

Grade 9 Natural Sciences Worksheet

Current electricity investigation 4

Investigative question

If we add more cells in series in a circuit, will the light bulb shine brighter?

Aim

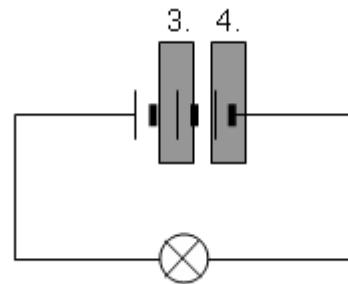
To investigate current strength when cells are added in series.

Apparatus

Circuit board, components and 3 torch cells.

Method

1. Set up a circuit containing one cell and one light bulb.
2. Observe the brightness of the light bulb.
3. Add a second cell in series and observe the brightness of the light bulb.
4. Add a third cell in series and observe the brightness of the light bulb.
5. Complete the table below.



Results

Number of cells in series	Brightness of light bulb (brightest, bright, least bright)
One	
Two	bright
Three	

[4]

Discussion

Select the most appropriate word or term to make each statement correct. [6]

1. A number of cells connected together is called a (battery/transistor).
2. The brightness of the light bulb represents (resistance/current strength) in the circuit.
3. As more cells are added in series, the brightness of the light bulb (increases/stays the same/decreases).

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Conclusion

1. Adding cells in series (increases/does not affect/decreases) the current in the circuit.
2. An advantage of connecting cells in series is that (the cells last longer/the current strength is increased. [4]

Rubric for assessing practical work

Category	Levels of Achievement			
	4	3	2	1
Handling apparatus	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								
Results	4	<table border="1"> <thead> <tr> <th>Number of cells in series</th> <th>Brightness of light bulb (brightest, bright, least bright)</th> </tr> </thead> <tbody> <tr> <td>One</td> <td>least bright</td> </tr> <tr> <td>Two</td> <td>bright</td> </tr> <tr> <td>Three</td> <td>brightest</td> </tr> </tbody> </table>	Number of cells in series	Brightness of light bulb (brightest, bright, least bright)	One	least bright	Two	bright	Three	brightest
		Number of cells in series	Brightness of light bulb (brightest, bright, least bright)							
		One	least bright							
		Two	bright							
Three	brightest									
1 – 3	6 – 2 marks each	<ol style="list-style-type: none"> 1. A number of cells connected together is called a battery. 2. The brightness of the light bulb represents current strength in the circuit. 3. As more cells are added in series, the brightness of the light bulb increases. 								
Conclusion	4	<p>Adding cells in series increases the current in the circuit. An advantage of connecting cells in series is that the current strength is increased.</p>								
Practical work	6	See rubric in Appendix of Assessment Standards.								

Rubric for assessing practical work

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