

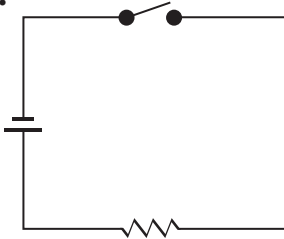
Topic 3.4 How are circuits used in practical applications?

Series and Parallel Circuits, page 139

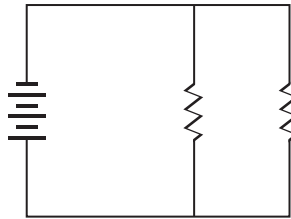
1. Sample answer: Another analogy that can be used to compare series and parallel circuits is plumbing pipes. Some pipes are just single pipes with no off shooting side pipes. This type of pipe is similar to a series circuit. Just as the water flows along just one path in the pipe, the charges flow along just one path in a series circuit. Other pipes have one or more side pipes that branch off of them. This type of pipe is similar to a parallel circuit. Just as the water flows along two or more pipes, the charges flow along two or more pathways in a parallel circuit.

Drawing Circuit Diagrams, page 140

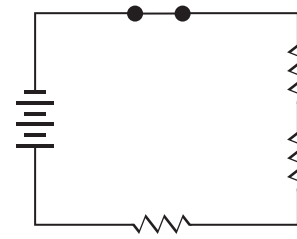
1.



2.

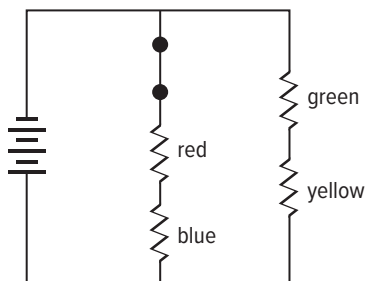


3.



Circuit Challenge, page 141

1.



2. Sample answer: The circuit must be a parallel circuit because all the loads did not turn off when the red bulb was switched off or the green bulb was unscrewed. The red and blue bulbs must be in series on one branch of the circuit because the blue bulb turned off when the red bulb was switched off. When a load is switched off, removed, or burns out, all the loads wired in series with it stop running. The green and yellow bulbs are on another branch because they were not affected when the red bulb was switched off. However, they must be in series on that branch because the yellow bulb turned off when the green bulb was unscrewed.

Multiple Parallel Circuits, pages 142–143

1. a) Buildings have multiple parallel circuits.
 b) Each solid line leaving the circuit panel represents a single parallel circuit.
 c) The disks represent ceiling lights.

d) Labels indicate the large cable from the power company and explain that the box is the circuit panel. These help you visualize the path electrical energy takes from the power company through the wiring of the building, as described in the introductory text.

e) Sample answer: What do the dotted lines indicate?

From Generating Station to Television, page 144

Drawings should reflect the following:

- Generating Station to home: A very large electrical cable carries electrical energy from a generating station to a building.
- Within the home and to the television: The large cable branches out and is connected to each of the many parallel circuits inside a circuit panel. The cables for all circuits leave this circuit panel and carry electrical energy throughout the home. One carries it to the outlet into which the television is plugged.

3.4 Assessment, pages 145–147

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|------|-------|-------|
| 1. B | 6. B | 11. D |
| 2. A | 7. A | 12. A |
| 3. A | 8. A | 13. C |
| 4. B | 9. D | 14. D |
| 5. B | 10. C | 15. C |

16.

