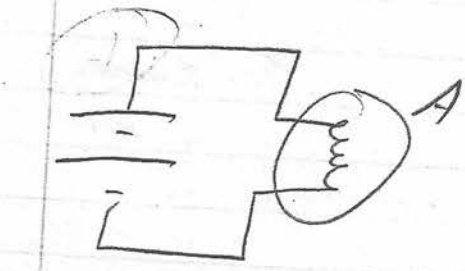
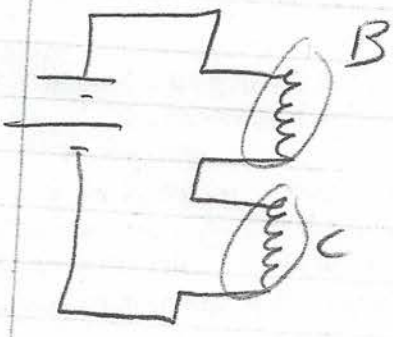
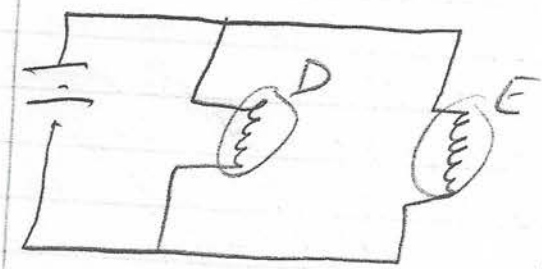
10/25/11

- Water Analogies!
- Light bulbs!
- Resistance!
- Bulb brightnesses in series/parallel







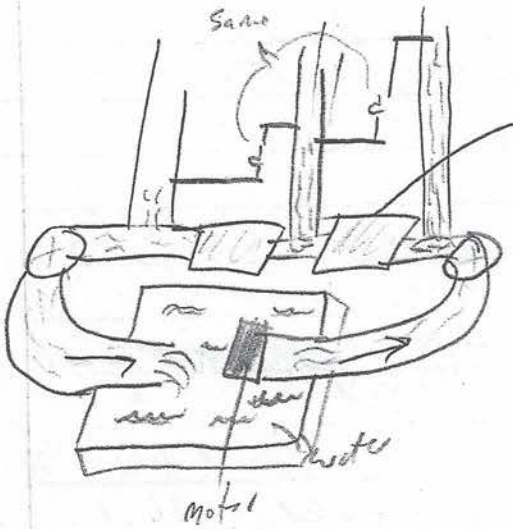
We originally guessed, based only on our intuition that A: D=E>B=C because the voltage vs the same for A D+E but half for B+C. But then we started... thinking. And we got to thinking that the current flow through B+C would be the same as A, therefore the same brightness, + D+E would have less current flow + less brightness.

Our first guess was right. Not only did D+E have the same voltage drop, but the same I. B+C had less voltage drop across each + less I.

What we did not expect was the resistance of the bulbs to change when in series.

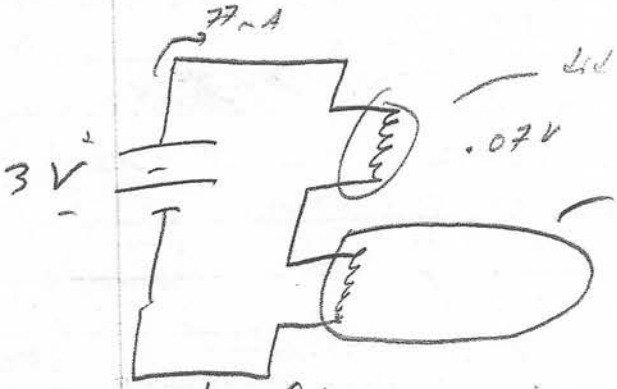
Q: Why do the bulbs resistances change?

Water analogies!



Even though there are 2 different spots of resistance, the water entering must equal the water leaving. The tubes represent voltmeters. Even though there's more water in the first 2 tubes, the difference is the same

Q: should the last tube have no water?

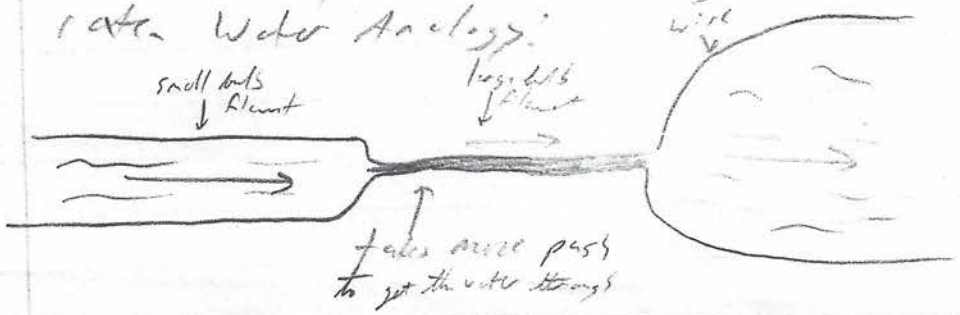


did not light

hogged all the potential

And here's why!

The filament of the small bulb is much thicker than the long bulb, causing much less resistance than the long bulb. Since the current is the same for both, the larger bulb takes more potential to move the same amount of electrons through it at the same rate. Water Analogy:



Q: If we added more source potential, would we get the small bulb to light?

In class observations

If wires don't have negligible resistance, then the wires will heat up and potentially start a fire. Using bulbs that have larger resistances make the resistance of the wires to become more negligible.

Q: Why do the same bulbs in a series have less resistance than the same bulbs in parallel circuits?

Potential drop across each bulb in a series is the same. The more bulbs you add, the less the drop in potential. The more bulbs that you add to a series circuit, each bulb will have less resistance. When the resistance of the bulbs is much less than the resistance of the wire, the parallel circuit is "abnormal." The distance of the bulb from the battery makes a difference on its brightness because of the resistance of the wire. The wire, since it has the most resistance, will heat up.

Current is like water moving through a pipe. The water entering must equal the water leaving. Through the first pipe sponge is more water entering it than entering the second sponge, but there is also more water leaving the first sponge than the second sponge. What matters is the difference between water entering and leaving, the drop of potential. The difference between water entering a leaving each sponge is the same.