# Project

Robot demonstration. Print the plastic. Build next time. Buy parts and keep it, or build it for the library.

# Electricity: Current & Voltage

Electricity happens when electrons flow through wires and do work. Like water flowing in a pipe and turning a water wheel. **Voltage is like pressure**; too much pressure, the pipe bursts; too much voltage, we get a spark. **Current is amount of electricity over time**. How much water from your garden hose? A fire hose? Batteries are like a bottle of water. Light bulbs and microcontrollers are like water wheels. Can you guess what a resistor does? Resistors are like nozzles on a hose.

# Review

Pass around a breadboard. Show how to use Ardublock. Setup = once; Loop = over and over.

# LEDs

Single LED

* Resistor – limits current so the LED doesn’t burn up. (Try it without code.)
* Digital pin – 5V or 0V. What does that do to the LED? (LED\_Digital)
* Analog pin – 256 voltages from 05 to 5V. What does that do to the LED (LED\_Analog)
* How could I make the LED to glow slowly on, then slowly off? (LED\_Analog\_Both\_Ways)

RGB LED

* Three LEDs in one! (Try it without code.)
* We can use this to make many colors! Try it. (LED\_RGB\_Simple)
* Can you fade one color off and another color on at the same time? Use “for”. (LED\_RGB\_Fade)
* BONUS: Can you make a whole rainbow appear? (LED\_RGB\_Rainbow)

# Serial Port

* Print…we can make the microcontroller talk to us. (Serial\_Print)
* Echo…we can type to the microcontroller. (Serial\_Echo)
* Useful for finding problems…try it in LED samples.

# Homework – Can you make an LED blink & fade? Print plastic if you want to make a robot next time!