<Dead Robots image>

Welcome

<Goals image>

Have fun!

No grades, no competing with other students.

It is all about Teamwork

If you’re not cheating, you’re not trying!

Ask for help!

<Etiquette image>

We will start on time

You don’t have to have your video on

Y’all are probably more skilled at Zoom than I am

[How to handle questions]

Ok, open your kits and build this:

<Soldering diagram>

<Just kidding! Image>

Bui seriously, you will build this before the end of the course

Just not right now

<image of conductor>

What is a conductor? <answer via chat>

What is the opposite of a conductor? <answer via chat>

What make something conductive? <answer via chat>

<Table of atomic elements>

Conductors: typically copper

What else might conduct? <chat>

Key: Need to have free electrons

<atom>

Atoms are REALLY small.

Easy to think of them like Sun & Planets

Of course you would be wrong!

That’s ok, it is still a good analogy

<atom diagram>

Nucleus is the sun, electrons are like the planets

Nucleus has parts: Neutrons & protons

These parts have ‘charge’

Think of charge as ‘attraction’

The earth is attracted to the Sun by gravity

Electrons and the nucleus are held together by electromagnetic force

Same concept, just a different force

<electron charge>

Protons are positive, neutrons are neutral (no charge) and electrons are negative

Opposites attract, negatives repel

Atoms typically have the same number of electrons as protons

But, you can move electrons from one atom to another.

This creates ions (positive – missing electrons & negative – too many electrons)

<static hair>

Electrons hate each other

<static spark>

Shuffle feet across rug, touch door knob

What is happening <chat>

Creating ions

<lightening>

Same thing only bigger!

Clouds (air) moving over the earth

<lyden jar>

Using this concept, Faraday moved wool over metal

Tried to capture the ions in a Lyden Jar.

How do we get electricity today? <chat>

<battery>

Chemical process that separates electrons from protons

Each chemistry creates a different voltage

What types of batteries <Chat>

<voltage or water tower>

Each battery has a different voltage

Voltage is like pressure

Resistance is like hose size

Current is how fast the water is flowing

Electrons are like water molecules

<DVOM>

We can measure these things with DVOM

Find it in your kit and a 9V battery

Now find AA battery. What is voltage?

Try to measure two AA batteries

Now use battery holder

<motor>

Connect motor to single AA

Double AA

9V

What is difference? <chat>

<basic circuit>

Created a circuit for electrons to flow, bottom of battery to top

Why bottom to top? Electrons are neg and hate other electrons

<short circuit>

Battery short, feel the heat

Throw away battery, probably destroyed it

<resistor & Omege>

Resistors limit current

Measured in Ohms or Omega

Measure using DVOM and alligator clips

<Populated Board>

Building & measuring is easier with board

<board with connections shown>

Top & bottom are plus & minus

No connection over gully (ICs)

<resistor in board>

Find resistor in kit

Mount on board

Measure the resistance

<circuit with resistor>