



### Project Skills:

The youth will be testing and experimenting with magnets and magnetic objects.

### Life Skills:

- Learning to Learn
- Applying Science & Technology
- Problem Solving
- Leading self and others
- Decision making

### Academic Standard:

Science D.4.8 Ask questions and make observations to discover the differences between substances that can be touched (matter) and substances that cannot be touched (forms of energy, light, heat, electricity, sound, and magnetism)

### Grade Levels:

2<sup>nd</sup> – 5<sup>th</sup> grades

### Time:

90 minutes

### Supplies Needed:

- Dowels
- String
- Magnets
- Paper clips
- Paper
- Random objects (magnetic and not)
  - Spoon
  - Wire
  - Nails
  - Sponge
  - Pencil, etc
- Bowl
- Water
- Tape
- White Cardstock paper
- Marker
- Gold Bars (see below)

### Do Ahead:

- Make copies of the gold bars and put different values on them (1, 5, 10, 15, 20, 25, 50)
- Tie string onto the end of the dowel and then tie a magnet onto the end of the string (this will be your makeshift fishing pole)
- Attach paper clips to the gold bars

## 4-H Project Area

# Reactions-Magnets

### BACKGROUND

Magnets are composed of a north and south poles. The basic principle of a magnet is “opposites attracting”. Some objects that appear to be attracted by a magnet may not be.

### WHAT TO DO

**Activity:** Fishing for treasures

**Time:** 30 minutes

**Background:** Magnets have a special power which enables them to attract things made from iron or steel. One end of a magnet is called the North Pole and the other end is called the South Pole. If you bring two north poles together they repel each other, or push each other away. But if you put a south pole next to a north pole, they jump together because opposite poles attract.

**Objective:** The youth will learn the basic principles of magnets being attracted to one another.

### Procedure:

1. Mark off a square about 4ft X 4ft using tape
2. Scatter gold bars in the square
3. Pair up youth into teams of two
4. Give each team one pole (look in the Do Ahead section to see how to make the pole from the dowels, string and magnets)
5. Explain that one person will be the fisher and the other will take off what they catch
6. Give youth a set amount of time to pick up the gold bars
7. After time is up, have youth count up the numbers that are on the gold bars
8. The team with the highest total wins
9. Put all of the gold bars back into the square and have the team switch who will be the fisher and who will take off the catch

**Activity:** Testing the Pull (2 Activities)

**Time:** 30 minutes

**Background:** Magnets pull on magnetic materials, such as iron, nickel, cobalt and steel, but pull through non-magnetic things, like cardboard, glass, plastic and wood. Magnets can even travel through water.

**Objective:** The youth will learn basic principles of magnetic pull.

### Procedure:

1. Cardboard Maze
  - a. Draw a maze on a piece of white cardstock paper
  - b. Place a paper-clip on the top of the paper with the maze up
  - c. Hold a magnet under the paper
  - d. Once the magnet and paper-clip connect, guide the paper-clip through the maze
2. Rescue a paper-clip from a glass of water without getting wet
  - a. Fill a glass or bowl with water and drop a bunch (30) of paper-clip inside
  - b. Take a magnet and put it on the outside of the bowl and try to pull the paper-clips up the side to the top
  - c. Remove the paper-clips from the bowl as you go, but don't get your hands wet

**Time:** 30 minutes

**Activity:** Magnet Roulette

**Sources:**

[www.kids-science-experiments.com/](http://www.kids-science-experiments.com/)

**Authors:** Ashley Pomplun,  
Kim Westover, Megan Wecker;  
CYFAR Project,  
Waushara County Extension, 2010

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**Activity Plan:** ACTpa122

**Background:** The youth will be given various objects that may or may not be magnetic, and they will have to decide which may be and try to pick them up with a magnet.

**Objective:** The youth will use basic knowledge of magnetism that they have learned.

**Procedure:**

1. Place various object (magnetic and non magnetic) in an area or on a table
2. Divide youth into two groups
3. Give each group a magnet
4. Each group will be given the chance to go up to the area of objects and to try to pick up one item that they think is magnetic (pick it up using their magnet)
5. The group must decide on the object as a group
6. If they pick up the item, they take it back with them
7. The next group does the same thing
8. Keep repeating until there are no more items to pick up
9. The group with the most items wins

**TALK IT OVER****Reflect:**

1. Why was it hard to use the magnet as a fishing pole?
2. Where could you use magnets to get something?
3. Was it harder to make the magnet work with water or the cardboard?
4. What are some other objects you could move with a magnet?
5. Did some of the objects seem to be magnetic, but not be? Why?
6. What was your strategy for picking up the magnets?

**Apply:**

1. In what other situations could you use a magnet?
2. What is another type of environment where you would have to observe the situation before making a decision?
3. In what other situations would you have to manipulate or control a device to access another device?

**HELPFUL HINTS**

1. With the Testing the Pull Activities, it make it more fun for the youth if they are competing with boys versus girls.
2. With the maze game, keep track of the time it takes for each youth to go from the start to the finish. It is another competition that they can have with each other.
3. Make sure the magnet is strong enough to pull the paper-clips up through the water.
4. Don't use a metal bowl – it makes it harder to move the magnet
5. With the gold bars, we put the same amount with a 1 and 5. A little bit less with 10 and 20. Only 6 or so had 25 and 2 or 3 had 50 marked on them.
6. To determine the number of gold bars you will need, figure each youth or team will collect around 20 bars

**Reviewed by Wisconsin Curriculum Team on January 2011**



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