Conceptual

You can use the Arduino microcontroller to vary the voltage of an output pin using pulse width modulation (PWM). If this signal drives the transistor base you can control larger current loads.

☐ Determine how pulse width modulation (PWM) allows you to vary the output speed of a motor or brightness of a LED (light).

☐ Draw the voltage as a function of time for a 25% PWM signal.

Basic Make

☐ (RE) Make this circuit – make sure to use an output pin that is labeled PWM

☐ Make a program to control the load (motor). Use *analogWrite()* to output a PWM signal (8-bit resolution).

Advanced/Extended Make

☐ Add a switch that the Arduino reads

o Count the number of presses and increase the speed from stopped to full   and turns on load when it is pressed.

☐ Explore power options

☐ Duplicate diagrams using Fritzing
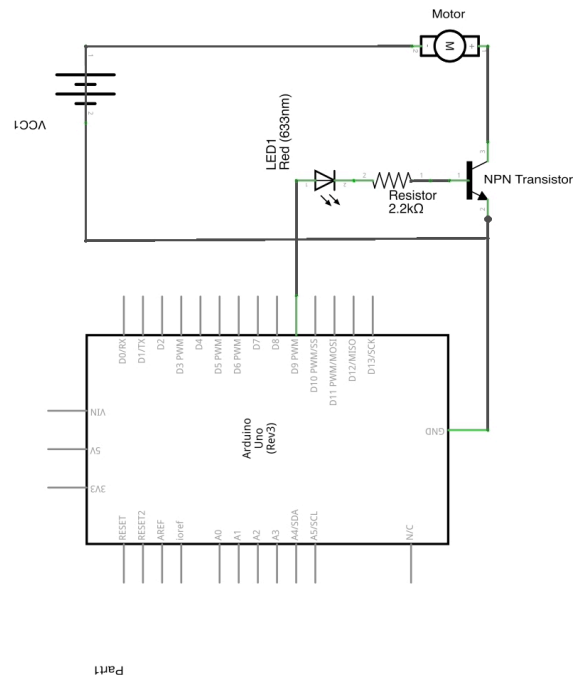
fritzing

Equipment

☐ Computer with access to Fritzing and Arduino

☐ Circuit components: Arduino and misc electronic parts

Objective

Physics Concepts

☐ Problem solving

☐ Logical thinking

Experimental analysis

☐ Circuit design

Technology Concepts

☐ Schematic Symbols

☐ Programming Syntax – analogWrite()