Magnets

**MA STE Standards that are supported by this 5 E Learning Experience**

*See Appendix for grades k-12 progression of Physical Science Standards:*

* PS2.A Forces and Motion
* PS2.B Types of Interactions

 **Learning Outcomes:**

* Students will explore properties of magnets
* Students will explore & identify materials that are attract to magnets
* Students will use evidence to infer the properties of magnets
* Students will propose how to solve a problem using the force of magnetic attraction

**Materials:**

 Magnets bar magnets, wands, magnetix

 Variety of materials around room at a station to test attraction of magnets

 Demonstration Floating washers

**Procedure:**

***Engage:***

 1. Look I can make these rings float? How can I do that? (Discrepant Event)

 2. Raise discussion and brainstorm ideas in notebook and have students share ideas with partner and whole group.

 3. Let’s explore properties of different materials or forces in nature to see if we can determine how to explain or test this phenomenon.

***Explore:*** Study about magnets today

1. Let’s try to investigate

2. In groups, I am giving you two magnets. I would like you to work together to observe how they work. What can you discover about how they work?

* What do you notice when you bring one magnet close to a second magnet?
* Does it respond the same on either end? Top and bottom?
* What happens when you bring two magnets close together?
	+ Teacher checks in with students and asks guiding questions

 3. Let’s see if we can figure out whether not magnets do this to other materials besides themselves.

* + Take a look at this box of stuff
	+ See what happens when you bring the magnets close to them
	+ Hmm. Let’s try categorizing the types of materials that move to the magnet or away from the magnet.
	+ What can you share with the group about magnets and how they work?

***Explain*** from the activity: Using evidence

1. Let’s consider evidence from your investigation. Questions for writing in notebooks, journals, and/group & class discussion

Introduce terms: attract

* What happened when you worked with the magnets?
* What does this tell us about…
* What happened when you worked with the materials? Which materials responded to the magnet? Which did not?
* What does this tell us about…

 2. Other ways of explaining:

* KWEL as a way to organize
* other ways you could help students to explain their evidence and introduce vocabulary?
	+ Use video
	+ Use book
	+ Discussion from experience/evidence & Lecture

***Elaborate***

1. What can we do with this info.
2. Well – if we go back and consider those rings. How might magnetic forces be affecting them?
	1. What else do you notice?
	2. Can you draw or write what you think might be happening?
	3. How can we test out your hypothesis?
3. Other activities that promote the application of ideas
4. Problem based learning
5. Engineering Design Problem
	1. You are a……
6. Revisit model or problem and describe how it could work
	* + - That Magnetic Dog and the Floating washers

Evaluate

* Quiz
* Self evaluation

Sources:

School of Engineering, Vanderbilt University. Curricula Unit: Clean up this mess. Retrieved

Whatley, B. (1994). That Magnetic Dog. Angus & Robertson: Australia.

Appendix

