

Cause and Effect • Compare and Contrast



Unit Essential Question

How do magnets interact with one another and other objects?

UNIT DESCRIPTION

In this “Magnetic Masterpieces!” unit, students will explore and discover the world of magnets through the arts. They will do hands on arts projects and make real world connections to gain in depth understanding of how magnets work. Students will use visual arts, theatre, and music to strengthen their science and art content knowledge.

PROJECTS

- Magnetic Discovery Painting
- Magnetic Slime
- Magnetic Drama
- Magnetic Rap

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Units provide differentiated ideas and activities aligned to a sampling of standards. The units do not necessarily imply mastery of standards, but are intended to inspire and equip educators.

Produced through the U.S. Department of Education: Arts in Education—Model Development and Dissemination Grants Program
Cherokee County (GA) School District and ArtsNow, Inc.

Unit Description	Table of Contents
<p>In this “Magnetic Masterpieces!” unit, students will explore and discover the world of magnets through the arts. They will do hands on arts projects and make real world connections to gain in depth understanding of how magnets work. Students will use visual arts, theatre, and music to strengthen their science and art content knowledge.</p>	<ul style="list-style-type: none"> ● Magnetic Discovery Painting ● Magnetic Slime ● Magnetic Drama ● Magnetic Rap

UNIT ESSENTIAL QUESTION

How do magnets interact with one another and other objects?

CROSS-CUTTING INTERDISCIPLINARY CONCEPT

Compare and Contrast
Cause and Effect

REAL WORLD CONTEXT

Students will explore magnets through the use of everyday objects. They will discover why certain objects are attracted to magnets, while others are not. They will also discover why the poles of magnets attract and repel each other. We will explore the world of Disney to see how they use magnets throughout the park every day. We will also look at how magnets are used in sorting materials at recycling centers.

STANDARDS

Curriculum Standards	Arts Standards
<p>S3P2 Students will investigate magnets and how they affect other magnets and common objects. a. Investigate to find common objects that are attracted to magnets. b. Investigate how magnets attract and repel each other.</p> <p>CCSS.ELA.W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</p> <p>CCSS.ELA-Literacy.W.3.1.d Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</p> <p>CCSS.ELA-Literacy.V.3.2.b Develop the topic with facts, definitions, and details.</p> <p>CCSS.ELA.Literacy.V.3.3.a Use dialogue and descriptions of actions, thoughts, and feeling to</p>	<p>VA3PR.1 Creates artworks based on personal experience and selected themes. b. Creates artworks emphasizing one or more elements of art (e.g., color, line, shape, form, texture).</p> <p>VA3PR.2 Understands and applies media, techniques, and processes of two-dimensional art processes (drawing, painting, printmaking, mixed-media) using tools and materials in a safe and appropriate manner to develop skills. f. Creates paintings with a variety of media (e.g., tempera, watercolor).</p> <p>VA3PR.3 Understands and applies media, techniques, and processes of three-dimensional works of art (ceramics, sculpture, crafts, and mixed-media) using tools and materials in a safe and appropriate manner to develop skills. b. Creates sculpture using a variety of methods (e.g., paper-mâché, cutting, folding, found objects).</p>

<p>develop experiences and events or show the response of characters to situations.</p> <p>MGSE3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. See Glossary: <i>Multiplication and Division Within 100</i>.</p>	<p>TAES3.2 Developing scripts through improvisation and other theatrical methods.</p> <p>c. Develops characters and setting through action, sensory details, cause and effect relationships, and Dialogue.</p> <p>e. Creates scripts that are appropriate in purpose, expectations, and length for the audience.</p> <p>TAES3.3 Acting by developing, communicating, and sustaining with roles within a variety of situations and environments.</p> <p>a. Communicates a character's actions, motives, emotions, and traits through voice, speech, and language.</p> <p>M3GM.1 Singing, alone and with others, a varied repertoire of music.</p> <p>a. Sing melodies in the range of an octave using appropriate head voice accompanied and unaccompanied.</p> <p>M3GM.2 Performing on instruments, alone and with others, a varied repertoire of music.</p> <p>a. Perform rhythmic patterns using body percussion as well as a variety of instruments with appropriate technique.</p>
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ASSESSMENTS

<p>Summative Assessments</p>
<ul style="list-style-type: none"> ● Pre/Post Test ● Magnetic Discovery Rubric ● Magnetic Slime Rubric ● Magnetic Drama Rubric ● Magnetic Rap Rubric

CHARACTER EDUCATION COMPONENTS

CHARACTER ATTRIBUTES ADDRESSED

<p>In “Magnetic Rap,” third grade classes will perform their rap for first grade classes. The reason for this pairing is because both grade levels learn about magnets. The first grade students will watch and critique the performance, ask questions, and give compliments.</p>	<ul style="list-style-type: none"> ● Respect to others ● Collaboration with one another ● Ensemble skills (working together)
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PARTNERING WITH FINE ARTS TEACHERS

<p>Music Teacher:</p> <ul style="list-style-type: none"> ● Enhance the creation of the rap and the percussive elements of the performance. The music teacher can encourage students to create a rhythm for the rap using percussion instruments.

Visual Arts Teacher:

- “Magnetic Slime” and “Magnetic Discovery Painting” could both be conducted in the visual arts classroom. Visual Arts teachers may have suggestions on how to showcase the artwork created from “Magnetic Discovery Painting.”

APPENDIX (See Downloads)

- Pre/Post Test

ADDITIONAL RESOURCES

Books

- *Magnets: Pulling Together, Pushing Apart* by N. Rosinsky
- *Magnetic and Nonmagnetic* by Angela Royston
- *Amazing Magnetism (Magic School Bus)* by Rebecca Carmi
- *Shivers in the Fridge* by Fran Manushkin (fiction)
- *Magnet Magic* by Phyllis Adams (fiction)
- *Marto’s Magnets* by Wendy Pfeffer
- *What Makes a Magnet?* by Franklyn M. Branley

Websites

- Monster Magnet Video on YouTube: <https://www.youtube.com/watch?v=MfNt44pFo9o>
- YouTube video: [Kid-powered Magnetic Separating Recycling Conveyor Belt](#)
- sciencewiz.com/Portal/portal_to_magnetism.php
- www.internet4classrooms.com/science_elem_magnets.htm

CREDITS

U.S. Department of Education

Arts in Education--Model Development and Dissemination Grants Program

Cherokee County (GA) School District and ArtsNow, Inc.

Ideas contributed and edited by:

Shannan Cagle, Liz Pendlington, Melissa Joy, Shannon Green, Dr. Maribeth Yoder-White, Susie Spear Purcell, Jessica Espinoza

Name _____

Date _____

Grade 3: Magnets Pre/ Post Test

Section 1: Multiple Choice

Circle the correct answer.

1. What material in objects usually causes them to be attracted to magnets?
 - A. Copper
 - B. Iron
 - C. Aluminum

2. If the north pole of one magnet is brought close to the south pole of another, what will happen?
 - A. The two magnets will repel.
 - B. The magnets will break.
 - C. The two magnets will attract.

3. What will happen if you bring the south pole of a magnet near the south pole of another magnet?
 - A. The two magnets will repel.
 - B. The magnets will break.
 - C. The two magnets will attract.

4. Which of the following objects will most likely NOT be attracted to a magnet?
 - A. an iron nail
 - B. a paper clip
 - C. a quarter

5. How many poles does a magnet have?
 - A. one
 - B. two
 - C. three

6. Which of the following objects will most likely be attracted to a magnet?
- A. an iron nail
 - B. a copper penny
 - C. a silver spoon
7. What does *repel* mean?
- A. come together
 - B. break apart
 - C. push away
8. Ann has a bowl filled with a mixture of salt, iron filings, and sand. If Ann puts the end of a magnet into the mixture, what will stick to the magnet?
- A. the salt
 - B. the iron filings
 - C. the sand
9. ____ poles attract each other, while ____ poles repel each other.
- A. Like, similar
 - B. Opposite, like
 - C. Like, opposite
10. Which of the following objects would be attracted to magnets?
- A. a paperclip
 - B. a wooden chair
 - C. a glass of water
11. Which of the following objects would be attracted to magnets?
- A. a quarter
 - B. a rubber ball
 - C. a staple

12. Where would you most likely find a magnet?
- A. in your television
 - B. in your phone
 - C. in your computer
 - D. All of the above
13. Which of the following would a magnet NOT attract?
- A. a paper clip
 - B. a marker
 - C. a nail
14. Which form of transportation does NOT use magnets to work?
- A. airplane
 - B. high speed train
 - C. horse

Section 2: Fill in the Blank

Circle the correct word that should go in the blank.

15. Magnets have different _____.

Colors	strengths	patterns
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16. Iron would be _____ to a magnet.

repel	attracted	steel
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17. _____, _____, and _____ are attracted to magnets.

Eraser	paperclip	nail	penny	dime	thumbtack
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Section 3: Extended Response

Select one question to respond to. Write your response using complete sentences.

You have a bowl containing an eraser, paper clip, nail, penny, dime, and a thumbtack. Which items in the bowl are magnetic? Why did you choose these items?

Explain one real world application of magnets. Tell how you use magnets in your life.



Project Essential Questions

- What common objects are attracted to magnets?
- How do objects both magnetic and non-magnetic interact with magnets?

PROJECT DESCRIPTION

In this project, students will use their knowledge of previously taught magnetic properties to create a visual arts piece. Students will explore a variety of magnetic and non-magnetic materials to create a one-of-a-kind painting. During their painting, they will differentiate objects between magnetic and non-magnetic properties. Students will take time to document their observations and write about their magnetic discoveries.

LEARNING TARGETS

“I Can...”

- Make predictions about magnetism based on my knowledge of magnetic properties
- Differentiate objects that are magnetic from those that are non-magnetic
- Use visual arts to create a unique painting based on the properties of these objects (magnetic objects will be used to “paint” while non-magnetic objects will remain stationary).
- Sort objects by their magnetic properties
- Reflect on my findings and draw conclusions about magnets based on my project observations

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DURATION: 1-2 days

Project Description	Learning Targets
<p>In this project, students will use their knowledge of previously taught magnetic properties to create a visual arts piece. Students will explore a variety of magnetic and non-magnetic materials to create a one-of-a-kind painting. During their painting, they will differentiate objects between magnetic and non-magnetic properties. Students will take time to document their observations and write about their magnetic discoveries.</p>	<p>“I Can...”</p> <ul style="list-style-type: none"> ● Make predictions about magnetism based on my knowledge of magnetic properties ● Differentiate objects that are magnetic from those that are non-magnetic ● Use visual arts to create a unique painting based on the properties of these objects (magnetic objects will be used to “paint” while non-magnetic objects will remain stationary). ● Sort objects by their magnetic properties ● Reflect on my findings and draw conclusions about magnets based on my project observations

ESSENTIAL QUESTIONS

<ul style="list-style-type: none"> ● What common objects are attracted to magnets? ● How do objects both magnetic and non-magnetic interact with magnets?

STANDARDS

Curriculum Standards	Arts Standards
<p>S3P2 Students will investigate magnets and how they affect other magnets and common objects. a. Investigate to find common objects that are attracted to magnets.</p> <p>ELA.W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</p>	<p>VA3PR.1 Creates artworks based on personal experience and selected themes. b. Creates artworks emphasizing one or more elements of art (e.g., color, line, shape, form, texture).</p> <p>VA3PR.2 Understands and applies media, techniques, and processes of two-dimensional art processes (drawing, painting, printmaking, mixed-media) using tools and materials in a safe and appropriate manner to develop skills. f. Creates paintings with a variety of media (e.g., tempera, watercolor).</p>

KEY VOCABULARY

Content Vocabulary
<ul style="list-style-type: none"> ● Magnet ● Characteristics ● Iron ● Steel ● Attract ● Magnetism ● Bar magnet ● North Pole

<ul style="list-style-type: none"> • South Pole
Art Vocabulary
<ul style="list-style-type: none"> • Aesthetics: the term that refers to that which is beautiful and visually pleasing • Color: an element of art with three properties 1) hue, the name of the color, e.g. red, yellow, etc. 2) intensity or the purity and strength of the color such as brightness or dullness and 3) value, or the lightness or darkness of a color • Media: the tools and materials an artist uses

TECHNOLOGY INTEGRATION

<ul style="list-style-type: none"> • Recycling YouTube video: Kid-powered Magnetic Separating Recycling Conveyor Belt: https://www.youtube.com/watch?v=FFvc0-cP0jw

ASSESSMENTS

Formative	Summative
<ul style="list-style-type: none"> • Teacher will monitor students through anecdotal notes while they are creating their paintings and sorting their materials 	<ul style="list-style-type: none"> • Written student observations and reflections in Science Journal • Science Journal Rubric (See Downloads) • Magnetic/Non-magnetic painting Rubric (See Downloads)

MATERIALS

Thick cardstock, Tempera paint (primary colors), various sized paint brushes, chalk pastels, class sets of wand magnets, dozen cookie sheets (small)
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Activating Strategy (5- 10 min)
<ul style="list-style-type: none"> • YouTube video: Kid-powered Magnetic Separating Recycling Conveyor Belt (57 seconds): https://www.youtube.com/watch?v=FFvc0-cP0jw • Teacher demonstration with soda can and vegetable/soup can • Discuss: Why is one type of can magnetic while the other is not?
Main Activity
<p>Part 1</p> <ul style="list-style-type: none"> • Teacher will lead a class discussion of what makes an object magnetic. Teacher will make a T-chart (magnetic, non-magnetic) and students will contribute ideas to fill it in. Students will make predictions as to which objects are magnetic and non-magnetic. <p>Part 2</p> <ul style="list-style-type: none"> • Students will create a T-chart and label one side magnetic and the other non-magnetic. • Student partner groups will each be given a paper bag containing: small piece of wood, penny, paper clip, eraser, dime, screw, thumb tack, nail. • Each group will be given two bowls, one to sort magnetic, one to sort non-magnetic. • Each group will be given one cookie sheet, two pieces of cardstock, two magnetic wands, tape to adhere the paper to the cookie sheet, and four colors of paint (one squeeze of each color on each paper).

- Students will take turns choosing an item and seeing if they can paint with it. After both students have used the item, they will place it in the appropriate bowl.

Part 3

- Students will complete their T-chart based on their sorting of magnetic or non-magnetic objects.
- Students will complete a written reflection evaluating why certain objects are magnetic or non-magnetic.
- Compare the T-chart created as a class to those created by the students.

Classroom Tips:

- Teacher will pre-select partner groups
- Teacher will lay-out behavior expectations
- Teacher will model how to set-up the cookie sheet, paper, paint, and magnets

REFLECTION**Reflection Questions**

- *How did creating a painting through the exploration of magnetic and non-magnetic materials help me identify some common objects that are attracted to magnets, as well as those that are not?*

DIFFERENTIATION**Remedial/EL Students:**

- During the Reflection part of this project the following modifications could be made: place students in small groups, assist with Guided writing, provide sentence starters, provide graphic organizers, a word bank based on content vocabulary, a paragraph frame, or modify the length/writing assignment based on student needs.

Accelerated:

- These students could research how recycling is done in the real world using magnets to separate metal from other objects (like in the video). They could then compose a narrative story to portray the journey of a piece of metal or nonmetal object through the recycling process. Also, they could research other uses of magnets in the real world (such as store sensors on clothing for anti-theft).

ADDITIONAL RESOURCES**Books**

- *What Makes a Magnet?* by Franklyn M. Branley

Websites

- YouTube video: Kid-powered Magnetic Separating Recycling Conveyor Belt:
<https://www.youtube.com/watch?v=FFvc0-cP0jw>
- sciencewiz.com/Portal/portal_to_magnetism.php
- www.internet4classrooms.com/science_elem_magnets.htm

APPENDIX (See Downloads)

- **Magnet Painting Rubric**

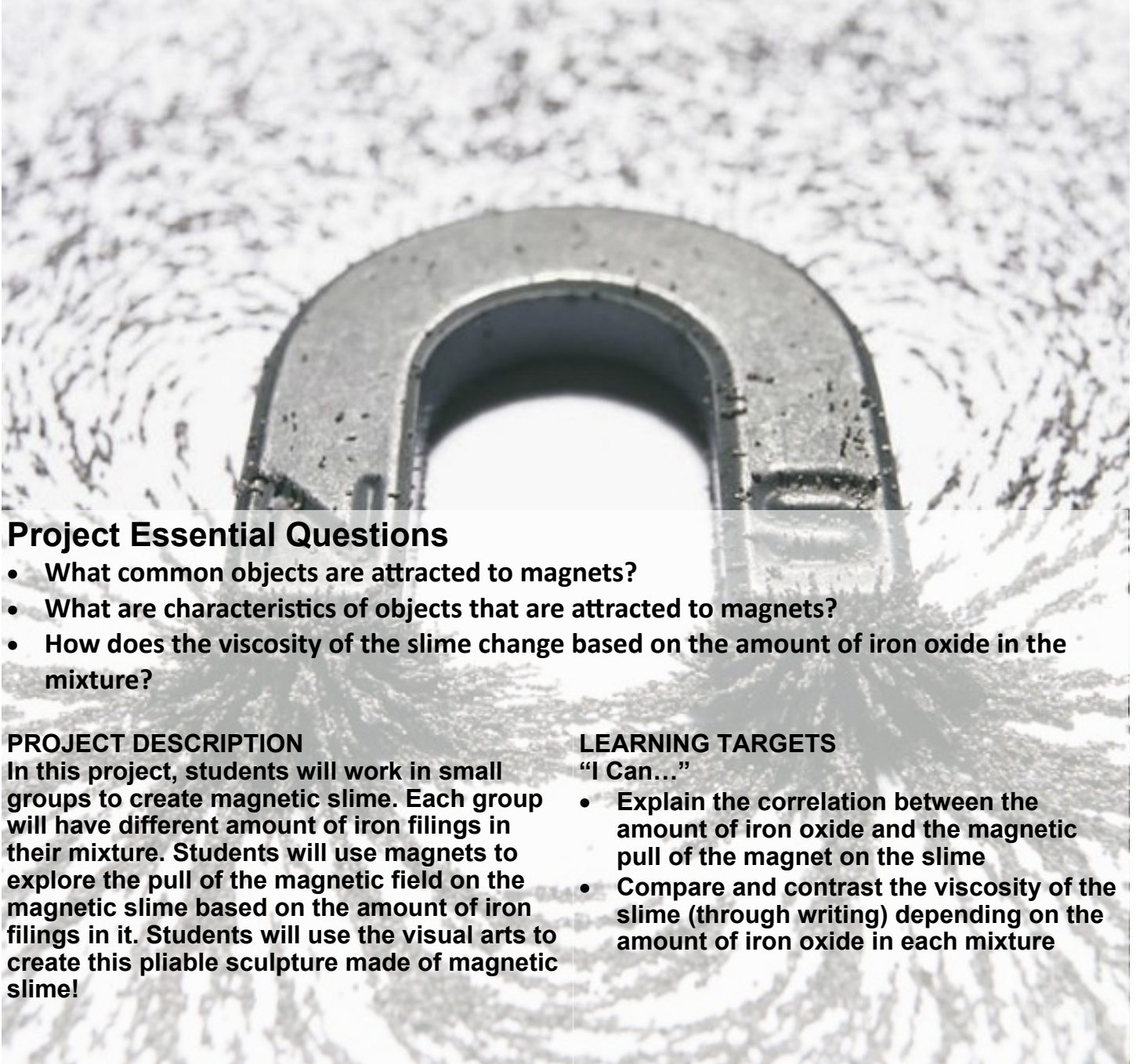
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Magnet Painting Rubric

Task	4	3	2	1
Writing Process	Their informative writing is well organized: introduces the topic, develops the topics with facts and details, and provides a concluding statement. Everything is written in complete sentences. Science vocabulary is present in student writing.	Most of the time the informative writing is well organized: introduces the topic, most of the time develops the topics with facts and details, and provides a concluding statement. Most of the time, the writing is written in complete sentences. Science vocabulary is included some in student writing.	Some of the time the informative writing is organized: somewhat introduces the topic, somewhat develops the topics with facts and details, and somewhat provides a concluding statement. Some of the time, the writing is written in complete sentences. Science vocabulary is rarely included in student writing.	Rarely is the informative writing organized: does not introduce the topic, develop with facts and details, or provide a concluding statement. Rarely is the writing written in complete sentences. Science vocabulary is not included in student writing.
Creation of painting using magnetic and non-magnetic objects	All magnetic objects have been swirled through all four colors, covering the majority of the cardstock.	All or most of the magnetic objects have been swirled through at least three colors, covering the majority of the cardstock.	Some of the magnetic objects have been swirled through at least two colors, covering at least 50% of the cardstock is covered.	Less than half of the objects were used to create the painting, and less than half the cardstock is covered.
Accuracy of Science Content (T-Chart)	All eight objects are sorted into the correct categories of magnetic/non-magnetic.	At least six objects are sorted into the correct categories of magnetic/non-magnetic.	At least four objects are sorted into the correct categories of magnetic/non-magnetic.	At least two objects are sorted into the correct categories of magnetic/non-magnetic.
Student Collaboration	Student worked well with their partner throughout the entire project. Student gave positive feedback to peer. They shared materials appropriately.	Student worked well with their partner most of the time. Student gave positive feedback to their peer most of the time. They mostly shared their materials appropriately.	Student worked well with their partner some of the time. Student gave positive feedback to their peer some of the time. They somewhat shared their materials appropriately.	Student did not work well with their partner. Student did not give positive feedback to their peer. They did not share their materials appropriately.

Total Score: _____



Project Essential Questions

- What common objects are attracted to magnets?
- What are characteristics of objects that are attracted to magnets?
- How does the viscosity of the slime change based on the amount of iron oxide in the mixture?

PROJECT DESCRIPTION

In this project, students will work in small groups to create magnetic slime. Each group will have different amount of iron filings in their mixture. Students will use magnets to explore the pull of the magnetic field on the magnetic slime based on the amount of iron filings in it. Students will use the visual arts to create this pliable sculpture made of magnetic slime!

LEARNING TARGETS

“I Can...”

- Explain the correlation between the amount of iron oxide and the magnetic pull of the magnet on the slime
- Compare and contrast the viscosity of the slime (through writing) depending on the amount of iron oxide in each mixture

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DURATION: 2-3 days

Project Description	Learning Targets
<p>In this project, students will work in small groups to create magnetic slime. Each group will have different amount of iron filings in their mixture. Students will use magnets to explore the pull of the magnetic field on the magnetic slime based on the amount of iron filings in it. Students will use the visual arts to create this pliable sculpture made of magnetic slime!</p>	<p>“I Can...”:</p> <ul style="list-style-type: none"> ● Explain the correlation between the amount of iron oxide and the magnetic pull of the magnet on the slime ● Compare and contrast the viscosity of the slime (through writing) depending on the amount of iron oxide in each mixture

ESSENTIAL QUESTIONS

<ul style="list-style-type: none"> ● What common objects are attracted to magnets? ● What are characteristics of objects that are attracted to magnets? ● How does the viscosity of the slime change based on the amount of iron oxide in the mixture?

STANDARDS

Curriculum Standards	Arts Standards
<p>S3P2 Students will investigate magnets and how they affect other magnets and common objects. a. Investigate to find common objects that are attracted to magnets.</p> <p>ELA.W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</p>	<p>MA:Cr2.1.3 Form, share, and test ideas, plans and models to prepare for media arts productions.</p>

KEY VOCABULARY

Content Vocabulary
<ul style="list-style-type: none"> ● Magnet ● Characteristics ● Iron ● Horseshoe magnet ● Magnetism ● Attract ● Strength ● Viscosity ● Compare & contrast
Art Vocabulary
<ul style="list-style-type: none"> ● Media: the tools and materials an artist uses ● Collaboration: two or more people working together in a joint intellectual effort ● Dialogue: a conversation between two or more persons ● Diction: using a “crisp and clear” actor voice that can be understood by everyone watching and listening

TECHNOLOGY INTEGRATION

- Make a “How To” video of the magnetic slime process. The video will demonstrate the correlation between the amounts the iron oxide and the magnetic field of the slime.

ASSESSMENTS

Formative	Summative
<ul style="list-style-type: none"> • Teacher observation with anecdotal notes regarding student participation and exploration during the slime experiment. 	<ul style="list-style-type: none"> • Students’ video demonstrating the correlation between the amounts the iron oxide and the magnetic field of the slime. • Students’ compare and contrast writing piece, discussing both the magnetic field as well as the viscosity of the slime.

MATERIALS

Class sets of horseshoe magnets, class set of neodymium magnets, bags of iron filings, liquid starch, liquid white glue, paint stir sticks, smocks, 4 bowls per small group

Activating Strategy (5-10 min)

- Monster Magnet Video on YouTube: <https://www.youtube.com/watch?v=MfNt44pFo9o>
- Discuss that we will be making our own magnetic slime.

Main Activity**Part 1**

- Teacher will list steps to create magnetic slime. Each group will make four different strengths of slime.
- Teacher will explain the purpose of creating four strengths of slime.

Part 2

- Pour ¼ cup of liquid starch into each of your four bowls.
- Add 1 tablespoon of iron powder to one bowl, two to the next, three to the next, and four to the last. Stir each until well mixed. (Each bowl should be labeled so students know how much iron filings they contain.)
- Add ¼ cup of white liquid glue to each bowl and mix.
- Take the slime out of each bowl and mix (separately) with your hands until it’s well mixed.
- Pat the slime dry with a paper towel to get rid of any excess liquid. The finished slime won’t make your hands black, but the extra liquid will.

Part 3

- Students will use their magnets to explore the correlation between the amount of iron filings in the slime and the strength of the magnets pull.
- Students will use their hands to explore the viscosity of the slime depending on the amount of iron filings in each mixture.
- Students will write a preliminary compare and contrast based on their findings.

Classroom Tips:

- Teacher will pre-determine small groups that can work well together.
- Students will wear smocks to protect clothing.
- Teacher will set clear behavior expectations.

REFLECTION**Reflection Questions**

How did creating magnetic slime with different amounts of iron filings help me understand the correlation between the amount of iron filings in the slime and the strength of the magnets pull?

DIFFERENTIATION**Remedial/EL Students:**

- During the Reflection part of this project the following modifications could be made: place students in small groups, assist with Guided writing, provide sentence starters, provide graphic organizers, a word bank based on content vocabulary, a paragraph frame, or modify the length/writing assignment based on student needs.

Accelerated:

- These students could predict what effect different sizes of magnets would have on each oobleck sample. Students could also design a color coded ratings chart for the strength of the magnets based on ROYGBIV (red could be the strongest magnetic attraction and violet could be the least magnetic attraction).
- These students could also make a table projecting what would happen if more filings were added, or if the slime had less filings in it. Students could use a similar ratings chart as above for the amount of filings in the substance.

ADDITIONAL RESOURCES**Books**

- *Shivers in the Fridge* by Fran Manushkin (fiction)
- *Magnet Magic* by Phyllis Adams (fiction)
- *Marto's Magnets* by Wendy Pfeffer

Websites

- Monster Magnet Video on YouTube: <https://www.youtube.com/watch?v=MfNt44pFo9o>

APPENDIX (See Downloads)

- **Written Reflection Sheet for Magnetic Slime**
- **Rubric for Magnetic Slime**

CREDITS

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Magnetic Slime Rubric

Task	4	3	2	1
Writing Process	Student demonstrates a thorough understanding of how the different amounts of iron filings affected the strength and viscosity of the slime. Their analysis is written in complete sentences, using proper capitalization and punctuation. All science content vocabulary is spelled correctly.	Student most of the time demonstrates an understanding of how the different amounts of iron filings affected the strength and viscosity of the slime. Their analysis is mostly written in complete sentences, with proper capitalization and punctuation. Nearly all science content vocabulary is spelled correctly.	Student somewhat demonstrates an understanding of how the different amounts of iron filings affected the strength and viscosity of the slime. Their analysis is somewhat written in complete sentences, with proper capitalization and punctuation. Half of the science content vocabulary is spelled correctly.	Student rarely demonstrates an understanding of how the different amounts of iron filings affected the strength and viscosity of the slime. Their analysis is not written in complete sentences, and without proper capitalization or punctuation. Most of the science content vocabulary is spelled incorrectly.
Creation of magnetic slime	Students followed all the directions correctly. He/she used and created each mixture of slime correctly.	Student mostly followed the directions correctly. He/she used and created most of the mixtures of slime correctly.	Student somewhat followed the directions correctly. He/she used and created some of the mixtures of slime correctly.	Students rarely followed the directions correctly, most of the mixtures were mixed incorrectly.
Student collaboration	Student worked well with their partner throughout the entire project. Student gave positive feedback to peer. They shared materials appropriately.	Student worked well with their partner most of the time. Students gave positive feedback to their peer most of the time. They mostly shared their materials appropriately.	Student worked well with their partner some of the time. Student gave positive feedback to their peer some of the time. They somewhat shared their materials appropriately.	Student did not work well with their partner. Student did not give positive feedback to their peer. They did not share their materials appropriately.

Total Score: _____

Written Reflection- Magnetic Slime

1. We made magnetic slime with different amounts of iron filings. How did this help me understand the relationship between the amount of iron filings in the slime and the strength of the magnets' pull?

2. Why do you think the iron filings affected the viscosity of the slime?

Written Reflection- Magnetic Slime

1. We made magnetic slime with different amounts of iron filings. How did this help me understand the relationship between the amount of iron filings in the slime and the strength of the magnets' pull?

2. Why do you think the iron filings affected the viscosity of the slime?



Project Essential Questions

- Why do magnets attract and repel each other?
- How can drama be used to model the relationships between magnetic poles?

PROJECT DESCRIPTION

In this project, students will dramatize how magnets attract and repel. Students will create dialogue and use their actor voices and bodies to dramatize different magnetic poles, as well as common objects that are magnetic and non-magnetic.

LEARNING TARGETS

- “I Can...”
- Describe why magnetic poles attract and repel
 - Dramatize magnetic poles using dialogue and movement
 - Apply drama to the classification of common objects that are magnetic and non-magnetic

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DURATION: 2-3 days

Project Description	Learning Targets
<p>In this project, students will dramatize how magnets attract and repel. Students will create dialogue and use their actor voices and bodies to dramatize different magnetic poles, as well as common objects that are magnetic and non-magnetic.</p>	<p>“I Can...”:</p> <ul style="list-style-type: none"> ● Describe why magnetic poles attract and repel ● Dramatize magnetic poles using dialogue and movement ● Apply drama to the classification of common objects that are magnetic and non-magnetic

ESSENTIAL QUESTIONS

<ul style="list-style-type: none"> ● Why do magnets attract and repel each other? ● How can drama be used to model the relationships between magnetic poles?
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STANDARDS

Curriculum Standards	Arts Standards
<p>S3P2 Students will investigate magnets and how they affect other magnets and common objects. b. Investigate how magnets attract and repel each other.</p> <p>ELA.W.3.1.D Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</p> <p>ELA.V.3.2.B Develop the topic with facts, definitions, and details.</p> <p>ELA.V.3.3.A Use dialogue and descriptions of actions, thoughts, and feeling to develop experiences and events or show the response of characters to situations.</p>	<p>TAES3.2 Developing scripts through improvisation and other theatrical methods. c. Develops characters and setting through action, sensory details, cause and effect relationships, and dialogue. e. Creates scripts that are appropriate in purpose, expectations, and length for the audience.</p> <p>TAES3.3 Acting by developing, communicating, and sustaining with roles within a variety of situations and environments. a. Communicates a character's actions, motives, emotions, and traits through voice, speech, and language.</p>

KEY VOCABULARY

Content Vocabulary
<ul style="list-style-type: none"> ● Poles ● Attract ● Repel ● Magnetic ● Non-magnetic ● Opposite

Art Vocabulary
<ul style="list-style-type: none"> ● Character: an actor or actress in a specified role ● Collaboration: two or more people working together in a joint intellectual effort ● Concentration: the ability of the actor/actress to be “in” character – that is, to be like the character s/her is portraying – in dialog, attitude, carriage, gait, etc. ● Dialogue: a conversation between two or more persons ● Diction: using a “crisp and Clear” actor voice that can be understood by everyone watching and listening ● Facial Expression: using your face to show emotion ● Gesture: an expressive movement of the body or limbs

TECHNOLOGY INTEGRATION

<ul style="list-style-type: none"> ● Computers or tablets could be used to type students’ scripts instead of writing them on an index cards
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ASSESSMENTS

Formative	Summative
<ul style="list-style-type: none"> ● Accuracy of written dramatization ● Collaboration of peers 	<ul style="list-style-type: none"> ● Written script with beginning, middle, and end. ● Magnetic Drama Rubric (See Downloads) ● Completed Video

MATERIALS

<p>North and South magnet labels (affixed to the magnet characters shoulders. North on one shoulder, South on the other shoulder), pictures of other common objects that are magnetic and non-magnetic (paper clip, nail, safety pins, aluminum can, a plastic bottle), iPad for videoing or other video device</p>

Activating Strategy (5-10 min)
<ul style="list-style-type: none"> ● Teacher will begin lesson by getting all students involved in the process of using their voice and body. ● Teacher can begin with the E-clap technique. The teacher will say “E” using different levels of voice and speed, while the students clap at that level and speed. The teacher can then clap, and have the students say “E” to the volume level and speed of the clap. ● Any other drama voice warm-up strategies would also be effective.
Main Activity
<p>Part 1</p> <ul style="list-style-type: none"> ● Teacher will use magnets to demonstrate how opposite poles attract and like poles repel. ● Teacher will then demonstrate how to dramatize how opposite poles would attract, and like poles would repel using voice and body movements. ● Teacher will also demonstrate how to dramatize how common objects are either magnetic or non-magnetic. <p>Part 2</p> <ul style="list-style-type: none"> ● Teacher will review the information the students have learned about magnetic and non-magnetic objects.

- Teacher will review the elements of a story telling drama using a simple beginning, middle, and end script.

Part 3

- Students will create and write a small group short dramatization about magnets and how the poles attract.
- Students will include a beginning, middle, and end for their dramatization.
- An example of this would be two north poles walk up to each other, and repel one another.
- Students will use their voice and body to dramatize this action. They might begin with “Hey, why are you pushing me?” (beginning), “I’m not pushing you, you are pushing me.” (middle), “I know, we are like poles, and we are repelling each other.” (end).
- The students will repeat this type of process with common objects in their group.
- Groups will have at least 3 small scripts with beginning, middle, and end. One of them has to be about the poles repelling and attracting.
- The others can be about being attracted or not attracted to the other magnetic and non-magnetic objects in the group.

Part 4

- Students will present their magnetic drama to the class. Other classroom students may provide constructive feedback on theatrical delivery (diction, facial expression, tone, volume, pitch, etc.) using theater vocabulary.

Classroom Tips:

- Teacher will pre-select student groups
- Teacher will constantly monitor the room, and work with groups as needed.

REFLECTION**Reflection Questions**

- *Explain how north and south poles attract and repel each other.*
- *How did our drama production help me understand how north and south poles attract and repel each other?*
- *How did our drama production help me understand how other common objects are attracted or not attracted to magnets?*

DIFFERENTIATION**Remedial/EL Students:**

- In Part 2 of this project, teachers could provide students with visual guides of what makes up magnetic/non-magnetic properties, and provide students with visual guides on story parts.
- In Part 4 of this project, a Review of Theatrical Terms with students in small group would be beneficial.

Accelerated:

- These students could compose a song using found/body sounds that goes with either repel or attract. When two objects/poles come “on stage” in the class, they would provide the song in the background to illustrate either repelling or attracting as the drama is performed on stage.
- These students could also research to compare and contrast the earth’s north and south pole to the north and south (positive and negative) poles of a bar magnet.

ADDITIONAL RESOURCES

Books

- *Magnetic and Nonmagnetic* by Angela Royston
- *Amazing Magnetism (Magic School Bus)* by Rebecca Carmi

APPENDIX (See Downloads)

- **Magnetic Drama Rubric**
- **Magnetic Drama Written Reflection**

CREDITS

U.S. Department of Education
Arts in Education--Model Development and Dissemination Grants Program
Cherokee County (GA) School District and ArtsNow, Inc.
Ideas contributed and edited by:
Shannan Cagle, Liz Pendlington, Susie Spear Purcell, Jessica Espinoza

Magnetic Drama Rubric

Task	4	3	2	1
Writing Process	Student demonstrates a thorough understanding of which objects are magnetic and non-magnetic through more than three fully developed scenes. Each scene clearly depicts the interaction of a material and a magnetic pole.	Student demonstrates a thorough understanding of which objects are magnetic and non-magnetic through at least three mostly developed scenes. Each scene mostly depicts the interaction of a material and a magnetic pole.	Student demonstrates an understanding of which objects are magnetic and non-magnetic through at least two somewhat developed scenes. Each scene somewhat depicts the interaction of a material and a magnetic pole.	Student demonstrates a minimal understanding of which objects are magnetic and non-magnetic through at least two rarely developed scenes. Each scene rarely depicts the interaction of a material and a magnetic pole.
Science Concept	The science vocabulary is used correctly and fully integrated throughout each scene.	The science vocabulary is mostly used correctly and mostly integrated throughout each scene.	The science vocabulary is somewhat used correctly and somewhat integrated throughout each scene.	The science vocabulary is rarely used correctly and rarely integrated throughout each scene.
Performance Skills	Student consistently uses a loud, clear, expressive voice to perform his or her scene. Facial expressions and body movement is integrated fully.	Student most of the time uses a loud, clear, expressive voice to perform his or her scene. Facial expressions and body movement is integrated most of the time.	Student somewhat uses a loud, clear, expressive voice to perform his or her scene. Facial expressions and body movement is somewhat integrated.	Student rarely uses a loud, clear, expressive voice to perform his or her scene. Facial expressions and body movement is rarely integrated.
Student collaboration	Student consistently collaborates with their group members and contributes ideas to the group. Mutual respect is consistently demonstrated by student towards his/her peers.	Student most of the time collaborates with their group members and contributes ideas to the group. Mutual respect is mostly demonstrated by student towards his/her peers.	Student somewhat collaborates with their group members and contributes some ideas to the group. Mutual respect is somewhat demonstrated by student towards his/her peers.	Student rarely collaborates with their group members and rarely contributes ideas to the group. Mutual respect is rarely demonstrated by student towards his/her peers.

Total Score: _____

Written Reflection – Magnetic Drama

1. Explain how north and south poles attract and repel each other.

2. How did our drama production help me understand how north and south poles attract and repel each other?

3. How did our drama production help me understand how other common objects are attracted or not attracted to magnets?



Project Essential Questions

- What common objects are attracted to magnets?
- What are characteristics of objects that are attracted to magnets?
- How can music be used to dramatize the concept of magnetism?

PROJECT DESCRIPTION

In this project, students will integrate their knowledge of magnets to create and perform a rap. Students will use music, rhythm, and verses to dramatize objects that do and don't have magnetic pulls. They will do this using a sixteen measure, four-beats per measure composition to create their verses. Students will use actions, emotions, and voice to perform their rap.

LEARNING TARGETS

- "I Can..."
- Classify objects that are and are not magnetic
 - Create a sixteen-measure verse, with four beats per measure, that demonstrates my understanding of magnets
 - Perform my rap using actions, emotion, and voice

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Units provide differentiated ideas and activities aligned to a sampling of standards.

The units do not necessarily imply mastery of standards, but are intended to inspire and equip educators.

Produced through the U.S. Department of Education: Arts in Education—Model Development and Dissemination Grants Program
Cherokee County (GA) School District and ArtsNow, Inc.

DURATION: 2-3 days

Project Description	Learning Targets
<p>In this project, students will integrate their knowledge of magnets to create and perform a rap. Students will use music, rhythm, and verses to dramatize objects that do and don't have magnetic pulls. They will do this using a sixteen measure, four-beats per measure composition to create their verses. Students will use actions, emotions, and voice to perform their rap.</p>	<p>"I Can...":</p> <ul style="list-style-type: none"> ● Classify objects that are and are not magnetic ● Create a sixteen-measure verse, with four beats per measure, that demonstrates my understanding of magnets ● Perform my rap using actions, emotion, and voice

ESSENTIAL QUESTIONS

<ul style="list-style-type: none"> ● What common objects are attracted to magnets? ● What are characteristics of objects that are attracted to magnets? ● How can music be used to dramatize the concept of magnetism?

STANDARDS

Curriculum Standards	Arts Standards
<p>S3P2 Students will investigate magnets and how they affect other magnets and common objects. a. Investigate to find common objects that are attracted to magnets.</p> <p>ELA.W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</p> <p>MGSE3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. See Glossary: <i>Multiplication and Division Within 100</i></p>	<p>M3GM.1 Singing, alone and with others, a varied repertoire of music. a. Sing melodies in the range of an octave using appropriate head voice accompanied and unaccompanied.</p> <p>M3GM.2 Performing on instruments, alone and with others, a varied repertoire of music. a. Perform rhythmic patterns using body percussion as well as a variety of instruments with appropriate technique.</p>

KEY VOCABULARY

Content Vocabulary
<ul style="list-style-type: none"> ● Magnet ● Magnetic ● Non-magnetic ● Attract ● Repel ● Opposite ● Poles ● Metal ● Non-Metal

<ul style="list-style-type: none"> • Informational
Art Vocabulary
<ul style="list-style-type: none"> • Beat: the pulse underlying music • Measure: the space between two bar lines • Collaboration: two or more people working together in a joint intellectual effort • Diction: using a “crisp & clear” actor voice that can be understood by everyone watching and listening

TECHNOLOGY INTEGRATION

<ul style="list-style-type: none"> • iPad: students will record their group performances on the iPad. Performances will be used as a summative assessment.

ASSESSMENTS

Formative	Summative
<ul style="list-style-type: none"> • Student rap template – one 16-measure verse, with 4 beats per measure, about objects that are attracted to magnets, one 16-measure verse, with 4 beats per measure, about objects that are not attracted to magnets. 	<ul style="list-style-type: none"> • Recorded rap • Completed rap writing

MATERIALS

<p>IPad, garageband application, rap template, wooden pitch frogs, plastic egg shakers</p>
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Activating Strategy (5-10 min)
<ul style="list-style-type: none"> • Teacher will sing and perform the chorus of The Magnet Rap using Garage Band app. • Teacher will distribute instruments and have the class perform the chorus. • Discuss: <i>How will creating a rap help you remember what objects are and are not magnetic?</i>
Main Activity
<p>Part 1</p> <ul style="list-style-type: none"> • Teacher will show the chorus of the Magnet Rap on the promethean board. Teacher will demonstrate (sing) the 16-measure, 4-beats per measure verse. Teacher will model to students how to use the Magnet Rap Template to write their two verses. (One verse for magnetic objects, one verse for non-magnetic objects) • Teacher will also use the measure and beats of the rap to correlate the creation of the rap to multiplication and division skills. <p>Part 2</p> <ul style="list-style-type: none"> • Student groups will create two verses of The Magnet Rap. Students will use the template to create their verses. Teacher will circulate while groups are working and assist where needed. • Students will use instruments and/or body percussion to perform the rap. • Students will use 16 measures, with 4 beats per measure, to write and perform their rap. <p>Part 3</p>

- Students will practice their rap to bring it to performance level
- Student groups will perform their rap using instruments and/or body percussion.
- Students will perform their rap using actions, emotions, and voice.

Classroom Tips:

- Teacher will pre-select student groups that will work well together.
- Teacher will pre-select areas for the groups to work together on their rap.
- Teacher will discuss group work expectations using the **Magnetic Rap rubric** (See Downloads)

REFLECTION**Reflection Questions**

- *How did creating a rap help me remember common objects that are magnetic and non-magnetic?*
- *How did using the 16-measure, 4-beats per measure pattern help my group write the rap?*
- *What math skills were utilized to write the rap?*
- *How did math help you write and perform the rap?*

DIFFERENTIATION**Accelerated:**

- These students could turn the rap into a music video with different sounds and video features.
- They could also design an album cover, keeping in mind to use certain colors for magnetic objects (perhaps warm) and other colors for non-magnetic objects (perhaps cool).

ADDITIONAL RESOURCES**Books**

- *Magnets: Pulling Together, Pushing Apart* by N. Rosinsky

APPENDIX (See Downloads)

- **Magnetic Rap Rubric**
- **Magnetic Rap Written Reflection**

CREDITS

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Arts in Education--Model Development and Dissemination Grants Program
Cherokee County (GA) School District and ArtsNow, Inc.
Ideas contributed and edited by:
Shannan Cagle, Liz Pendlington, Dr. Maribeth Yoder-White, Jessica Espinoza

Magnetic Rap Rubric

Task	4	3	2	1
Accuracy of Science Content	Student demonstrates a thorough understanding of magnets and how they work. Their rap consistently includes factual information and science vocabulary.	Student mostly demonstrates an understanding of magnets and how they work. Their rap mostly includes factual information and science vocabulary.	Student somewhat demonstrates an understanding of magnets and how they work. Their rap somewhat includes factual information and science vocabulary.	Student rarely demonstrates an understanding of magnets and how they work. Their rap rarely includes factual information and science vocabulary.
Organization of Rap	Magnet rap consists of 16 measures, with 4 beats per measure. Rap includes 4 lines of 4 measures each with lines 1 & 2 rhyming and lines 3 & 4 rhyming.	Magnet rap consists of 16 measures, with 4 beats per measure. Rap includes 4 lines of 4 measures but only one pair of sentences rhymes.	Magnet rap consists of 8 measures, with 4 beats per measure. Rap did include at least one sentence pair of rhyming words.	Magnet rap consists of 8 or less measures, and no rhyming words.
Student collaboration	Student worked well with their partner throughout the entire project. Student gave positive feedback to peers.	Student worked well with their partner most of the time. Student gave positive feedback to their peer most of the time.	Student worked well with their partner some of the time. Student gave positive feedback to their peer some of the time.	Student did not work well with their partner. Student did not give positive feedback to their peer.
Performance Skills	Student consistently uses a loud, clear, expressive voice to perform his or her rap. Facial expressions and body movement is integrated fully. Student consistently speaks in rhythm, maintaining the beat.	Student most of the time uses a loud, clear, expressive voice to perform his or her rap. Facial expressions and body movement is integrated most of the time. Student mostly speaks in rhythm, maintaining the beat.	Student somewhat uses a loud, clear, expressive voice to perform his or her rap. Facial expressions and body movement is somewhat integrated. Student somewhat speaks in rhythm, maintaining the beat.	Student rarely uses a loud, clear, expressive voice to perform his or her rap. Facial expressions and body movement is rarely integrated. Student rarely speaks in rhythm, maintaining the beat.

Total Score: _____

Written Reflection – Magnetic Rap

1. How did creating a rap help me remember common objects that are magnetic and non-magnetic?

2. How did using the 16-measure, 4-beats per measure pattern help my group write the rap?

3. What math skills were utilized to write the rap?

4. How did math help you write and perform the rap?
