

Let's Stick Together!

Overview: How many different ways can you stick two things together? Hmm... tape, glue, chewing gum, and... MAGNETS! In this scientific exploration, your students will investigate objects that are magnetic and what those items have in common.

Procedure:

- 1) Explain to students that they will be trying to find out which items in their bucket are magnetic and which items are not. Discuss how magnetic items will stick to their magnet, while non-magnetic items will not stick and simply fall off of the magnet.
- 2) Provide the student with their materials (bucket of items, magnet, recording sheet, etc).
- 3) Model to the student an item that is magnetic from the bucket. Show the student how it sticks to the magnet. Record the item as being magnetic on the student's recording sheet. Place the item into the "magnetic" jar.
- 4) Model to the student an item that is not magnetic from the bucket. Show the student how it does not stick to the magnet. Record the item as not being magnetic on the student's recording sheet. Place the item into the "non-magnetic" jar.
- 5) Allow the student to choose items at random from the bucket to test for its magnetic properties, recording each item onto the student's recording sheet each time, and placing the item in the correct jar.
- 6) When the student has completed testing each item, review the collected data. Look at each jar of magnetic and non-magnetic items.
- 7) Discuss with the student what the items in the magnetic jar have in common (they all have metal on them). Discuss what is different about the items in the non-magnetic jar (they all don't have metal on them).

ASOLs Covered in this Activity:

SCIENCE

- 5S-SI 1:** The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
- a) distinctions are made among observations, conclusions, inferences, and predictions;
 - b) objects or events are classified and arranged according to characteristics or properties;
 - e) predictions and inferences are made, and conclusions are drawn based on data from a variety of sources;
 - h) hypotheses are developed as cause and effect relationships;
 - i) data are collected, recorded, analyzed, and displayed using bar and basic line graphs;
 - k) data are communicated with simple graphs, pictures, written statements, and numbers;
- 5S-SI 2** The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
- d) hypotheses are formed from testable questions;
 - h) predictions are made using patterns from data collected, and simple

- graphical data are generated;
- i) inferences are made and conclusions are drawn;
- 8S-SI 1** The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations which
 - a) observations are made involving fine discrimination between similar objects and organisms;
 - d) hypotheses are stated in ways that identify the independent and dependent variables;
 - e) a method is devised to test the validity of predictions and inferences;
 - h) data are analyzed and communicated through graphical representation;
- 8S-SI 2** The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
 - a) data are organized into tables showing repeated trials and means;
 - g) variables are controlled to test hypotheses, and trials are repeated;
 - h) data are organized, communicated through graphical representation, interpreted, and used to make predictions;
 - i) patterns are identified in data and are interpreted and evaluated.
- 8S-SI 3** The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
 - i) frequency distributions, scatter plots, line plots, and histograms are constructed and interpreted;
 - j) valid conclusions are made after analyzing data;
 - l) experimental results are presented in appropriate written form;
- HSS-SI 1** The student will plan and conduct investigations in which
 - c) scales, diagrams, charts, graphs, tables, imagery, models, and profiles are constructed and interpreted;

Extension Idea:

These standards can be addressed through the course of this activity's scientific process.

- 5S-FME 2** The student will investigate and understand the characteristics of electricity. Key concepts include
 - e) simple electromagnets and magnetism;
- 8S-FME 5** The student will investigate and understand the nature of matter. Key concepts include
 - d) physical properties;

Extension Idea:

Throughout this activity, students will explore the physical properties of items to determine if each item is magnetic or non-magnetic.

- 8S-ESS 5** The student will investigate and understand the organization of the solar system and the interactions among the various bodies that comprise it. Key concepts include
 - f) the unique properties of Earth as a planet;
- HSS-ESS 1** The student will investigate and understand the characteristics of Earth and the solar system. Key concepts include
 - c) characteristics of the sun, planets and their moons, comets, meteors, and

asteroids;

Extension Idea:

A further discussion can be had on how the Earth is magnetic and how that affects navigation using a compass.

READING & WRITING

- 3E-RW 2a:** The student will use newly acquired vocabulary drawn from reading and other content areas.
- 3E-RW 2b:** The student will demonstrate understanding of the meaning of newly acquired vocabulary.
- 3E-RW 6d:** The student will demonstrate understanding of words that signal spatial and temporal relationships (e.g., behind, under, after, soon, next, later).
- 3E-RW 3g:** The student will identify words from other content areas.
- 3E-CN 1g:** The student will sequence at least two steps in a procedure or ideas/incidents in an event.
- 4E-RW 1c:** The student will use newly acquired vocabulary drawn from reading and other content areas.
- 4E-CN 1d:** The student will interpret information presented visually and orally;
- 5E-RW 1f:** The student will demonstrate understanding of content-specific words.
- 5E-WP 1b:** The student will select an event or personal experience and use drawing, writing, or dictating to compose a message about it;
- 5E-WP 2a:** The student will use technology (including assistive technologies) to produce and publish writing;
- 5E-WP 3c:** The student will select an event or personal experience and write one thing about it;
- 5E-WP 6a:** The student will use technology to produce and share writing;
- 5E-WP 9a:** The student will list words that describe an event or personal experience to use when writing about it;
- 6E-RW 1b:** The student will use context clues to determine the meaning of vocabulary words drawn from reading and other content areas
- 7E-RW 1b:** The student will determine the meaning of words and phrases;
 - c:** The student will use context clues to determine the meaning of vocabulary words drawn from reading and other content areas;
- 8E-RW 1b:** The student will demonstrate knowledge of new vocabulary drawn from reading and other content areas;
 - e:** The student will acquire and use content words and phrases.
- 8E-WP 1a:** The student will write to convey ideas and information including facts, details, and other information.
 - b:** The students will write about a personal experience by introducing the event or experience, at least one character, and two or more events in sequence.
 - d:** The student will use content specific vocabulary when writing about a topic.
- 8E-WP 3b:** The student will write to convey ideas and information including facts, details, and other information as well as graphics and multimedia as needed.
- 8E-WP 5a:** The student will write an argument to support a claim with one clear reason or piece of evidence.
 - b:** The student will write to convey ideas and information clearly including facts, details, and other information.

HSE-RW 2c: The student will acquire and use content words and phrases.

HSE-RW 3c: The student will demonstrate knowledge of the meaning of words and phrases from reading and other content areas by using context;

HSE-CN 2c: The student will analyze information presented in different media on related topics to answer questions or solve problems.

HSE-WP 1b: The student will write to convey ideas and information using clear organization and including facts, details, and other information as well as graphics and multimedia as needed.

c: The student will write about an event or personal experience by introducing the event or experience, at least one character, and describing multiple events in sequence.

Extension Idea:

Upon completion of this experiment, students will write a text that summarizes their experiences and findings. This can be a fun way for the students to demonstrate what they have learned. Particular attention may be given to content words, figurative language, and sequence of events. Encourage students to include illustrations, tables, graphs, and digital photographs. Texts might take the form of a PowerPoint presentation, book, journal entry, newsletter, or blog. These texts might make great additions to self-selected reading libraries.

MATH

3M-MG 4a: The student will recognize that shapes in different categories can share attributes.

Extension Idea:

By completing this activity, students will see that many different items are in the magnetic jar, however they all share the same attribute of being magnetic.

3M-PSPFA 1 The student will

- a) create picture graphs from collected measurement data;
- b) use picture or bar graph data to answer questions;
- c) insert data into a preconstructed bar graph template;

5M-PSPFA 1 The student will

- a) compare two sets of data within a single data display such as a picture graph, line plot, or bar graph;
- b) represent and interpret data on a picture, line plot, or bar graph given a model and a graph to complete.

6M-PSPFA 1 The student will

- a) display data on a graph or table that shows variability in the data;
- b) summarize data distributions on a graph or table;
- c) answer a question related to the collected data from an experiment, given a model of data, or from data collected by the student.

8M-PSPFA 1 The student will

- b) describe how a graph represents a relationship between two quantities.

HSM-FS 3 The student will

- a) given data, construct a simple graph (table, line, pie, bar, or picture) and answer questions about the data.

Extension Idea:

Each student should record the results of their experiment. Data can be collected in a variety of ways and displayed as many different graphs and charts.

4M-NSCE 1b: The student will compare whole numbers ($<$, $>$, $=$);

Extension Idea:

Students can count the amount of items they have placed in the magnetic and non-magnetic jars. A comparison can then be made about the number of items in each jar.

Materials Needed:

- large bucket/container
- two smaller containers/jars
- a large lot of random items (both magnetic items and non-magnetic items)
- large strong magnet
- data recording sheet for the student to record what is and isn't magnetic

Instructional Setting:

This activity can be completed at any location where the student has space to work. The student can complete the activity at a desk/table or on the floor in either the general education or special education classroom.

Community Connections and/or Peer Interaction:

This activity can be used as a center, as a small group lesson, or as a large group lesson. If the student has the option to be in the community, this activity can be done while walking through a store, bringing a magnet along on the trip and not physically sorting the items, only recording if they are magnetic or not.

Functional Activity/Routine:

This activity encourages functional skills such as independently completing a task as well as following instructions.

Strategies to Collect Evidence:

For collection of evidence, each student will produce a data recording sheet to indicate which items were magnetic and which items were not. A choice board or voice output device will be made available for students who need adult assistance in recording their responses.

Specific Options for Differentiating this Activity:

- Students may record their data in the most appropriate way for their learning style; this may include making a list of items in each jar, creating an object graph, creating a paper/pen graph/chart, etc.
- Allow students to use their preferred "pencil" when writing. This may include a writing utensil, keyboard, alternative pencil, or dictating to a scribe.
- Prepare, as necessary, for each student to make choices and communicate with their preferred method. This may include using augmentative communication.

-For students with poor fine motor skills use a magnetic wand and a flat container in place of the jars.