Rigorous Curriculum Design
Unit Planning Organizer

<table>
<thead>
<tr>
<th>Subject(s)</th>
<th>Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade/Course</td>
<td>First</td>
</tr>
<tr>
<td>Unit of Study</td>
<td>Push and Pull- Affects of Motion</td>
</tr>
<tr>
<td>Unit Type(s)</td>
<td>☐ Topical  x Skills-based ☐ Thematic</td>
</tr>
</tbody>
</table>

**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.
<table>
<thead>
<tr>
<th>Essential Questions</th>
<th>Corresponding Big Ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>How does push or pull affect the motion of an object?</td>
<td>n/a</td>
</tr>
</tbody>
</table>

**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**

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.

**Informal Progress Monitoring Checks**

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

<table>
<thead>
<tr>
<th>Learning Activities Using Text or Program</th>
<th>Authentic Performance Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

**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.
“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](http://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.
### Research-Based Effective Teaching Strategies

Table

<table>
<thead>
<tr>
<th>Check all those that apply to the unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Identifying Similarities and Differences</td>
</tr>
<tr>
<td>x Summarizing and Note Taking</td>
</tr>
<tr>
<td>x Reinforcing Effort, Providing Recognition</td>
</tr>
<tr>
<td>x Homework and Practice</td>
</tr>
<tr>
<td>□ Nonlinguistic Representations</td>
</tr>
<tr>
<td>x Cooperative Learning</td>
</tr>
<tr>
<td>x Setting Objectives, Providing Feedback</td>
</tr>
<tr>
<td>x Generating and Testing Hypotheses</td>
</tr>
<tr>
<td>□ Cues, Questions, and Advance Organizers</td>
</tr>
<tr>
<td>x Interdisciplinary Non-Fiction Writing</td>
</tr>
</tbody>
</table>

### 21st Century Learning Skills

Table

<table>
<thead>
<tr>
<th>Check all those that apply to the unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Teamwork and Collaboration</td>
</tr>
<tr>
<td>□ Initiative and Leadership</td>
</tr>
<tr>
<td>x Curiosity and Imagination</td>
</tr>
<tr>
<td>x Innovation and Creativity</td>
</tr>
<tr>
<td>x Critical thinking and Problem Solving</td>
</tr>
<tr>
<td>□ Flexibility and Adaptability</td>
</tr>
<tr>
<td>x Effective Oral and Written Communication</td>
</tr>
<tr>
<td>x Accessing and Analyzing Information</td>
</tr>
<tr>
<td>□ Other</td>
</tr>
</tbody>
</table>

### Instructional Resources and Materials

<table>
<thead>
<tr>
<th>Physical</th>
<th>Technology-Based</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><a href="http://idahoptv.org/dialogue4kids/season9/forcesmotion/facts.cfm">http://idahoptv.org/dialogue4kids/season9/forcesmotion/facts.cfm</a></td>
</tr>
</tbody>
</table>
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.
ii. Gravity
   1. Dropping items
   2. Jumping
iii. Wind
   1. Fan blowing items across water/land
iv. Magnet
   1. Moving iron objects with magnets
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](http://www.firstschoolyears.com/science/forces/forces.html) (this website provides several activities for push and pull)
   d. [http://www.gscdn.org/library/cms/69/13969.pdf](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)

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.
      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 force 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.
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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pencil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper Clip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penny</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marble</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scissors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuts &amp; Bolts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yarn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Button</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Magnet Code

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

<table>
<thead>
<tr>
<th>Image</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>⚡</td>
<td>B</td>
</tr>
<tr>
<td>🌚</td>
<td>C</td>
</tr>
<tr>
<td>🪝</td>
<td>D</td>
</tr>
<tr>
<td>🎈</td>
<td>E</td>
</tr>
<tr>
<td>🌾</td>
<td>F</td>
</tr>
<tr>
<td>🍎</td>
<td>H</td>
</tr>
<tr>
<td>⚪️</td>
<td>I</td>
</tr>
<tr>
<td>⭐️</td>
<td>K</td>
</tr>
<tr>
<td>🌌</td>
<td>L</td>
</tr>
<tr>
<td>🌡️</td>
<td>M</td>
</tr>
<tr>
<td>🎨</td>
<td>N</td>
</tr>
<tr>
<td>☑️</td>
<td>O</td>
</tr>
<tr>
<td>🍰</td>
<td>P</td>
</tr>
<tr>
<td>⯝</td>
<td>R</td>
</tr>
<tr>
<td>🍦</td>
<td>S</td>
</tr>
<tr>
<td>☀️</td>
<td>V</td>
</tr>
</tbody>
</table>

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.

   🍎 🌌 🌌 🍎
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.
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.  
   ___

© Rainbow Educational Media
Magnets That Help Us

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

- Globe
- Crane
- Door
- Radio
- Cassette
- Cell phone
- Delivery man
- Construction worker
- Woman

© Rainbow Educational Media
**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
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

© Rainbow Educational Media
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
Magnet Riddle

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

ACHDFGLWP1NRCOEQZAXLSJWTDKPM

Where do you grow a magnet?
In a magnetic ___ ___ ___ ___.
Solutions for Pages 1-2

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

```
= B  = C  = D  = E  = F
= H  = I  = K  = L  = N
= O  = P  = R  = S  = V

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.
```

**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.
```
True or False

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

1. In some ways, the Earth is like a giant magnet. **T**
2. Two north poles of a magnet will attract each other. **F**
3. A magnet will pick up a wooden spoon. **F**
4. A magnet's force can work through paper and plastic. **T**
5. We can use a compass to make a magnet. **F**
6. A compass needle points to the South Pole. **T**
7. A train in Japan uses magnets to boost above the tracks. **T**
8. Use magnets to help us hear music. **T**

Magnets That Help Us

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

---

**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
Solutions for Pages 7-8

**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

**Magnet Riddle**

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

ACHDBGLWFPINRCEOQIZAXLSJWTDIKPM

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