

10.3

CHECK YOUR Understanding

1. Define the term “voltage” (electric potential difference) in your own words. State the symbol and SI unit that are used for voltage.
2. When you connect a voltmeter to the terminals of a battery, the voltmeter indicates the voltage of the battery. Are electrons flowing through the voltmeter? What evidence supports your answer?
3. How should a voltmeter be connected to a battery to measure the voltage of the battery? Draw a circuit diagram to explain your answer.
4. Compare the way that an ammeter is connected in a circuit with the way that a voltmeter is connected in a circuit. Explain the difference.
5. Figure 12 shows a circuit that consists of a 1.5 V electric cell, a switch, a light bulb, and a voltmeter. When the switch is closed, what reading will the voltmeter indicate?

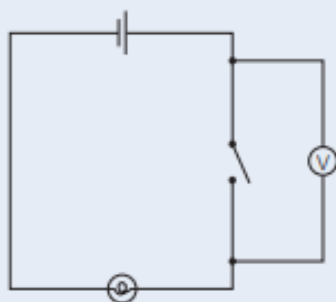


Figure 12

6. Draw a circuit diagram that shows three cells connected in parallel.
7. What is the voltage of three 1.5 V cells connected in series to form a battery? What is the general rule for the voltage of a battery made from cells connected in series?
8. What is the voltage of three 1.5 V cells connected in parallel to form a battery? What is the general rule for the voltage of a battery made from cells connected in parallel?

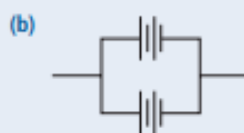
9. The circuit diagrams in Figure 13 show electric cells connected to make batteries. Copy the circuit diagrams into your notebook, and label the positive (+) and negative (−) terminals of the batteries. Determine the voltage of each battery.



Each cell is 1.5 V.



Each cell is 2.0 V.



Each cell is 1.2 V.



Each cell is 1.5 V.

Figure 13

10. (a) What is the advantage of making a battery using cells connected in series?
(b) What is the advantage of making a battery using cells connected in parallel?
11. A car battery produces 12 V from electric cells that each produce 2.0 V. What is the minimum number of electric cells in a car battery?
12. A battery, composed of six 1.2 V cells, is connected to a light bulb (Figure 14). What is the voltage of the filament of the light bulb?

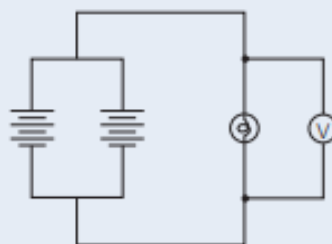


Figure 14