ACTIVITIES

Student Activities and Assessment *continued*

6 Discuss how these magnetic field shapes are similar to the magnetic field of the earth. Remind students that magnetic fields are three dimensional, not flat. Pose the following questions to the class:

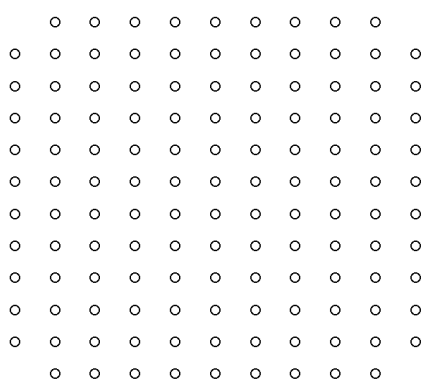
a Can you see the magnetic field?
(No, it is invisible - what you see is the pattern made by the compass needles)

b Where was the field the strongest?
(The field is the strongest at the poles of the magnet)

d Were the field lines the same for different kinds of magnets?
(No, you may see different lines for different magnets, but it will always be strongest at the poles)

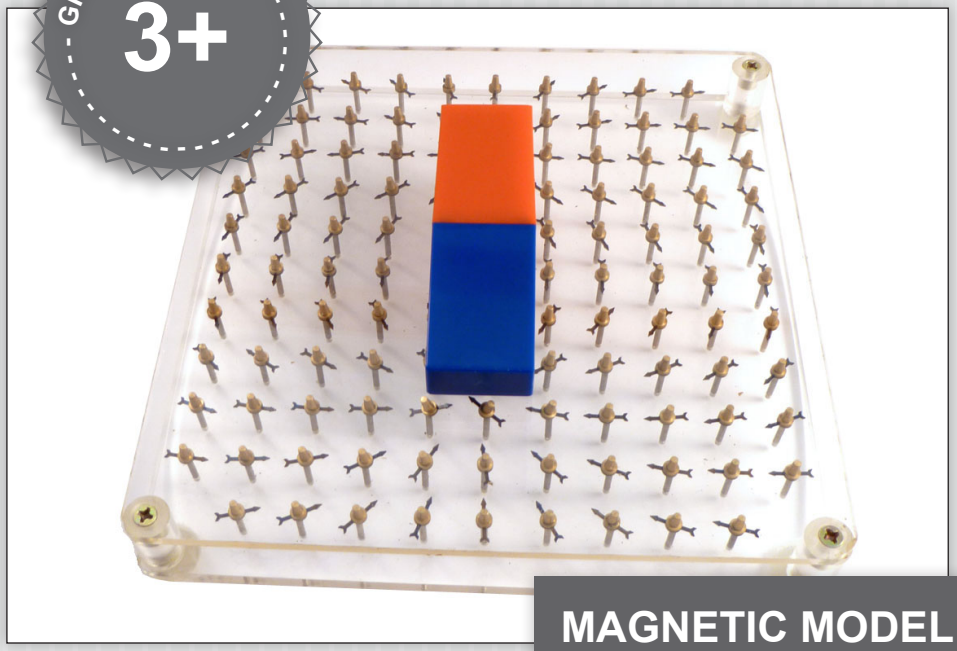
c Draw what you think the Earth's magnetic field might look like.
(Share an image of the Earth's magnetic field from the internet or a student textbook)

You may wish to photocopy the following diagram and have students help record the field lines.
(Make a copy for each type of magnet used so they can compare the field lines)



TEACHERS GUIDE

GRADE LEVEL 3+



MAGNETIC MODEL FIELD

ITEM # 3119-00

ENERGY - MAGNETISM

This sturdy acrylic box is comprised of 117 mounted magnetic needles and visually demonstrates the magnetic fields produced by a magnet. Ideal for use with overhead projectors.
Dimensions are 6" X 6". Magnets sold separately.
Students will be able to define basic vocabulary regarding magnets and magnetic fields. They will also be able to determine outside forces that affect the magnetic fields.

Vocabulary

Enrichment Activities

Attract:
To draw by a physical force causing or tending to cause to approach, adhere or unite.

Repel:
To act with a force that drives or keeps away something.

Magnet:
A body that can attract certain substances, such as iron or steel, as a result of a magnetic field.

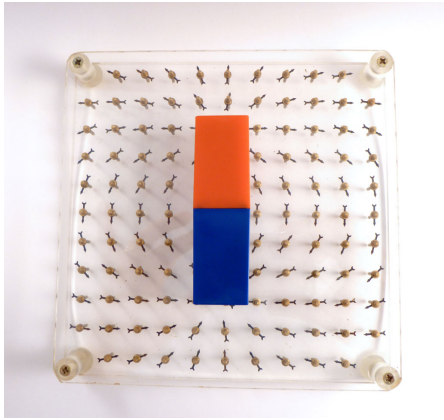
Magnetic pole:
Either of two regions of a magnet, designated north and south, where the magnetic field is the strongest.

Magnetic field:
A region of space near a magnet, electric current, or moving charged particle in which a magnetic force acts on any other magnet, electric current or moving charged particle.

Discussion

Lesson Extension

Have students test if insulators affect the magnetic field. Hold the following objects between the magnets and the compass of paperclips (done in small student groups). A sheet of paper, a sheet of aluminum foil, a piece of thin plastic, (overhead transparency would work) thin piece of balsa wood, and fabric would all be good to try.



Activities

1. In class discussion, elicit students' prior knowledge by asking for examples of magnets in their life. Ask students to explain how they think a magnet works and what the above vocabulary terms mean.

2. Show students different kinds of magnets (bar, horseshoe, refrigerator magnet etc.) and ask students to predict their strength. Have students record their predictions. Allow students time to test their predictions.
(You may allow students to write their own methods or follow the procedure below)

   a. Have students place each magnet in a clothespin (or tie with string if it will not fit)

   b. Hold the magnet out horizontally and place a paperclip against the bottom surface of the magnet (facing the floor). Continue to place paperclips on the surface of the magnet until it will no longer hold the paperclips.

   c. Record the number of paperclips held by each magnet as a measure of their force. To increase the accuracy of students' results, have them perform several trials with each magnet and average their results.

3. In class discussion, ask students about the magnetic field. Tell students that we can measure the direction of the magnetic field with a compass. Pass out small compasses to each student group and allow them time to explore with the magnets from the previous experiment and record their observations.

Note

It is always best to DO an experiment ahead of time to be able to best present it to the class.

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4. Summarize the ideas of the class on the white board or overhead projector.

5. Show students the Magnetic Model Field. Give one to each group (or if you only have one, use on the overhead projector and do as a class). Have students experiment with different magnet types and draw a map of the needles for each type of magnet.

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