

Name: _____ Period: _____ Date: _____

StickMan Physics Batteries and Lights

<https://www.stickmanphysics.com/unit-8-current-and-circuits/batteries-and-lights/>

Page Questions

1. What is the positive terminal of a battery called? _____
2. What is the negative terminal of a battery called? _____
3. The convention is to follow current from the _____ terminal to the _____
4. Common AAA, AA, C, and D batteries are how many volts? _____
5. What is the voltage of 4 AA batteries in series? _____
6. What is the voltage of 4 AA batteries in parallel? _____
7. Would two similar lightbulbs in series or parallel be brighter when connected in a closed circuit to a battery?

Example Problems

1. What is the resistance of a light bulb that has 0.3 amps of current flow when 1.5 volts drop across it?
2. What is the power of a light bulb that has 0.3 amps of current flow when 1.5 volts drop across it?
3. You want to place a strand of 500 of these lights that will have 0.3 amps of current flow when in the presence of a 1.5 voltage drop. The cost per kilowatt hour is 12 cents per kilowatt hour according to you power bill. How much will it cost to run these lights for 5 hours each night?
4. What is the voltage of 5 batteries placed in series with a correct orientation as seen below, and would current flow right or left?



5. What is the voltage of 5 batteries placed in series with a correct orientation as seen below, and would current flow right or left?



6. Would two AA and one C battery create a current if placed in series in a closed circuit and if so what would the voltage be?



7. Which lightbulbs would burn brighter if the circuit was closed?

Read the article how batteries and capacitors differ and answer the following questions

<https://sciencenewsforstudents.org/article/explainer-batteries-capacitors>

8. In circuits, how does a common battery store energy?
9. In circuits, how does a capacitor store energy?
10. What is another name for electric potential?
11. What can an electric potential drive?
12. What does a battery consist of?
13. What is a measure of the trend of packing more energy into smaller spaces?
14. What is the problem with a lot of energy in a small space?
15. What function can capacitors serve besides storing energy?
16. What is the basic design of a capacitor?
17. What determines amount of energy a capacitor can store?
18. What is an advantage of a battery verses a capacitor?
19. What is a disadvantage of a battery verses a capacitor?
20. What is a supercapacitor?