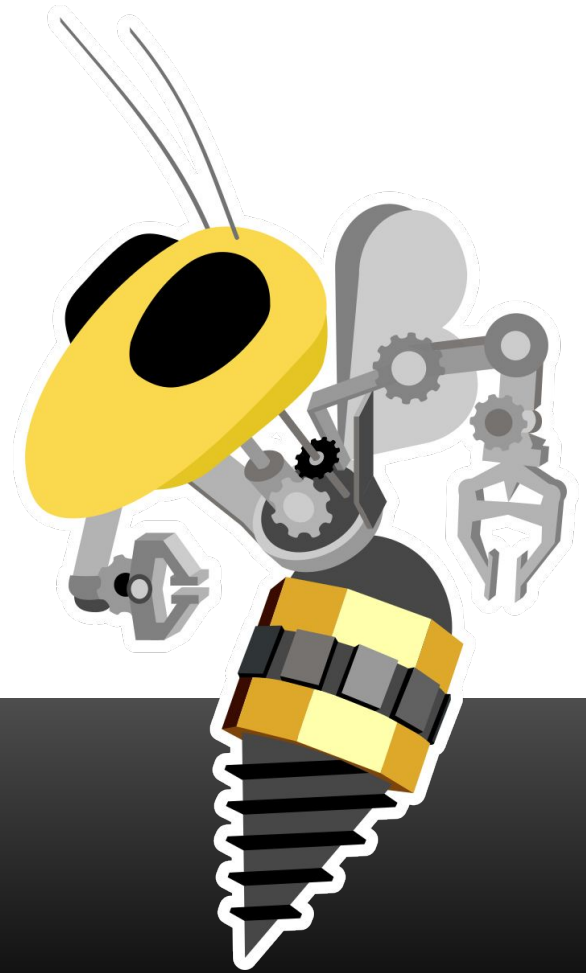


# Welcome

Electrical Training Week 1

**ROBOJACKETS**  
COMPETITIVE ROBOTICS AT GEORGIA TECH

[www.robojackets.org](http://www.robojackets.org)



# Last Week!

- Introductions
- What is RoboJackets Electrical?
- Logistics

# This Week!

- Electricity Basics
- Prototyping + Lab



# Electricity Basics

Overview of Reference Guide + Applications

# Ohm's Law

- $I = V/R$
- Current ( $I$ ): net flow of charged particles, Amperes(A)
- Voltage ( $V$ ): electric field potential difference, Volts(V)
- Resistance ( $R$ ): difficulty for current to pass through, Ohms( $\Omega$ )

# Measuring

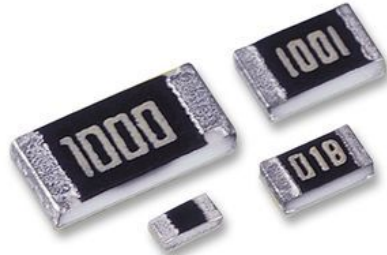
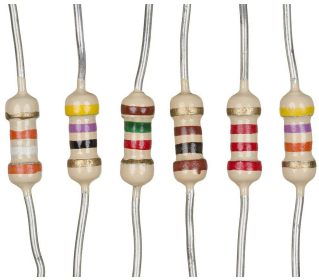
## Multimeter Basics



# Electrical Components

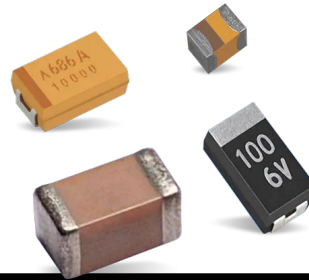
## Resistors

- Reduce current flow, divide voltage



## Capacitors

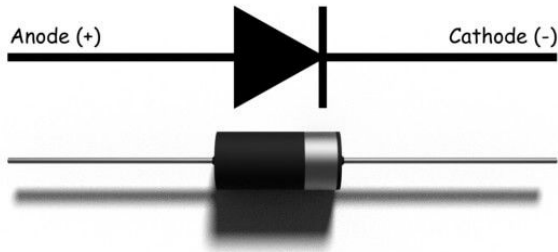
- Stores energy, smooths voltage levels



# Electrical Components

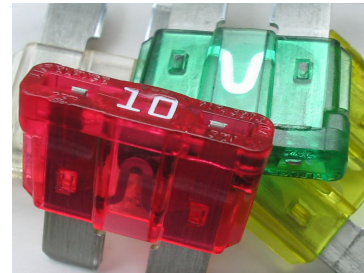
## Diodes

- Conducts current primarily in one direction



## Fuses

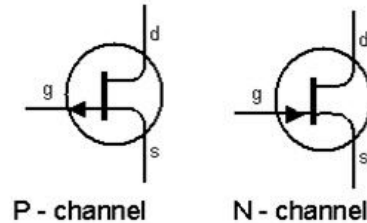
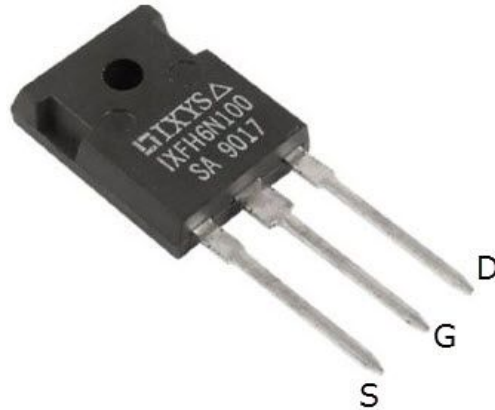
- Prevents over current





# Electrical Components: Transistors

- Can act as electronic switches
- Can amplify electrical signals

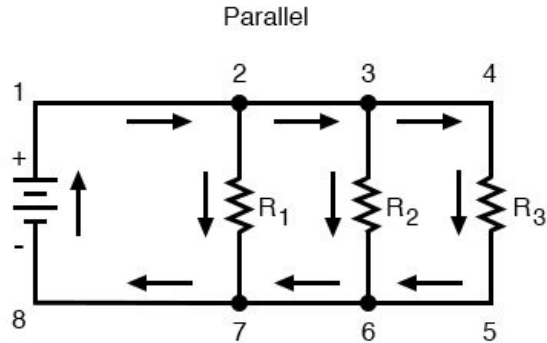


D=Drain  
S=Source  
G=Gate

# Circuits

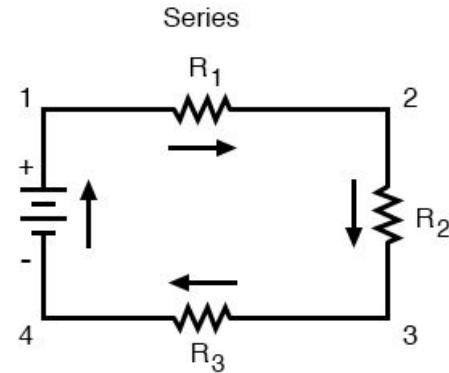
## Parallel

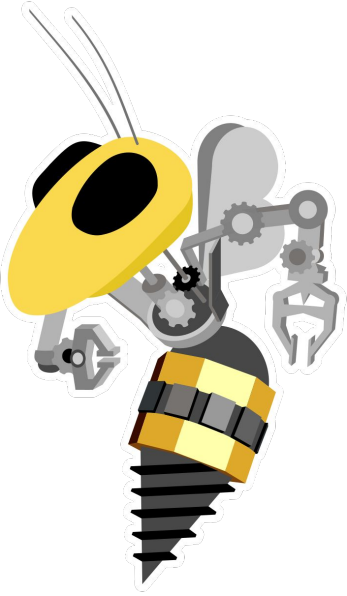
- Constant voltage



## Series

- Constant current



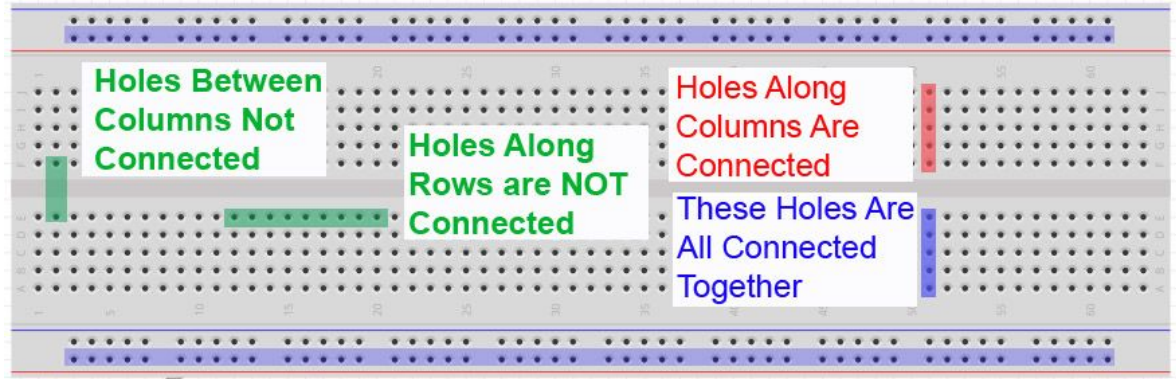


# Prototyping

Breadboard + Arduino Uno

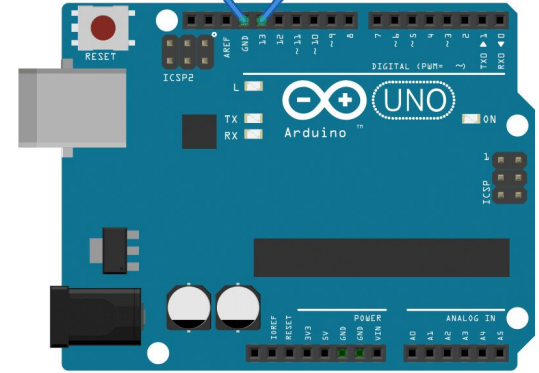
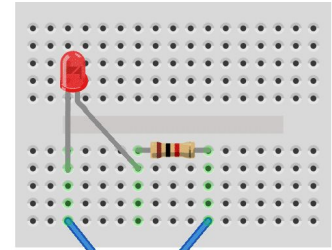
# Breadboards

*A way to  
prototype basic  
circuit designs*

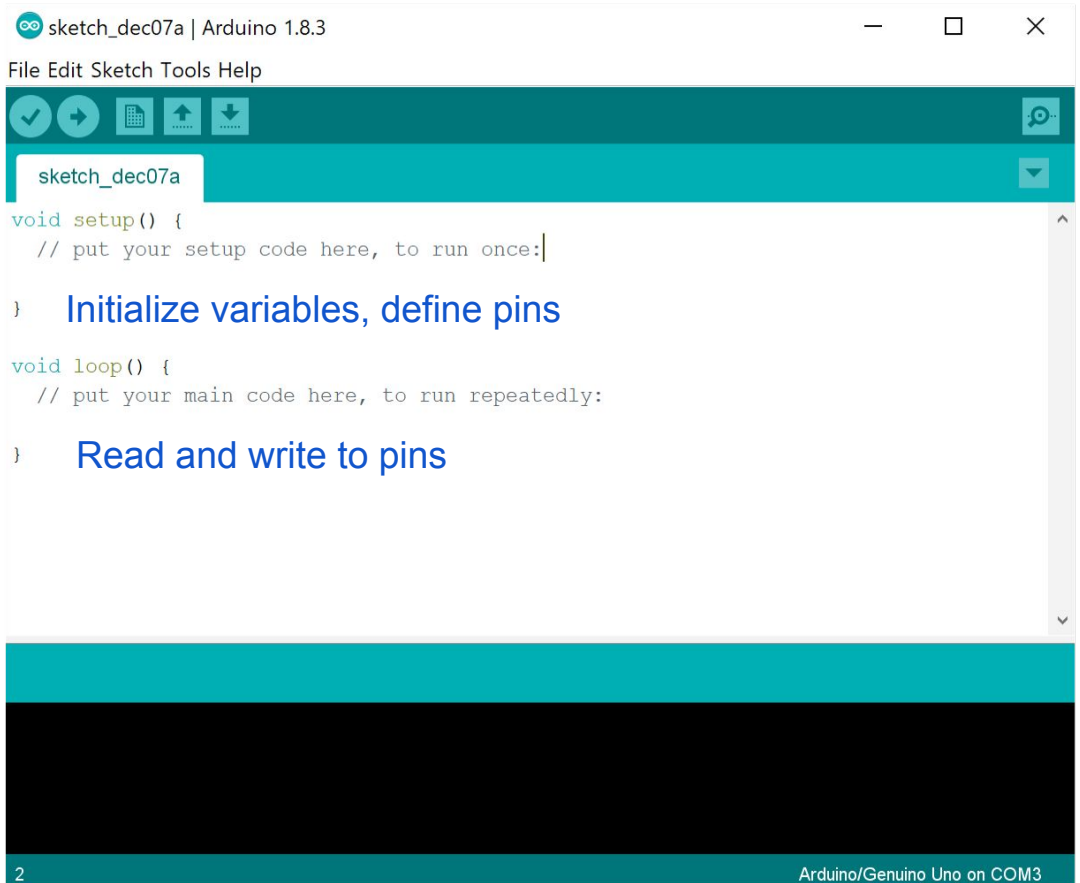


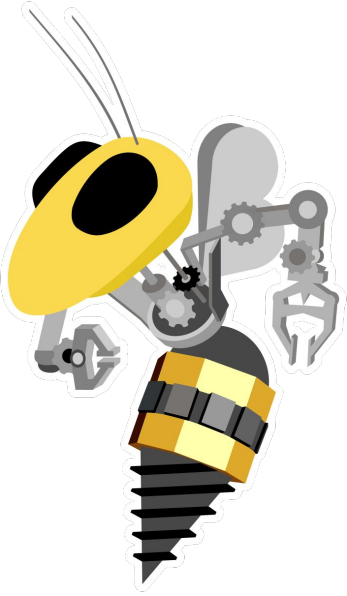
# Arduino Uno

*Microcontroller  
with I/O ports to  
control  
electronics*



# Arduino IDE





# Lab

Blinking LEDs + Fun

# Lab Setup

- Install Arduino IDE
- Configure: Tools>Board>Arduino/Genuino Uno
- Plug in Arduino
- Choose Port: Tools>Port
- Follow the [Lab 1 Guide](#)