

ELECTRONICS: CONCEPTS AND BASIC COMPONENTS

THEME	Breadboard, components in series and in parallel
FORMAT	Group (students work in small groups)
PREPARATION TIME	1 hour
ACTIVITY LENGHT	30-45 minutes
DIFFICULTY LEVEL	average

PEDAGOGICAL GOALS

- To discover and learn how to use the breadboard.
- To assemble circuits with components in series and in parallel and measure resistance, voltage and current.

NECESSARY MATERIALS

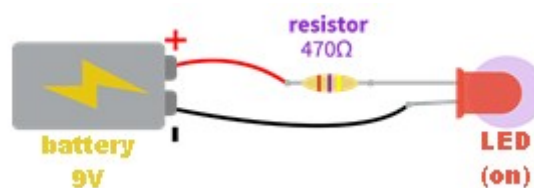
- A multimeter

For each group of students.

- 1 9V battery
- 1 breadboard
- 2 470 Ω resistors
- 1 red LED

Preparation:

- Draw the circuit with LED and resistor on the board (see below)



- Assemble kits with the necessary materials for each group of students

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Leading the activity:

- Show students a breadboard. Explain that it is a contact matrix with holes and conductive connections for the assembly of experimental electronic circuits. Explain that the columns on each side of the breadboard are connected to each other. The outside lines too.
- Present the kit you have set up for each group of students.
- Divide the class into small groups of 4 to 5 students and deliver a kit to each group.

Step 1:

- Ask the groups to assemble the circuit with LED, resistor and battery on the breadboard.
- Share the result. Ask students who finished and were able to assemble able to help the other groups.

Step 2:

- Ask students to set up another circuit on the breadboard with two resistors in series and to draw the circuit on their notebooks.
- Have them measure the resistance, current and voltage between the outer ends of the resistors with a multimeter. Ask them to write down the results in their notebooks.
- Then tell the students to set up a circuit with the resistors in parallel and to draw the circuit on their notebooks.
- Have them measure the resistance, current and voltage between the outer ends of the resistors with a multimeter. Ask them to write down the results in their notebooks.

Discussion and reflection:

Call up some groups and ask them to present what they did during the activity, showing the drawings and measurements.

After completing the activity, create a collective discussion with the class about the activity. See some examples of possible questions.

- What is the function of a breadboard and why is it used?
- What happens to the electrons in a circuit with two resistors in series? What was the resistance measured in this circuit? Why does it happen?
- And what happens to electrons when the resistors are in parallel? What was the measured resistance? Why does it happen?

Credits:

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