

Magnets: Sorting Challenge

NOTE: Children should always be given ample time to experiment, notice, and wonder before they are provided an explanation.

Always engage children with our two favorite questions:

**What do you notice?
What do you wonder?**



Resist the urge to answer any questions children have while exploring. Instead, respond back with questions to children and let them make sense of the world. Sample questions you might use: What do you think? Do you notice any patterns? What could we change? Can we test something else? What can we try next? If children ask a testable question, which they could answer by doing an experiment, talk through with them how they might design a test to help answer their question/ As much as possible and within reason, let them actually test their questions by trying the experiments they propose.

Learning Objectives

Children will...

- sort small objects manually.
- experience the increased efficiency of sorting the objects using a magnet.
- learn that not all metals are magnetic, a common misconception.

Key Question

Which method would be faster to sort, manually or using a magnet?

Vocabulary

| | | |
|----------------|------------|----------------|
| Magnet | Attraction | Permanent |
| Magnetism | Temporary | Magnetic |
| Magnetic poles | Steel | Strength |
| Iron | Repel | Magnetic Force |

Materials

| | | |
|---|---|---------------------------------------|
| Magnets | Other small magnetic and nonmagnetic items you can think of | Watch or clock watch with second hand |
| An assortment of paper clips, brass fasteners (nonmagnetic) | Box of paper clips | |

Notice and Wonder Developmentally Appropriate Practice

- Distribute items for sorting on a table.
- Explain to children they need to sort out the objects that are magnetic and nonmagnetic. First they will do this with a list of objects and then with a magnet.
- Have children predict which method would be more efficient.
 - Guide children to realize that a way to compare the two strategies would be to time them.
- Have children sort manually first while an adult keeps time. The children should place each magnetic object on a separate spot.
 - A list of objects that are magnetic should be made in advance so the teacher can call out the name of each object. If they pick up the wrong object, do not worry. Let them put it in a spot.
- When done, test each object sorted to see if they are actually all magnetic.
- Repeat sorting but this time, let them use a magnet to run over the objects and put them into separate spots while an adult keeps time.
- Discuss and record what they learned using questions like the ones below.
 - Which method of sorting was faster– manual or using magnet? How do you know?
 - Why do you think the magnet helped sort faster?
 - What were some problems in the magnetic sorting?
- Dump out the box of paper clips on the table. Tell children their task will be to pick up the paper clips and put them back in the box as quickly as they can.
- On the word GO, start the timer and let the children collect the paper clips.
- Repeat the activity but let children use magnets to collect the paper clips this time.
- Discuss and record what they learned using questions like the ones below.
 - Which method of picking up the paper clips was faster – manual or using magnet? How do you know?
 - What else could you use a magnet to pick up if they spilled?

Children should notice...

- not all metals stick to magnets.
- it is much faster to sort things and pick up things using a magnet.



Extensions for Additional Learning

For this extension you will need salt, iron filings, and tweezers. NOTE: Iron filings can be obtained from sand (see lesson on Mining with Magnets).

Present a bag with salt and iron filings. Show tweezers as one strategy; have children try to sort manually using the tweezers. Encourage children to think of other solutions, such as dissolving the salt in water. Discuss advantages and disadvantages of all solutions suggested, including the use of magnet. If possible, try several of the strategies suggested.

#STEMAZingPictureBook Recommendations:

Magnets Push, Magnets Pull by David A. Adler and Anna Raff

Read on YouTube - (<http://bit.ly/MagnetsPushMagnetsPullReadAloud>)

Connections to the activity: Guide for young children learning about magnetism.

Videos:

Recycling Center - Sorting Aluminum and Steel

<https://www.youtube.com/watch?v=BuBIDn9kkY8>

Fun with Magnets! SciShowKids

<https://www.youtube.com/watch?v=s236Q1nuWXg>

Magnets and Magnetism – Magnets video for kids

<https://www.youtube.com/watch?v=-aNpmCSZHbk>

Magnetism | The Dr. Binocs Show | Educational Videos For Kids

<https://www.youtube.com/watch?v=yXCeuSiTOug>

SAFETY CONCERNS

Remember that placing magnets near computers, television sets, phones, CD'S or credit cards may cause damage.

What the heck? Explanation of Sorting Challenge

Magnets are frequently used to sort out ferrous or magnetic materials. One example of that is sorting out magnetic cans from recycling. Magnets can also be used to pick up objects that are magnetic.

Early Learning Standards

Science Standard - Strand 1: Inquiry & Application - Concept 1: Exploration, Observation & Hypotheses

The child observes, explore, and interacts with materials, others, and the environment.

Science Standard - Strand 1: Inquiry & Application - Concept 2: Investigation

The child researches their own predictions and the ideas of others through active exploration and experimentation.