Intended Grade Level: Pre-K to 3rd Grade

Objective	Assessment
Objective 1: Students can identify objects that are attracted to magnets and those that are not.	**Assessment:** Scavenger hunt.
Objective 2: Students can demonstrate an understanding of the terms "attracting" and "repelling".	**Assessment:** Interactive game.
Objective 3: Students can pick out to like poles and two opposite poles.	**Assessment:** Fishing activity.

Academic Standards: Next Generation Science Standards

K-PS2-1: Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.

2-PS1-2: Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

3-PS2-3: Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

Materials:

Beginning "Magic Show":
* 1Decorative Cardboard Box
*1 Bar magnet
*Several materials attracted to magnets
    *Nails
    *Washers
*12" metal rod
*3-4 Donut Magnets
*1 set of "Sizzlers" Magnets

Scavenger Hunt (per group of 2):
*1 Bar magnet per student
* "Mini Kits" that include both magnetic and non-magnetic materials.

Pull & Push Demo:
*1 strong 10 ft. rope

End Assessment (per student):
*fish coloring sheet
*1 straw
*1 1"piece of tape
*2 refrigerator magnets
*1 pair of safe scissors

General Supplies (per student):
*Exploring Notebook
*Colored Pencils

Background Information & Fun Facts:

- Electrons spin in opposite directions and generally their spins cancel each other out, resulting in a non-magnetic material. However, if there are more electrons spinning in a given direction, atomic magnetism will result.
- Some metals are attracted to magnets and others are not. Those attracted include iron, steel, nickel, and cobalt.
- Magnetism was discovered 2000 years ago in rocks called Lodestone (magnate).
- Earth has magnetic poles that reside in the iron core. These magnetic poles have changed places over a hundred times in the past 400 million years.
- Animals, birds, and fish have tiny magnets in their body and are able to migrate due to the Earth's magnetic poles.

Planning and Preparation:

- Be sure to print off enough handouts for each student.
- Find a cardboard box that is at least 2 ft x 1 ft x 2 ft in size. In order for the show to be more interesting, decorate the box! Cut out the back of the box, the side that the students will not be able to see.
- Have a Ziploc bag filled with materials you would like to use for your magic show.
- Put "Mini Kits" together for each group of two students.
    - Include various items that are attracted to magnets and some items that are not. Examples may include:
        - Matchbox cars
        - Nails
        - Paperclips
        - Sea Shells
        - Bouncy Balls

Engage:

1. A Magical Cardboard Box
    a. Time to get cheezy! Inform the students that today they are going to witness a magic show.
    b. Place the decorative box on a table, so that the students can only see the front.
    c. Pick one of the magnetic items and hold it in front of the box.
    d. With the other hand, use the magnet to move the item around the surface of the box.
    e. Repeat and ask students to make observations.
2. Floating Circles
    a. For the second "trick", allow students to hold the metal rod and make observations.
    b. Once they have decided there is nothing out of the ordinary, place the first magnet on the rod. (The magnet will appear to be floating around the metal rod.)
    c. Just when they thought it couldn't get any cooler, place the second magnet on. Ask the students why this is happening.
    d. Continue to place two more magnets on the rod.

3. Noisy Spheres
    a. Pass around the "Sizzlers". Let each half of the room observe only one of the magnets. Have each side communicate their observations with the other side.
    b. Tell the students that an amazing noise is about to be heard and have them sit quietly.
    c. Hold one magnet in each hand and then toss the magnets two feet up in the air and let the "magical sound" play.

Explore:

1. Pass out "Exploring Notebooks" and colored pencils.
2. Provide each group of two, a "Mini Magnet Kit" and a bar magnet.
3. Have the students go through the kits and record their data in their "Exploring Notebooks".
4. Once the groups have tested all of their materials, discuss their findings as a group.
5. Ask the class what is a hypothesis.
6. Formulate a hypothesis about magnets.
7. Have students go around the classroom, testing their hypothesis. Recording their findings in their "Exploring Notebook".

Explain:

1. Discuss the students' findings and come to the consensus about what qualifies as magnetic and what does not.
2. Ask students if they noticed throughout their scavenger hunt if any of the objects were pulled to the magnet. Then ask if any objects were pushed away from the magnet.
    a. Talk about the terms attracting (pulling) and repelling (pushing).
3. Ask students if they can think of any examples of attracting or repelling.
4. Play tug-o-war with the students to emphasize a pulling force.

Evaluate:

1. Inform the students that they are now going to be part of a fishing competition!
2. Have students color their fish and then cut it out.
3. Glue a small refrigerator magnet to the mouth of the fish.
4. Thread the string through the straw and tape the end of the string to the bottom of the straw.
5. Tape the other end of the string to the backside of a refrigerator magnet.
6. Ask students to recall information by asking what part of their fish will be magnetic and how magnets attract and repel each other.

Resources:
Gibson, Gary. *Young Einstein In Action Discovering Science: Playing with Magnets*. Franklin: Flowerpot, 2012. Print.
"Magnets Documentary." *YouTube*. YouTube, 27 Sept. 2012. Web. 15 Apr. 2013. http://www.youtube.com/watch?v=DNmRR3DWtng
Sloane, Christina. "How to Explain Magnets to Kindergarteners." *EHow*. Demand Media, 05 Oct. 2010. Web. 15 Apr. 2013. http://www.ehow.com/how_7294840_explain-magnets-kindergarteners.html

Is it Magnetic?

Object:	**Magnetic ☺ or Not Magnetic ☹**

Hypothesis: If ____

then ____.

Scavenger Hunt

Object:	**Magnetic ☺ or Not Magnetic ☹**

Draw a picture of a pull (attracting):

Draw a picture of a push (repelling):