

## Grade 9 Natural Sciences Worksheet

### Strength of an electric current

#### Investigative question

Is the strength of an electric current affected when successive light bulbs are added in series?

#### Aim

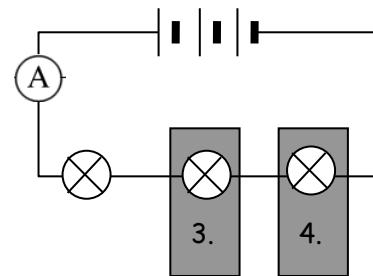
To measure the strength of electric current when resistors are added in a series circuit.

#### Apparatus

Circuit board and components, 3 torch cells, an ammeter.

#### Method

1. Set up a circuit containing three cells, one light bulb and an ammeter connected in series.
2. Take down the reading on the ammeter.
3. Add a second light bulb and take down the reading on the ammeter.
4. Add a third light bulb and take down the reading on the ammeter.
5. Complete the table below.



#### Results

Number of light bulbs in series	Ammeter Reading (A)
One	
Two	
Three	

[2]

#### Discussion

Select the most appropriate word or term to make each statement correct:

[8]

1. When more than one light bulb is connected in series in a circuit the bulbs (are equally bright/differ in brightness).
2. Adding light bulbs in series (increases/decreases) the resistance in the circuit.

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3. As more light bulbs are added in series, the brightness of the light bulbs (increases/ stays the same/decreases).
4. As more light bulbs are added in series, the ammeter reading (increases/stays the same/decreases).

### Conclusion

Adding more resistors in series (increases/decreases) current strength. [2]

### Rubric to assess practical work

Category	Levels of Achievement			
	4	3	2	1
<b>Handling apparatus</b>	Learner can manipulate apparatus and helps others in the group/sets up apparatus entirely unassisted. [8marks]	Learner is confident and can set up the circuit with minimal assistance. [6 marks]	Learner is unsure of what to do but attempts to set up the circuit with prompting. [4 marks]	Clumsy, not confident, little basic understanding of circuits. [2 marks]

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### Suggested Solutions

Question number	Possible marks	Solution
<b>Results</b>	2	As more light bulbs are added, the ammeter readings will decrease.
<b>Discussion</b>	8	<ol style="list-style-type: none"> <li>1. When more than one light bulb is connected in series in a circuit the bulbs are equally bright.</li> <li>2. Adding light bulbs in series increases the resistance in the circuit.</li> <li>3. As more light bulbs are added in series, the brightness of the light bulbs decreases.</li> <li>4. As more light bulbs are added in series, the ammeter reading decreases.</li> </ol>
<b>Conclusion</b>	2	Adding more resistors in series decreases current strength.
<b>Practical work</b>	8	See rubric in Appendix of Assessment Tools.

### Rubric to assess practical work

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