

## Skill Demo 7: Analog to Digital Converter

NAME \_\_\_\_\_ GTID \_\_\_\_\_

### Goals:

Understand what a 1-bit analog to digital converter is and how to make one.

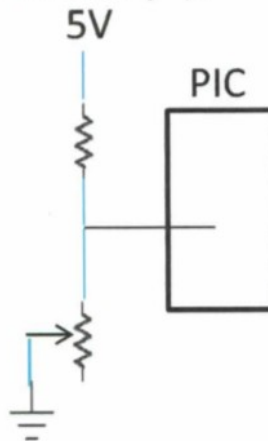
### Tools/supplies:

Teensy  
various resistors  
photoresistor  
potentiometer (optional – combinations resistors can be used as well, as long as you get to within 0.2V in demo 1 below)  
laptop  
breadboard  
USB cable

### Background:

All videos from Skill Demos 1-6  
Class lecture

1. Build a voltage divider (depicted below), using a potentiometer. Detect the voltage at which the PIC changes state from a stable 0 to a stable 1 and vice versa (the point may be different going up or down – the “zone of uncertainty”).

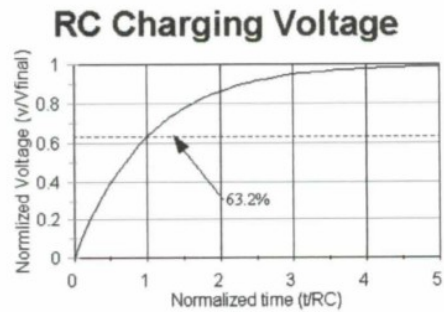
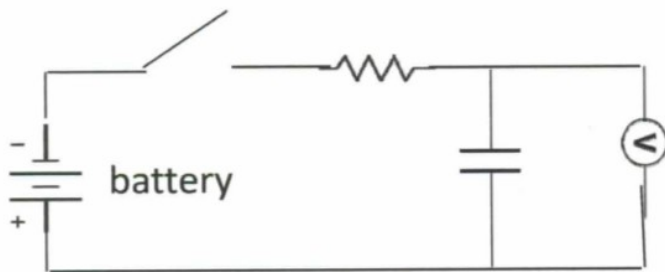


Initials \_\_\_\_\_

Date \_\_\_\_\_

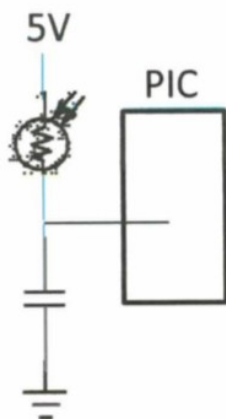
Time \_\_\_\_\_

2. Build an RC circuit (depicted below), such that the voltage reading on the voltmeter reaches full voltage 5 seconds after the switch is closed. Note the diagram of voltage versus time in an RC circuit.



Initials \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

3. Build an RC circuit (depicted below), which is able to distinguish three states of a light using a photoresistor (i.e., determine how long it takes for the pin to switch from a 0 to a 1 using the capacitor as a timer). This method is called a 1 bit Analog to Digital Converter.



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