

Matthew Vieira

Magnets and Motion

1, 40 minute class period

Goals:

- Understand how magnets can be used to move objects
- Understand why scientists do research using magnets

Objectives

- Predict the behavior of a magnetic object in a magnetic field
- Use a magnet to separate magnetic and non-magnetic components of a heterogeneous mixture

Materials

- Bar magnets
- Iron Nails
- Iron Filings
- Sulfur Powder
- Large Weighing boats
- Small sample of ferrofluid
- Disposable gloves

Prior Knowledge:

- The existence of magnetic dipoles

NJCCCS:

5.6.8.A.4; 5.1.8.C.1; 5.1.8.C.2;

Procedure:

1. Instructor begins with a lecture on magnets
 - a. What they are
 - b. Different kinds
 - c. What leads to magnetic attraction
2. Split the students into groups (random selection)
3. Distribute 2 bar magnets and an iron nail to each group
4. Let the students explore how one magnet affects the iron nail.
5. Then have the students try to touch the other magnet to the opposite end of the nail (Try both poles)
6. Discuss how permanent magnets align the dipoles and how this can be used to move certain objects
7. Place a mixture of sulfur and iron filings in a weighing boat, mix.

8. By moving a magnet underneath the boat, the iron will be attracted and can be moved around in the container, but the sulfur will stay where it is.
9. In a separate weighing boat, show how the same can be done with ferrofluid.
10. Discuss what a ferrofluid is and how research hopes to use them.