

4

Lesson Exemplar for Science

Quarter 3

Lesson

2

GOVERNMENT PROPERTY
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Lesson Exemplar for Science Grade 4
Learning Resource Unit on Describing Force
Quarter 3: Lesson 2 (Week 2)
S.Y. 2024-2025

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LESSON EXEMPLAR




SCIENCE / QUARTER 3 / GRADE 4

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	<p><i>The learners learn that:</i></p> <ol style="list-style-type: none"> 1. Science processes help in observing and predicting how things move. 2. Pushes and pulls can change the position and shape of objects. 3. Gathering scientific information helps explain the behavior of objects and materials. 4. Magnets affect some objects and materials without touching them. 5. Energy is present whenever there is movement, sound, light, or heat.
B. Performance Standards	<p><i>By the end of the quarter, learners use simple equipment and processes to measure and record data related to movement and describe and predict the way things around them move using more scientifically technical language and concepts, such as speed and force. They demonstrate an understanding that science processes are used to gain a deeper understanding about forces that cannot be seen directly, including the properties of magnets.</i></p>
C. Learning Competencies and Objectives	<p><i>Learning Competency 1: The learners identify examples of how objects can affect other objects even when they are not in contact with each other, such as magnets attracting other objects.</i></p> <p><i>Learning Competency 2: The learners carry out guided investigations to identify the properties of magnets, including how they affect other magnets and objects made of different materials.</i></p> <p><i>The learners will be able to:</i></p> <ol style="list-style-type: none"> 1. <i>Lesson Objective 1: identify common magnetic materials (e.g., iron, steel, nickel) and non-magnetic materials.</i> 2. <i>Lesson Objective 2: recognize that magnets' opposite poles attract while like poles repel.</i> 3. <i>Lesson Objective 3: identify and describe key properties of magnets, such as polarity, strength, and the ability to attract certain objects.</i>
C. Content	<p>Force Exerted by a Magnet (Force at a Distance) and Properties of a Magnet</p> <ul style="list-style-type: none"> • Force can be exerted without touching an object, like the force exerted by a magnet. • Magnets attract materials made of iron, nickel, and cobalt. Materials that do not contain these metals are non-magnetic, like wood, plastic, cloth, etc. • Earth is a big magnet. • The strength of magnets varies. • Magnets have two poles, the north (N) and the south poles (S).

	<ul style="list-style-type: none"> • Similar poles repel while opposite poles attract. • Many objects used in our daily lives contain magnets, like speakers, cell phones, magnetic locks of bags and wallets, and refrigerator magnets, among others.
D. Integration	<p>Technology - Applications of magnets in various technologies, such as magnetic levitation trains, MRI machines, and electric motors. Many objects used in our daily lives contain magnets, like speakers, cell phones, magnetic locks of bags and wallets, and refrigerator magnets, among others.</p> <p>Gratitude (Grade 3 GMRC & VE): Being grateful for the “treasures” or “something” of great worth in one’s family, school, community, and country like parents, teachers, classmates, and friends.</p>

II. LEARNING RESOURCES

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- *Magnetic field experiment with magnet bars Free Vector.* (2019, October 31). Freepik. <https://tinyurl.com/5yc8a3ed>
- Freepik (n.d.). *Discover the best free graphic resources about magnet with the same poles, 81,716 results.* <https://tinyurl.com/ycy7hser>
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- Monica Lozano Hughes, & Weinstein, H. (2015). *Magnet Max*. Brown Books Publishing Group.

III. TEACHING AND LEARNING PROCEDURE		NOTES TO TEACHERS												
<p>A. Activating Prior Knowledge</p>	<p>DAY 1</p> <p>1. Short Review</p> <p>A. Think-Pair-Share (5 minutes)</p> <p>Instruct the students to think about the following questions and make individual written responses in their science notebooks. After writing their responses, they will share their answers with their seatmates.</p> <ol style="list-style-type: none"> 1. When force is applied, does it always require contact between the two objects involved? 2. Is it possible for us to push or pull an object without touching it? Explain your answer. 	<p>Start by introducing the Think-Ink-Share activity. Elicit several responses from your students.</p> <ol style="list-style-type: none"> 1. No, force doesn't always require direct contact between the objects involved. Forces can act at a distance like gravity and magnetic force. 2. Yes, it's possible for us to push or pull an object without touching it, like using a magnet to pull a magnetic object. 												
<p>B. Establishing Lesson Purpose</p>	<p>1. Lesson Purpose</p> <p>Activity 1: Self-Assessment (5 minutes)</p> <p>Instructions: Read the listed learning targets below. Instruct the students to assess themselves to see if they have developed these skills already and rate themselves according to the guide below. They write their ratings in the column Before Learning the Lesson. After learning the lesson, we will go back to this.</p> <p style="text-align: center;">  I still need help to do this.  I can do this by myself.  I can do this by myself and in different ways. </p> <table border="1" data-bbox="477 1098 1637 1362"> <thead> <tr> <th>Learning Targets</th> <th>Before Learning the Lesson</th> <th>After Learning the Lesson</th> </tr> </thead> <tbody> <tr> <td>1. I can identify how magnets affect other objects.</td> <td></td> <td></td> </tr> <tr> <td>2. I can identify common magnetic materials (e.g., iron, steel, nickel) and non-magnetic materials.</td> <td></td> <td></td> </tr> <tr> <td>3. I can recognize that magnets opposite poles attract while like poles repel.</td> <td></td> <td></td> </tr> </tbody> </table>	Learning Targets	Before Learning the Lesson	After Learning the Lesson	1. I can identify how magnets affect other objects.			2. I can identify common magnetic materials (e.g., iron, steel, nickel) and non-magnetic materials.			3. I can recognize that magnets opposite poles attract while like poles repel.			<p>Guide the learners in answering the Self-Assessment activity. As a class, review each learning target on the list and ask them to rate themselves individually. After they answer each item, ask how many rated themselves with one, two, or three stars. Let them raise their hands or stand to be identified. This gives an idea of how many need to learn more about the lesson and how many have already developed the skills. You may ask them to copy the table with the learning targets in their notebook since this will be revisited at the end of the lesson.</p>
Learning Targets	Before Learning the Lesson	After Learning the Lesson												
1. I can identify how magnets affect other objects.														
2. I can identify common magnetic materials (e.g., iron, steel, nickel) and non-magnetic materials.														
3. I can recognize that magnets opposite poles attract while like poles repel.														

4. I can identify and describe key properties of magnets, such as polarity, strength, and the ability to attract certain objects.

2. Unlocking Content Area Vocabulary

Oral Recitation: Define the Word (5 minutes)

Instructions: Using your homework, define the following terms:

Term	Definition
1. Magnets	
2. Repel	
3. Attract	
4. Demagnetization	

Part 2:

1. Magnets	A magnet is a natural rock or a metal object capable of attracting specific types of metal towards it.
2. Repel	To force something to move away
3. Attract	To pull something toward another thing
4. Demagnetization	The reduction or complete removal of a materials's magnetic properties

In the unlocking of vocabulary, conduct an oral recitation for students to define the terms for this week using their homework.

C. Developing and Deepening Understanding

1. Explicitation

Introduction (5 minutes)

Introduce this lesson on magnets by asking if it is possible to push or pull an object without touching it.



a. Did You Know?

Motivate students to learn more about magnets by giving fun facts about magnets.

Did you know that the Earth is a large magnet?

The Earth possesses a magnetic north and magnetic south, with invisible lines of magnetic force extending from the north to the south.

b. What Do You Know?

Students' answers may include magic, having superpowers, and magnetism. If students mention magnets, ask more questions about what they already know. Tell them that there are forces in nature that can push or pull objects without touching them.

For this lesson on magnets, you will need magnets. You may conduct the activities in groups with five to ten magnets. Always remind students to think of safety first, and they should help each other in group activities.

Engage students in a discussion about what they know about magnets using the questions below:

1. Do you have an object with you right now or at home that has a magnet? What is it used for?
2. How does a magnet affect other objects?
3. What kinds of objects are attracted to a magnet?

c. What Will You Know?

Activity 2: Anticipation-Reaction Guide (5 minutes)

Below are statements about magnets. On the column before the statements, put a check [/] mark if you agree with the statement and an X if otherwise. Do not answer the column after the statements.

Before (Anticipation)	Statement	After (Reaction)
	1. All metals are attracted to magnets.	
	2. Magnets can lose their magnetic properties over time.	
	3. Plastic and glass are attracted to magnets are attracted to magnets.	
	4. You can cut a magnet in half to create two separate magnets.	
	5. Magnets have a single pole, either north or south.	

d. Class Interaction (20-25 minutes)

Discuss with the students what magnets are and their basic properties, such as having poles (north and south), the ability to attract certain materials, and the concept of repulsion between like poles.

- Force can be exerted without touching an object, like the force exerted by a magnet.
- Magnets attract materials made of iron, nickel, and cobalt. Materials that do not contain these metals are non-magnetic, like wood, plastic, cloth, etc.

You may look for other fun facts about magnets. If you have a globe, you may also show it to them.

Establish connections between the lesson and their knowledge by asking the guided questions.

1. Students' responses may vary and include a ref magnet or magnetic lock of a wallet. You may mention applications of magnets in various technologies, such as magnetic levitation trains, MRI machines, and electric motors. Many objects used in our daily lives contain magnets, like speakers, cell phones, magnetic locks of bags and wallets, and refrigerator magnets, among others.
2. A magnet can attract objects if they are within the magnet's magnetic field.
3. Magnets attract objects made of iron, nickel, or cobalt.

For now, ask the students to answer the Before column. All answers are accepted as this is based on what they know so far. Make sure to return to it when you finish the activities on magnets. In the After column, students must respond to what they have learned.

- The strength of magnets varies. Its strength is determined based on its size and the number of its tiny magnets (magnetic domains) that are aligned.
- Magnets have two poles, the north (N) and the south poles (S).
- Similar poles repel while opposite poles attract.
- Magnets can lose their magnetism over time, which is called demagnetization. However, this process typically occurs very slowly, and in many cases, magnets can retain their magnetic properties for years or even decades without significant loss. The rate of demagnetization depends on various factors, including the material composition of the magnet, exposure to high temperatures, physical damage, and exposure to strong external magnetic fields.
- If you cut a permanent magnet in half along its axis, each half will typically retain its magnetic properties and behave as a smaller magnet. However, the strength of each resulting magnet may be slightly weaker than the original due to the cutting process and potential damage to the material.
- Many objects used in our daily lives contain magnets, like speakers, cell phones, magnetic locks of bags and wallets, and refrigerator magnets, among others.

DAY 2

2. Worked Example

a. Activity 3: Reading a Story-Magnet Max (15-20 minutes)

Present the story titled Magnet Max. You may use the *Magnet Max - Read by Mrs Smalley* on YouTube. It's written by Monica Lozano Hughes and illustrated by Holly Weinstein.

There once was a boy named Magnet Max, who wanted to test what magnets attract. He loved to explore with objects galore to see what kinds of things would react. One sunny day, Magnet Max went to play at Nick's house. Nick did not know this great find. Max showed him the habit of his wonderful magnet. Watching it work blew Nick's mind!
 "Wow," Nick yelled. "That's swell!" The magnet's powers gave him a thrill. Magnet Max made no reply. With the wink of an eye, he made his magnet attract at his will. Nick leaped up with glee at the magic, you see, and asked, "How do you get them to

Reiterate that there are forces that do not require contact with an object. They are called non-contact forces, which will be covered in Grade 5.

A magnet is a rock or a metal that can attract other metals. Its force is called magnetic force, which can pull magnetic objects without touching them.

Magnets come in different shapes and sizes, but they have the same properties. They have poles (north and south) where their magnetic force is strongest. Around the magnet is a magnetic field within which its magnetic force acts.

Use a short story to present some information about magnets. You may play the video if you can project it or read the story yourself. Make sure to give them the guide question before starting. Ask them

stick?” “Magnets give off a magnetic field,” Max replied. “They stick to anything, like iron or steel, real quick!”

“If you please, even nickel and cobalt can be attracted with ease. There are so many possibilities!”

“These are metals that can be part of many things, such as rings, and being magnetic is key.”

So on that day, the boys decided to play by searching for things they could find. They looked for metal objects all about, in and out, and found many items. A paper clip, the refrigerator, a nail and a bolt were attached to the magnet with force.

Nick exclaimed, “Goodness sakes! I’m amazed at the magic it makes! Can we get it to stick to a horse?”

But a shoe, a ball, a plant, and a doll could not stick to the magnet, of course. “These items are not magnetic or kinetic,” said Max. “They don’t have the special force.”

The day had gone by as they searched far and wide in the house for more objects to test. They heard Nick’s mom call from way down the hall. “Max, your mom says it’s time to go rest.” Max and Nick said, “Aw man!”

“We’ve just begun. We aren’t done. We were just about to test out a comb!”

They both looked at the magnet, wanting more to explore. It was time for Max to go home. Then Max said, “How about we hang out tomorrow, and we can continue our play?” As Nick walked home, he thought of what they suggested and tested and how fun it was to explore today.

Max wanted to share his tool, that’s so cool so other kids could feel the same joy. He lay down in bed to relax. Then, closing his eyes, he dreamed of how wise he would be as the explorer Magnet Max!

Before proceeding to the next activity, ask the students to answer the guide questions about the story:

1. Who are the characters? What did they do to magnets?
2. How do magnets affect other objects?
3. What kinds of objects are attracted to a magnet?

Discuss students’ answers to the guide questions. Discuss with them the properties of magnets, such as polarity, strength, and ability to attract certain materials without touching them.

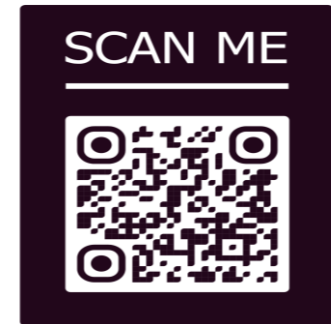
b. Activity 4: Will it attract? (20-25 minutes)

Begin the next activity by discussing with students the concept of magnetism and how magnets attract certain materials. Introduce the activity by telling

to write their answers in the science notebook.

Please unlock the meaning of terms that students are not familiar with. Before reading the story, give the guide questions to the students so they can take note of answers from the story.

You may use the link or the QR code below to access the story on YouTube:



Link: <http://bit.ly/3T4AcVR>

Answers to the guide questions:

1. The characters are Max and Nick. They tested what materials are attracted to Max’s magnet.

the students that they will be identifying objects attracted and not attracted to a magnet.

In Activity 4: Will it attract? they are presented with pictures of magnetic and non-magnetic objects. They will draw a line from the magnet to the things it will attract.

Discuss their answers to the process questions:

1. Which objects are attracted to the magnet? Why?
2. Which objects are not attracted to the magnet? Why?

Show the YouTube video Fun with Magnets. Guide students to come up with this conclusion: magnets attract materials made of iron, nickel, and cobalt, and materials that do not contain these metals are non-magnetic like wood, plastic, cloth, etc.

DAY 3

3. Lesson Activity

Introduce the idea of a "Magnet Treasure Hunt" and explain that they will be exploring the classroom or designated area to find objects with magnetic properties.

Activity 5: Magnet Treasure Hunt (35-40 minutes)

A. Magnetic or Non-Magnetic

2. Magnets can pull magnetic materials.
3. The magnet attracted a paper clip, a refrigerator, a nail, and a bolt.

Answers to Activity 4 process questions:

1. The paper clip, the nail, and the keys are attracted to the magnet because they are magnetic metals.
2. The pencil, eraser, wooden chair, paper, and crayons are not attracted to the magnet because they are non-magnetic materials.

You may use the link or the QR code below to access the video on YouTube:



SCAN ME

<https://bit.ly/40MkzDW>

In activity 5, you will need two magnets with the north and south poles labeled. You may group the students according to the number of magnets available.

1. Divide the students into small groups or pairs and provide each group with a bar magnet or any available magnet, a container of objects, and a worksheet for recording observations.
2. Instruct the students to use the magnet to explore the objects in their container. They should test each object to determine whether it is magnetic or non-magnetic. They should categorize the objects into "Magnetic" and "Non-Magnetic."

Process Questions:

1. How did you decide which materials belonged to the group that is attracted to magnets and which ones did not?
2. What are the characteristics of the objects attracted to the magnet?
3. Why do you think certain materials are attracted to magnets while others are not?

Before conducting the treasure hunt activity, integrate their GMRC & VE lesson on gratitude. Guide them to be grateful for the “treasures” or “something” of great worth in their family, school, community, and country like parents, teachers, classmates, and friends.

Activity 5A: Magnetic or Non-Magnetic

Magnetic	Non-magnetic
paper clip iron nail keys metal keychain	eraser crayons paper cloth plastic coins

Possible answers to the process questions in Activity 5A:

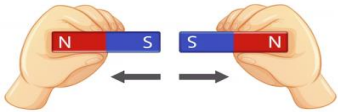
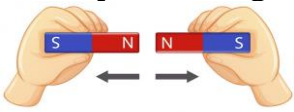
1. The materials that got stuck into the magnet when placed near it are classified as magnetic while the ones that did not get stuck to the magnets are the non-magnetic.
2. The objects attracted to the magnet are magnetic metals. The ones that are not

B. Magnets Push or Pull

1. Students will explore how magnets react with other magnets. Before conducting the activity, they must predict what will happen if the magnets' poles are placed next to each other.

Activity	Prediction
<p>South to South Place two magnets 5 centimeters away with both south poles facing each other.</p>	
<p>North to North Place two magnets 5 centimeters away with both north poles facing each other.</p>	
<p>North to South Place two magnets 5 centimeters away, with the south pole of one magnet facing the other magnet's north pole.</p>	

2. Conduct the activities given in the table below to observe how magnets behave. Write your observations and illustrate what you observe. Use arrows to indicate if magnets pull or push each other away. Explore further by moving the magnets closer or farther from each other.

Activity	Observation and Illustration
<p>South to South Place two magnets 5 centimeters away with both south poles facing each other.</p> 	
<p>North to North Place two magnets 5 centimeters away with both north poles facing each other.</p> 	

attracted to the magnet are made of paper, plastic, cloth, and other non-magnetic materials.

Activity 5B: Magnets Push or Pull Predictions

- The two magnets will push each other away.
- The two magnets will push each other away.
- The two magnets will attract each other.

Synthesis:

Bring the class together for a synthesis activity where students share their findings and discuss any patterns or surprises in the magnetic and non-magnetic materials they discovered.

Ask students to consider how the properties of magnets, such as polarity and attraction/repulsion, were demonstrated during the treasure hunt.

Extended Practice:

Extend the learning by challenging students to create their own "Magnet Treasure Hunt" at home. They can involve family members, categorize objects, and present their findings to the class, briefly explaining their process.

Provide additional magnetic and non-magnetic materials for further exploration, including items with

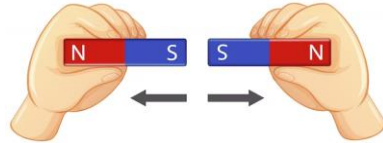
North to South or South to North

Place two magnets 5 centimeters away, with the south pole of one magnet facing the north pole of the other magnet.



South to South

Place two magnets 5 centimeters away with both south poles facing each other.



Process questions:

1. What are the characteristics of objects attracted to the magnet? What about the ones not attracted to the magnet?
2. What have you observed when you moved the magnets closer or away from each other?
3. What conclusion can you draw about magnets based on this activity?

C. Video Presentation: Show the class the YouTube video titled Magnets and Magnetism | Magnets Video for Kids to combine all lessons learned about magnets. (10 minutes)

Magnets exert a force of attraction on materials containing iron, steel, nickel, or cobalt. Additionally, magnets can draw other rigid magnets closer or push them away (repel). This happens because of the magnet's two contrasting ends, or poles: a north pole and a south pole. North poles are drawn to the south poles of other magnets while they repel other north poles, and south poles exhibit similar behavior, attracting north poles and repelling other south poles.

varying shapes, sizes, and compositions.
Differentiation:

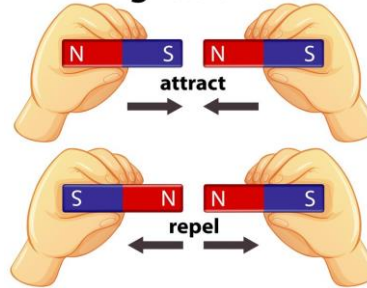
For students who grasp the concepts quickly, introduce a more advanced extension by exploring the magnetic field around different objects using iron filings, or experiment with the strengths of magnets and how they influence their ability to attract objects. Offer additional support and guidance for students who may need it by providing clear instructions, using visual aids, or conducting a small group treasure hunt with a teacher's assistance.

Possible answers to Activity 5B process questions:

1. When we moved the two magnets with unlike poles farther, they no longer attracted each other, but when we moved them closer, they pulled each other fast.
2. Magnets can attract magnetic materials at a certain distance. Moving a magnet away or close to a magnetic material changes its magnetic force.

You may use the link or the QR code below to access the Magnets and Magnetism | Magnets Video for Kids video on YouTube:

Magnetic Force



Picture Link: <https://tinyurl.com/ypmw9fkb>



SCAN ME
Link: <https://bit.ly/3R4kU1C>

D. Making Generalizations

DAY 4

1. Learners' Takeaways (10 minutes)

Anticipation-Reaction Guide

Below are statements about magnets. On the column after the statements, put a check [/] mark if you agree with the statement and an X if otherwise. Compare your answer with your previous response.

Before (Anticipation)	Statement	After (Reaction)
	1. All metals are attracted to magnets.	
	2. Magnets can lose their magnetic properties over time.	
	3. Plastic and glass are attracted to magnets.	
	4. You can cut a magnet in half to create two separate magnets.	
	5. Magnets have a single pole, either north or south.	

2. Reflection on Learning (10 minutes)

Self-Assessment

Instructions: Revisit the Self-Assessment checklist used at the start of this week. Ask your students to write their self-assessment ratings using the scale below in the third column of the table below.

Go back to the Anticipation-Reaction Guide used at the start of the lesson. Ask your students to write their reaction whether they agree or not to the given statements about magnets in the last column of the table.

