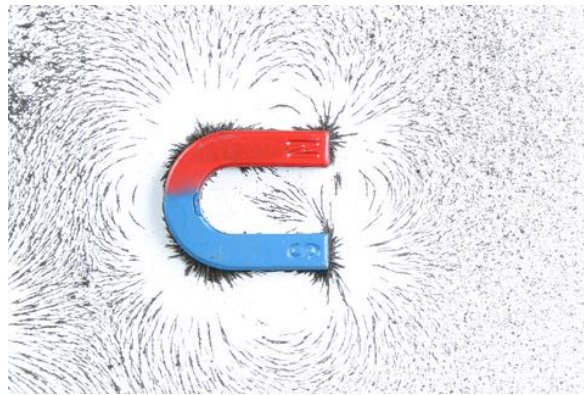




NASA Spotlite Interactive Lesson

Magnets and Metals Grades 3-5



Student Packet



NASA Spotlite Interactive Lesson Guide



What are NASA Spotlites?

NASA Spotlites are 90-120 second student-produced video segments that address common science misconceptions.

NASA Spotlites are designed to increase scientific literacy in a standards-based classroom. By producing Spotlite videos, students gain production experience, as well as deepen their understanding of science content. Approved NASA Spotlites can be found at the NASA eClips website. <https://lfnasaclips.arc.nasa.gov>



A misconception is a view or opinion that is incorrect because it is based on faulty thinking or understanding.

This is an Interactive PDF. Features in this packet may include:

- fillable boxes
- quick checks
- multiple choice questions
- interactive GIFs (graphics interchange format)
- links to videos and online interactives

The hyperlinks included in this document open PDFs or webpages and may perform differently based on the device being used. Links may have to be cut and pasted into a web browser to open. PDFs and other documents may need to be downloaded to view.

Try using Adobe Acrobat Reader and Flash Player for optimal performance of all interactive features included in this guide.

Save



Remember to save your responses.

Under "file" choose "save as."

Type your name in front of the document name.

Choose "save."

Pretest

Magnets and Metals Grades 3-5 Pretest NASA Spotlight Interactive Lesson

Read each question and select the best choice.

1. A material that has a magnetic field that can attract
repel other magnetic materials is

2. The region around a magnet where its force
attracts or repels is called

3. Magnets attract

4. Which of the following materials would be attracted
to a magnet?

5. Sarah was testing the following items to see if
they could be picked up by her horseshoe magnet.
Which item was she able to pick up?



A. mixed metal nickel (75% copper)



B. aluminum foil ball



C. iron screw



D. aluminum can

Engage

In today's lesson you will learn about magnets. Using interactive Frayer Models, you will learn key vocabulary that will help you understand the materials that are attracted to magnets.

What do you already know about magnets?

True or False: All metals are attracted to magnets.

Spotlite Video

Next, you will watch a short video about magnets and metals. As you watch the video, pay close attention to any new vocabulary.

NASA Spotlites about Magnets:



NASA eClips™ Website - <https://nasaclips.arc.nasa.gov>
NASA eClips™ YouTube - <https://youtu.be/4miSpNimwqw>



NASA eClips™ Website - <https://nasaclips.arc.nasa.gov>
NASA eClips™ YouTube https://youtu.be/_5QlwGKfHRQ

Explore

Explore Activity

Explore the metallic samples attracted to the magnet. Look at the samples and find common characteristics. Can you think of any other samples to test?

1. paper clip

2. nickel

3. penny

4. paper

5. aluminum foil



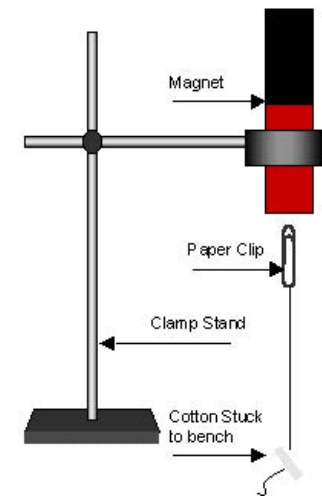
Use two magnets to demonstrate that a magnet has two ends or poles that will attract or repel from the poles of another magnet.

What did you discover?

Tape one end of a piece of string to a desk; tie the other end onto a paper clip. Take a second piece of string and suspend the magnet from a ruler anchored with books. Adjust the level of books so that the distance between the magnet and the paper clip allows the clip to stand up without touching the magnet.

You can place pieces of paper or cloth between the clip and the magnet to show the strength of the magnetic force. Can you find materials that block magnetic forces?

With the string still attached, try to raise the paper clip from the desk with a magnet without letting the magnet and paper clip touch. How were you able to accomplish this? What methods and strategies did you use?



Activity Credit:

<https://spacemath.gsfc.nasa.gov/NASADocs/magbook2002.pd> f#page=8

Explore

Think-Pair-Share

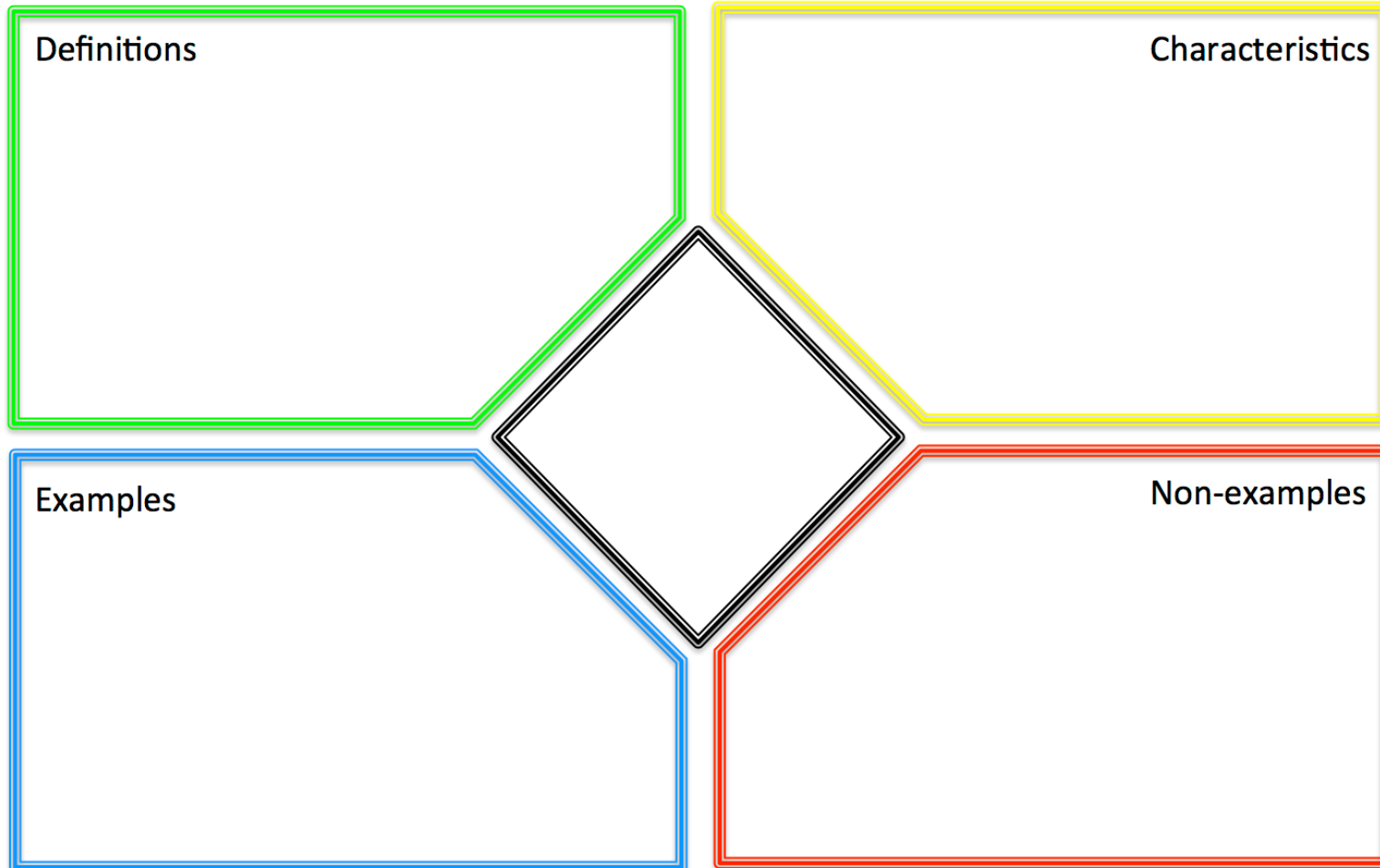


What kinds of materials are attracted to magnets?

Explain


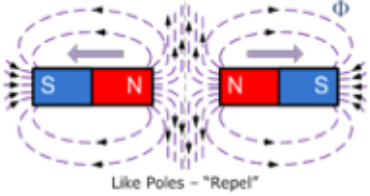


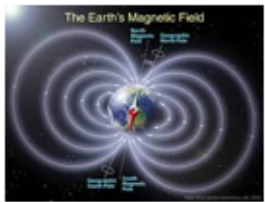
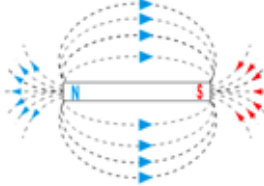
Frayer Model for Vocabulary Development

Use the graphic organizer to write definitions, characteristics, examples and non-examples for a vocabulary word. You can include drawings, graphics, and diagrams.

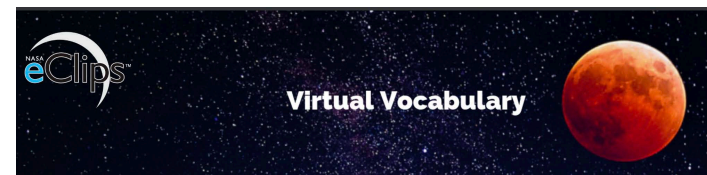


The diagram is a Frayer Model graphic organizer. It consists of a central diamond shape with a double black border. Four rectangular boxes are attached to the sides of the diamond, each with a double border of a different color: green for the top-left box, yellow for the top-right box, blue for the bottom-left box, and red for the bottom-right box. The boxes are labeled as follows: 'Definitions' in the top-left, 'Characteristics' in the top-right, 'Examples' in the bottom-left, and 'Non-examples' in the bottom-right.

Explain

Word	Definition	Word	Definition
MAGNET 	A magnet is a metal that has the property of attracting certain substances such as iron.	REPEL 	Repel means to push away.
ATTRACT 	To attract is to pull together.	IRON <small>26: Iron 2,8,14,2</small> 	Iron is a malleable, silver-white metallic element with the chemical symbol: Fe
MAGNETIC FIELD 	A magnetic field is the region around a magnet where its force attracts or repels materials.	POLE 	A pole is one of the two ends of a magnet where the magnetic force is the strongest.

Visit the NASA eClips™ Virtual Vocabulary for more definitions.



Posttest

Magnets and Metals Grades 3-5 Pretest / Posttest NASA Spotlight Interactive Lesson

Read each question and select the best choice.

1. A material that has a magnetic field that can attract or repel other magnetic materials is

2. The region around a magnet where a magnetic force can be found is called

3. Magnets attract

4. Which of the following materials would be attracted to a magnet?

4. Sarah was testing the following items to see if they could be picked up by her horseshoe magnet. Which item was she able to pick up?



A. mixed metal nickel (75% copper)



B. aluminum foil ball



C. iron screw



D. aluminum can

Elaborate/Extend

Elaborate/Extend Activity NASA Connection



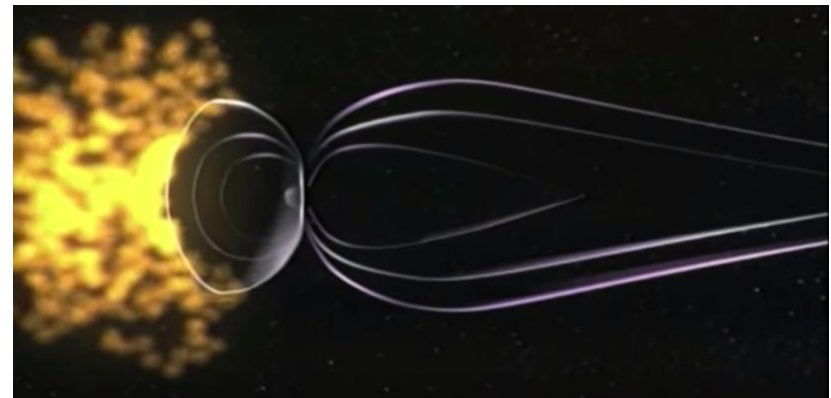
Watch one of these videos to learn more about Earth's magnetic field, called the magnetosphere.



Video Link - **Earth's Magnetosphere**

<https://science.nasa.gov/science-news/news-articles/earths-magnetosphere>

How does this magnetic field protect Earth?



Video Link – **Our World: The Sun, A Real Star**

<https://nasaclips.arc.nasa.gov/video/ourworld/our-world-the-sun-a-real-star>

Evaluate

Identify Misconception

What is a common misconception people have about magnets and metals and how can you correct the misconception?



NASA eClips™ Website - <https://nasaclips.arc.nasa.gov>
NASA eClips™ YouTube https://youtu.be/_5QlwGKfHRQ

Vocabulary Review

Most asteroids are composed mainly of rocky material, along with some clays and metals. Others are made mostly of the metals iron, nickel and cobalt, and may even contain platinum and gold. How could magnetic properties be used to sort the asteroids?

Carefully re-watch the NASA Spotlight videos to assess your understanding about which materials are attracted to magnets.

NASA Spotlight: Magnets and Metals



NASA eClips™ Website - <https://nasaclips.arc.nasa.gov>
NASA eClips™ YouTube - <https://youtu.be/4miSpNimwqw>

Product Information

Image Credit:

Cover: <https://www.nasa.gov/audience/forstudents/k-4/dictionary/Magnet.html>

Ferromagnetic materials: <https://commons.wikimedia.org>

Lines of Magnetic Flux: <https://www.electronics-tutorials.ws/wp-content/uploads/2018/05/electromagnetism-mag3.gif> Magnetic

Materials: <https://www.electronics-tutorials.ws/wp-content/uploads/2013/08/mag1.gif?fit=447%2C141>

U.S. Circulating Coins Composition History: <https://www.usmint.gov/learn/history/coin-production>

pole magnets: <https://imgaz.staticbg.com/thumb/large/2014/xuzijiao/04/SKU193397/SKU193397.jpg>

magnet string paper clip: https://upload.wikimedia.org/wikipedia/commons/3/3d/Indian_rope_trick.png

Images on pretest and posttest: <https://www.publicdomainpictures.net>

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