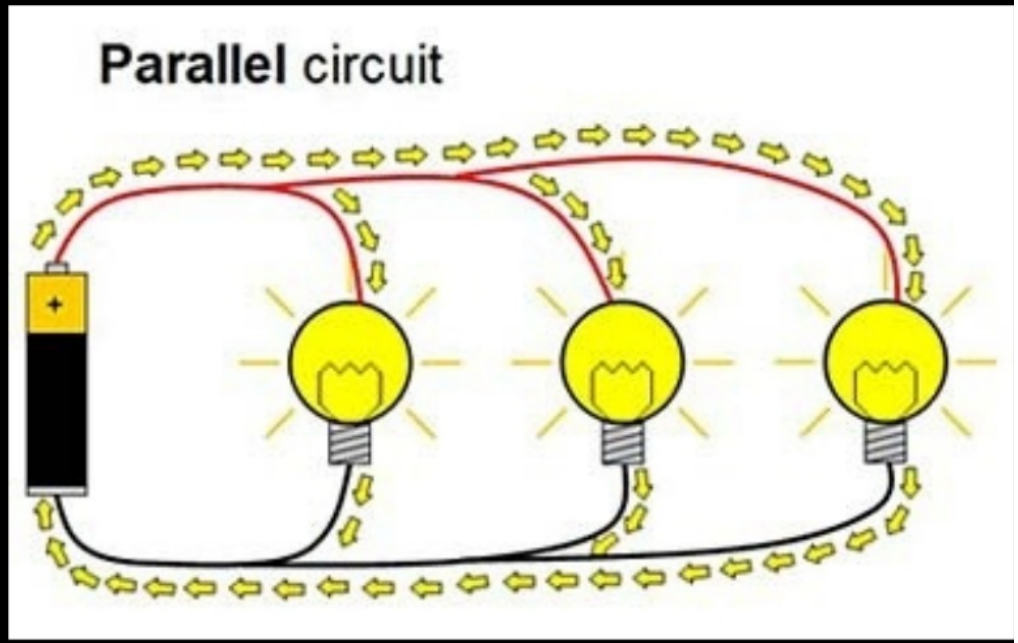
2.13.20

Electricity:Parallel Circuits

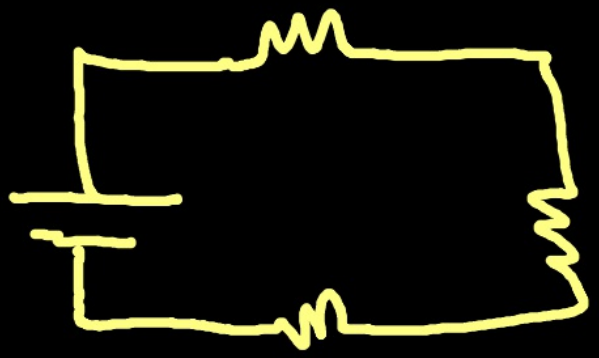
Today's Objectives:

- How is a parallel circuit different than series?
- Parallel facts
- Where can you find them
- Parallel circuit math



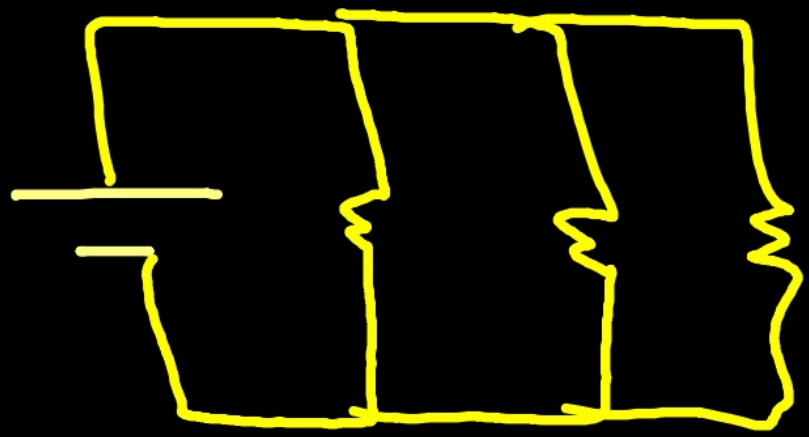
1 battery, 3 bulbs....

Series



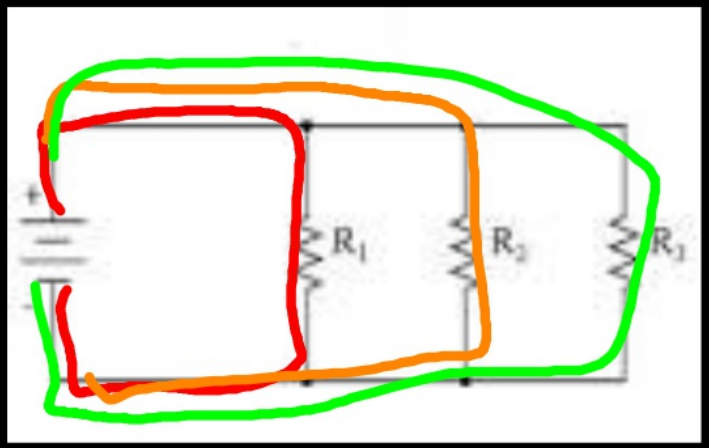
"One big loop"

Parallel



"3 parallel lines"

Parallel Facts



Multiple paths for electricity to take. (this one has 3)

When you unplug 1 bulb, the others stay on.

* Voltage is the same everywhere in the circuit.

Total Resistance (Parallel)

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

R_1 = 10 ohms

R_2 = 15 ohms

R_3 = 20 ohms

$$\frac{1}{R_T} = \frac{1}{10} + \frac{1}{15} + \frac{1}{20}$$

$$\frac{1}{R_T} = 0.2167$$

Series (all)

10 + 15 + 20 =

45 Ω

inverse

x^{-1}

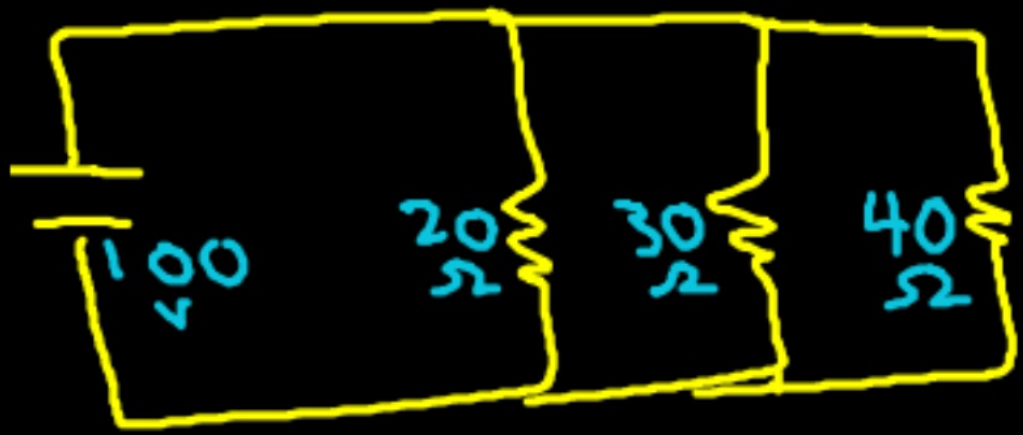
$1/x$

$$R_T = 4.615\ \Omega$$

Parallel Circuit Problem

$$I = V / R$$

$$V = IR$$



$$\left(\frac{1}{20} + \frac{1}{30} + \frac{1}{40}\right)^{-1}$$

	*V	I	R
R1	100	5.00	20
R2	100	3.33	30
R3	100	2.50	40
Total	100	10.83	9.23

Stays The Same:

Amps- Series

Volts Parallel

Parallel Circuit Lab

Purpose: To measure the effect of adding bulbs in parallel on current.

Predictions:

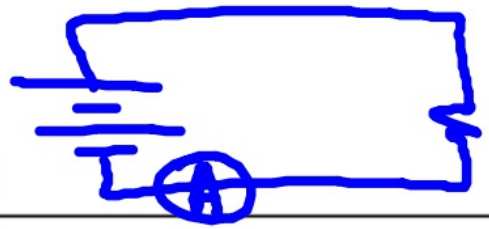
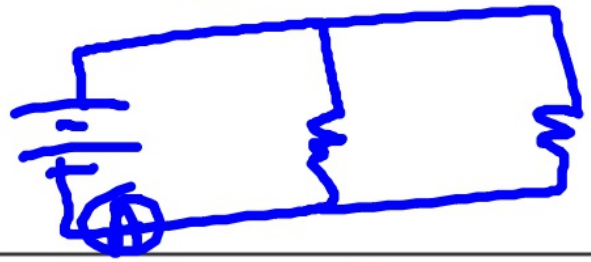
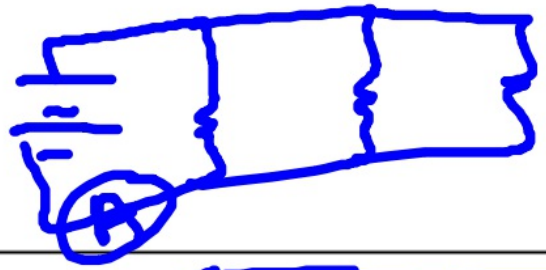
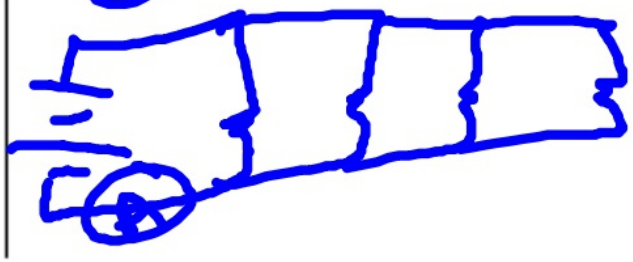
1) When you keep adding bulbs in parallel, what happens to the bulb brightness?

   A) get dimmer B) get brighter C) stay the same

2. What happens to the current in the circuit?

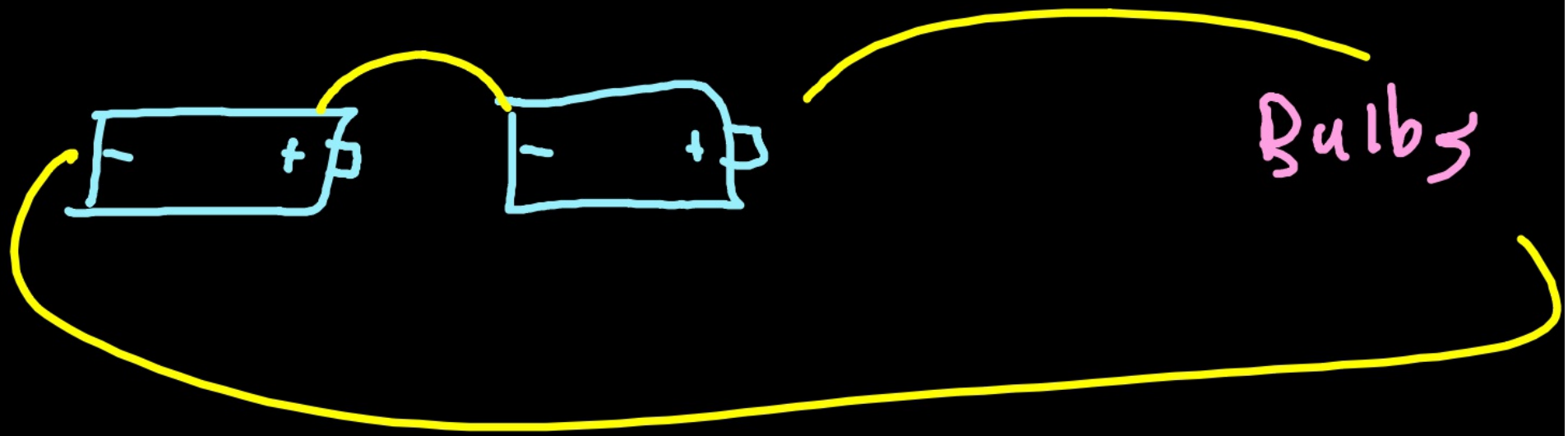
   A) increases B) decreases C) stays the same

Parallel Circuit Lab - Data and Calculations

	Draw The Circuit Diagram	Measured Current (amps)	Calculated Resistance (ohms)
2 battery, 1 bulb (Simple Circuit)			
2 batteries, 2 bulbs in parallel			
2 batteries, 3 bulbs in parallel			
2 batteries, 4 bulbs in parallel			

Circuit Building Lab

- 2 batteries (2 holders, 4 clips)
- 3 bulbs & holders
- bunch of wires



1. Series 3 bulbs
   A) build the circuit in real life
   B) draw the circuit diagram in your lab book

2. Parallel
   A) build the circuit (get a check first)
   B) draw it in your lab book