



Re-Evaluating Digital Technology to Enhance Learning

Lesson Plan

Lesson Title: TRAFFIC LIGHTS WITH PUSH BUTTON FOR PEDESTRIAN CROSSING

Lesson Duration: 2 HOURS

Level: Vocational School – Technology – Domotic Systems

Student Age Range: 15-18

Learning Style(s) of Students:

This lesson is intended for students with any learning style, but it is specifically adapted for visual learners and social learners.

Additional Student Information:

The students who develop this workshop must have acquired basic concepts about robotics (handling of the Arduino IDE, programming control structures, inputs, outputs and control process). This lesson is given under the paradigm of learning based on projects.

Digital Technology Hardware Required:

ARDUINO UNO CARD	
SIMPLE SCREEN PROJECTOR	

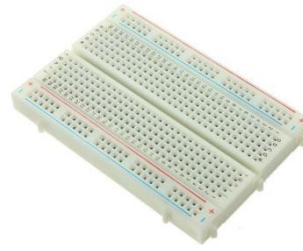
Digital Technology Software Required:

ARDUINO IDE 1.8.10	
Additional Software:	Powerpoint, Moodle, and video processing software

Other Equipment Required:

RED LEDS (2 UNITS)	
GREEN LEDS (2 UNITS)	
YELLOW LEDS (1 UNIT)	
RESISTORS 220 Ω (5 UNITS)	
RESISTORS 4,7 K Ω (1 UNIT)	
NORMALLY OPEN PUSH BUTTON (1 UNIT)	

PROTOBOARD BREADBOARD



Lesson Plan:

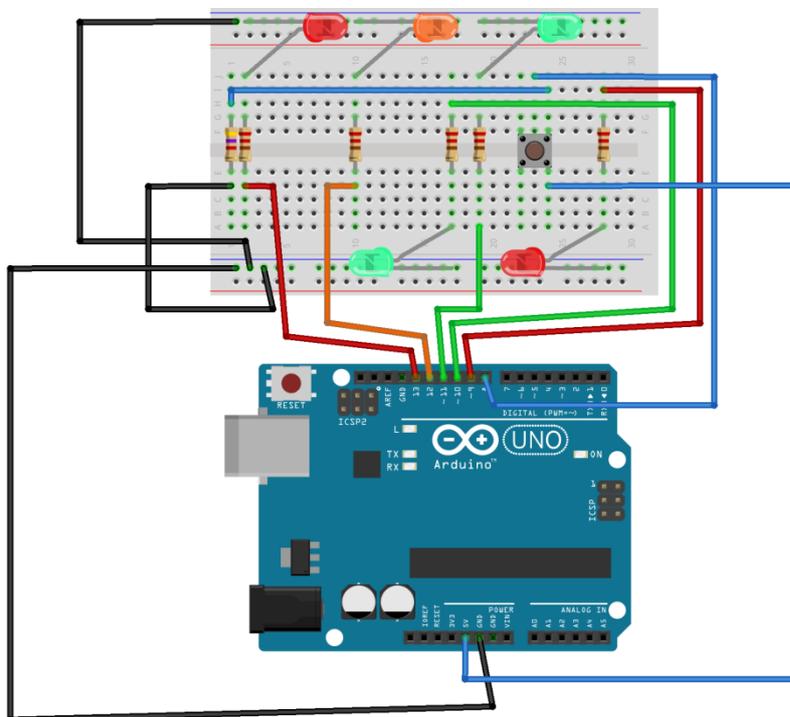
The objective of the lesson is to carry out a project of a simulation of a real semaphore (traffic light controller) using open source hardware and software based on Arduino. All the necessary material is provided to the students.

Time to complete the workshop (2hours)

[Preparation]: Before the workshop begins, the teacher must have prepared all the documentation for the workshop in the moodle platform and set an **assignment** link for students to upload their work at the end of the lesson.

The lesson plan works according to the following time line

[10 minutes]: The students download the schematics and the requirements from the moodle platform and examine carefully the schematics. This schematics are published on the moodle platform of the school. A brief explanation is given by the teacher before the students start their work.



[15 minutes]: The students must check that the components are compatible with the circuit schematics (for example, resistances need to match the correct values for the project. This way we work the resistance colours code)

[30 minutes]: Students must find the required components and assemble the electronics.

[15 minutes]: Once the electrical diagram is assembled, a single traffic light is programmed. Students test the system and check that everything is working according to requirements.

[15 minutes]: Once the traffic light is working ok and successfully tested, students must program an interruption in the sequence of the traffic light so the pulsation of the pedestrian crossing starts the countdown sequence to turn the right lights on and off to simulate real traffic lights.

[30 minutes]: Students make a powerpoint presentation showing and explaining their work, stating their decisions and the challenges they had to overcome

[15 minutes]: Students produce a video to show how the circuit works. They upload their work to the moodle platform.

[After the lesson] The teacher downloads the assignments, evaluates them and gives them feedback through the moodle platform.