SCENARIO	
Title	**Arduino - RGB diode control**
Summery	Students will use the Arduino set to build a signaling model using RGB diode.
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Didactic objectives
General objectives: - learning the concept of RGB, color palette   - learning about the RGB LED   **Detailed objectives:**   - Arduino support with RGB diode   - programming in Scratch for Arduino

Physics☐   Mathematics☐   Information Technology☒   Robotics☒   Programming☐

Education Level: 10-12years☒   12-14years☐

Problem Statement
How do RGB LEDs work?   How to program a traffic light system with RGB diode?

BOM (Bill Of Materials needed)
- computer station for a group of students (3-4 people)   - multimedia board with a projector for presentation   - Internet access   - Arduino set   - Arduino IDE software

Activity description

The scenario is planned for 3 lessons.

Course of classes:
1. Organization in the classroom. Division of students into groups.
2. Introduction of the RGB color palette concept. Rules for mixing colors.
3. Connecting the RGB diode to the Arduino.
4. Entering the program and uploading it to Arduino.
5. Observation of the tile, color sequence.
6. Analysis of program components - what part of the code is responsible for a given color?

7. Task for students.
   a. How does the traffic light work? How long do the individual colors glow? Finding dependencies.
   b. Try a combination of individual colors (HIGH, LOW settings at the pins)
   c. Save the algorithm (eg green 20 seconds, yellow 4 seconds, red - 20 seconds).
   d. Saving the algorithm in the program.
   e. Checking the program execution.
8. Correction of irregularities and errors.
9. Summary of the classes. Analysis of new skills. Self-evaluation of students.

Resources

```
const int RED_CZERWONY=9;
const int GREEN_ZIELONY=10;
const int BLUE_NIEBIESKI=11;
void setup() {
  pinMode(RED_CZERWONY, OUTPUT);
  pinMode(GREEN_ZIELONY OUTPUT);
  pinMode(BLUE_NIEBIESKI OUTPUT);

  // put your setup code here, to run once:

}

void loop() {
  digitalWrite(RED_CZERWONY HIGH);
  digitalWrite(GREEN_ZIELONY LOW);
  digitalWrite(BLUE_NIEBISEKI LOW);
  delay(20000);

  digitalWrite(RED_CZERWONY HIGH);
  digitalWrite(GREEN_ZIELONY HIGH);
  digitalWrite(BLUE_NIEBISEKI LOW);
  delay(4000);

  digitalWrite(RED_CZERWONY HIGH);
  digitalWrite(GREEN_ZIELONY LOW);
  digitalWrite(BLUE_NIEBISEKI LOW);
  delay(20000);
  // put your main code here, to run repeatedly:

}
```

Students' Evaluation

Evaluation tools:

- observation of students' work and their activities,

- observation of the ability to work in a group,

- students' self-assessment - what I have learned, what I can, what I would like to know, what algorithm I can create,

- program feasibility.

Bibliography
https://www.arduino.cc/
http://forbot.pl/blog/artykuly/programowanie/kurs-arduino-w-robotyce-1-wstepid936
http://s4a.cat/
https://majsterkowo.pl/podlaczamy-diode-rgb-ze-wspolna-anoda-arduino/

Scalability
Older students can perform tasks on their own and build their own color sequences.
Junior students should initially work in the Scratch environment and build their first color algorithms there.

More information
Scenario was created as part of the project "InnoExperiment - Innovative Approach to Teaching through Experiment" carried out under Key Action 2. Erasmus +. The scenario will be made available on the project platform.