing up, the flow begins again and the electrons start moving like "hot potatoes" around the circle. Because it is turned "on," the "light bulb" can jump up from the floor and "glow" again.
10. Keep playing the game for a few minutes or until all the students understand how the current (or flow of electrons) moves through a closed circuit (closed circle or when the switch is on). Once they understand, students should know to stop the flow of electrons when the switch is turned off, or the circuit is open. Re-assigning the roles of the switch, battery and light bulb several times. See if the students have ideas of other items that could use the flow of energy just like the light bulb.

VARIATIONS:

Hand Squeeze. Have the student hold hands in a circle and ask them to represent the flow of electrons by a gentle "squeeze" of hands that flows from one student to the other, around and around the circle. The circuit breaks when the flow of electrons is not smooth, or when two students next to each other do not hold their hands together. Have students waiting to join the circuit as "insulators," such as wood or rubber, which break the circuit, causing the light bulb to "turn off," even if the switch is "turned on."

