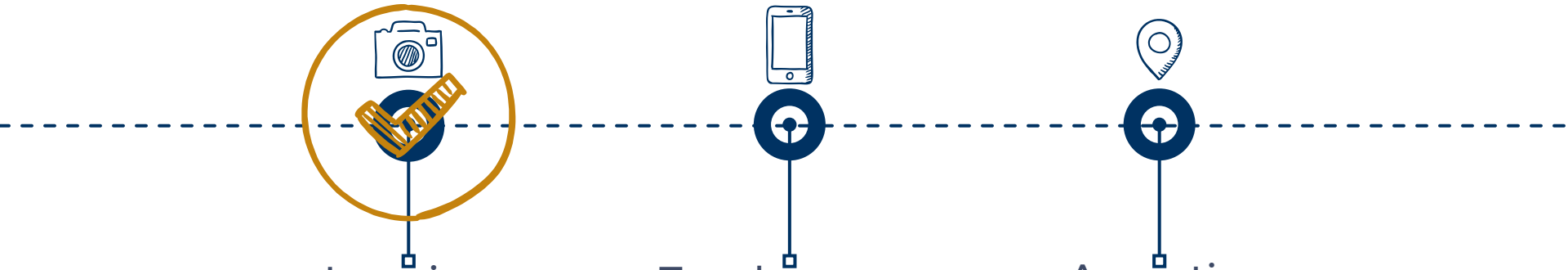
EECS 16A Touchscreen 1

Insert your names here

Semester Outline



Imaging Module

Touchscreen Module

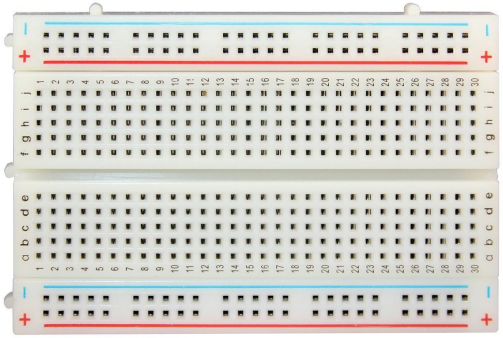
Acoustic Positioning Module

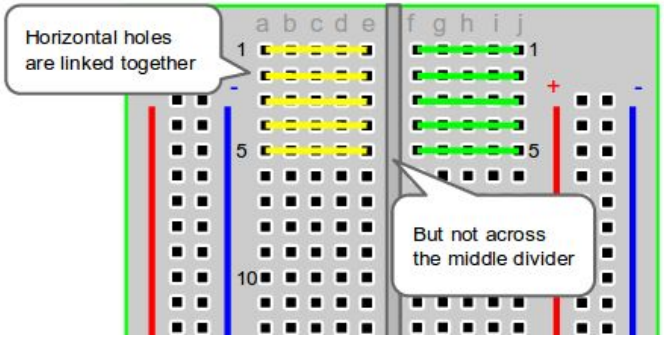
Today’s lab:

- Breadboarding
- Build multiple functional circuits
- Learn how to use Multimeter

Breadboarding basics

- Similar to Imaging 1: Intro to Breadboarding
- Build up breadboarding skills
  - Connect to concepts in lecture, including Voltage Dividers and KVL
- Very important skill: prototype, debug, and translate theoretical ideas into real circuits





Poll time!

Review of breadboarding practices from Imaging 1.

1. Which of the following are good breadboarding practices?
   a. Check the resistor value by its color bands
   b. Plug in component legs in different rows
   c. Use black and red wires for the rails

2. For which of the following components does polarity matter?

   Resistor LED Capacitor Ambient Light Sensor

Poll time!

Review of breadboarding practices from Imaging 1.

1. Which of the following are good breadboarding practices?
   a. Check the resistor value by its color bands
   b. Plug in component legs in different rows
   c. Use black and red wires for the rails

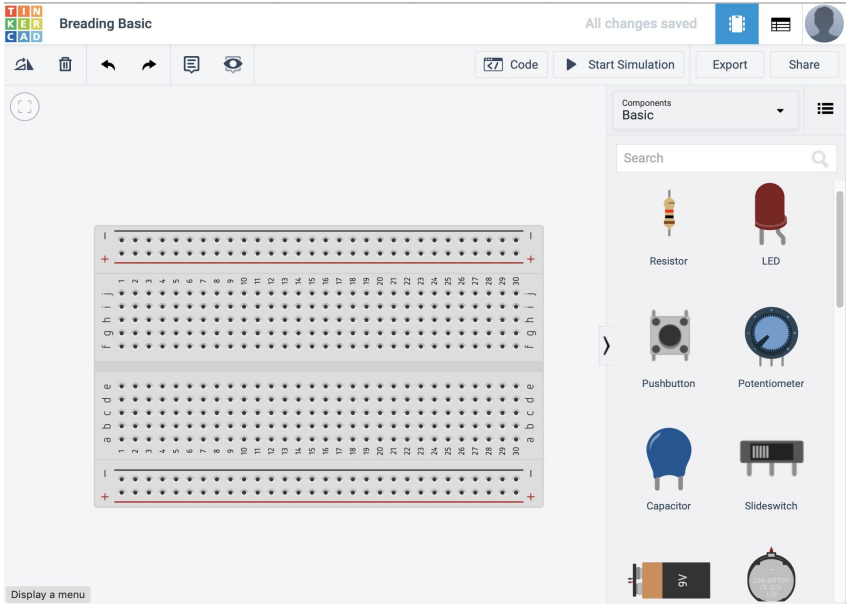
2. For which of the following components does polarity matter?

   Resistor LED Capacitor Ambient Light Sensor

TinkerCAD

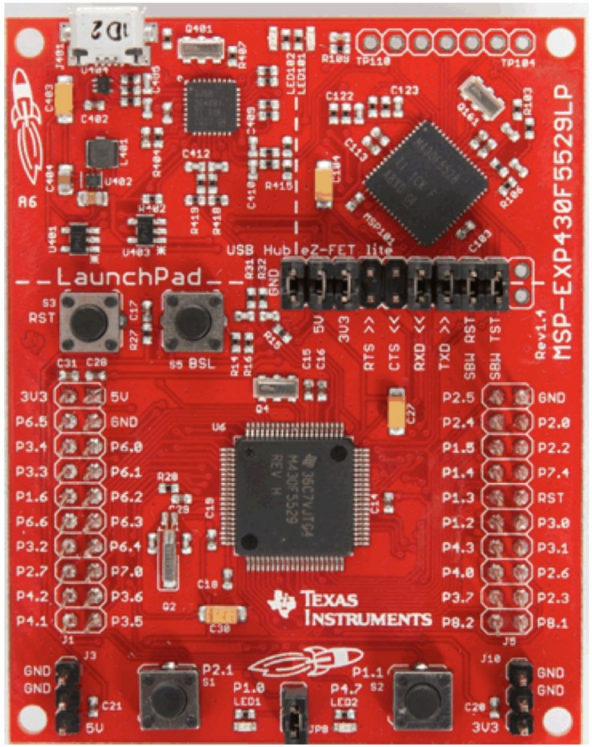
- Circuit design prototyping software
  - Primary circuit software in this course
  - Useful for many different electrical projects

- Run online using an Autodesk account



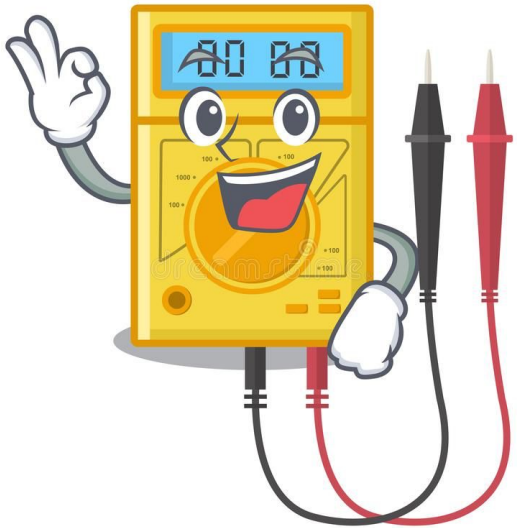
Launchpad Review

- Micro-Controller
- Power Supply
- Voltmeter



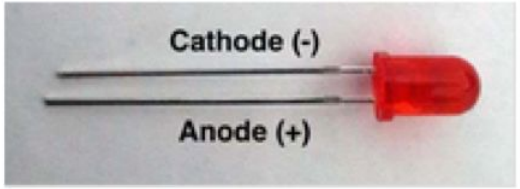
Multimeter (Circuit Debugger)

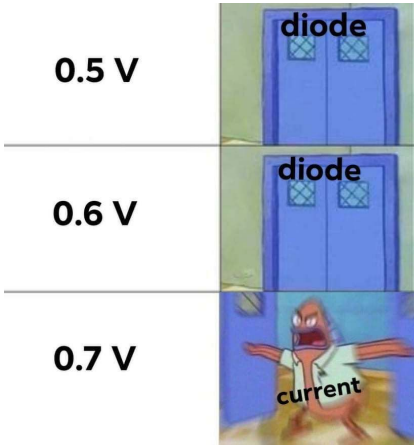
- Voltmeter
  - Infinite resistance
  - Connect in parallel with component
- Ammeter
  - Very low resistance
  - Act as a wire in the circuit
  - Connect in series with component
- Ohmmeter
  - Remove resistor from circuit before use
  - Connect in parallel with resistor



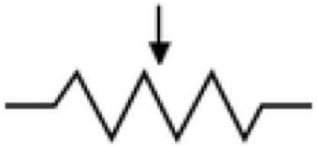
Circuit Elements

LED

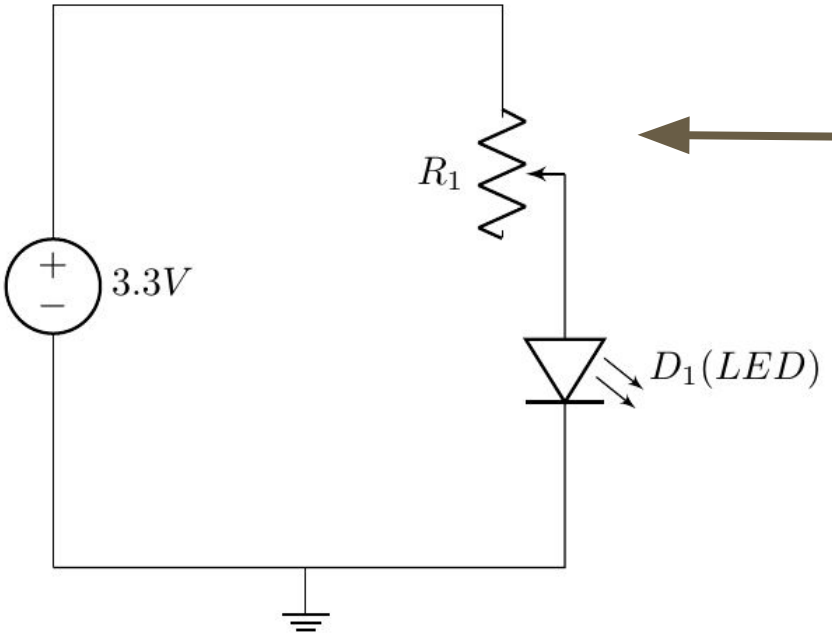




Potentiometer



LED Fader Circuit



Voltage Divider Circuit

What is the voltage value u_2 at Node 2?

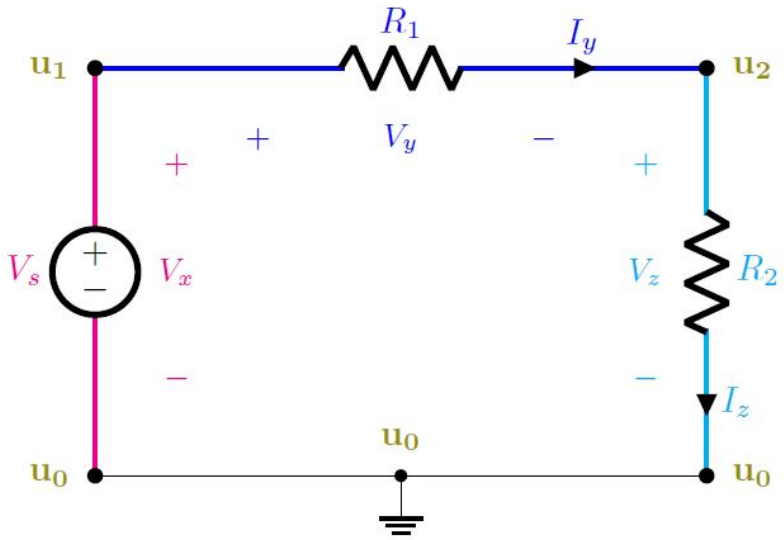
$I_y = I_z = V_s/(R_1 + R_2)$ (Ohm's Law)

$u_2 - u_0 = R_2 * I_z$

$u_2 - 0 = R_2 * V_s/(R_1 + R_2)$

$u_2 = V_s * R_2/(R_1 + R_2)$

What is the voltage value u_2 if R_1 equals to R_2 ?



Pointers

- Try to debug your circuit by yourself before you ask the TAs
  - However, don’t spend too long, after 5 minutes or so queue for help

- Task 3c: Launchpad acts as single point voltmeter