

Magnets: Float Like A Butterfly, Sting Like A Bee

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...

- have an opportunity to test their creativity in this open-ended activity in which children will use magnets and other materials to build systems that defy gravity.

Key Question

How can you devise a system that defies gravity?

Vocabulary

Gravity
Force
Strength
System

Magnetism
Gravitational force
Attract
Magnetic poles

Repel
Magnetic force

Materials

Magnets, large number
of strong ones
Tape
Thread

Paper clip
Steel soup can
(unopened)
Scissors

Carboard box (shoe box
works perfectly)
Butterfly clip art or draw
your own insect or bird

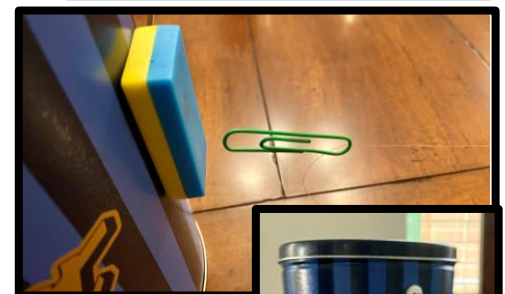
Notice and Wonder Developmentally Appropriate Practice

1. Find a clean small cardboard box or shoe box. An adult should cut away two sides of the box opposite sides leaving a "U" shape.
2. Tape a strong magnet bar-shape magnet along on side of the box.
3. On thin paper, draw and cut out a butterfly shape, insect or bird that you might want to use. Attach a stretched paper clip to the wing or head of butterfly. Tie a length of string to the paper clip.
4. Tape the loose end of the thread to the side of the box opposite the magnet. When the thread is pulled taut, the butterfly should almost touch the magnet.
5. Stand the box up so the magnet is at the top. Hold the butterfly just below the magnet and let it float. Adjust the length of the thread to get the best floating effect.



Children should notice...

- gravity would make the clip fall to the table: instead, it is held in the air by a force from the magnet.



Extensions for Additional Learning

This activity can be done with an unopened steel can of soup. Place a magnet on the can of soup. Tie a paper clip to a length of thread, tape the other end to the table. Position the can so that the paper clip and magnet are attracted to one another and yet do not touch. Experiment with different barriers between the clip and the can: various types of paper, foil, etc. Discuss how these systems defy gravity. Why does the clip seem to float in the air? What would happen if the thread were not taped down? Which is stronger, the pull of the earth's gravity or the pull of the magnet?



#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.

SAFETY CONCERNS

An adult should cut the box for the children.

If a child swallows more than one magnet, it can be very dangerous.

What the heck? Explanation for Float like a Butterfly, Sting Like A Bee

Forces are either pushes or pulls. Usually, when an object is lifted up and released, the force due to gravity will pull it back down to the ground. In this experiment, the magnet above the paperclip is able to provide a second force on the paperclip with the butterfly and bee. The upward force counteracts the gravity pulling down on the paperclip with the butterfly and bee, which allows them to defy gravity.

AZ 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.

