

Electricity 1 - Circuits Activity

In this activity you will measure the current and voltage of various arrangements of lamps.

Materials

- 3 Lamps
- 1 Multimeter
- 6 Wires
- 1 Power supply

WARNINGS

- IF YOU SEE THE RED LIGHT ON THE POWER SUPPLY IMMEDIATELY TURN IT OFF!!!
- You must only use the power supply on the 1.5V setting.
- IF YOU SEE THE RED LIGHT ON THE POWER SUPPLY IMMEDIATELY TURN IT OFF!!!

Instructions for your Labbook

For EACH of the sections that follow, you should have:

- EVERY schematic copied into your lab notebook
- Any and ALL measured values
- A description of what that circuit did.

Single bulb

Set the power supply to 1.5V and leave it OFF until you have made and double checked your circuit.

Once you have the circuit completed:

- Turn on the power supply
- IF YOU SEE THE RED LIGHT IMMEDIATELY SHUT OFF THE POWER SUPPLY AND DOUBLE CHECK YOUR CIRCUIT BEFORE TRYING AGAIN

If all goes well, copy the schematic and describe what happens in your labbook.



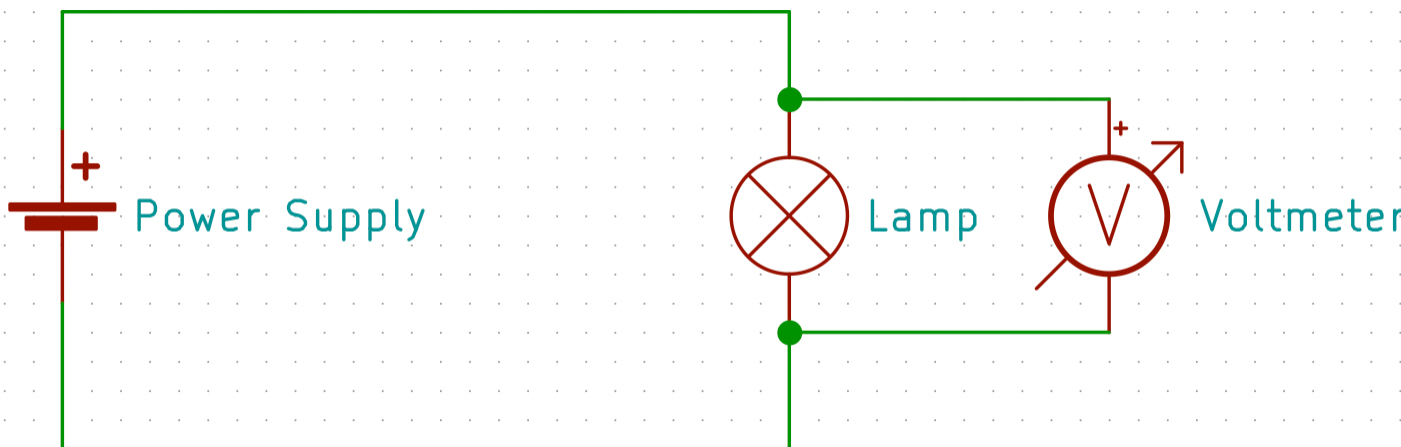
Single bulb - Voltage measurement

Set the power supply to 1.5V and leave it OFF until you have made and double checked your circuit.

Once you have the circuit completed:

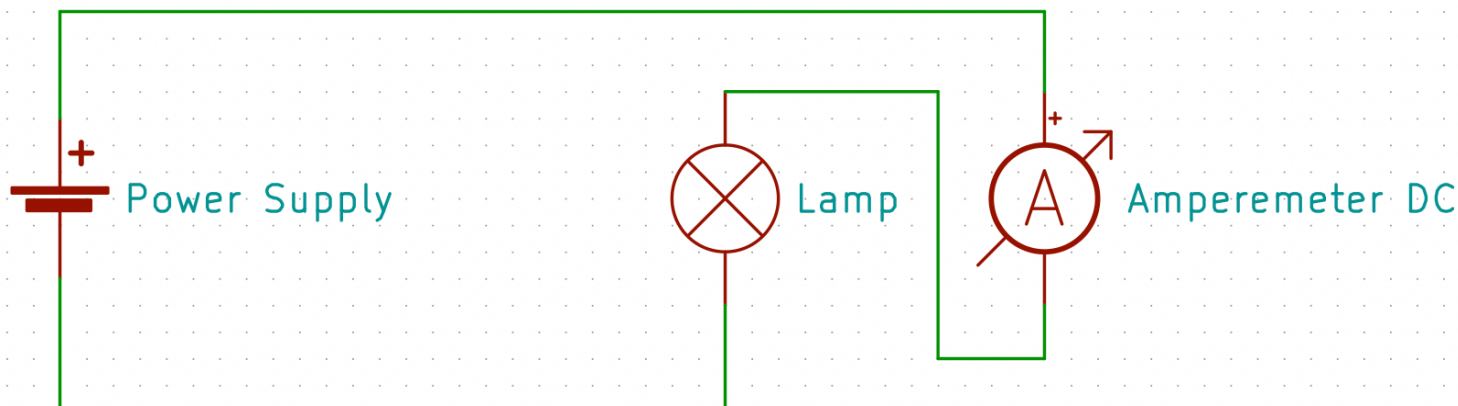
- Turn on the power supply
- IF YOU SEE THE RED LIGHT IMMEDIATELY SHUT OFF THE POWER SUPPLY AND DOUBLE CHECK YOUR CIRCUIT BEFORE TRYING AGAIN

If all goes well, copy the schematic and describe what happens in your labbook.



Single bulb - Current Measurement - A

Set the power supply to 1.5V and leave it OFF until you have made and double checked your circuit.



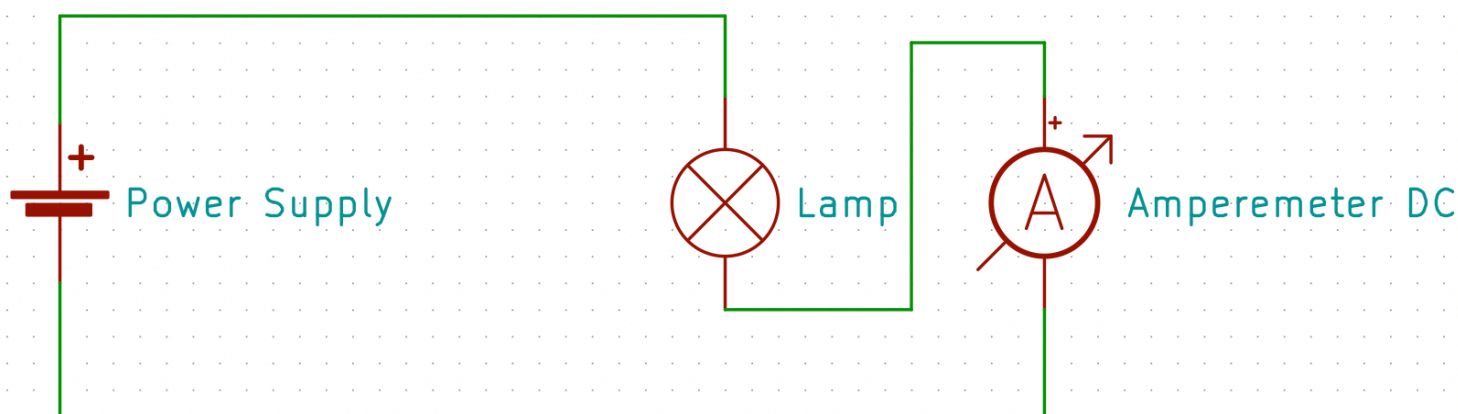
Once you have the circuit completed:

- Turn on the power supply
- IF YOU SEE THE RED LIGHT IMMEDIATELY SHUT OFF THE POWER SUPPLY AND DOUBLE CHECK YOUR CIRCUIT BEFORE TRYING AGAIN

If all goes well, copy the schematic and describe what happens in your labbook.

Single bulb - Current Measurement - B

Set the power supply to 1.5V and leave it OFF until you have made and double checked your circuit.



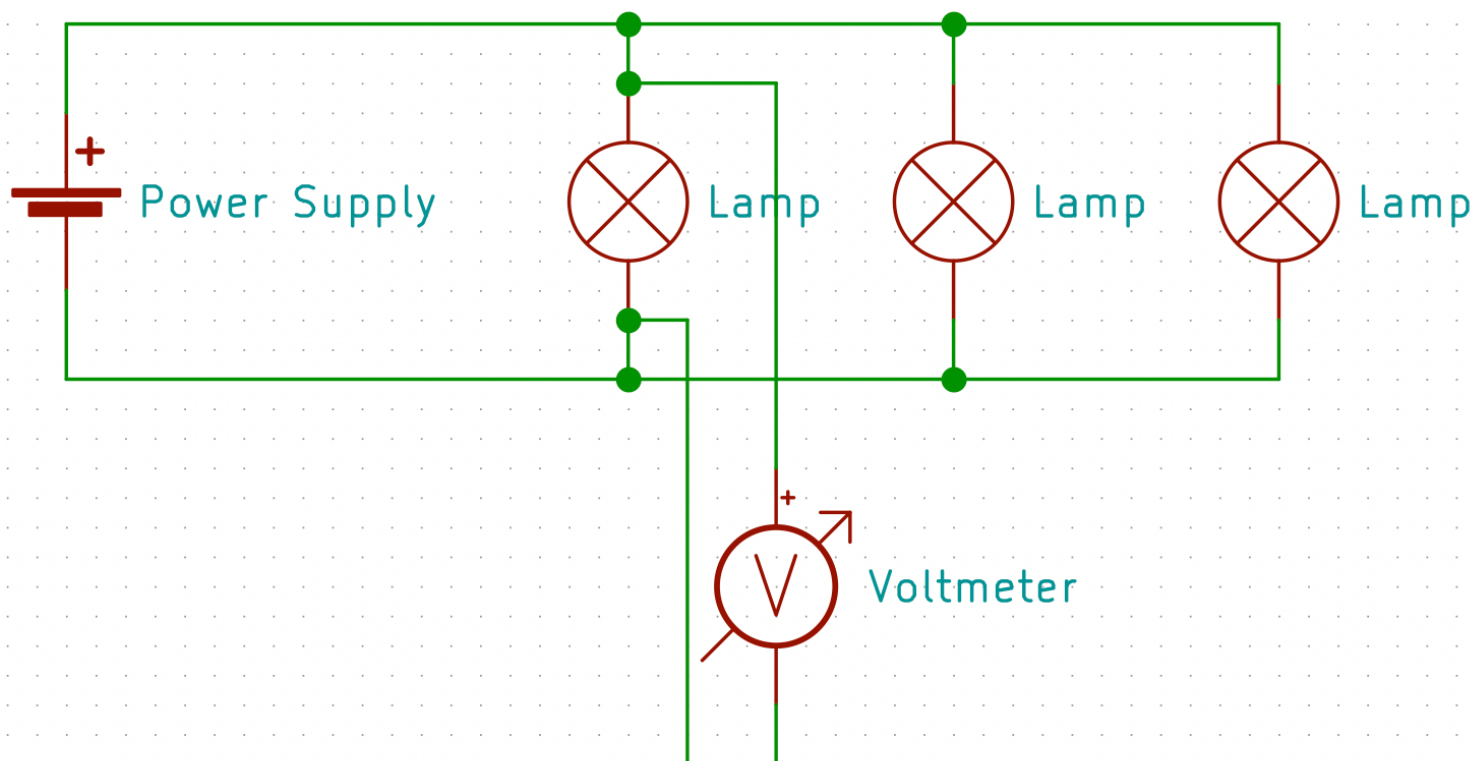
Once you have the circuit completed:

- Turn on the power supply
- IF YOU SEE THE RED LIGHT IMMEDIATELY SHUT OFF THE POWER SUPPLY AND DOUBLE CHECK YOUR CIRCUIT BEFORE TRYING AGAIN

If all goes well, copy the schematic and describe what happens in your labbook.

Parallel Circuit - Voltage Measurement

Set the power supply to 1.5V and leave it OFF until you have made and double checked your circuit.



Once you have the circuit completed:

- Turn on the power supply
- IF YOU SEE THE RED LIGHT IMMEDIATELY SHUT OFF THE POWER SUPPLY AND DOUBLE CHECK YOUR CIRCUIT BEFORE TRYING AGAIN

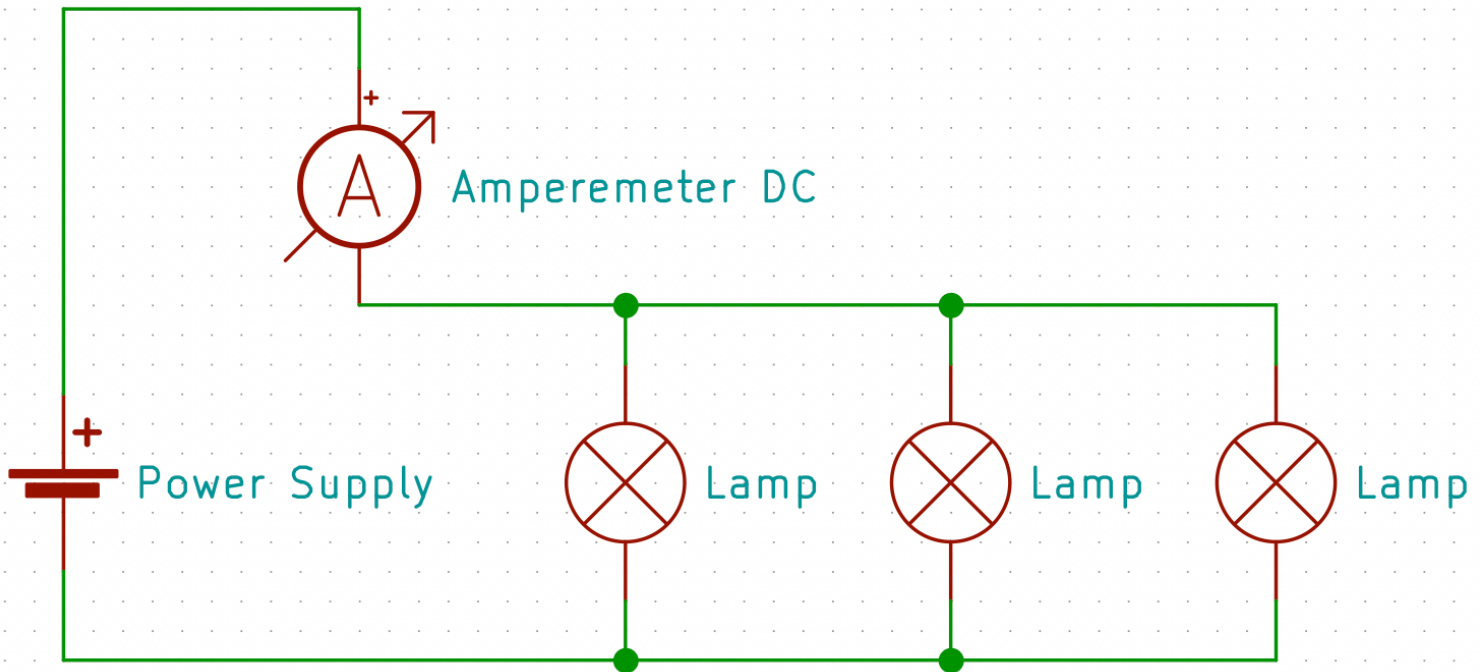
If all goes well:

- Copy the schematic into your notebook
- Write down the voltage for the first lamp.
- Measure the voltage across the second lamp.
- Measure the voltage across the third lamp.

Make sure that you record the voltage for ALL three lamps!!!

Voltage Circuit - Current Measurement

Set the power supply to 1.5V and leave it OFF until you have made and double checked your circuit.



Once you have the circuit completed:

- Turn on the power supply
- IF YOU SEE THE RED LIGHT IMMEDIATELY SHUT OFF THE POWER SUPPLY AND DOUBLE CHECK YOUR CIRCUIT BEFORE TRYING AGAIN

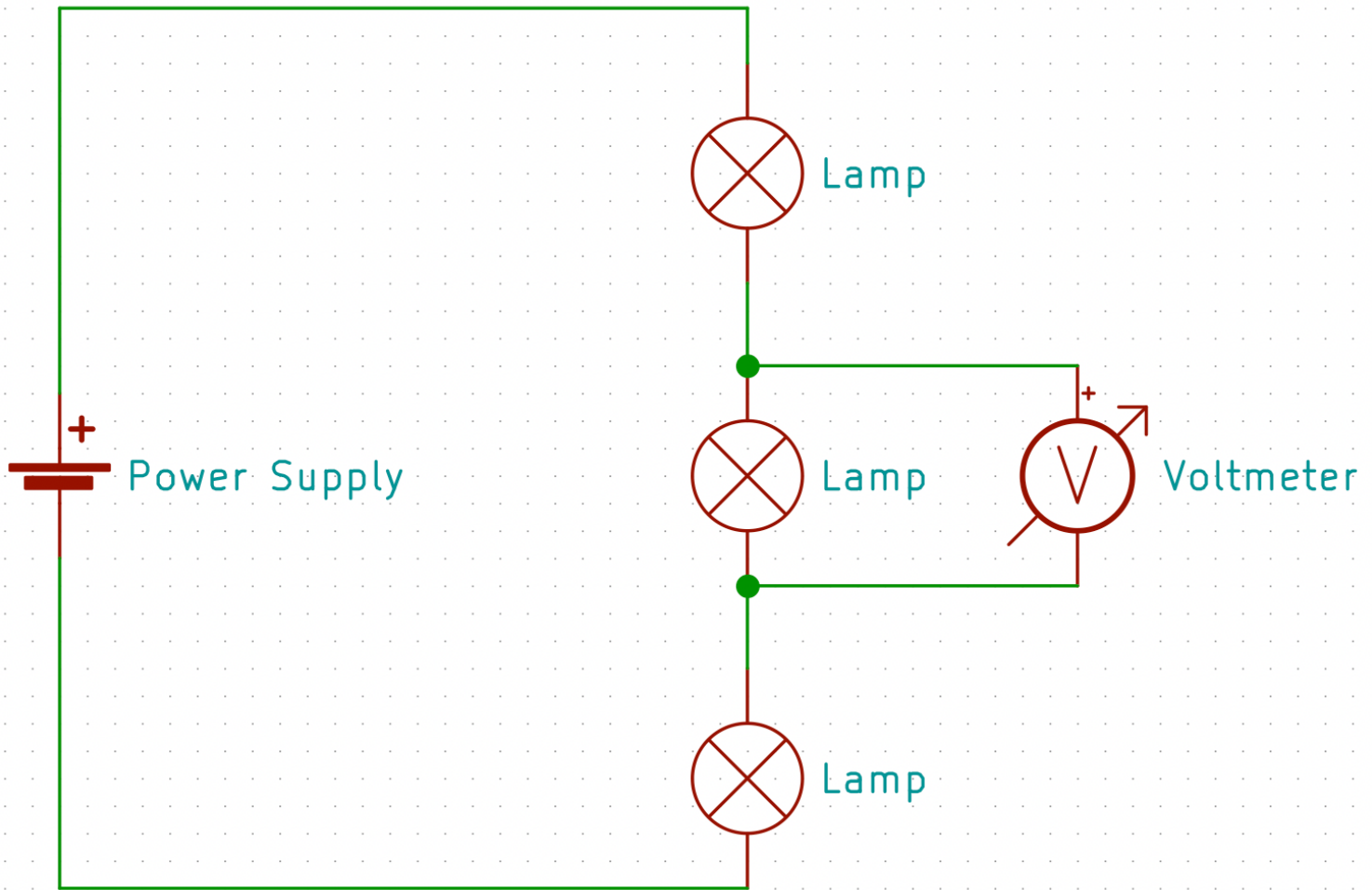
If all goes well:

- Copy the schematic into your notebook
- Write down the current for all three lamps together.
- TURN OFF THE POWERSUPPLY
- Re-wire the circuit to measure the current into the first lamp.
- TURN OFF THE POWERSUPPLY
- Re-wire the circuit to measure the current into the second lamp.
- Turn on the power supply.
- TURN OFF THE POWERSUPPLY
- Re-wire the circuit to measure the current into the third lamp.

Make sure that you record the current for ALL three lamps!!!

Series Circuit - Voltage Measurement

Set the power supply to 3.0V and leave it OFF until you have made and double checked your circuit.



Once you have the circuit completed:

- Turn on the power supply
- IF YOU SEE THE RED LIGHT IMMEDIATELY SHUT OFF THE POWER SUPPLY AND DOUBLE CHECK YOUR CIRCUIT BEFORE TRYING AGAIN

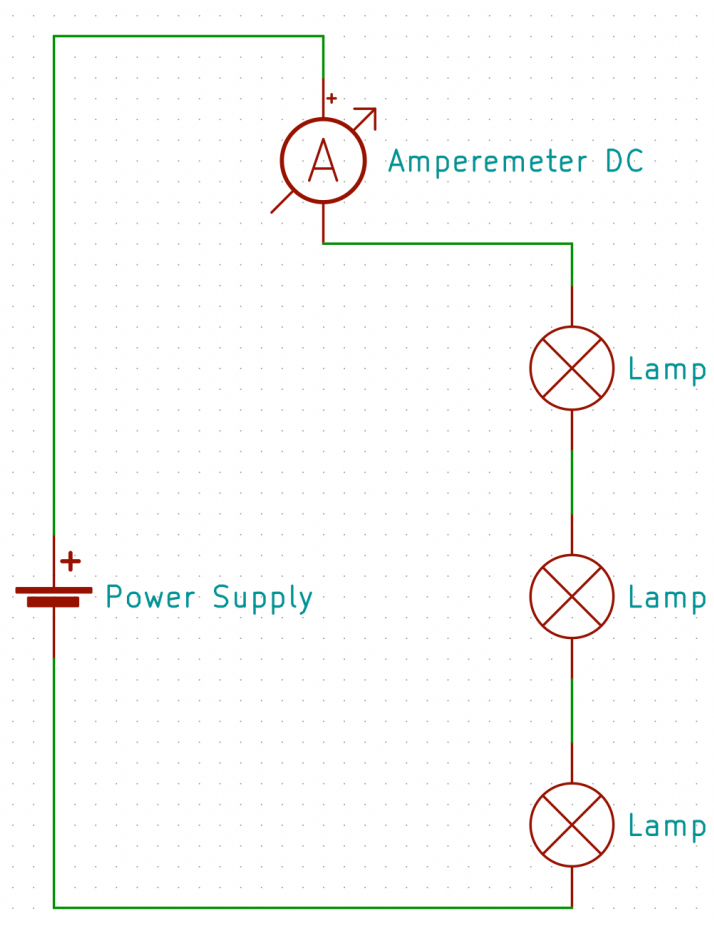
If all goes well:

- Copy the schematic into your notebook
- Measure the voltage for the first lamp.
- Measure the voltage across the second lamp.
- Measure the voltage across the third lamp.

Make sure that you record the voltage for ALL three lamps!!!

Series Circuit - Current Measurement

Set the power supply to 3.0V and leave it OFF until you have made and double checked your circuit.



Once you have the circuit completed:

- Turn on the power supply
- IF YOU SEE THE RED LIGHT IMMEDIATELY SHUT OFF THE POWER SUPPLY AND DOUBLE CHECK YOUR CIRCUIT BEFORE TRYING AGAIN

If all goes well:

- Copy the schematic into your notebook
- Write down the voltage for the first lamp.
- TURN OFF THE POWERSUPPLY
- Re-wire the circuit to measure the current into the second lamp.
- Turn on the power supply.
- TURN OFF THE POWERSUPPLY
- Re-wire the circuit to measure the current into the third lamp.

Make sure that you record the current for ALL three lamps!!!

Challenge Circuit

Make a circuit with three light bulbs where:

- 2 bulbs have the same brightness
- A 3rd bulb has a different brightness

Once you have a working circuit, copy the schematic into your lab notebook and measure the voltage for all three bulbs.