

Section 21.2 Batteries

In your textbook, read about dry cells, the lead–acid storage battery, and lithium batteries.

Complete the table below by writing the type of battery described on the right. Choose your answers from the following types: *lead–acid battery*, *lithium battery*, *mercury battery*, *nickel–cadmium battery*, *zinc–carbon dry cell*.

Type of Battery	Description
1.	Often used to power hearing aids and calculators because of its small size
2.	The standard, rechargeable automobile battery
3.	Often used in cordless drills, screwdrivers, and shavers because it is compact and rechargeable
4.	The most commonly used voltaic cell from the 1880s until recently
5.	Lightweight, long-lasting battery often used in watches and computers to maintain time and date settings

In the space at the left, write *true* if the statement is true; if the statement is false, change the italicized word or phrase to make it true.

- _____ 6. In a zinc–carbon dry cell, a carbon rod serves as the *cathode*.
- _____ 7. *Secondary* batteries produce electric energy by means of redox reactions that are not easily reversed.
- _____ 8. One advantage of alkaline cells is that they are *larger* than dry cells.
- _____ 9. When a lead–acid battery is generating electric current, *sulfuric* acid is consumed and lead(II) sulfate is produced.
- _____ 10. Dry cells, alkaline cells, and mercury batteries are examples of *primary* batteries.
- _____ 11. Compared to most other batteries, lithium batteries store a *small* amount of energy for their size.
- _____ 12. *Secondary* batteries are rechargeable.
- _____ 13. Each cell in a lead–acid battery generates about *12 volts*.
- _____ 14. In a mercury battery, liquid mercury is *reduced*, forming mercury oxide.
- _____ 15. Lead–acid batteries and nickel–cadmium batteries are examples of *secondary* batteries.

Section 21.2 *continued*

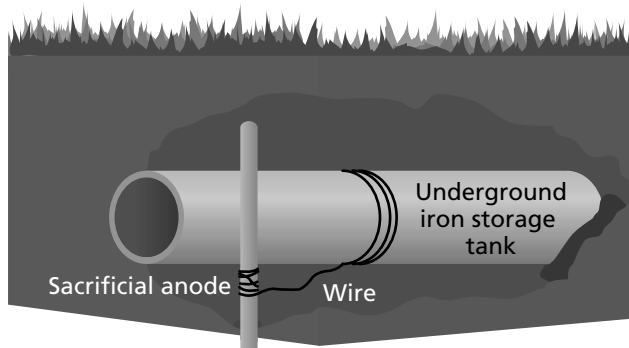
In your textbook, read about fuel cells.

Circle the letter of the choice that best completes the statement or answers the question.

16. The main purpose of a fuel cell is to produce
 - a. fuel.
 - b. electric energy.
 - c. chemical energy.
 - d. heat.
17. In the hydrogen–oxygen fuel cell,
 - a. hydrogen is oxidized and oxygen is reduced.
 - b. oxygen is oxidized and hydrogen is reduced.
 - c. both oxygen and hydrogen are oxidized.
 - d. both oxygen and hydrogen are reduced.
18. What is the main difference between the reaction in a hydrogen–oxygen fuel cell and the burning of hydrogen in air?
 - a. When hydrogen burns in air, the oxidation and reduction reactions are separated.
 - b. The burning of hydrogen in air does not produce water.
 - c. The reaction in a fuel cell does not produce water.
 - d. The reaction in a fuel cell is very controlled.

In your textbook, read about corrosion.

Use the diagram below to answer the following questions.



19. What is the function of the sacrificial anode?

20. Name one metal that is commonly used as a sacrificial anode.

21. Galvanizing the iron tank (or pipe) would serve the same function as a sacrificial anode. What is galvanizing?

22. In what two ways does galvanizing protect iron?

