

Alternative Assessment

1. During a field investigation with your class, you find a roundish chunk of metal that attracts iron objects. Design a procedure to determine whether the object is magnetic and, if so, to locate its poles. Describe the limitations of your method. What materials would you need? How would you draw your conclusions? List all the possible results you can anticipate and the conclusions you could draw from each result.
2. Imagine you have been hired by a manufacturer interested in making kitchen magnets. The manufacturer wants you to determine how to combine several magnets to get a very strong magnet. He also wants to know what protective material to use to cover the magnets. Develop a method for measuring the strength of different magnets by recording the maximum number of paper clips they can hold under various conditions. First open a paper clip to use as a hook. Test the strength of different magnets and combinations of magnets by holding up the magnet, placing the open clip on the magnet, and hooking the rest of the paper clips so that they hang below the magnet. Examine the effect of layering different materials between the magnet and the clips. Organize your data in tables and graphs to present your conclusions.
3. Research phenomena related to one of the following topics, and prepare a report or presentation with pictures and data.
 - a. How does Earth's magnetic field vary with latitude, with longitude, with the distance from Earth, and in time?
 - b. How do people who rely on compasses account for these differences in Earth's magnetic field?
 - c. What is the Van Allen belt?
 - d. How do solar flares occur?
 - e. How do solar flares affect Earth?
4. Obtain old buzzers, bells, telephone receivers, speakers, motors from power or kitchen tools, and so on to take apart. Identify the mechanical and electromagnetic components. Examine their connections. How do they produce magnetic fields? Work in a cooperative group to describe and organize your findings about several devices for a display entitled "Anatomy of Electromagnetic Devices."
5. Magnetic force was first described by the ancient Greeks, who mined a magnetic mineral called magnetite. Magnetite was used in early experiments on magnetic force. Research the historical development of the concept of magnetic force. Describe the work of Peregrinus, William Gilbert, Oersted, Faraday, and other scientists.