

PROJECT 2: Building a Traffic Light

Time Frame: 120 minutes

Lesson Objectives	Materials needed
<ul style="list-style-type: none"> ● Learn about Arduino hardware and software ● Learn about circuits ● Learn how to build a traffic light 	<ul style="list-style-type: none"> ● Arduino Uno board - 1 ● Breadboard - 1 ● Jumper wires - 11 ● Red LED - 1 ● Yellow LED - 1 ● Green LED - 1 ● 220Ω resistors - 3

Lesson Activity

10 min	Registration
15 min	Show two Arduino project videos: <ul style="list-style-type: none"> ● Ask students to share what they have observed
25 min	Introduction to Arduino hardware: <ul style="list-style-type: none"> ● Learn about the main features of the board; microcontroller chip, USB connector, power jack slot, digital and analog input pins, output pins and reset pin Introduction to Arduino software: <ul style="list-style-type: none"> ● Discuss IDE (Integrated Development Environment) and Sketch <ul style="list-style-type: none"> ○ Input Area - white area ○ Status Bar - blue area below the white one ○ Program Notification Area - black area below the blue one ● Describe the functions of the 5 icons above the Input area ● Ask students to connect the board to the laptops: <ul style="list-style-type: none"> ○ Ensure the Port connected to the Arduino is recognised [Tools bar // select 'Port' // select Arduino Uno (Each Arduino board has a unique reference)]
15 min	Introduction to circuits: <ul style="list-style-type: none"> ● Describe breadboard, LED, resistor, jumper wires https://www.youtube.com/watch?v=oiqNaSPTI7w
40 min	Activity 2.2: Traffic lights project http://www.makeuseof.com/tag/arduino-traffic-light-controller/ <ul style="list-style-type: none"> ● Ask students to connect Circuit 2.2 ● Ask students to input the code ● Describe how the code works ● Describe how the circuit works
15 min	Wrap up: <ul style="list-style-type: none"> ● Lessons Learnt and Q&A