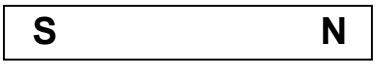
Module 16 Physics

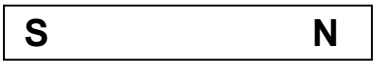
Assignment #1 Read pages 523 - 536.

1. Every magnet has a north pole and a south pole. If you cut a magnet in half, can you have a piece of metal with just one pole?

2. Do magnetic field lines point toward the north pole or away from the north pole?

3. Draw the magnetic field lines for the magnets shown below:





4. Would the magnets in the previous problem move toward each other or away?

5. What are two similarities between magnetism and electricity?

6. What causes some materials to be magnetic while other materials are not?

7. What is the difference between substances that are ferromagnetic, paramagnetic, and diamagnetic?

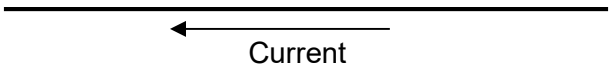
8. What is the difference between a geographic North Pole and a magnetic North Pole?

9. Which type of North Pole can change positions?

10. What causes the earth's magnetic field?

11. What is the right-hand rule of magnetism?

12. Draw the direction of the magnetic field in the wire shown below. Use X for the tail end of the arrow and • for the point end of the arrow. Do not draw circular arrows (too confusing).



13. True or False: Electrical current produces a magnetic field.

14. True or False: A magnetic field can produce an electrical current.

15. Honors: How does temperature affect a magnet?

16. Honors: Explain the difference between the dynamo theory and the rapid decay theory.

17. Honors: Besides sticking things to your fridge, list three things that magnets are used for.

18. What is electromotive force?

19. What does “flux” mean? (Look it up.)

Use the formula $\Phi = B\ A \cos \theta$ for the following questions.

20. A magnet which produces a field strength of 3 Tesla is moved through a loop with an area of 0.1 m^2 at an angle of 30º. What is the magnetic flux of this system?

21. Which will produce the greater current: a magnet moving through a 2.0 m^2 loop or a 0.2 m^2 loop?

22. Which will produce the greater current: a magnetic field parallel to the surface of the loop (θ = 90º) or a magnetic field perpendicular to the surface of the loop (θ = 0º)?

23. List three things that use inductance.

24. What is the difference between direct current and alternating current?

25. Most power plants use the same method for turning magnets in a coil of wire to generate electricity. Explain how they make electricity.

26. Why do they use alternating current, and not direct current, in your house?

27. According to Figure 16.10 in your book, the maximum amount of voltage in your household circuits is 170 V. Why do we say that the house voltage is 120 V?