

Name \_\_\_\_\_

Number \_\_\_\_\_

Date \_\_\_\_\_

## Guided Reading Chapter 8: Magnetism and Electromagnetism

### *Section 8-1: The Nature of Magnetism*

1. Circle the letter of the mineral that magnetic rocks contain.
  - a. magnetite
  - b. manganese
  - c. lodestone
  - d. lignite
2. What is magnetism?
3. any magnet, no matter what its shape, has two ends, each one called a(n) \_\_\_\_\_.
4. Circle the letter of each sentence that is true about magnetic poles.
  - a. One pole of a magnet will point north.
  - b. Both the north and the south pole always point north.
  - c. Two north poles make up a pair of unlike, or opposite, poles.
  - d. The pole that points south is labeled the south pole.
5. What happens if you break a magnet in two?
6. The region of a magnetic force around a magnet is known as its \_\_\_\_\_.
7. What are the lines called that map out the magnetic field around a magnet?
8. When the magnetic fields of two or more magnets overlap, what is the result?
9. What do the magnetic properties of a material depend on?
10. The smallest particle of an element that has the properties of that element is called a(n) \_\_\_\_\_.

11. One of about 100 basic materials that make up all matter is called a(n) \_\_\_\_\_.
12. What is the central core of an atom called?
13. What is the difference between protons and electrons?
14. A cluster of billions of atoms that all have magnetic fields that are lined up in the same way is known as a(n) \_\_\_\_\_.
15. How are magnetic domains arranged differently in magnetized material and in material that is not magnetized?
16. What is a ferromagnetic material?
17. What are two ways to make a magnet from an unmagnetized ferromagnetic material?
18. A magnet made of a material that keeps its magnetism is called a(n) \_\_\_\_\_.
19. What might happen if you drop a permanent magnet or strike it hard?
20. Is the following sentence true or false? Above a certain temperature, a material loses the property of ferromagnetism.
21. Suppose you break a magnet into four pieces. What will be the magnetic properties of each piece?

### ***Section 8-2: Magnetic Earth***

1. What is a compass?
2. Which way does a compass needle usually point?
3. How is Earth like a bar magnet?

4. The poles of a magnetized needle on a compass align themselves with Earth's \_\_\_\_\_.
5. Circle the letters of the two answers that name the same place on Earth.
  - a. geographic north pole
  - b. geographic south pole
  - c. magnetic north pole
  - d. true north
6. Is the following sentence true or false? The magnetic poles are not located exactly at the geographic poles.
7. The angle between a line to the geographic north pole and a line to the magnetic north pole is known as \_\_\_\_\_.
8. The doughnut-shaped regions 1,000 – 25,000 Km above the Earth are called the \_\_\_\_\_.
9. What do the Van Allen belts contain?
10. The stream of electrically charged particles flowing at high speeds from the sun is called the \_\_\_\_\_.
11. Circle the letter of the sentence that explains Earth's magnetosphere.
  - a. The doughnut-shaped region 1,000 Km above Earth.
  - b. The region of Earth's magnetic field shaped by the solar wind.
  - c. The region between the geographic north pole and the magnetic north pole.
  - d. The region of Earth's magnetic field in the Van Allen belts.
12. What is an aurora?
13. Complete the following about what causes the Northern Lights.
  - a. Particles from the solar wind penetrate Earth's \_\_\_\_\_.
  - b. Then, the particles follow the lines of Earth's magnetic field to the magnetic \_\_\_\_\_.
  - c. When the particles get close to the surface, they interact with atoms in the \_\_\_\_\_.
  - d. The interaction causes the atoms to give off glowing \_\_\_\_\_.

14. How could Earth's magnetic field magnetize an iron bar over many years?

15. The magnetic record in the rock on the ocean floor depends on when the rock was \_\_\_\_\_.

### ***Section 8-3: Electric Current and Magnetic Fields***

Match each particle with its electric charge.

1. \_\_\_\_\_ electron
2. \_\_\_\_\_ proton
3. The flow of electric charges through a material is called \_\_\_\_\_.
4. How is the rate at which an electric current flows determined?
5. Circle the letter of each of the following that stands for the unit of current.
  - a. A
  - b. ampere
  - c. aurora
  - d. amp
6. Is the following true or false? The number of amps tells the amount of charge flowing past a given point each second.
7. An electric current produces a(n) \_\_\_\_\_.
8. Look at Figure 17 on page 263. Why are the compass directions different in Figure 17B than in Figure 17C?
9. What causes all magnetism?
10. What is an electric circuit?

11. What are the three basic features all electric circuits must have?
12. What does a source of electrical energy do in an electrical circuit?
13. When a switch in an electrical circuit is closed, is the circuit complete or broken?
14. A device that uses electrical energy as it interferes with, or resists, the flow of charge is called a(n) \_\_\_\_\_.
15. Circle the letter of each of the following that could be a resistor in an electrical circuit.
- a. computer
  - b. switch
  - c. battery
  - d. light bulb
16. What is resistance?
17. Within a material, what results in the conversion of an electron's energy to thermal energy and electromagnetic energy?
18. Why did Thomas Edison decide to use tungsten when he developed his electric light bulb?
19. What is a superconductor?

#### ***Section 8-4: Electromagnets***

1. Is the following true or false? The strength of a magnetic field decreases as the number of loops in a wire increases.

2. Suppose you wind a current-carrying wire into a coil. How have you changed the wire's magnetic field?
3. A current-carrying wire with many loops is called a(n) \_\_\_\_\_.
4. How could you turn off a solenoid's magnetic field?
5. Is the following true or false? When iron is placed within a solenoid's magnetic field, the iron becomes a magnet.
6. What is an electromagnet?
7. In an electromagnet, what produces the temporary magnetic field?
8. Describe three ways you can increase the strength of an electromagnet.
9. Is the following true or false? When you record information on a computer disk, you are using electromagnets.
10. When you talk into a microphone, the variations in your voice are changed into variations in a (n) \_\_\_\_\_.