Science K-2: Magnets and Motion

Intended Audience: Students with significant cognitive disabilities

# **Standards:**

SC.K.P.8.1 Sort objects by observable properties, such as size, shape, color, temperature (hot or cold), weight (heavy or light), and texture.

SC.K.N.1.2 Make observations of the natural world and know that they are descriptors collected using the five senses.

SC.1.P.8.1 Sort objects by observable properties, such as size, shape, color, temperature (hot or cold), weight (heavy or light), and weight objects sink or float.

SC.1.N.1.2 Using the five senses as tools, make careful observations, describe objects in terms of number, shape, texture, size, weight, color, and motion, and compare their observations with others.

SC.1.N.1.3 Keep records as appropriate- such as pictorial and written records- of investigations conducted.

SC.2.P.8.1 Observe and measure objects in terms of their properties, including size, shape, color, temperature, weight, texture, sinking or floating in water, and attraction and repulsion of magnets.

SC.2.N.1.3 Ask “how do you know?” in appropriate situations and attempt reasonable answers when asked the same question by others.

# **Learning Objectives:**

1. Students will identify objects that are attracted and not attracted by magnets (i.e. wood, plastic, glass and nickel, other metals).

2. Students will categorize objects into 2 groups: those objects that attract and those that repel.

3. Students will demonstrate that magnets can push or pull other objects that are magnetic.

# **Vocabulary:**

1. magnet: a piece of metal (such as iron or steel) that is able to attract certain metals

2. north pole: the part of the magnet that points toward the north when the magnet is suspended

3. south pole: the part of the magnet that points toward the north when the magnet is suspended

4. attract: to pull to, i.e. A magnet attracts iron.

5. repel: to move away, push apart

6. polarity: having positive and negative charges

# Materials:

* Prepare prior to instruction: gather magnets in varying sizes
* Prepare prior to instruction: gather objects that are not magnets (i.e. wood, glass, plastic) in varying sizes
* Video: [Magnetism for Kids](https://www.youtube.com/watch?v=DR9w4koW2EA)
* Observation sheet with 4 columns for: magnet type, attracts to magnet, does not attract to magnet, and moves object without touching
* Data chart/graphic organizer for independent work
* [Playing with Science video tutorial: Push & Pull](http://www.floridastudents.org/PreviewResource/StudentResource/173544)
* Science journals

# **Essential/Guiding Questions:**

1. How do you know which objects are attracted to magnets?

2. How do you know which objects are repelled by magnets?

3. How can magnets make objects move without touching them?

# Lesson Presentation:

**Activating Prior Knowledge:**

1.In a 2-minute talk, have students share what they know about magnets with a peer partner. Student #1 talks for 1 minute; student #2 talks for 1 minute.

2. After the 2 minute talk time, have students share out what they already know about magnets. Use a visual timer to support time to talk.

3. Tell students that they are going to learn about magnets and how they attract or repel/don’t attract other objects.

**Modeled instruction:**

1. Show the video, [Magnetism for Kids](https://www.youtube.com/watch?v=DR9w4koW2EA), as a warm up.

2. Tell the students that during science today, they will learn about magnets and observe and compare how different types of magnets affect different objects.

3. Show students a large horseshoe-shaped magnet. Tell them that magnets have the power to attract or repel other objects. Define attract and repel. Allow for exploration, asking students to describe what they are seeing and touching.

4. Show students 2 piles of objects; one pile of objects that are attracted to and repel magnets and another pile of objects that are not attracted to or repelled by magnets.

5. With the large magnet, attract and then repel an object. Explain to students what is happening.

6. Then attempt to attract and repel an object that is not magnetic. Explain what is happening and the different reaction.

**Supported/Guided instruction:**

1. Replay the video, [Magnetism for Kids](https://www.youtube.com/watch?v=DR9w4koW2EA) as a review.

2. Re-teach: Show students 2 piles of objects; one pile of objects that are attracted to and repel magnets and another pile of objects that are not attracted to or repelled by magnets.

3. With a large magnet, attract and then repel an object. Ask students what they see.

4. Then attempt to attract and repel an object that is not magnetic. Ask students what they see now? What is the difference?

5. Teacher will model how students will use the graphic organizer or chart by touching several types of magnets to an object to see if it is attracted to or repelled by the magnet or is not attracted to the magnet. Model how to record findings and observations by drawing a picture of the magnet, then marking the appropriate box/boxes with an “X.”

6. Divide the students into partners or small groups. Each pair/small group should receive several types of magnets and several objects and a chart/graphic organizer to record their findings.

7. Students will use the graphic organizer or chart (see sample in materials) to show and to confirm their observations.

8. Give each group several different types of magnets and 4 different objects. Objects do not need to be the same between each group but each group needs to have some objects that are attracted to magnets and some that are not attracted to magnets.

9. After observations are complete, teacher will review findings and record evidence and findings on a large OWL or other data gathering chart.

**Independent Work:**

1. Students will sort and count magnetic and non-magnetic objects.

2. Students will actively show that magnets can push or pull other objects that are magnetic.

**Small group suggestions:**

1. Students can work collaboratively to sort and/or categorize magnets and other objects by their magnetism.

2. Students can read an informational paragraph, [Magnet and Magnetism for Kids](https://kids.britannica.com/kids/article/Magnet-and-Magnetism/353411%20). (Running record/lexile level should match text.)

3. Students can match pictures/photos of magnetic and non-magnetic objects.

4. Students can jot in their Science journals about magnets and how they react to other objects.

# Assessment:

1. Students will categorize magnets into different categories (i.e. those that attract or repel, those that have magnetic force or those that do not).

2. Students will demonstrate that magnets can push or pull other objects that are magnetic.

2. Teachers should utilize district created rubrics to score student work.

# UDL:

**Multiple means of representation:**

1. Students can use a bar graph to show which magnets attract and which repel.

2. Students can draw a picture to represent those magnets that attract and those that repel.

3. Students can write in Science journals about magnets that attract and magnets that repel.

4. Students can orally share which magnets attract and which repel.

5. Students can work individually, in pairs, or in a small group.

6. Students can work independently with peer or adult supports.

**Multiple means of expression:**

1. Students can use an iPad or other touch device to show similarities and differences.

2. Text to speech options are available for computers, iPads and other hand held devices. Google Chrome offers free extensions, such as Selection Reader and Select and Speak-Text to Speech, and apps, such as Text to Speech, Text to Speech with Google Drive, and TTS Reader- Unlimited Text-to-Speech.

3. Speech to text options are also available from Google. Extensions include Voice Note II-Speech to Text, Online speech recognition, and Co: Writer Universal. Voice Note II is also available as an app; Speech notes-Speech to Text Notepad is available as well.

4. Additional information about text to speech and speech to text options are available through your district Assistive Technology Department.

5. Expression may come in the form of verbal responses, signed responses, pointing/gestures, eye gaze, or through the use of a low or high tech device.

6. All students should have access to expressive language/technology that is appropriate for their specific need.

**Multiple means of engagement:**

1. Provide students with choices of how to interact with materials.

2. Provide students or small groups with various places in the classroom in which to work, i.e. floor, desks, at the board.

3. Limit distractions in the work areas.

4. Encourage collaboration with peers in partners or small groups.

5. Allow students to work independently.

6. Allow students to be positioned for maximum learning engagement.

7. Provide students with additional materials, if necessary.

8. Provide supervision to students who need assistance when handling larger magnets and other heavier objects.

# Assistive Technology Recommendations:

1. All students should have a means of expressive communication and a way to be actively engaged in learning.

2. Response modes may include, but are not limited to: eye gaze, gesturing or pointing to pictures/words/phrases, signing, low tech devices (Go Talks, etc.), or dynamic devices (iPad, etc.)

3. Lesson vocabulary, photos/pictures and graphic representations should be created and/or printed prior to the lesson to provide all students with an opportunity to be engaged in discussion.

# Technology Needed:

* Smartboard

# Additional Resources:

* [Website for various magnet experiments](http://www.lovemyscience.com/cat_magnetic.html)
* Video: [Magnetism for Kids](https://www.youtube.com/watch?v=DR9w4koW2EA)
* Science Made Easy video: [How Magnets Work](https://www.youtube.com/watch?v=5C-RM4fh5Xg),
* Book (narrative): Magnet Max by Monica Lozano Hughes, Holly Weinstein, illus.
* Book (informational): Magnets: Pushing Together, Pulling Apart by Natalie M. Rosinsky, Sheree Boyd, illus.
* Book (informational): Magnets Push, Magnets Pull by David A. Adler, Anna Raff, illus.

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