

Chapter 21 Magnetism

Section 21.3 Electrical Energy Generation and Transmission

(pages 642–647)

This section describes how electricity is generated and transmitted for human use. It also describes how generators and transformers function.

Reading Strategy (page 642)

Sequencing As you read the section, complete the flowchart to show how a step-up transformer works. Then make a similar flowchart for a step-down transformer. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.



Generating Electric Current (pages 642–643)

- Circle the letter for the name of the process of generating a current by moving an electrical conductor relative to a magnetic field.
 - electromagnetic force
 - electromagnetic field
 - electromagnetic induction
- Electrical charges can easily flow through materials known as _____. Circle the correct answer.

conductors generators magnets
- Circle the letter of the correct answer. According to Faraday's law, electric current can be induced in a conductor by _____.
 - a static magnetic field
 - moving the conductor
 - a changing magnetic field
- Is the following sentence true or false? Moving a magnet relative to a coil of wire induces a current in the wire if the coil is part of a complete circuit. _____

Chapter 21 Magnetism

Generators (pages 643–644)

5. Use the words in the box to fill in the blanks. A generator converts _____ energy into _____ energy.

chemical	mechanical
electrical	potential

6. Circle the letter that best describes how most of the electrical energy used in homes and businesses is produced.

- a. with DC generators
- b. using AC generators at large power plants
- c. by rotating a magnetic field around a coil of wire

7. Is the following sentence true or false? In an alternating current produced by an AC generator, the flow direction of charges switches back and forth. _____

8. Circle the letter of each sentence that is true about generators.

- a. Small generators can produce enough electricity for a small business.
- b. DC generators produce current that flows back and forth.
- c. Most modern power plants use DC generators.

Transformers (pages 644–645)

9. A device that increases or decreases voltage and current of two linked AC circuits is called a(n) _____.

10. Use the words in the box to fill in the blanks. To change voltage and current, a transformer induces a changing magnetic field in one coil, which then induces a(n) _____ in a nearby coil with _____ number of turns.

AC current	the same
DC current	a different

Electrical Energy for Your Home (pages 646–647)

11. Name at least three sources used to produce electrical energy in the United States. _____
