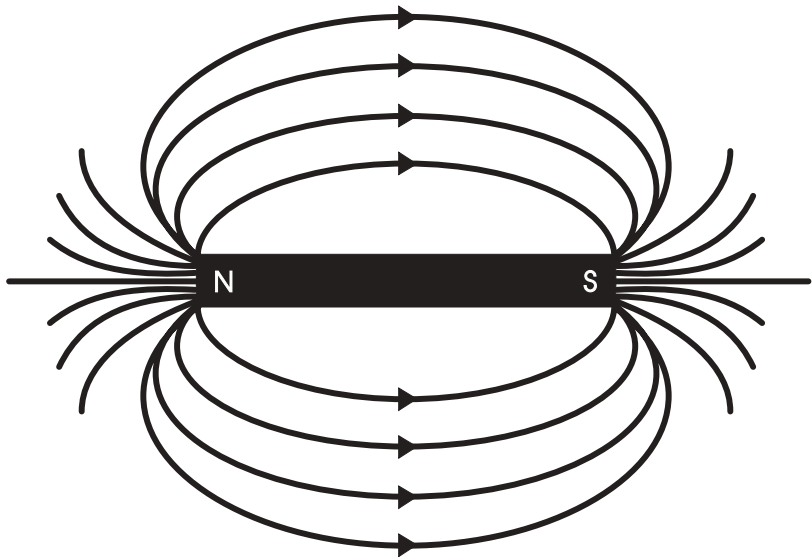




**THINK
THEMES!**

MAGNETS



Magnets

State Goals and Chicago Academic Standards & Frameworks

State Goal 11: Have a working knowledge of the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.

Chicago Academic Standard A: Understand that science involves asking and answering questions and comparing experimental results to what is already known.

Curriculum Framework Statements:

- 1 Conduct simple experiments and observations and explain what was discovered.
- 2 Demonstrate how repeated observations improve confidence in results.
- 3 Read and discuss science-related materials from a variety of sources.

Chicago Academic Standard B: Design and conduct simple scientific investigations in which observations are made, data are gathered and organized, and reasonable conclusions are drawn.

Curriculum Framework Statements:

- 1 Ask questions and formulate hypotheses about objects, events, and organisms that can be tested through scientific investigation.
- 2 Observe and describe changes in terms of starting conditions, type of change, and ending conditions, using words, diagrams, or graphs (e.g., melting ice cubes, germinating seeds, burning candles).
- 3 Select and use instruments to collect, organize, and present data related to a scientific investigation (thermometers, timers, magnifiers, balances, microscopes, calculators, and computers).
- 4 Gather data from investigation by applying a variety of scientific skills (e.g., measurement, reading recording methods).
- 5 Organize observations and measurements into charts and graphs and communicate conclusions orally and in writing.
- 6 Use data based on observations from guided experiments to construct reasonable and accurate explanations.
- 7 Compare observations of individual and group results.

Chicago Academic Standard C: Understand and apply the concepts, principles, and processes of technological design.

Curriculum Framework Statements:

- 1 Plan and construct simple physical structures to solve specific technological challenges (e.g., blocks to build bridges, towers from drinking straws).

State Goal 12: Have a working knowledge of the fundamental concepts and principles of the life, physical, and earth/space sciences and their connections.

Chicago Academic Standard C: Describe and compare the properties and interactions of matter and energy.

Curriculum Framework Statements:

- 2 Examine, describe, classify, and compare large-scale physical properties of matter (e.g., size, shape, color, texture, odor flexibility, state of matter).

Chicago Academic Standard D: Investigate, explain, and demonstrate characteristics of forces and motion.

Curriculum Framework Statements:

- 1 Compare and contrast an action and reaction in the behavior of objects.
- 2 Describe how push or pull may affect the motion of objects.
- 3 Compare forces using various tools.

Magnets

Second Language Goals and Standards (Adapted from CPS – ESL Goals and Standards PK-12)

Goal I: To use the second language to achieve in all academic areas and settings.

Standard A: Students will use the second language for personal and instructional interactions in the classroom.

Performance Indicators:

- 1d Acquire the vocabulary necessary for instruction.
- 1t Follow simple oral directions.
- 2d Share personal experiences both orally and in writing.
- 2m Participate in a teacher-controlled discussion.
- 3f Make inferences.

Standard B: Students will use the second language to obtain, process, construct, manipulate, provide and expand knowledge and information through spoken and written media.

Performance Indicators:

- 1m Attempt to convey gathered information in writing.
- 2b Retell a story or narrate an experience using sequence and detail.
- 3d Summarize material which has been read.
- 3g Summarize material received orally as well as visually.

Standard C: Students will use appropriate learning strategies to construct and apply academic knowledge.

Performance Indicators:

- 1d Rehearse and visualize information.
- 1h Use pictures for purposes of classification.
- 1j Use manipulatives and illustrations to elicit verbal understanding of various concepts.
- 2n Connect new information to prior knowledge and experience.
- 3c Collect and organize information.

Goal II: To use the second language for all social and personal purposes.

Standard D: Students will use appropriate learning strategies to extend their communicative competence.

Performance Indicators:

- 1c Ask about the meaning of a word using questions, body language and/or inflection.
- 1e Try out newly acquired language.



THEME: Forms and Function
TOPIC: Magnets

CPS ACADEMIC GOALS/STANDARDS/Frameworks

11/B/3,5,7 12/C/2 12/D/1-3

ACTIVITY 1

KWL / Exploring with Magnets

As a whole group, brainstorm what students know about magnets and record in the “K” column of the KWL chart.

Know	Want to know	Learned

Think-pair-share: Ask students to share with a partner what they would like to learn or know about magnets. Give students a few minutes to discuss with their partner and then record ideas in the “W” column of the KWL chart.

In small groups, have students explore and observe how magnets react to each other and other objects (e.g. paper clips, crayons, scissors, etc.).

Students work cooperatively to illustrate and record observations in a journal.

Each group compares their results with the results of the other groups.

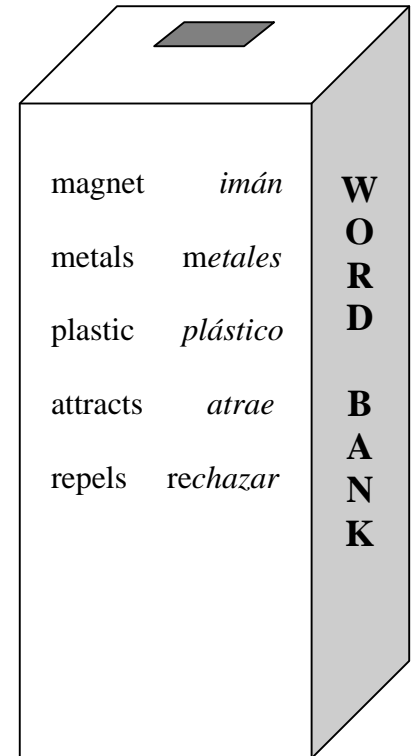
Add to the “L” column of the KWL chart.

CPS SECOND LANGUAGE
GOALS/STANDARDS/PERFORMANCE INDICATORS

1/B/1m 1/C/2n

MATERIALS

Chart paper
Colored markers
Variety of magnets
Variety of small objects
Student journals

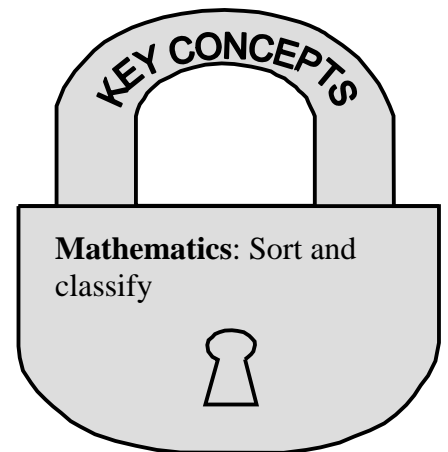


STRATEGIES

Whole Group
KWL
Small groups
Cooperative learning
Journaling

RESOURCES

Scott Foresman Science
“KWL” activity sheet



LITERACY CONNECTIONS

Journaling: Present observations/findings using invented spelling and letter/sound association.

THEME: Forms and Function
TOPIC: Magnets

CPS ACADEMIC GOALS/STANDARDS/Frameworks

11/C/1

ACTIVITY 2

Defining “Magnets”

Review KWL chart and show students the front cover of the story *Construye un imán*, by Guillermo Solano Flores or *Marta’s Magnets*, by Wendy Pfeffer (if you do not own either of these books, you can substitute with a book of your choice that defines the word “magnet”). Ask students to predict what the story will be about based on the picture and the title. Teacher reads the story aloud pausing occasionally to check for comprehension.

Follow-up activities:

Partner retelling of the story.

Whole group discussion on the different uses of magnets. Record the students’ ideas on a chart.

CPS SECOND LANGUAGE GOALS AND STANDARDS

1/B/2b; 3d, g

MATERIALS

Book defining magnets (suggested: *Construye un imán*, by Guillermo Solano Flores or *Marta's Magnets*, by Wendy Pfeffer)

Chart paper

STRATEGIES

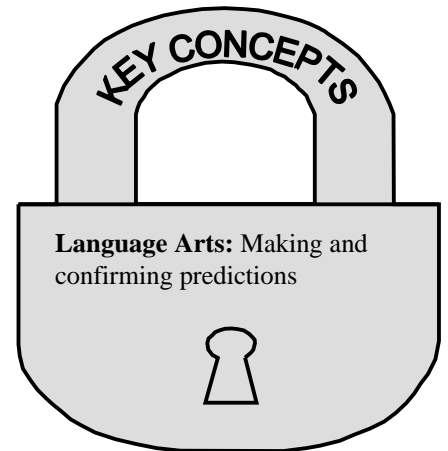
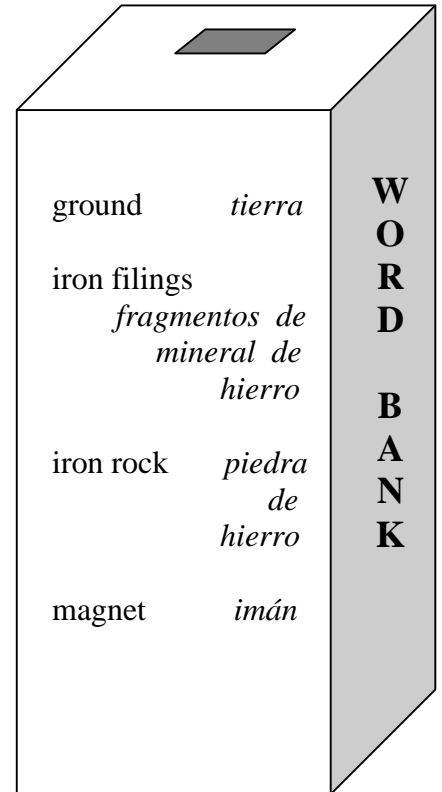
Whole group
Partners
Anticipation/prediction guides

RESOURCES

“Retell” activity sheet

LITERACY CONNECTIONS

Partner retelling of the story and filling out a story map as a whole group.



THEME: Forms and Function
TOPIC: Magnets

CPS ACADEMIC GOALS/STANDARDS/Frameworks

11/B/1, 6 11/C/1 12/C/2

ACTIVITY 3

What are magnets made of?

Add to KWL chart what students know or want to know about how a magnet is made or where it comes from.

Create a small landfill in a rectangular plastic container (add sand, rocks, dirt, candy wrappers, iron filings).

Have students sit in a circle. Pass around a magnetic rock (it looks like a black rock) for them to observe.

Pass around the tray and have each student use the rock to see if they can attract any of the elements.

Discussion: Iron filings are one of the components of the Earth's basic materials. They build up on one another to form a magnetic rock.

Bring a variety of different sizes and shapes of magnets to share with the students and ask students if they think the magnets look this way when they are pulled out of the ground. (If students know that they do not, ask them to explain why they think they look the way they do. If they don't know, explain that man takes the iron rock, melts it down, and places the liquid in a mold in the shape of a magnet.)

CPS SECOND LANGUAGE GOALS AND STANDARDS

1/A/1d; 2d, m; 3f

MATERIALS

KWL chart	Small rectangular plastic container
Sand	Different sized/shaped magnets
Dirt	Candy wrappers
Iron filings	Magnetic rock
Rocks	



STRATEGIES

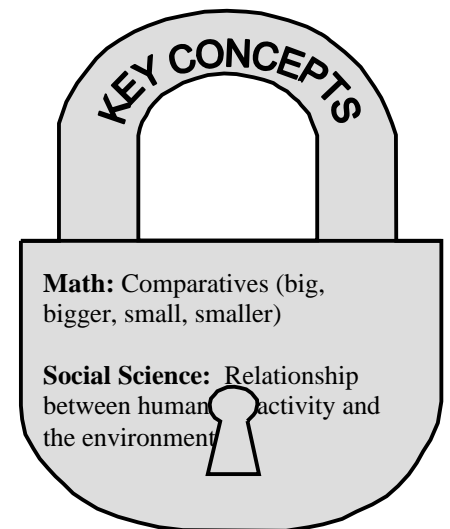
Whole group
TPR (total physical response)
Language experience

RESOURCES

Follow-up: Make a plan to show the process of melting down

Scott Foresman Science

Hands-On Science: Imanes activity sheet titled "Observemos los imanes"



LITERACY CONNECTIONS

Expository writing on steps of making a plan using recipe card worksheet
Students will use inventive spelling and letter sound correspondence to write a language experience story.

THEME: Forms and Function
TOPIC: Magnets

CPS ACADEMIC GOALS/STANDARDS/Frameworks

11/A/1,2 11/B/1,3-7 11/C/1 12/D/1-3

ACTIVITY 4

What kinds of things do magnets attract?

Teacher models how to make a prediction as to whether or not a magnet will attract a particular object (e.g. plastic chair, metal leg on a chair, hair).

Teacher records predictions on the board and tests objects with a magnet.

Name of object	Prediction	Attracts (yes/no)
paper plate	yes	no
nail	yes	yes

Have students select 3-5 items in the classroom that they would like to test.

Partners record the items they select on a chart and make a prediction.

Partners use a magnet to touch the items to determine if their predictions were correct.

Share results with the whole group.

CPS SECOND LANGUAGE GOALS AND STANDARDS

1/C/1h, j; 3c

MATERIALS

Variety of metal and non-metal objects from the classroom
1 magnet per partnership
1 chart for each partnership to record information

STRATEGIES

Whole group
Partnerships
Word building
Word banks
Mapping

RESOURCES

Scott Foresman Science

Hands-On Science: Imanes

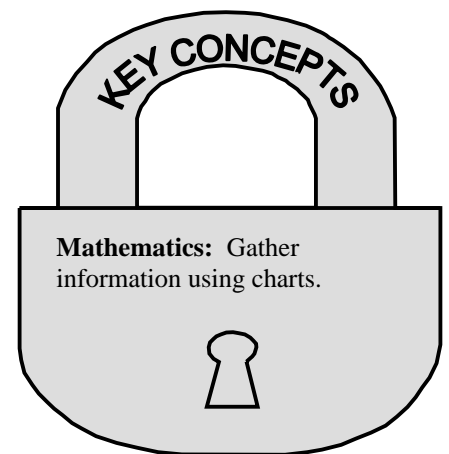
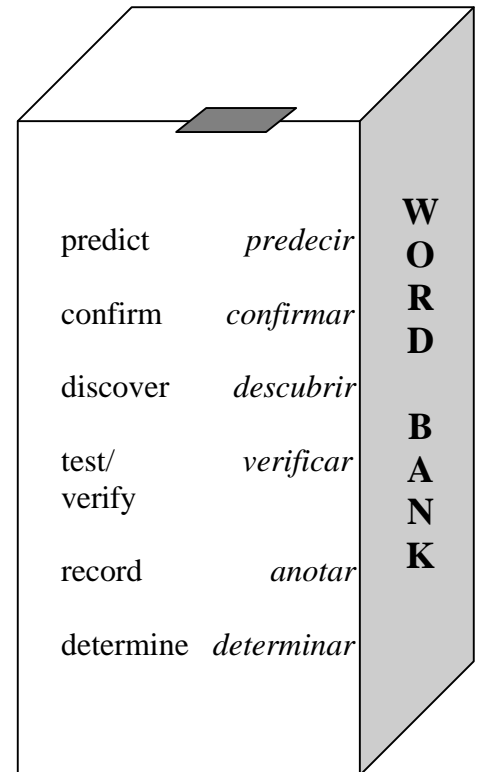
“Attraction” activity sheet

“What do magnets attract?” activity sheet to be done at home to identify things that a magnet attracts

LITERACY CONNECTIONS

Use inventive spelling and letter sound correspondence to record the items they would like to test.

Demonstrate the ability to demonstrate one-step to three-step directions by filling in words in the appropriate place on a chart and recording the findings.



THEME: Forms and Function
TOPIC: Magnets

CPS ACADEMIC GOALS/STANDARDS/Frameworks

12/D/1-3

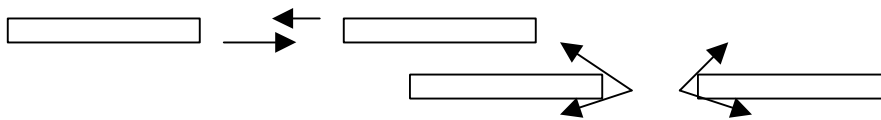
ACTIVITY 5

Can magnets attract other magnets?

In small groups students explore whether magnets attract or repel one another and brainstorm explanations as to why they attract or repel each other.

Come together as a whole group and share ideas/findings.

Teacher explains, by modeling, the attraction and repelling of magnets. While doing so, teacher explains to the students that this happens because each magnet has two parts called “poles” (the North pole and the South pole). Illustrate examples on the board:



Give each small group one magnet labeled with N and S. Have them use it to test against other non-labeled magnets and determine which side of each non-labeled magnet is N or S.

*Option: For second grade and up, create a compass as a follow-up activity. Simple directions can be found in *Magnets/Imanes* published by Teacher Created Materials.

CPS SECOND LANGUAGE GOALS AND STANDARDS

1/C/1j

2/D/1c, e; 2c, e

MATERIALS

Variety of magnets in different shapes and sizes
Pictures labeled with North and South Pole
1 bar magnet labeled with N & S for each group

STRATEGIES

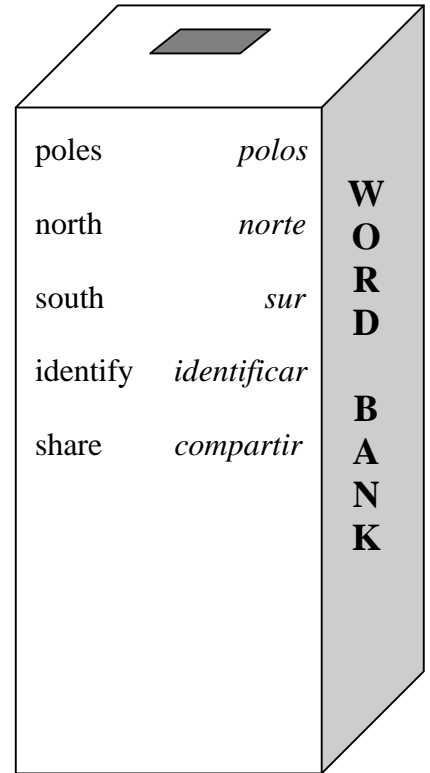
Small groups
Whole group
Cooperative learning
TPR
Word building

RESOURCES

Simple Science Fun, Hands-On Science Made Easy
Hands-On Science: Imanes worksheet titled
“Atracción magnética”

LITERACY CONNECTIONS

Deliver an oral presentation based on findings.



THEME: Forms and Function
TOPIC: Magnets

CPS ACADEMIC GOALS/STANDARDS/Frameworks

11/A/1-3

11/B/1-3,6,7

11/C/1

12/D/3

ACTIVITY 6

Creating a magnetic nail

Individuals make their own magnet using the following materials: 2-3 inch nail, small metal objects (e.g. paper clips, pins, etc.), bar magnet

Rub the bar magnet along the shaft of the nail in one direction about 60 times (the more you rub, the stronger the magnetism and the more objects it will attract).

Bring the nail close to metal objects and it will attract them.

Explain that the nail becomes magnetized because the atoms in the nail are distributed randomly and have both positive and negative charges. When the nail is rubbed with the magnet the charges align themselves in the same direction and magnetism is created.

In a journal, ask students to summarize in their own words what happened to the nail and exchange their journals with a partner.

Partners respond in writing whether they agree or disagree with their partners idea and record why or why not.

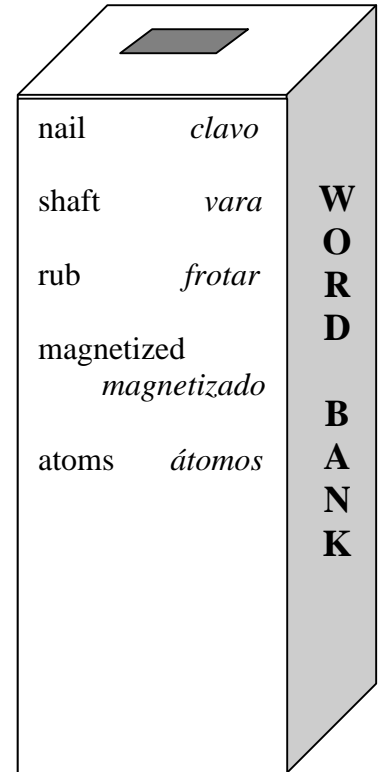
CPS SECOND LANGUAGE GOALS AND STANDARDS

1/A/1t

1/C/1D; 1j

MATERIALS

2-3" nail (one per each student)
Small metal objects (paper clips, pins, etc.)
Bar magnet

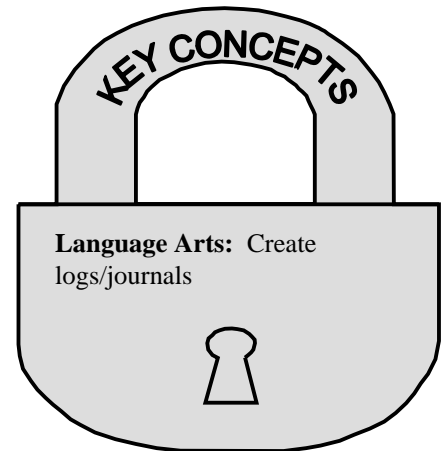


STRATEGIES

Individuals
Word building
Learning Log/Journal

RESOURCES

Hands-On Science: Imanes activity sheet titled
“La fuerza magnética”



LITERACY CONNECTIONS

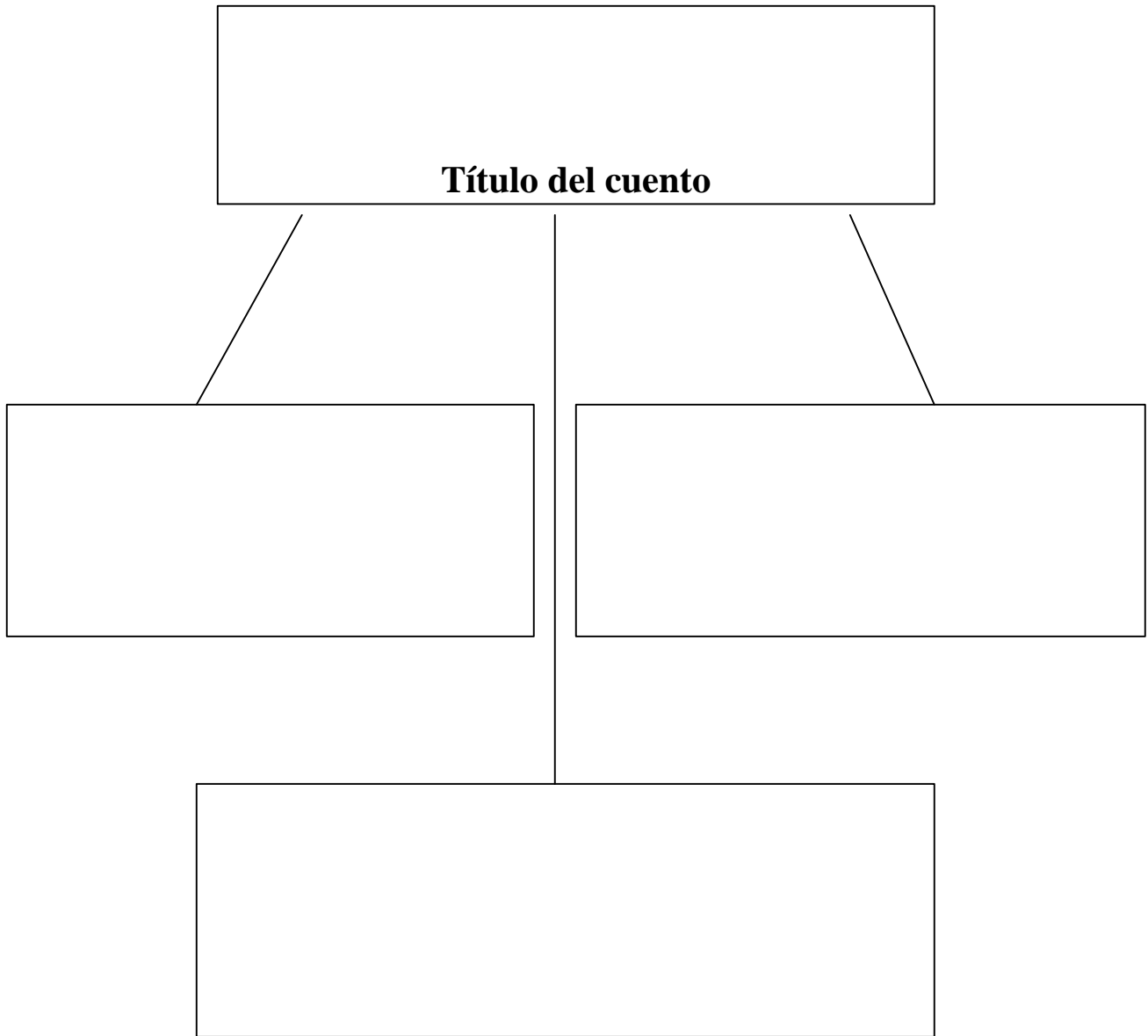
Students will use inventive spelling and letter/sound correspondence to record their ideas in a learning log/journal. Students will respond to their partner’s journal entry using correct capitalization and punctuation.

Nombres: _____

Fecha: _____

Imanes

Escribe 3 cosas que aprendiste acerca de los imanes.

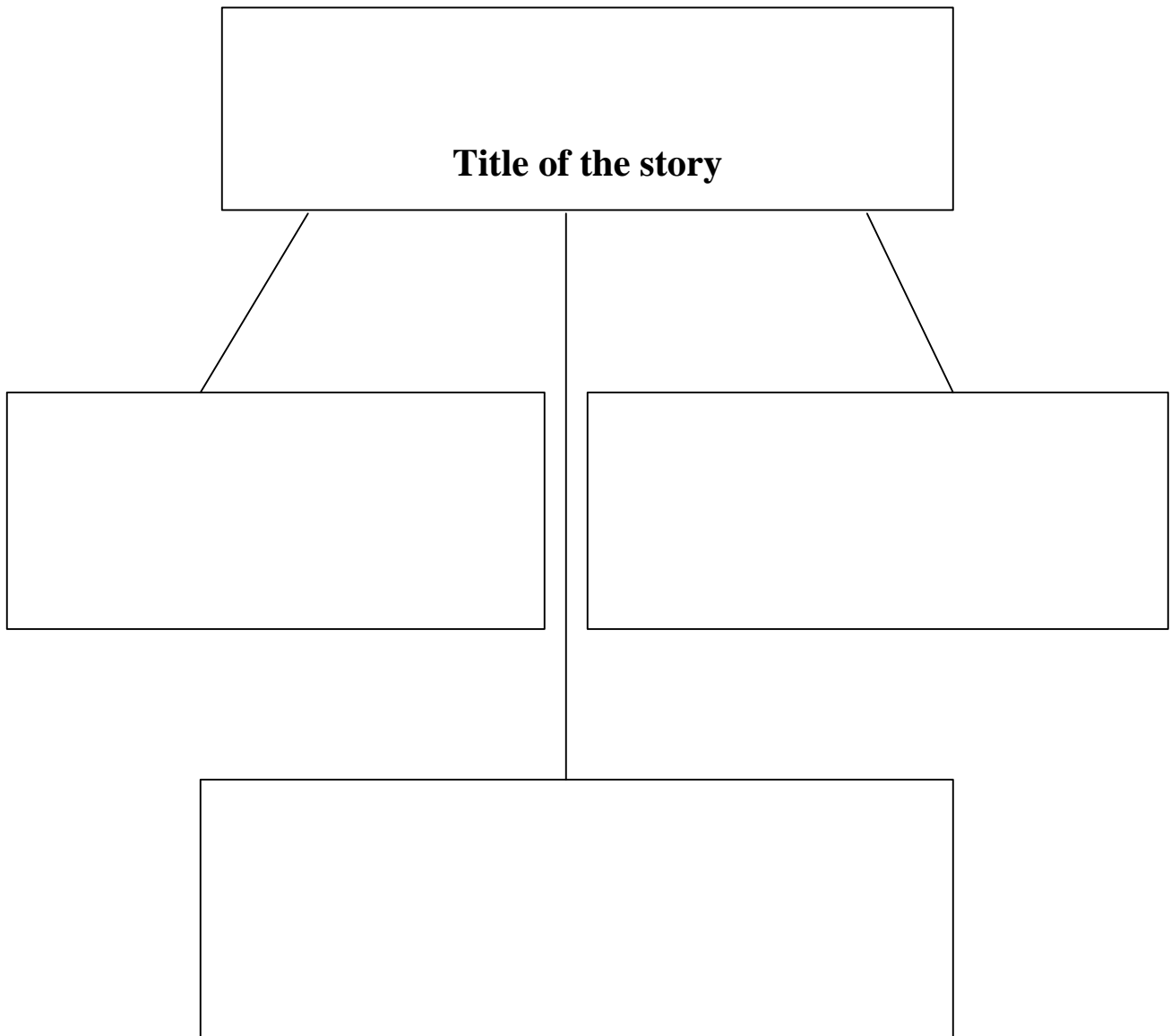


Names: _____

Date: _____

Magnets

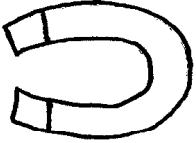
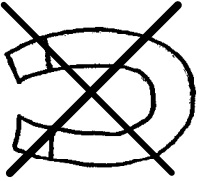
Write 3 things you learned about magnets.



Nombre: _____

Fecha: _____

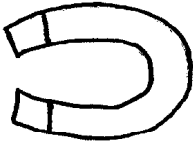
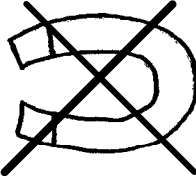
Atracción

Name: _____

Date: _____

Attraction

Nombre: _____

Fecha: _____

¿Qué atraen los imanes?

Nombre del objeto	Predicción	Atráe (sí/no)

Name: _____

Date: _____

What Do Magnets Attract?

Name of Object	Prediction	Attracts (yes/no)

MAGNETS

ASSESSMENT FOR ACTIVITY 1

Use responses from the “L” column of the KWL chart for your assessment. This can be an oral report of what they learned from their observations of how magnets react to each other and to other objects.

Describe characteristics of objects that react to magnets and those that do not.



MAGNETS

ASSESSMENT FOR ACTIVITY 2

Use this chart where you wrote students' predictions about the uses of magnets and review them with the students.

After reading the book, write on the chart the students' responses about the actual uses of magnets. Discuss with students the differences found.

Uses of Magnets

Predictions	Actual Uses



MAGNETS

ASSESSMENT FOR ACTIVITY 3

Discuss KWL responses about “What are magnets made of?”

Children can make their own magnets using the iron fillings and placing them on a zip lock bag, then using this magnet to attract other objects.



MAGNETS

ASSESSMENT FOR ACTIVITY 4

With a partner, students test different objects in the classroom and write their results on the chart. Ask students to present the results of their team's investigations: what items in the classroom they tested, their predictions and their results.

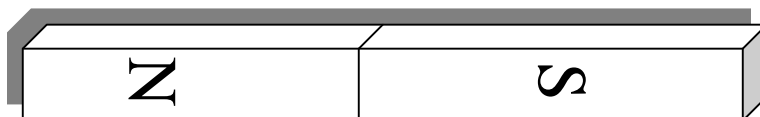
Object	Prediction	Attracts (yes/no)

MAGNETS

ASSESSMENT FOR ACTIVITY 5

Ask students to describe how the magnetic forces of attraction and repelling feel.

- What happens when two north poles are placed against each other? What do you feel?
- What happens when two south poles are placed against each other? What do you feel?
- What happens when one north pole is placed against a south pole? What do you feel?



MAGNETS

ASSESSMENT FOR ACTIVITY 6

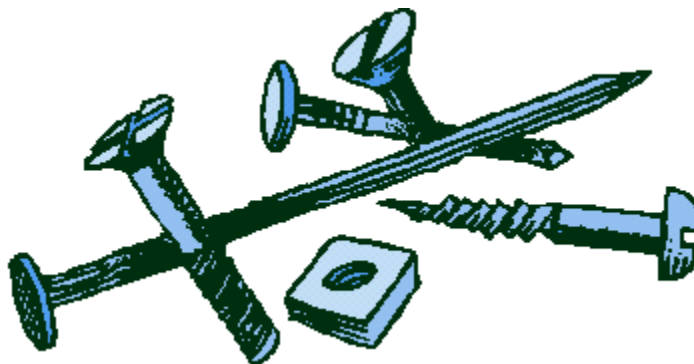
Review with the students their journals to evaluate their understanding about how and why the nail became a magnet.

Questions for discussion:

Is the nail a strong or weak magnet?

How long does the magnetic power of the nail last?

What other items can be turned into magnets?



Magnets Extension Activity A

Magnet Boxes

Vocabulary:

Magnets, iron filings, attract, force field

Materials:

A shallow box with a clear, plastic lid, heavy tape (such as duct tape), magnets, iron filings (purchased at a hardware store)

What to do:

1. An adult should assemble the magnet boxes. Place enough iron filings in the box to cover the bottom. Cover with the lid or heavy plastic wrap. Seal the box completely with tape.
2. Show children how to use the box by moving a magnet across the bottom to make the iron filings move. They look through the top to see the results. You may also use the magnet on plastic.
3. After the children have had a chance to explore the possibilities of the magnet boxes, they may begin to talk about the patterns created when the magnet is touched to the bottom of the box. Different shaped/strength magnets produce different designs.

Magnets Extension Activity B

How many more?

Vocabulary:

Magnets, attract, maximum, strength

Materials:

Different *types of magnets, paper clips*

What to do:

1. Divide students into groups and distribute a different magnet and a pile of paper clips to each group.
2. Have each group determine the maximum number of paper clips its magnet will attract.
3. Have students compare the strength of the magnets using subtraction. For example, you can ask, "How many more paper clips did this star magnet attract than this horseshoe magnet did?"

Magnets Extension Activity C

Go Fish!

Materials:

Stick or ruler

String

Small magnet

Small cutout paper fish

Paper clips

Shallow box

What to do:

1. Make a fishing pole by tying one end of a piece of string to a stick or ruler and the other to a small magnet.
2. Each student writes his or her name on a paper fish, attaches a paper clip, and puts the fish in the box.
3. Students take turns fishing for their names, trying to avoid landing any other fish.
4. Students can keep a tally count of how many times each name comes out.

CHILDREN'S BOOKS

MAGNETS

Branley, Franklin M., *What Makes a Magnet?*, (K-3)
ISBN# 0-06-445148-8

Castro, E., Flores, B., Hernández, E., *¿Que sera?*, (K-3)
ISBN# 0-673-78019-8

Cooper, Jason, *Magnets*, (K-3)
ISBN# 0-86593-165-8

Crews, Donald, *Harbor*, (K-3)
ISBN# 0-688-00861-5

Gordon, Maria, *Electricidad y Magnetismo*, (3-5)

Gramatky, Hardie, *Little Toot*, (K-3)
ISBN# 0-399-20649-3

Pfeffer, Wendy, *Marta's Magnets*, (K-3)
ISBN# 0-382-24932-1

Luz, Sonido, Electricidad, y Magnetismo, (5-8)

COMPUTER SOFTWARE:

My Science Books: Physical Science CD-ROM (K-2) Scholastic

INTERNET RESOURCES:

“Yahooligans”
<http://www.yahooligans.com/>

“Bill Nye the Science Guy”
<http://nyelabs.kets.org/>

