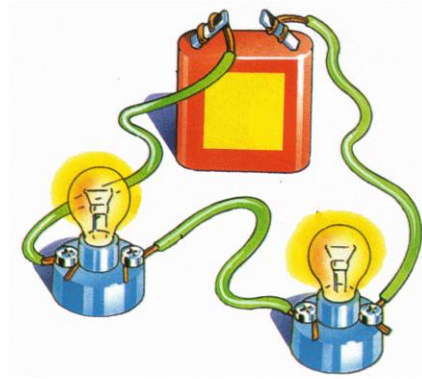
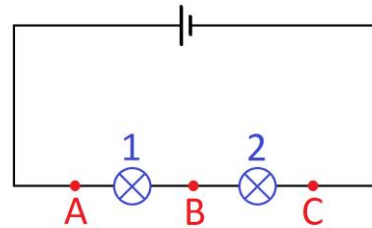


Workshop Project: Use the multimeter

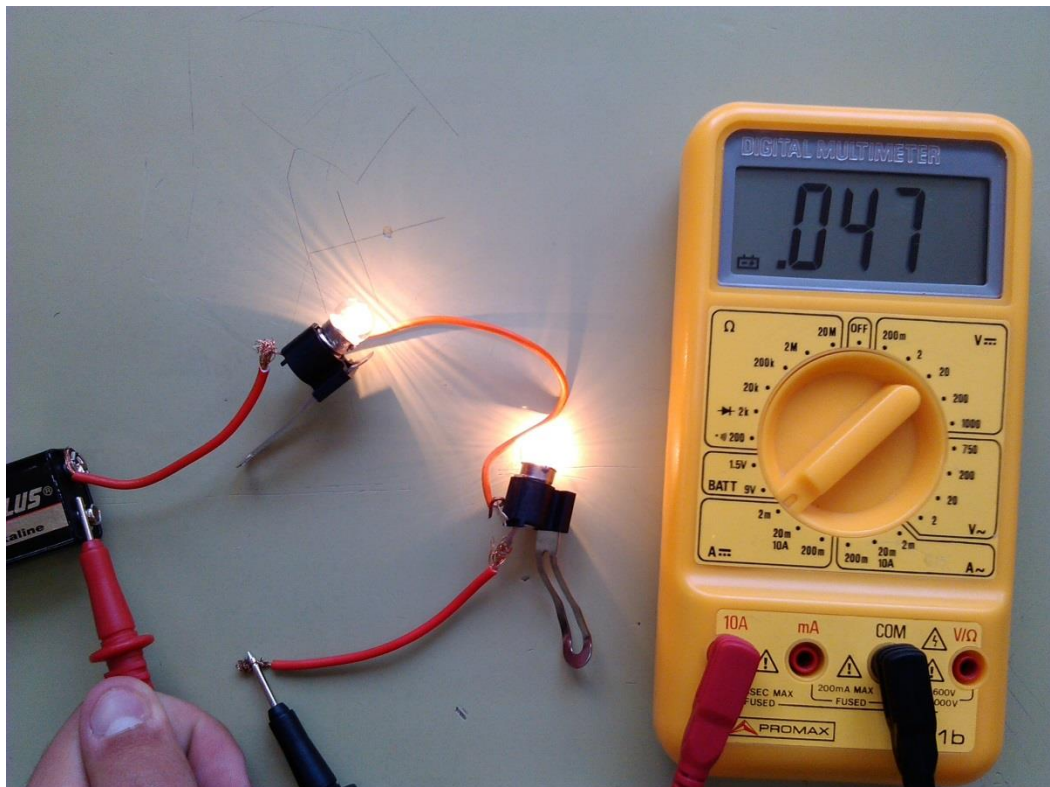


First of all we construct a series circuit with two light bulbs as shown in the drawing:



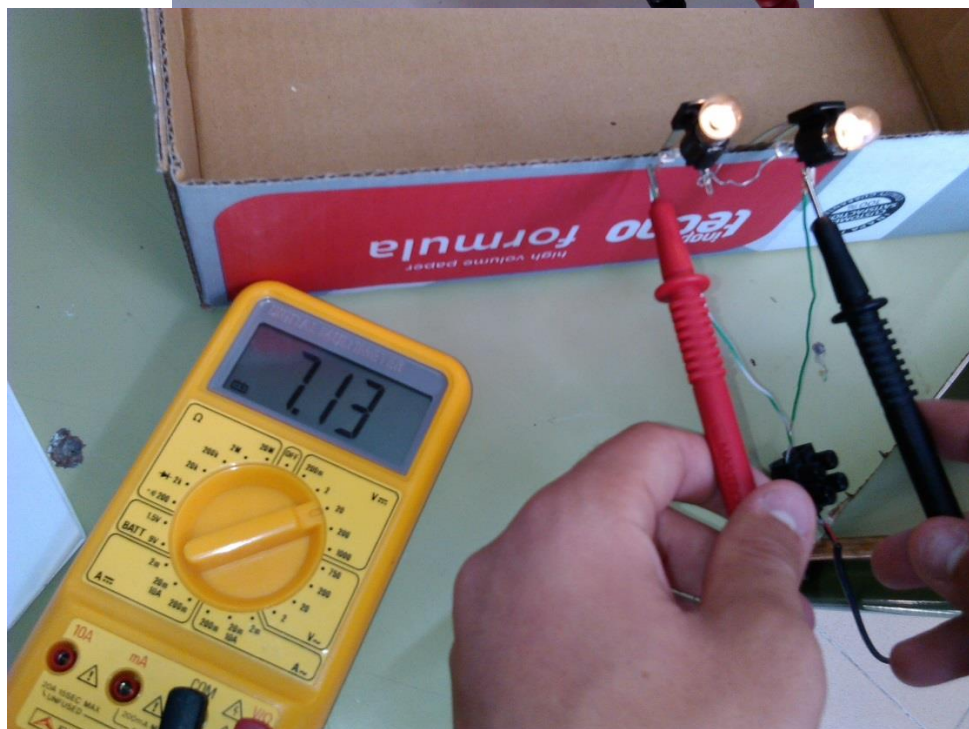
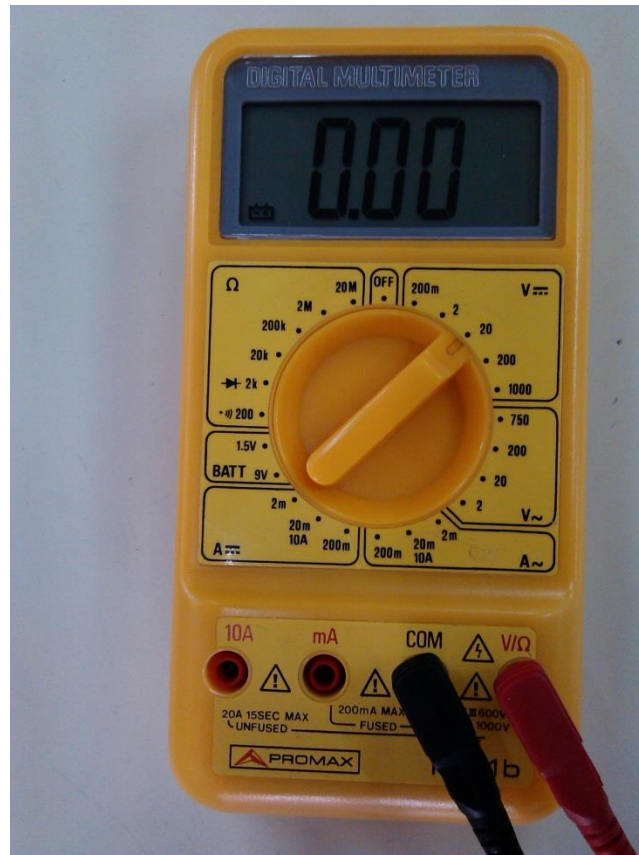
1. Measure the current in the circuit

- Move the dial to Current (A) in direct current.
- Connect the cables as shown in the picture (opening the circuit at point A and closing it with the multimeter wires).
- Write down in your notebook the reading on the screen of the multimeter.
- For example, in this case the reading is $0.047 \text{ A} = 47 \text{ mA}$



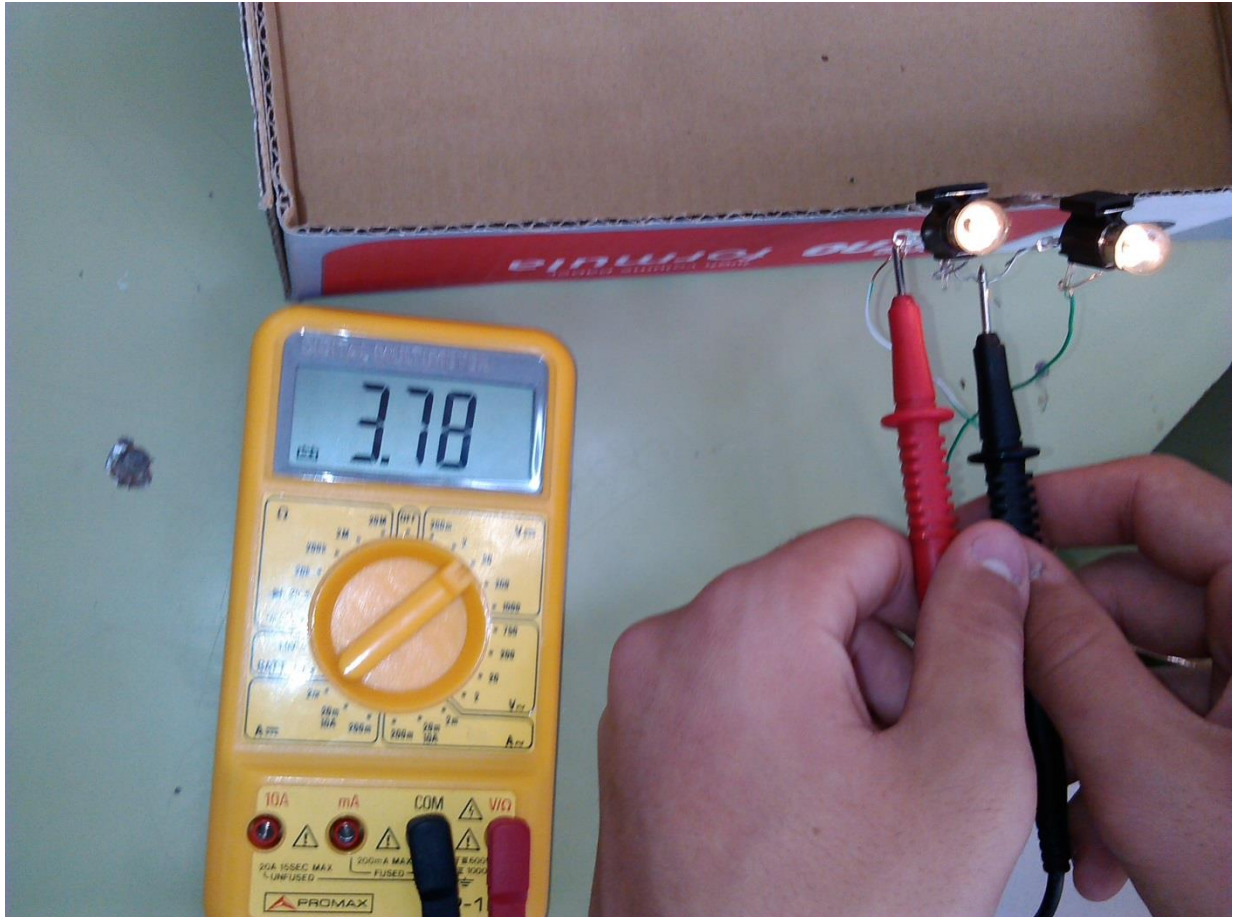
2. Measure the tension in the circuit

- Move the dial to Tension (V) in direct current.
- Connect the cables as shown in the picture (touching at points **A** and **C** of the drawing).
- Write down in your notebook the reading on the screen of the multimeter.
- Notice that the tension in circuit is the tension given by the battery.
- For example, in this case the reading is 7.13 V



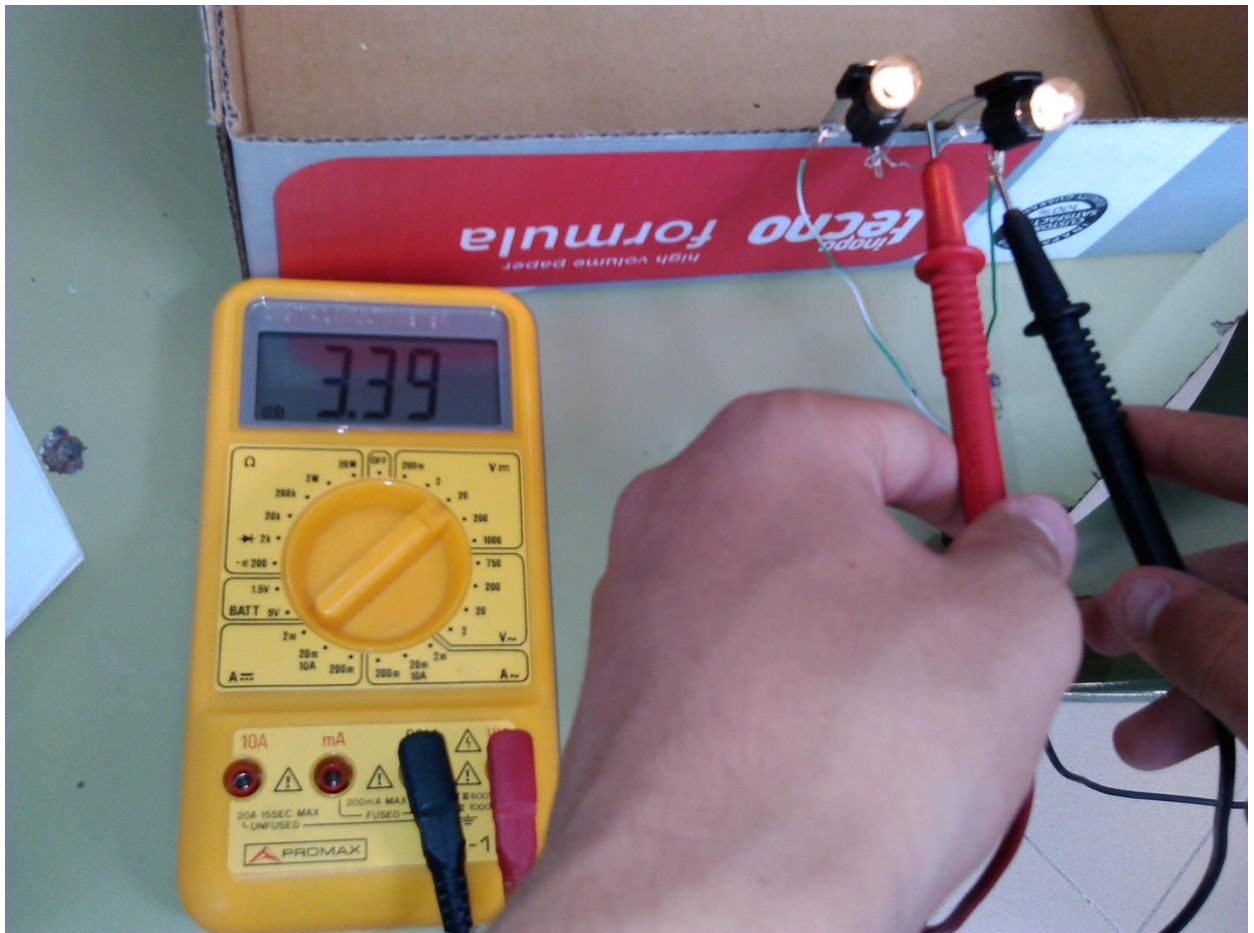
3. Measure the tension in bulb 2

- The dial stays in Tension (V) in direct current.
- Connect the cables as shown in the picture (touching at points **B** and **C** of the drawing).
- Write down in your notebook the reading on the screen of the multimeter.
- For example, in this case the reading is 3.78 V



4. Measure the tension in bulb 1

- The dial stays in Tension (V) in direct current.
- Connect the cables as shown in the picture (touching at points **A** and **B** of the drawing).
- Write down in your notebook the reading on the screen of the multimeter.
- For example, in this case the reading is 3.78 V



5. Check results of tensions

- It is a series circuit, so the addition of resistances should equal the total resistance.
- For example, in this case, $3.78\text{ V} + 3.39\text{ V} = 7.18\text{ V}$ which is approximately 7.13 V measured for the total circuit, so we consider that the measurements are correct.

6. Calculate resistance in the circuit and in each light bulb

- Use Ohm's Law to calculate the resistance in the circuit.

7. Measure resistances in the circuit and in each bulb

- Look at the instructions in the book to measure the resistance between points **A** and **C**.
- Now measure the resistance between points **B** and **C**.
- Now measure the resistance between points **A** and **B**.
- The total resistance should be approximately equal to the total resistance

8. Check that the calculated resistances coincide with the measured resistances.

- We used Ohm's Law to calculate the resistances, if the calculations and the measurements are correct they should coincide, check that they are correct.