ELECTRONICS: CONCEPTS AND BASIC COMPONENTS

THEME	Creating a simple LED circuit
FORMAT	Group (students work in small groups)
PREPARATION TIME	1 hour
ACTIVITY LENGHT	30-45 minutes
DIFFICULTY LEVEL	low

PEDAGOGICAL GOALS

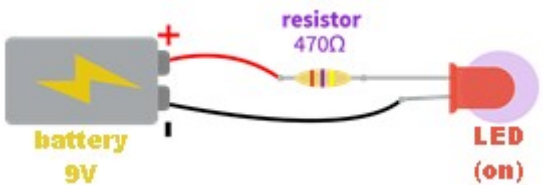
- To understand basic electronics concepts with the aid from the presentation of a simple electrical circuit.
- To practice the assembly of a simple circuit with battery, LED and resistor.

NECESSARY MATERIALS

- Internet access and a projector

For each students group:
- 1 9V battery
- 1 9V snap connector
- 3 female-female jumper wires
- 1 470Ω resistor
- 1 red LED

Preparation:
- Make sure you have access to the Internet and a projector in order to present the video.
- Draw the circuit explained in the video on the blackboard https://www.youtube.com/watch?v=RsbjpicvvP0 with a battery, two wires and a light bulb
- Draw the LED on the blackboard, mark the larger terminal with a positive + sign and the smaller terminal with a negative sign –
- 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:

- Present the video of lesson clicking in the following link: https://www.youtube.com/watch?v=RsbjpicvvP0
- If you don't have a projector or internet connection, don't worry
- Point to your drawn circuit design, with lamp, battery and two wires
- Open the discussion with your students so they can identify each part of the circuit. Here are some examples of possible questions:

• What are the different parts of this circuit?
• What happens if we build this circuit?
• Will it work if we invert the lamp terminals?

- Introduce the Kit you 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
- Ask the groups to assemble the circuit with LED, resistor, battery as drawn on the blackboard
- Share the result. Ask a few groups to present their circuit.
- Take the opportunity to discuss with students the problems that eventually appeared:
  - Did the LED remained off? Why? What if we invert the terminals?
  - Is the circuit correctly assembled and the LED is still off? What could have gone wrong? Is the battery discharged? Did the LED burn out?
  - When a problem occurs in the implementation of a practical exercise, it is the opportunity to exercise the identification of the problem. What are the parts of the circuit? Which part is not working? How can we test each part?
  - Help your students discover problems. Ask students to help each other.
  - Did any group try to assemble the circuit without the resistor? What happened? (the LED burned out)

Discussion and reflection:

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

• What is the difference between the lamp circuit and the LED circuit?
• Why does the LED have two terminals of different sizes?
• Why do we need to use a resistor in the LED circuit?
• Would the circuit work with a different color LED?

Credits:

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