Rigorous Curriculum Design
Unit Planning Organizer

Subject(s)	Science
Grade/Course	First
Unit of Study	Push and Pull- Affects of Motion
Unit Type(s)	❑ Topical x Skills-based ❑ Thematic
Pacing	

Priority Essential Standards
1.P.1 Understand how forces (pushes or pulls) affect the motion of an object.
1.P.1.1 Explain the importance of a push or pull to changing the motion of an object.
1.P.1.2 Explain how some forces (pushes and pulls) can be used to make things move without touching them, such as magnets.
1.P.1.3 Predict the effect of a given force on the motion of an object, including balanced forces.

"UNWRAPPED" Priority Standards
1.P.1.1 Students know a force is a push or pull. Students know a force, a push or a pull, can change the motion of an object in three ways: go faster, slower or change the direction of the motion. Students know a force (push or pull) is needed to start objects moving, keep objects moving or stop objects that are moving. 1.P.1.2 Students know magnets exert an unseen force that makes some things move without touching them. Students know magnets have poles that attract or repel each other. 1.P.1.3 Students know the size of the change in motion of an object is based on the amount of force applied to the object. Students know that balance is associated with position and weight.

Essential Questions	Corresponding Big Ideas
How does push or pull affect the motion of an object?	n/a

Standardized Assessment Correlations (State, College and Career)
Note to Curriculum Designers: Review grade-or course-specific state standardized assessments for the *types of questions directly related* to the "unwrapped" Priority Standards concepts and skills in focus for this unit of study. Identify the *vocabulary used* and *frequency of* these questions. Compare/contrast this information with the "unwrapped" concepts and skills listed above to determine how closely the two are *aligned*.

Unit Assessments	
Pre-Assessment	**Informal Progress Monitoring Checks**
http://www.vrml.k12.la.us/pptgames/pptsHOME/1stPPTS/ppts1stSC.htm **Teachers will need to save this power point and delete answer slides. Students could answer questions on paper. Another option for a pre-assessment is: Pushes and Pulls www.bbc.co.uk/schools/scienceclips/ages/5_6/pushes_pulls.shthml Can be done whole group or use smart responses Teacher may elect to type questions out and have students answer on paper for documentation, while showing the quiz on smartboard.	Teacher will do informal observations as students work in collaborative groups.
Post-Assessment	
Teachers may use Fill-in-the-Blank Blackline Master and Magnets Attract Blackline Master for Post-Assessment	

Engaging Learning Experiences	
Learning Activities Using Text or Program	**Authentic Performance Tasks**
For background knowledge for teachers, please refer to Content Notes, Session 3 , pages 3-3 through 3-19 (Teacher Manual – Solids and Liquids) These lessons may take up to 2 days to complete. Teachers can pace themselves accordingly. **Lesson 1** **Forces Push and Pull** **See attached detailed plans below** **Lesson 2** **Magnet Experiment – Push or Pull** **See attached detailed plans with experiment below** **Lesson 3** **The Power of Magnets** Power Point lesson on magnets – These pages could be printed off to use in collaborative groups for hands-on experiments. www.freeclubweb.com/powerpoints/science/magnets.html "Magnets" (Graves) **See attached detailed plans with performance task sheets below** **Lesson 4** **Magnetism Experiment: "Pointing North" – Making Needle Magnets** **See attached detailed plans with experiment sheets below** **Lesson 5** **Magnets** www.discoveryeducation.com – A First Look at Magnets (This video shows students performing different experiments. Teachers can stop the video to predict what will happen and then restart the video to have students check their predictions) Blackline Masters attached at bottom of lesson plans Several videos are available such as The Trouble with Force, (Blue Dragon: Slipping and Sliding) **Alternate lesson plans** **This website provides detailed lesson for a 5 day week. Although this was planned for Kindergarten, it would serve well for first grade.** http://www.ckcolorado.org/units/Kindergarten/K_TeachingMagnetsKindergarten.pdf	Blackline masters attached at bottom of lesson plans

Research-Based Effective Teaching Strategies	21st Century Learning Skills
✓ Check all those that apply to the unit: X Identifying Similarities and Differences x Summarizing and Note Taking x Reinforcing Effort, Providing Recognition x Homework and Practice ❑ Nonlinguistic Representations x Cooperative Learning x Setting Objectives, Providing Feedback x Generating and Testing Hypotheses ❑ Cues, Questions, and Advance Organizers x Interdisciplinary Non-Fiction Writing	✓ Check all those that apply to the unit: x Teamwork and Collaboration ❑ Initiative and Leadership x Curiosity and Imagination x Innovation and Creativity x Critical thinking and Problem Solving ❑ Flexibility and Adaptability x Effective Oral and Written Communication x Accessing and Analyzing Information ❑ Other

Instructional Resources and Materials	
Physical	**Technology-Based**
Literature – ***Forces Make Things Move***, by Kimberly Brubaker and Bradley and Paul Meisel. ***What Makes a Magnet?*** Branley and Kelley	www.internet4classrooms.com/grade_level_help/physical_science_magnetic_effect_first_1st_grade_science.htm http://idahoptv.org/dialogue4kids/season9/forcesmotion/facts.cfm

Forces

Push/Pull

Essential Standard: 1.P.1 Understand how forces (pushes or pulls) affect the motion of an object

Clarifying Objectives: 1.P.1.1 Explain the importance of push or pull to changing the motion of an object.

Task

1. Define and give examples of a push.
    a. Give definition of a push
        i. Students can write definition and illustrate its meaning in science notebook
    b. Chart objects that need to be pushed. (create an anchor chart for classroom)
2. Define and give examples of a pull.
    a. Students can write definition and illustrate its meaning in science notebook.
    b. Chart objects that need to be pulled. (create an anchor chart for classroom)
3. Recognize that a force is needed to start an object moving or stop objects that are moving.
    a. Define "force"
    b. Different types of force (push, pull, wind, gravity, magnet)
    c. Create experiments using different forces to start and stop objects in movements.

        i. This website provides several experiments to complete with different forces.
        http://www.dolvinpta.org/ACORNS/Boxes/Pushes%20and%20Pulls.pdf

ii. Gravity
   1. Dropping items
   2. Jumping
iii. Wind
   1. Fan blowing items across water/land
iv. Magnet
   1. Moving iron objects with magnets
      a. www.kids-science-experiements.com/testingthepull.html
      i. This website offers many experiments with magnets.
v. Push/pull
   1. Cars, toys with strings attached

4. Compare a push versus a pull to change the motion of an object in a variety of ways.
   a. Using a magazine find objects that are using the forces of push and pull. Place in a Venn Diagram to show work.
   b. http://www.firstschoolyears.com/science/forces/forces.html (this website provides several activities for push and pull)
   c. https://sites.google.com/a/solteacher.com/olteacher-com/home/first-grade-virginia-sol-resources/1st-grade-science/science-sol-1-2-force (this link will work best whole group instruction)
   d. http://www.gscdn.org/library/cms/69/13969.pdf (this a worksheet link that demonstrates push/pull) (could also be a pre/post test for push and pull)
   e. http://www.firstschoolyears.com/science/forces/worksheets/Push%20or%20Pull.pdf (worksheet to show push and pull)

5. Explain the importance of push or pull to changing the motion of an object.

Essential Standard: 1.P.1: Understand how forces (pushes or pulls) affect the motion of an object.

Clarifying Objective: 1.P.1.3: Predict the effect of a given force on the motion of an object, including balanced forces.

1. Recognize that the change in motion is related to the amount of force applied to the object.
    a. www.bbc.co.uk/schools/scienceclips/ages/5_6/pushes_pulls.shtml
        i. This website works well with smartboard. They must apply the amount of force to the given object to produce movement.
    b. Experiment with different inclines to make objects move faster or slower.
        i. Prop table up/down and race cars.
2. Compare and contrast a balanced and unbalanced object.
    a. Using a simple balance in teams balance different items.
        i. What causes items to be balanced and unbalanced? (weight)
        ii. How can we balance items?
3. Recognize that using the position of counterweights helps to keep objects balanced.
    a. http://eclkc.ohs.acf.hhs.gov/hslc/tta-system/teaching/eecd/Domains%20of%20Child%20Development/Mathematics/FirstGraders.htm
        i. This is an experiment for the students to discover balance how to make things balance on a scale.

Magnetism Experiment: Pulling and Pushing

Science Standard 1.P.1.2

http://www.kids-science-experiments.com/pushingandpulling.html

Materials you will need:

Water
A Bowl
Two Needle-Magnets
Small Pieces of Paper or Flat Pieces of Cork

Magnets behave in surprising ways when you put them together. To see how magnets react together; rest two needle-magnets (see Make Needle-Magnets Experiment Below) on small pieces of paper in a bowl of water. Watch how they pull and push.

Experiment Steps:

1. Place each needle on a piece of paper and float them side by side (with one point and one eye next to each other. What happened to the needles?
2. Next, place the needles so that both eyes are side by side. What happened this time?

Magnets have two ends (or poles). If you put the poles of two magnets together, they will either pull together or push apart. Magnets will pull (attract) each other if the poles are different. This invisible pull is called a magnetic force. Magnets will push (repel) each other if the poles are the same. This magnetic forces pulls against you.

Make Needle-Magnets

Science Standards 1.P.1.1.2

http://www.kids-science-experiments.com/makeneedlemagnets.html

Materials you will need:

- A Magnet
- A few Straight Pin
- A few Sewing Needles

Magnetism can be passed from magnets to other magnetic materials so they become magnets too. Here is a way to magnetize two needles. You can use these needle-magnets for other experiments in this site.

Experiment Steps:

1. Hold a needle by the eye and stroke it gently 30 times with your magnet, in the same direction. Do the same with the second needle, making sure that you use the same end of the magnet.
2. Test your needle-magnets on some pins before you use them for other experiments.

Magnetism Experiment: "Pointing North"

Science Standards 1.P.1.1.2

http://www.kids-science-experiments.com/pointingnorth.html

Materials you will need:

Water
A Bowl
A Compass
Two Small Pieces of Paper or Sliced Cork
Two Needle-Magnets (refer to experiment - Make Needle-Magnets)

Did you know that the Earth acts like a giant magnet and attracts other magnets towards its north pole? Try this experiment with two needle-magnets to see how the Earth pulls on magnets.

Experiment Steps:

1. Float a small piece of paper in a bowl of water and rest a needle-magnet on it. When the needle is still mark which way it points.
2. Now do the same with the second needle-magnet. Both needles should point the same direction, which is along a north-south line.

How to find north: To find out which end of your needle-magnet points north, you can either use a compass or you can use your shadow. Go outside at midday on a sunny day. If you are north of the equator, your shadow will point north. If you are south of the equator, it will point south.

Make Needle-Magnets

Science Standards 1.P.1.1.2

http://www.kids-science-experiments.com/makeneedlemagnets.html

Materials you will need:

- A Magnet
- A few Straight Pin
- A few Sewing Needles

Magnetism can be passed from magnets to other magnetic materials so they become magnets too. Here is a way to magnetize two needles. You can use these needle-magnets for other experiments in this site.

Experiment Steps:

1. Hold a needle by the eye and stroke it gently 30 times with your magnet, in the same direction. Do the same with the second needle, making sure that you use the same end of the magnet.
2. Test your needle-magnets on some pins before you use them for other experiments.

The Power of Magnets

Science Standard: 1.P.1.2

Use power point slide #2 to make predictions. (What will make a magnet move?)

Students will test objects and tell "What Will Make A Magnet Move?" *See attached worksheet.*

Use power point slide three to go over student answers.

Teacher will discuss the objects that make a magnet move on slides 5-7.

Use slide 9 for student's journal writing.

Science Standard: 1.P.1.2

Name:_____ Date _____

What will make a magnet move?

Test the items listed below to see if they can make the magnet move.

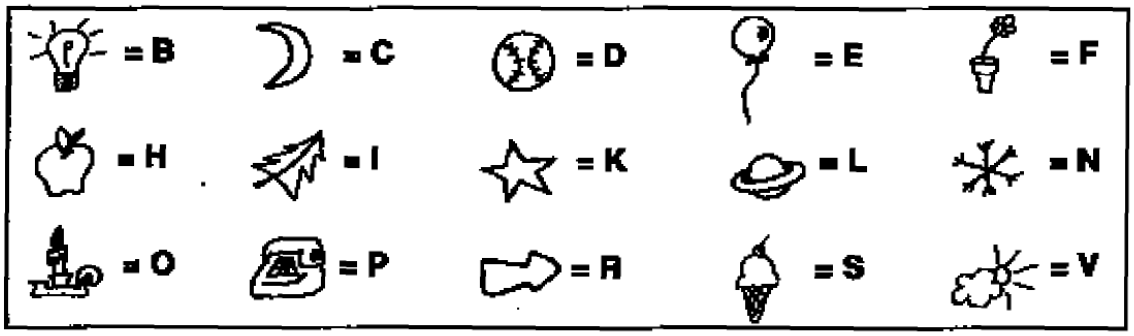
Check yes if the magnet moves the object. Check no if the magnet does not move the object.

Item	Yes	No
Pencil		
Paper Clip		
Penny		
Marble		
Scissors		
Nuts & Bolts		
Yarn		
Button		

Name _____ Date _____

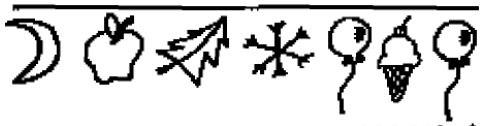
Magnet Code

Use the Secret Code below to read the facts about magnets.

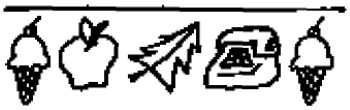


1. Lodestone is a _____ that acts like a magnet.

2. The _____ were the first people to make a compass.

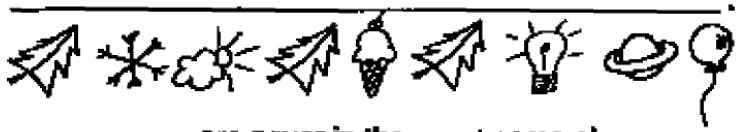


3. _____ use magnets to find their way at night.

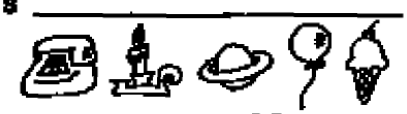


4. A school _____ rings by using magnets.

5. A magnetic field is always _____.



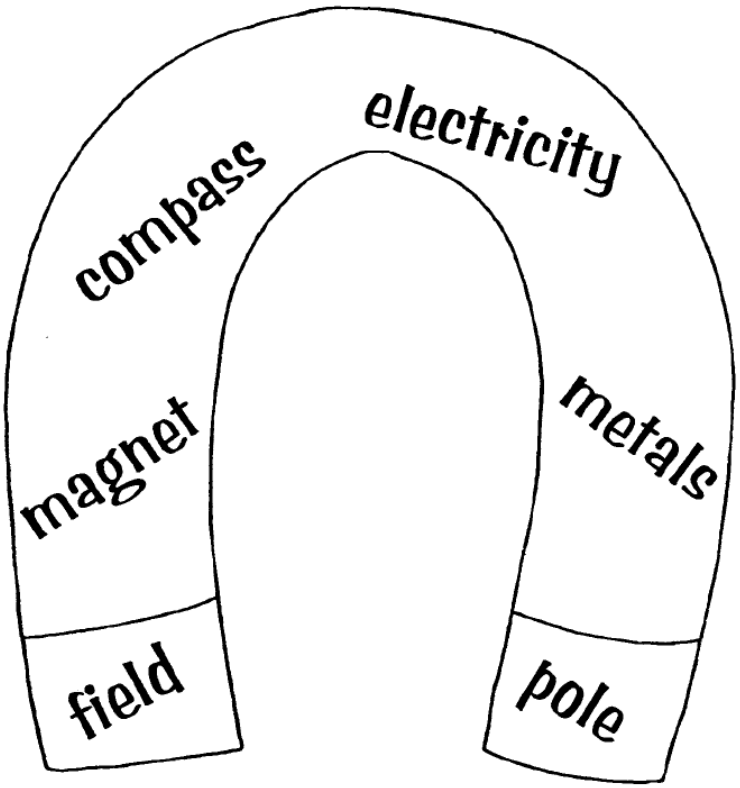
6. The Earth's _____ are never in the exact same place.



Name _____ Date _____

Fill in the Blanks

Fill in the blanks using the words inside the magnet.



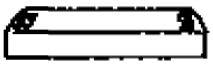
1. A _____ attracts things made of iron and steel.
2. A magnetic _____ is the area in which a magnet has its force.
3. Iron, steel and copper are types of _____ .
4. A _____ uses a magnet to point to the North Pole.
5. The area at each end of a magnet is called a _____ .
6. An electromagnet uses _____ to create a magnetic field.

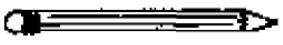
Name _____ Date _____

True or False

Write a "T" beside each true sentence and an "F" beside each false sentence.

____ 1. In some ways, the  is like a giant magnet.

____ 2. Two north poles of a  will attract each other.

____ 3. A magnet will pick up a wooden  .

____ 4. A magnet's force can work through paper and  .

____ 5. We can use a  to make a magnet.

____ 6. A  needle points to the South Pole.

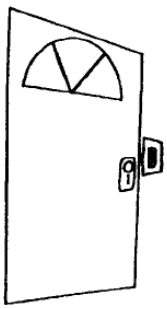
____ 7. A train in Japan uses magnets to float above the  .

____ 8.  use magnets to help us hear music.

Name _____ Date _____

Magnets That Help Us

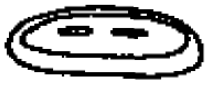
Each product on the left contains a magnet. Match each product with the person who is using it.

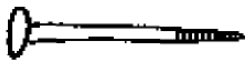


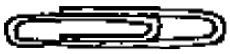
Name _____ Date _____

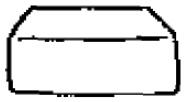
Magnet Attraction

Can the things below be attracted by a magnet? Write "YES" next to the things that can, and write "NO" next to the things that cannot.

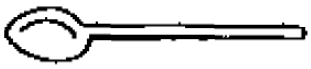
1.  plastic button _____

2.  iron nail _____

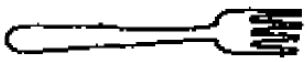
3.  steel paper clip _____

4.  rubber eraser _____

5.  paper stamp _____

6.  wooden spoon _____

7.  plastic bottle cap _____

8.  steel fork _____

Name _____ Date _____

Word Search

Look up and down in the puzzle to find the words below. Circle each word you find.

MAGNET
FIELD
COMPASS
IRON
STEEL
POLE
BATTERY
FORCE

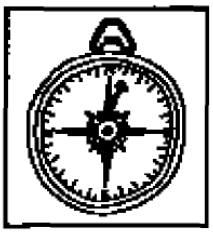
C	A	B	R	F	O	R	C	E	P
O	P	N	C	I	R	D	W	K	O
M	A	G	N	E	T	Q	E	B	G
P	H	R	M	L	A	H	W	D	L
A	D	E	X	D	O	V	P	N	Y
S	G	L	A	H	Q	G	O	A	J
S	S	B	S	T	E	E	L	S	I
N	K	M	O	T	J	P	E	J	R
B	A	T	T	E	R	Y	C	T	O
V	T	E	C	M	K	L	Q	S	N

Name _____ Date _____

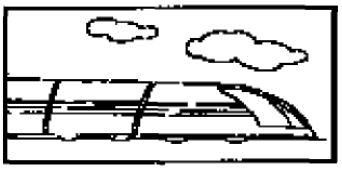
Uses for Magnets

Match each magnet USE with the correct picture on the right.

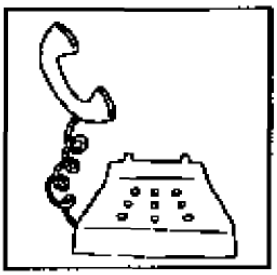
1. Lifting heavy things



2. Sorting things out



3. Showing the direction of the North Pole



4. Helping us talk to each other

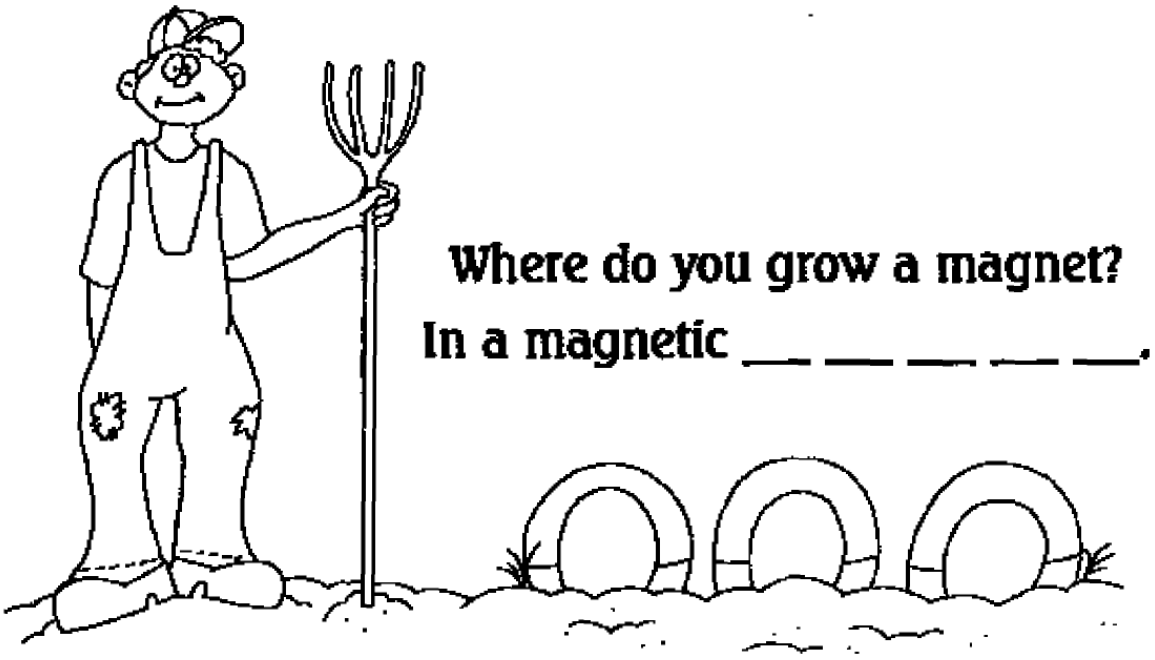
5. Helping us travel from place to place

Name _____ Date _____

Magnet Riddle

To solve the riddle, circle every fifth letter in the letter chain below. The first one has been circled for you.

A C H D (F) G L W P I N R C O E Q Z A X L S J W T D K P M



Where do you grow a magnet?

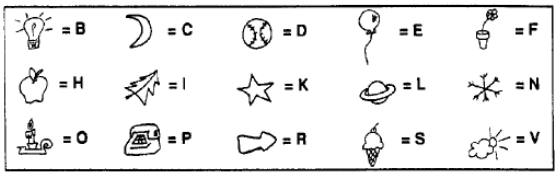
In a magnetic ___ ___ ___ ___ ___.

Solutions for Pages 1-2

Name _____ Date _____ 1

Magnet Code

Use the Secret Code below to read the facts about magnets.



1. Lodestone is a **rock** that acts like a magnet.

2. The **Chinese** were the first people to make a compass.

3. **Ships** use magnets to find their way at night.

4. A school **bell** rings by using magnets.

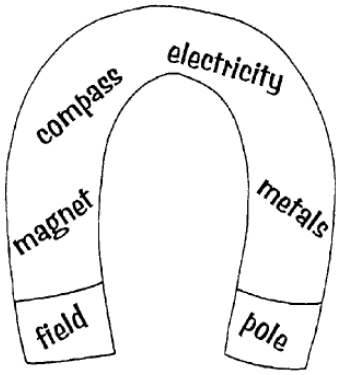
5. A magnetic field is always **invisible**.

6. The Earth's **poles** are never in the exact same place.

Name _____ Date _____ 2

Fill in the Blanks

Fill in the blanks using the words inside the magnet.



1. A **magnet** attracts things made of iron and steel.
2. A magnetic **field** is the area in which a magnet has its force.
3. Iron, steel and copper are types of **metals**.
4. A **compass** uses a magnet to point to the North Pole.
5. The area at each end of a magnet is called a **pole**.
6. An electromagnet uses **electricity** to create a magnetic field.

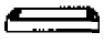
Solutions for Pages 3-4

Name _____ Date _____ 3

True or False

Write a "T" beside each true sentence and an "F" beside each false sentence.

T 1. In some ways, the  is like a giant magnet.

F 2. Two north poles of a  will attract each other.

F 3. A magnet will pick up a wooden .

T 4. A magnet's force can work through paper and  .

T 5. We can use a  to make a magnet.

F 6. A  needle points to the South Pole.

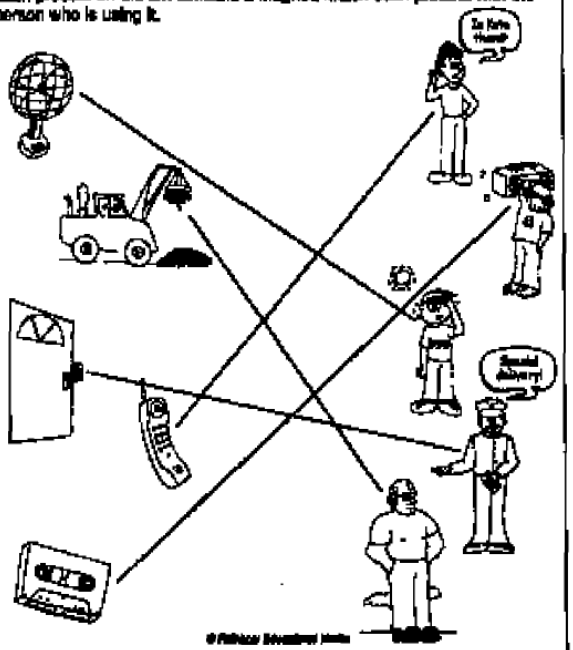
T 7. A train in Japan uses magnets to float above the  .

T 8.  use magnets to help us hear music.

Name _____ Date _____ 4

Magnets That Help Us

Each product on the left contains a magnet. Match each product with the person who is using it.



Solutions for Pages 5-6

Name _____ Date _____ 5

Magnet Attraction

Can the things below be attracted by a magnet? Write "YES" next to the things that can, and write "NO" next to the things that cannot.

1.  plastic button **NO**
2.  iron nail **YES**
3.  steel paper clip **YES**
4.  rubber eraser **NO**
5.  paper stamp **NO**
6.  wooden spoon **NO**
7.  plastic bottle cap **NO**
8.  steel fork **YES**

Name _____ Date _____ 6

Word Search

Look up and down in the puzzle to find the words below. Circle each word you find.

MAGNET
FIELD
COMPASS
IRON
STEEL
POLE
BATTERY
FORCE

C	A	B	R	F	O	R	C	E	P
O	P	N	C	I	R	D	W	K	O
M	A	G	N	E	T	Q	E	B	G
P	H	R	M	L	A	H	W	D	L
A	D	E	X	D	O	V	P	N	Y
S	G	L	A	H	Q	G	O	A	J
S	S	B	S	T	E	E	L	S	I
N	K	M	O	T	J	P	E	J	R
B	A	T	T	E	R	Y	C	T	O
V	T	E	C	M	K	L	Q	S	N

Solutions for Pages 7-8

Name _____ Date _____ 7

Uses for Magnets

Match each magnet USE with the correct picture on the right.

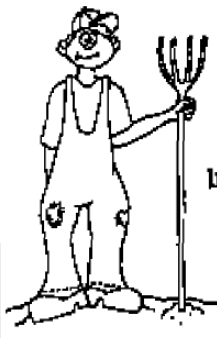
1. Lifting heavy things
2. Sorting things out
3. Showing the direction of the North Pole
4. Helping us talk to each other
5. Helping us travel from place to place

Name _____ Date _____ 8

Magnet Riddle

To solve the riddle, circle every fifth letter in the letter chain below. The first one has been circled for you.

A C H D G L W P I N R C O E Q Z A X L S J W T D K P M



Where do you grow a magnet?
In a magnetic F I E L D.