A POSTERIORI

Play · Experience · Learn

Name:		Class:	

Scratch + Arduino

Before you start…

Make sure you have the **mLink** software installed. The icon should look like this…

You will also need the following hardware…

Item	Qty
Laptop	x1
USB Cable	x1
Arduino	x1
Jumper wires	A bunch
LED	x1 set
Resistors	x1 set
Breadboard	x1

As the lessons progress, you will be provided with more hardware, but this is enough to start.

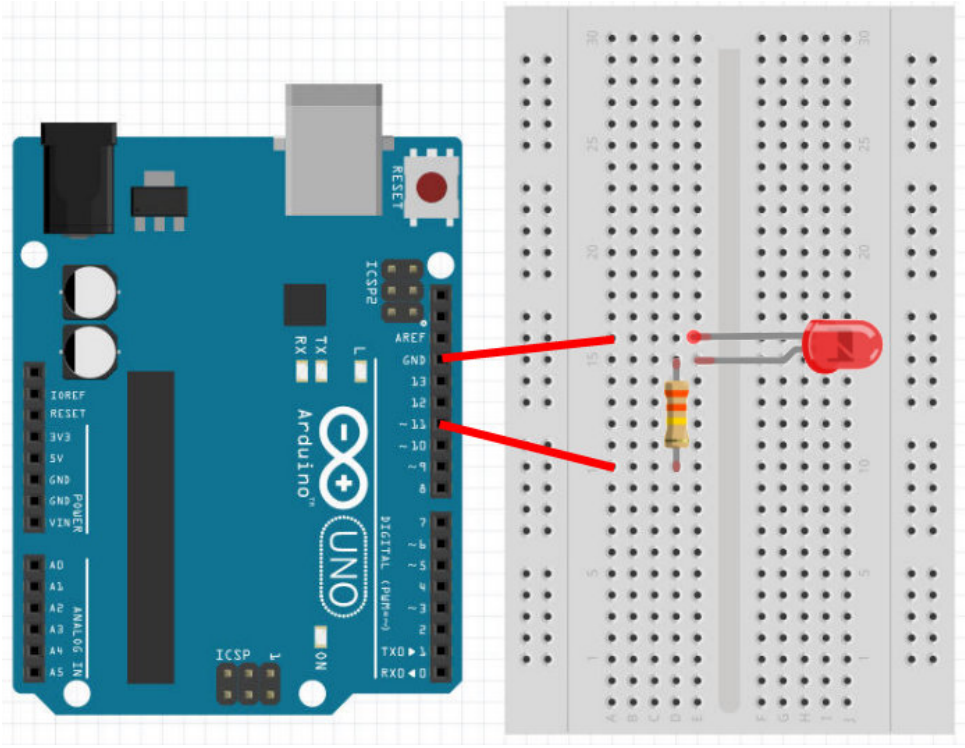
Getting the slides…

- **https://a9i.sg/huayi – look for Lesson 2 Slides**
- **Please use the PDF version**
  (your school laptops don't carry software that can properly show .ODP files)

Lesson 2 (PWM)

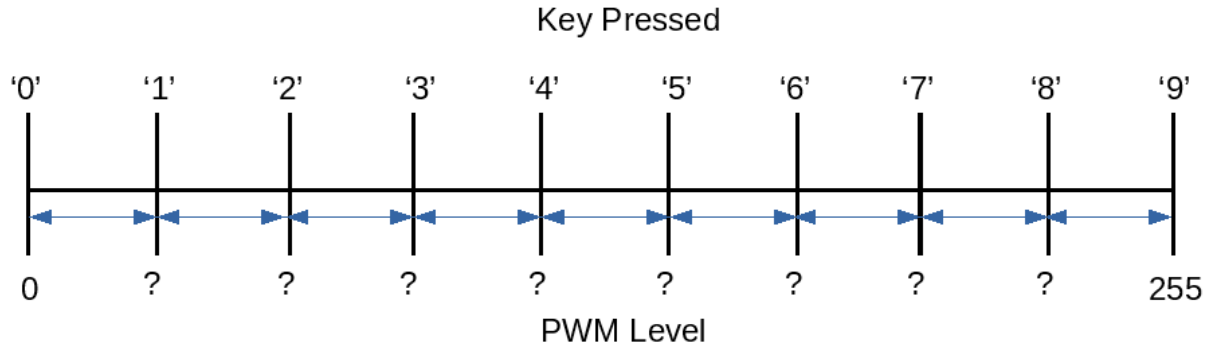
Exercise 2a (Control LED Brightness)

Review LED Circuit



LED
Connect short leg to ground (GND) and long leg to resistor.

Resistor
Use a 330 ohms resistor.
Connect one end to resistor and the other to Pin 11.



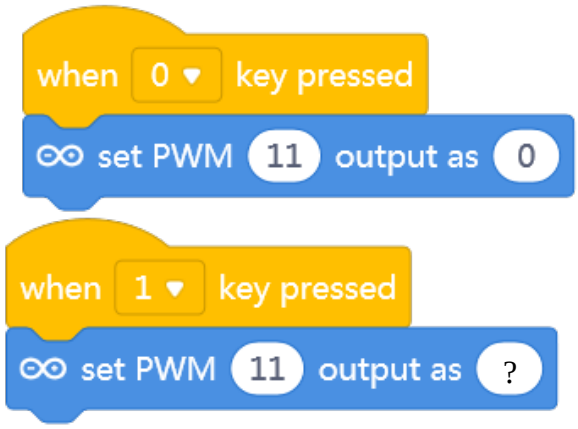
Fill in the correct levels

Key	PWM Level		Key	PWM Level
0	0		**5**	
1			**6**	
2			**7**	
3			**8**	
4			**9**	255

Try to come up with a general mathematical formula to calculate PWM Levels for N keys?

2a) Add code to control LED brightness levels using **all ten digit (0-9) keys**

You may be able to generalize the output as the above mathematical function...



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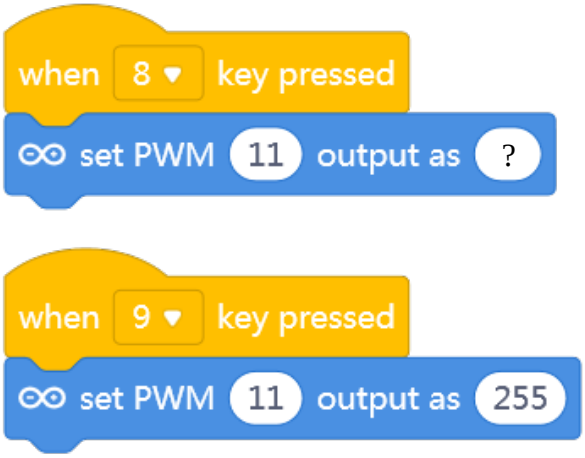
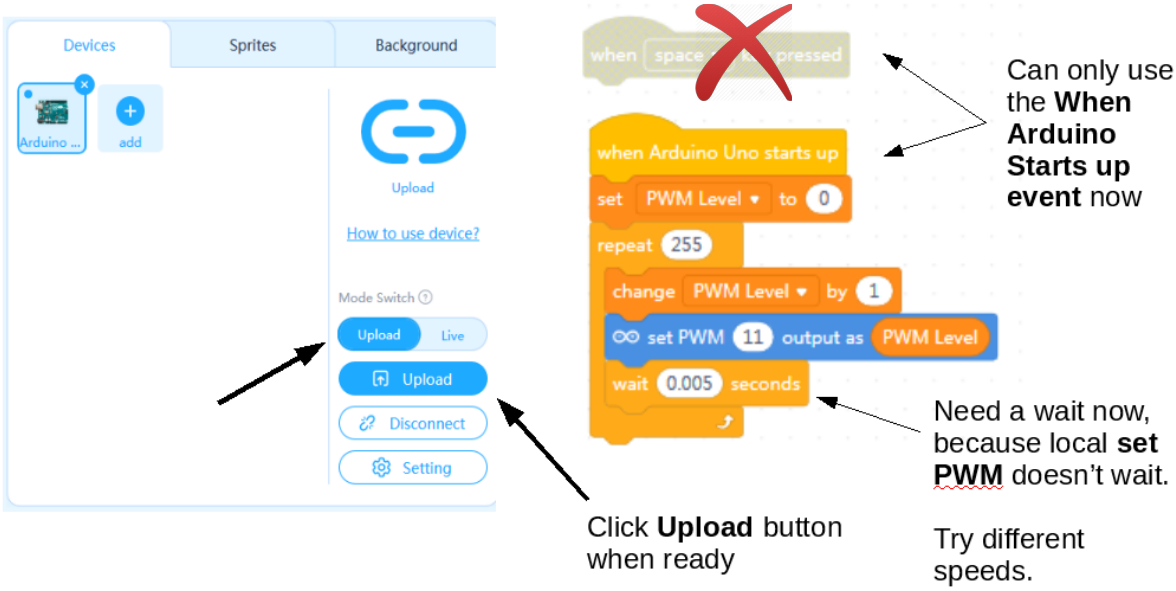


- For smoother effect, change to “Upload” mode



2b)

* What is the best wait time that gave you a smooth dimmer effect for the above Upload version of the Arduino code?

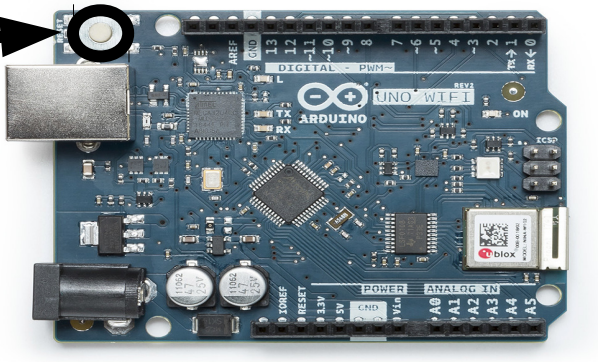
_____

* Extend the program above to make the dimmer effect go from low to high and back to low again.

* Extend the program to repeat this dim-up-down effect continuously for 10 times.

RESET

Click to restart the Arduino and the uploaded program.



Extra Challenges

* Convert your variable to a **Slider** and use it as a graphical **Variable** Dimmer Switch

* Create a Graphical **Dashboard** to control Lights
(on/off & blink buttons using sprites, slider dimmers using variables)

* Use a physical button to act as a **Toggle** Dimmer Switch (on/off)

* Use multiple LEDs to create a **Light Show** with blinking, dimming, and any other effects you can muster