Define and relate to the waterfall and grocery store analogy:

Voltage:

Current:

Resistance:

Give equations for:

Ohms law:

Coulomb’s law:

Electric power:

**SERIES AND PARALLEL**

**A series** circuit has certain characteristics and basic rules:

Battery

A

B

C

1. [The same current flows through each part of a series circuit.  It=I1=I2=I3](https://www.swtc.edu/ag_power/electrical/lecture/series_circuits.htm#1)
2. [The total resistance of a series circuit is equal to the sum of individual resistances.](https://www.swtc.edu/ag_power/electrical/lecture/series_circuits.htm#2) Rt=R1+R2+R3…
3. [Voltage applied to a series circuit is equal to the sum of the individual voltage drops.](https://www.swtc.edu/ag_power/electrical/lecture/series_circuits.htm#3) [The voltage drop across a resistor in a series circuit is directly proportional to the size of the resistor.](https://www.swtc.edu/ag_power/electrical/lecture/series_circuits.htm#4)  Bigger resistor = bigger voltage drop

Vt=V1+V2+V3…

1. [If the circuit is broken at any point, no current will flow.](https://www.swtc.edu/ag_power/electrical/lecture/series_circuits.htm#5)

Mable dies, what happens?

battery

A

B

C

A Parallel circuit has certain characteristics and basic rules:

1. [A parallel circuit has two or more paths for current to flow through.](https://www.swtc.edu/ag_power/electrical/lecture/parallel_circuits.htm#1)
2. [Voltage is the same across each component of the parallel circuit.](https://www.swtc.edu/ag_power/electrical/lecture/parallel_circuits.htm#2)

Vt=V1=V2=V3…

1. [The sum of the currents through each path is equal to the total current that flows from the source.](https://www.swtc.edu/ag_power/electrical/lecture/parallel_circuits.htm#3)

It= I1+I2+I3….

1. [You can find total resistance in a Parallel circuit with the following formula:](https://www.swtc.edu/ag_power/electrical/lecture/parallel_circuits.htm#4)  
   1/Rt = 1/R1 + 1/R2 + 1/R3 +...  
   Rt = R (t)otal
2. [If one of the parallel paths is broken, current will continue to flow in all the other paths.](https://www.swtc.edu/ag_power/electrical/lecture/parallel_circuits.htm#5)

Battery

A

B

C

*For questions 1 – 3 consider this circuit*

1. How many pathways are there for electricity to flow through?
2. Is this a series or parallel circuit?
3. If light bulb A was removed would light bulb B still work? Light bulb C?
4. What would happen to the other to the brightness of the other bulbs if more bulbs were added?

*For questions 4 through 7 consider this circuit*

battery

A

B

C

1. How many pathways are there for electricity to flow through?
2. Is this a series or parallel circuit?
3. If a light bulb A was removed would light bulb B still work? Light bulb C?
4. What would happen to the other to the brightness of the other bulbs if more bulbs were added?
5. What would happen to the brightness of the other bulbs if one of the bulbs burned out?
6. Circuit breakers, how are they wired, why?
7. Thick vs thin wires
8. What happens to force between two charged objects when distance of separation is…doubled, half, 4X
9. What happens to force between two charged objects when magnitude of both charges are doubled, if one charge is doubled?

Thick vs thin wires

Bright vs dim bulbs what causes this?

Circuit breakers, how are they wired, why?

What happens to brightness when bulbs are added or removed?