**Lesson 5: Potential Difference and Energy**

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**TASK 1: WHAT IS POTENTIAL DIFFERENCE?**

1. **How a battery works**

The table contains statements about how a battery lights a bulb. Most of the statements are right, a few of them are wrong.

Put them in order to complete a **scientific explanation** of how a battery lights a bulb.

Start with:

The battery is …

|  |  |  |
| --- | --- | --- |
| Energy is shifted from the moving charge to the bulb. |  | The battery is a chemical store and is full of electricity. |
|  |  |  |
| The charge moves from the battery to the bulb. |  | The charge moves in all the circuit at once. |
|  |  |  |
| Energy is shifted from the chemical store to the moving charge. |  | And the bulb warms up – it gets white hot. |
|  |  |  |
| The battery is a chemical store because it is full of chemicals. |  |  |

1. **Measuring current & potential difference**

Circle the circuit showing the **voltmeter** and **ammeter** connected correctly to measure the potential difference and current in the resistor.



Fill the spaces to complete the sentences below.

The voltmeter measures...................................... It must be connected as shown because

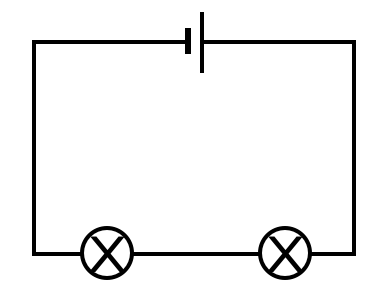
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The ammeter measures ..................................... It must be connected as shown because

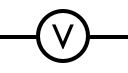
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**TASK 2: MEASURING POTENTIAL DIFFERENCE**

1. One person in your group should collect the equipment. You will need:
   * A battery
   * 2 bulbs
   * 5 wires
   * A voltmeter



1. Set up the circuit as shown in the circuit diagram – you will only need 3 wires for this. Check both bulbs light up. If they don’t, let your teacher know.
2. Separately, connect your voltmeter to one wire on each side:



1. Connect the voltmeter across each component and write down the results in the table below. Once you have written a result down, disconnect the voltmeter.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Position** | **Battery** | **Bulb 1** | **Bulb 2** | **Wire** |
| **Potential difference (V)** |  |  |  |  |

1. **Answer the questions in your book.**
   1. What was the potential difference across the battery?
   2. What was the **total** potential difference across the bulbs?
   3. What do you notice? Can you explain it?
   4. How can you explain the potential difference reading across the wire?

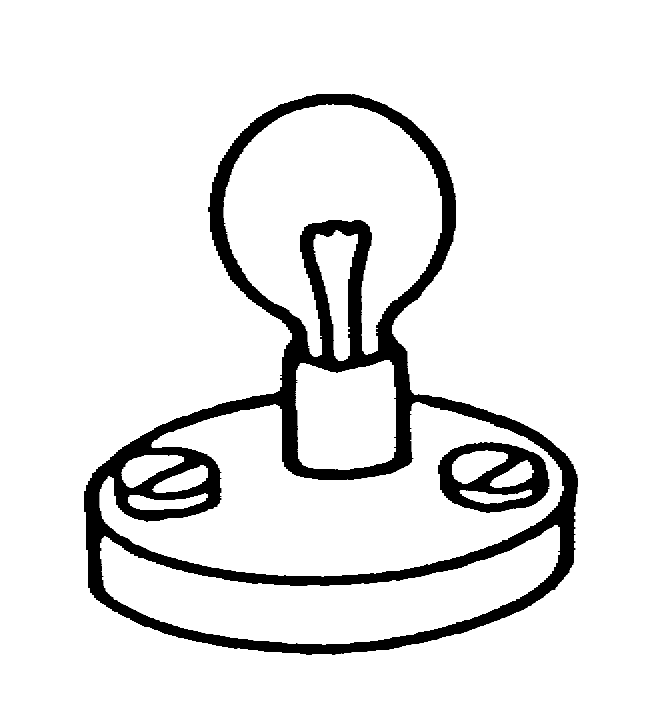
**NAME:**

**EXIT TICKET**

In this circuit, the bulb is lit.

current

wire B



wire A

**Battery**

The circuit is left switched on for several minutes. The bulb stays lit all the time. Its brightness does not change.

Read each of the statements below and put a tickin one box to show if you think it is **correct** or **incorrect.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **correct** | **don’t know** | **incorrect** |
| There is now less electric charge stored in the battery than there was at the start. |  |  |  |
| There is now less energy stored in the battery than there was at the start. |  |  |  |
| The battery now contains less electric current. |  |  |  |
| The potential difference across the battery is less than it was. |  |  |  |
| The battery now contains less electricity. |  |  |  |