PHYSICAL COMPUTING WITH ARDUINO

THEME	Creating robot dancers with motors
FORMAT	Groups or pairs
PREPARATION TIME	15 minutes
ACTIVITY LENGHT	1h30
DIFFICULTY LEVEL	Low-average

PEDAGOGICAL GOAL

This activity seeks to introduce students to servo motor control by creating a personal project. In this project, students will have the opportunity to work on a project defined according to their interests, and to express their creativity in creating an artistic and fun work.

This activity has as specific objectives:

• To offer opportunities for creative expression
• To understand the servo motor and analog input programming mechanism, based on personal projects

NECESSARY MATERIALS

For each students group:

- 1 computer
- 1 Arduino board
- 1 breadboard
- 1 or 2 servo motors
- LDR, potentiometer or other available sensor
- 1 1 KOhm resistor (for the sensor, if necessary)
- jumpers macho-macho

Collective materials for the class:
- Scrap material (aluminum foil tubes, packages, cardboad boxes, milk cart)
- Masking tape
- Wires
- Clothespin
- A projector or a television

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Preparation:

- Start by creating your own circuit for testing and presenting: assemble a circuit on the breadboard with 1 servo motor and 1 sensor of your choice, and a program that controls the motor from the sensor reading.
- Prepare material sets for each group and collect scrap materials.

Leading activity:

- Start by presenting your project to the class, in which the motor movement is controlled by the sensor.
- Present the code used, and the command used for motor control.
- Then, offer the materials to each group, who must create a dancing robot using a sensor and a motor. Inform the class that there is no right answer expected, and that they can define how they will control the engine, whether or not they use the sensor. Scrap materials can be used to create the structure of the project and to bring an artistic aspect to it.
- Inform students that every 15 minutes, everyone will stop what they are doing for 1 minute and you will put on a song. In these moments, it will be possible to watch the robots dancing. It is not necessary for students to complete their projects in 15 minutes - these are just moments of intermediate tests, in which students can contemplate the progress of their own projects and that of their colleagues.
- At the end of the activity, create a group exhibition, in which students circulate around the room to appreciate the projects created by the class.
- If Internet is available, students can consult the Code IoT platform materials for the development of the project.

Discussion and reflection:
- After completing the activity, ask each group to present the work created. At this point, groups can comment on things like:
    - What was the initial idea of the project? How has it changed over the course of its development?
    - How was the development process? What was more difficult? What was easy?
    - What did we learn in this project?
    - What would I do if there was more time?

Credits:
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