

## Grade 9 Natural Sciences Worksheet

### Current electricity investigation 3

#### Investigative question

When charges flow through a circuit, do all the charges flow through every part of the circuit?

#### Aim

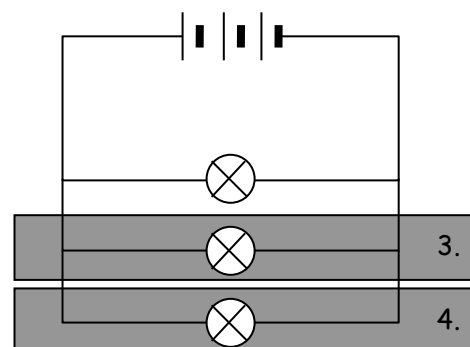
To investigate the strength of electric current in a parallel circuit.

#### Apparatus

Circuit board and components, 3 torch cells.

#### Method

1. Set up a circuit containing three cells and one light bulb.
2. Observe the brightness of the light bulb.
3. Add a second light bulb in parallel and observe the brightness of both light bulbs.
4. Add a third light bulb in a parallel and observe the brightness of all three light bulbs.
5. Complete the table below.



#### Results

Number of light bulbs in parallel	Brightness of light bulbs (brightest, bright, least bright)	Resistance (low, medium, high)
One		
Two	bright	medium
Three		

[4]

#### Discussion

Select the most appropriate word or term to make each statement correct. [8]

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

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4. As more light bulbs are added in parallel, the brightness of the light bulbs (increases/ stays the same/decreases) but there are now three connected in total.

### Conclusion

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

### Rubric for practical investigation

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. [6 – 5 marks]	Learner is confident and can set up the circuit with minimal assistance. [4 – 3 marks]	Learner is unsure of what to do but attempts to set up the circuit with prompting. [2 marks]	Clumsy, not confident, little basic understanding of circuits. [1 mark]

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### Suggested Solutions

Question number	Possible marks	Solution		
<b>Results</b>	4	<b>Number of light bulbs in parallel</b>	<b>Brightness of light bulbs (brightest, bright, least bright)</b>	<b>Resistance (low, medium, high)</b>
		One	bright	high
		Two	bright	medium
		Three	bright	low
<b>1 – 4</b>	8 – 2 marks each	1. When more than one light bulb is connected in parallel in a circuit the bulbs are equally bright. 2. Light bulbs are resistors. 3. Adding light bulbs in parallel decreases the resistance in the circuit. 4. As more light bulbs are added in parallel, the brightness of the light bulbs stays the same but there are now three bulbs connected.		
<b>Conclusion</b>	2	Adding more resistors in parallel increases current strength.		
<b>Practical work</b>	6	See rubric in Appendix of Assessment Tools.		

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