1st Grade

Sample Science Learning Plan

Big Idea/ Topic
Magnets

Standards Alignment
S1P2. Obtain, evaluate, and communicate information to demonstrate the effects of magnets on other magnets and objects.
   a. Construct an explanation of how magnets are used in everyday life.
   b. Plan and carry out an investigation to demonstrate how magnets attract and repel each other and the effect of magnets on common objects.

Crosscutting Concepts: Cause and effect, Structure and function

Connections to other content areas:
MGSE1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. (*We only use two categories in this science exploration.*)

Instructional Design
Note: Magnets are going to be very difficult to address in a virtual setting if students do not have access to magnets or at least access to the internet to observe magnets in action. While most families will likely have some magnets (refrigerator, clasp on a purse, etc.) student can use to experience the effect they have on common objects, experimenting with 2 bar magnets would be helpful for students when trying to experience how magnets repel each other. You will want to talk with your families about what types of magnets they may have access to. Consider ways your school community could provide or loan these to families. It may also be helpful to print and share this entire plan with families or provide them with the Dear Family/Caregiver letter and any appropriate books from your school library.

Engage
Phenomenon: Magnets can attract (pull) and repel (push) other magnets.

Students should understand that magnets are used in everyday objects and are used to push or pull things. Some objects move only when you touch them while others move without being touched.
Have students go on a scavenger hunt looking for magnets used in their homes. Have students share what they find and where they found them.

Ask students:
- How do we move things?
- Do objects move only when we touch them?
- Are there ways to move an object without touching it?

Then move something with a magnet. Now, ask students what moved the object?

**Teacher Notes:** Teacher will explain to students that magnets can also attract and repel one another. Magnets are attracted to objects that have iron in them.

**Plugged:** Using magnets, teacher can demonstrate on video. Have them make and share observations. As they explain their observations, you may want to begin using the vocabulary “attract” and “repel.” Encourage families to find magnets together around the home to experiment with (refrigerator, clasps on items, toys, etc.). Encourage them to use care and ensure students do not put magnets in their mouths. It may also be necessary to loan materials to families.

**Unplugged:** Encourage families to find magnets together around the home to experiment with (refrigerator, clasps on items, toys, etc.). Encourage them to use care and ensure students do not put magnets in their mouths. You may also send home pictures of magnets for students to examine and share their observations. It may also be necessary to loan materials to families.

**Explore**

Using various types of magnets, students will explore how magnets push and pull.

**Plugged:** Demonstrate for students using two magnets. Explore how magnets attract and repel each other and attract other objects. Students will explore in their home to find objects that magnets are attracted to.

**Caution!** While it is unlikely that students will have access to strong magnets, they may. Strong magnets near a computer or monitor can erase pixels and data. Do not allow students to put magnets near electronics, cell phones, tablets, etc. Students should never place magnets in their mouth. Ingesting magnets can be dangerous. Communicate this with families.

Students will explore how magnets repel each other. Teachers will have students share what they find on their walk around their homes to see if the magnets repel any other objects. When the students are done exploring the teacher will ask, what did the magnets repel? Explaining to students that magnets only repel other magnets. After exploring various objects, students will see how far they can repel each other or how close they get before they attract each other. Teacher will ask probing questions, what does it feel like when the magnets get closer together at opposite poles?

**Unplugged:** Provide two bar magnets to families so they may follow the “plugged” plan above.
**Explain**

Students will explain their observations through pictures or writings. Students can also draw pictures of objects in the classroom, their homes, or school where magnets are used.

Students will compare objects that were attracted to magnets and not attracted to the magnets. Teacher should remind students of why magnets are attracted to certain objects and not others. What materials are attracted to magnets (metals like iron and steel).

**Plugged:** Have students go around the room and find one items that they think will attract magnets.

Teacher will ask probing questions:

- Why did you choose this item?
- Why would a magnet attract to this object?
- Did you find any items that magnets wouldn't attach to? Why not?

Then have students test their theories using magnets. If the magnet does not attract to the item, ask them why did they think it did not attract? Ask: Are all metals attracted to a magnet? How could you find out? Have them work in groups to discuss their choices and revise their choices as needed.

**Unplugged:** Students could use sticky notes and a magnet and place the sticky notes on items they think will attract magnets. They could then test the item. This should be a done with an adult. If they don’t have sticky notes, they could take a walk around their house and predict, discuss and test.

**Elaborate**

Magnet Powered Cars: Students will design and make magnet powered cars using magnets and toy cars. First, students will tape magnets to the tops of toys cars. Then, students will use another magnet to attract or repel the car. This experiment shows kids that the magnets can affect objects even without physically touching them. Ask students would the car be attracted to the magnet without the magnet attached to it? If so, why. If not, why not?

**Unplugged:** Make sure families have access to a small toy car and magnet.

Ask: How can a magnet push or pull a car? Where will you attach the magnet so that it will give you the best way to push or pull the car? Try different spots such as on top, on the bottom, in front, in back or on the side of the car.

Teacher Notes: It is fundamental that students understand that magnets are attracted to items that are made from iron or some metals. Also, that magnets only repel other magnets.

**Evaluate**

Students can draw pictures of items that are attracted to magnets. They may explain orally or in writing how magnets are used in everyday life. Students can sort items that are and are not attracted to magnets. The recording sheets can be used to document their explorations.
Checklist:

Standard:

S1P2. Obtain, evaluate, and communicate information to demonstrate the effects of magnets on other magnets and objects.

   a. Construct an explanation of how magnets are used in everyday life.
   b. Plan and carry out an investigation to demonstrate how magnets attract and repel each other and the effect of magnets on common objects.

Checklist:

☐ Explain how magnets are used in everyday life.
☐ Investigate how magnets attract and repel one another.
☐ Investigate the effects of magnets on common objects.

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<table>
<thead>
<tr>
<th>Evidence of Student Success</th>
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<tbody>
<tr>
<td>• Students appropriate sort items.</td>
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<tr>
<td>• Students can use recording sheets documenting their explorations by noting which items were and were not attracted to the magnet.</td>
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<tr>
<td>• Students can accurately explain how magnets interact with other magnets using “attract” and “repel” appropriately.</td>
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<tr>
<td>• Students can explain how magnets are used in everyday life.</td>
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<table>
<thead>
<tr>
<th>Student Learning Supports</th>
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<tbody>
<tr>
<td>The goal for science education in the state of Georgia is as follows: All Students, over multiple years of school, actively engage in science and engineering practices and apply crosscutting concepts to deepen their understanding of the core ideas in these fields. The learning experiences provided for students should engage them with fundamental questions about the world and with how scientists have investigated and found answers to those questions. This lesson includes the disciplinary core ideas, science and engineering practices and crosscutting concepts to actively engage students in exploring science concepts with real world topics. As part of the vision, we must support the inclusion of all students in science learning.</td>
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<tr>
<td>Some general strategies to include all students in the learning process of science are as follows:</td>
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<tr>
<td>• Provide consistent and positive feedback.</td>
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<td>• Keep directions brief and clear.</td>
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<tr>
<td>• Make sure parents and students know schedules, due dates, requirements, expectations, and how assignments/tests are going to be collected.</td>
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<td>• Share evaluation results in a timely manner to students and parents.</td>
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<tr>
<td>• Package assignments in a way that students know the sequence, what is required, when it is required, what is available as choice and what is for fun.</td>
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</tbody>
</table>
• Provide/encourage organizational strategies such as where to work, store work, when and where to turn in assignments, graphic organizers, etc.
• Provide reminders of important dates and requirements.
• Go over notebook and journal ideas and share your entries with students so they can see what you expect.
• Allow dictation and/or text to speech software programs and tools.
• Check in with students by phone or online to answer questions, give reminders, and check progress.
• Provide parents with updates on progress and upcoming assignments. Communicate often.
• Provide resources that students can access offline.
• Allow students to give information orally or in drawings.
• Model expectations and demonstrations in video/online/phone.
• The teacher should have students match letter prior to reading or writing to remind them of the alphabet.
• The teacher can have students identify words that they know in any text that they are reading.
• The teacher can provide students with sentence frames to assist students frames to help students get started writing.
• Provide students with the opportunity to interact with numbers.
• The teacher should provide multiple ways for students to gain and show their knowledge.

Some strategies specific to this lesson are as follows:
• The teacher should consider providing students with suggestions of objects to look for during their scavenger hunt.
• The teacher should have discussion guidelines to help students feel more comfortable sharing in the class and allow all students to share. This should, also, help students feel like their voices are valued.
• The teacher should be sure to give students plenty of wait time to formulate answers to the questions that are going to be discussed in class.
• The teacher may need to repeat directions and the caution statement several times during the lesson.
• The teacher should consider providing students with ideas of things to test magnets on in their homes.
• The teacher should be sure that students have multiple formats to share their knowledge. These formats could include writing, drawing or verbally explaining.
• The teacher should allow students to explain their knowledge in their own words. The scientific vocabulary will come as students work through the lesson.

### Engaging Families

• Dear Family/Caregiver Letter
• Consider loaning books and magnet kits to families.
• Share craft/activity ideas that can be done at home like [Magnet Fishing](https://example.com) where students “fish” and sort objects.
Dear Family/Caregiver:

Magnets are everywhere and fascinating for children. Many toys and gadgets use magnets and can be found in many discount stores. In first grade, we want students to have time to play freely with magnets and to observe the effects of magnets and other objects. We want them to notice how magnets are used in everyday life. We do use the terms “attract” and “repel”.

Magnets are rocks or metals that have an invisible field around them. This field attract other magnets and certain metals. The magnetic field is concentrated around the ends of magnets. These ends are called poles and all magnets have two poles: a north pole and a south pole. You can feel the magnetic force if you hold two magnets so that their poles are near each other. If you hold opposite poles near each other, north and south, you will feel an attraction between the magnets. If you hold like poles near each other, south to south or north to north, you will feel the magnets repelling each other. This is what we want students to experience. When students hear north and south poles, they may have only heard those terms in relationship to places on Earth. They may ask about the connection. Well, Earth is a giant magnet! The planet’s core consists mostly of iron. The Earth has a magnetic field that stretches around the planet and is strongest near its North and South Poles.

A simple way to begin your exploration with magnets, is to go on a scavenger hunt in your house and identify any magnet you find (refrigerator magnets, toys, magnetic latches, name tags, etc.).

Using a refrigerator magnet, students can try and see if they will attract to various objects in the home made of various materials (cloth, wood, plastic, metals, stone, etc.). They should sort the items into two groups: those that attract and those that do not attract.

⚠️ Some caution should be used when dealing with children and magnets. Never leave a child unattended with small magnets that they could ingest. While it is unlikely that your child has access to strong magnets, be aware that strong magnets near a computer or monitor can erase pixels and data. Do not allow students to put magnets near electronics, cell phones, tablets, etc.
Pictures of Magnets Interacting

This red object is a magnet. What do you observe happening on the left end of this magnet? What are paperclips made of?

*Makelite 'Genuine Pin Master' magnet - side* by EraPhernalia Vintage, ... ['playin' hooky'] :o is licensed under [CC BY-SA 2.0](https://creativecommons.org/licenses/by-sa/2.0/)

Magnets have a north pole and a south pole. When you put the north pole of one magnet near the south pole of another magnet, what do you notice? Explore what happens if you put two like poles near each other.

*attract-1* by daynoir is licensed under [CC BY-NC-SA 2.0](https://creativecommons.org/licenses/by-nc-sa/2.0/)

These items are on a refrigerator. What do you notice? What do you wonder about? How do you think these items stay attached?

*Fridge Magnets USA* by Smabs Sputzer (1956-2017) is licensed under [CC BY 2.0](https://creativecommons.org/licenses/by/2.0/)
Directions: Color the 😊 face next to the items that magnets attract or color the 😞 next to the items that magnets do not attract.

<table>
<thead>
<tr>
<th>Objects</th>
<th>Attract</th>
<th>Do Not Attract</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Objects Image" /></td>
<td>😊</td>
<td>😞</td>
</tr>
<tr>
<td><img src="image2" alt="Objects Image" /></td>
<td>😊</td>
<td>😞</td>
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<tr>
<td><img src="image3" alt="Objects Image" /></td>
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<td><img src="image4" alt="Objects Image" /></td>
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<tr>
<td><img src="image5" alt="Objects Image" /></td>
<td>😊</td>
<td>😞</td>
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How many objects were attracted to the magnet?

How many objects were not attracted to the magnet?

Were more objects attracted to the magnet or not attracted to the magnet? How many more?
**Directions:** Color the 😊 face next to the items that magnets attract or color the 😞 next to the items that magnets do not attract.

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<tr>
<th>Objects</th>
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<tbody>
<tr>
<td>Screw</td>
<td>😊</td>
<td>😞</td>
</tr>
<tr>
<td>Book</td>
<td>😊</td>
<td>😞</td>
</tr>
<tr>
<td>Refrigerator</td>
<td>😊</td>
<td>😞</td>
</tr>
<tr>
<td>Balloons</td>
<td>😊</td>
<td>😞</td>
</tr>
<tr>
<td>Apple</td>
<td>😊</td>
<td>😞</td>
</tr>
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</table>

How many objects were attracted to the magnet?  
How many objects were not attracted to the magnet?  
Were more objects attracted to the magnet or not attracted to the magnet?  
How many more?
**Directions:** Draw a picture or write the name of the object you are testing. Color the appropriate face.

<table>
<thead>
<tr>
<th>Objects</th>
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<tbody>
<tr>
<td><img src="smiley.png" alt="Smiley" /></td>
<td><img src="sad.png" alt="Sad" /></td>
<td></td>
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