

## Electric circuits - adding another bulb

### Assessing learning

Learning intentions <i>Students should:</i>	Evidence of Learning Statement <i>Students will be able to:</i>
<ul style="list-style-type: none"> <li>understand the behaviour of a simple series circuit, in terms of the relationships between battery voltage, circuit resistance, and current</li> </ul>	<ul style="list-style-type: none"> <li>predict and explain the effect on current and components of opening or closing a switch in circuits with branches</li> </ul>

### Why this item?

This practical task uses the ‘predict-explain-observe-explain’ (PEOE) approach. Asking students to predict what they expect before the switch is closed will show which students are applying the rule that ‘current splits in a parallel circuit’ without understanding what that actually means.

### Ways to use the item

The activity can be presented as a teacher demonstration or as a class practical. A teacher demonstration may be better if the students are not confident in setting up the circuit correctly.

After the discussion about what did happen, which may have been unexpected, additional ammeters might be added to check that the current did indeed split – but the total current also increased.

### Evidence of learning

Students may have learned (without understanding) ‘current splits in a parallel circuit’. They may therefore expect the current to decrease when the second lamp is added.

Students who understand that the potential difference across each bulb is the same, so the same current will pass through each bulb, as if the other wasn’t there, should be able to predict that the current will not change.

### Requirements

Each student/group will require:

- power supply
- switch
- ammeter
- two identical bulbs in bulb holders
- (optional) two more ammeters.

### Source of item

Based on EPSE E07-022.

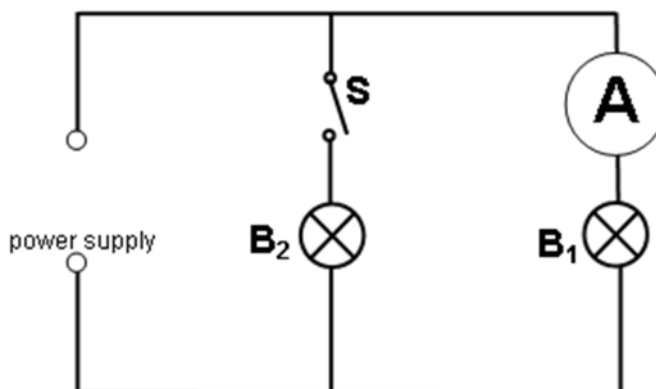
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### Purpose of this practical task

To find out what happens to the current in branches of a circuit.

- Set the power supply to 3 V.
- Connect the circuit as shown.
- Leave switch S open.

Bulb **B<sub>1</sub>** should be lit, and there should be a reading on the ammeter.



### Predict

What do you think will happen to the reading on the ammeter, and the brightness of bulb **B<sub>1</sub>**, when switch S is closed?

Ammeter reading .....

Brightness of **B<sub>1</sub>** .....

### Explain

Explain the thinking behind your prediction.

.....  
 .....

**Now close switch S and see if you were correct.**

### Observe

Describe what happens.

.....  
 .....

### Explain

Now that you have seen what happens, can you explain your observations? (If your prediction and explanation earlier were right, just say so – no need to write it again!)

.....  
 .....  
 .....