No Prep!

NGSS aligned

Motion and Matter

For **FOSS** Science Kits

A comprehensive student journal that follows all of the focus questions and investigations for the Motion and Matter FOSS kit. Over 65 picture supported vocabulary cards included!

Single License

Just a little note...

Thank you for purchasing this pack. Please take the time to email me (rebecca.seeley81@gmail.com) with any questions you may have, as well as **leave feedback** on your purchase! This earns you TPT points you can use towards your next TPT purchase!
[You can do this by going into "My Purchases" and clicking on the green "Provide Feedback" link under each purchase.]

This purchase grants you a single license. This means you may this product in your classroom only. Unlimited copies (for student use) may be printed for your classroom. This does not grant you permission to sell or give this product to other teachers on your team, in your school, or in/out of your district. These pages may not be posted on school websites without a link back to the original publisher.

Thanks so much and Happy Teaching!!

Teacher Tip

Thanks for purchasing this pack! I have tried to create an easy and fun way to learn using your FOSS Next Generation edition kit. The science notebook is to be used as you see fit. Print and use all of the pages, or simply print what you need/what you have time for. (I know science time can be hard to come by these days!!) I have also included some extra pages to enhance your teaching and your students' learning. I have left the page numbers empty so you can use them in any order you'd like.

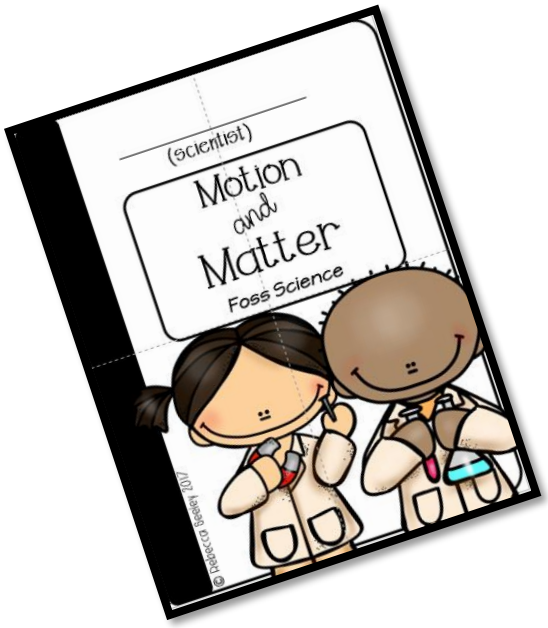
Check out the teacher tips throughout the pack for helpful hints and ideas. ☺

Teacher Tip

Science notebooking is a key component of FOSS science. On the next page you will find some simple guidelines to notebooking. I usually print this page out and laminate it. We go back and refer to it as we are notebooking to make sure we are covering all of the steps.

Science Notebooks

1. Date your entry
2. Think before you write
3. Use nice handwriting
4. Draw detailed pictures
5. Don't forget to label
6. Write in your table of contents
7. Share your findings



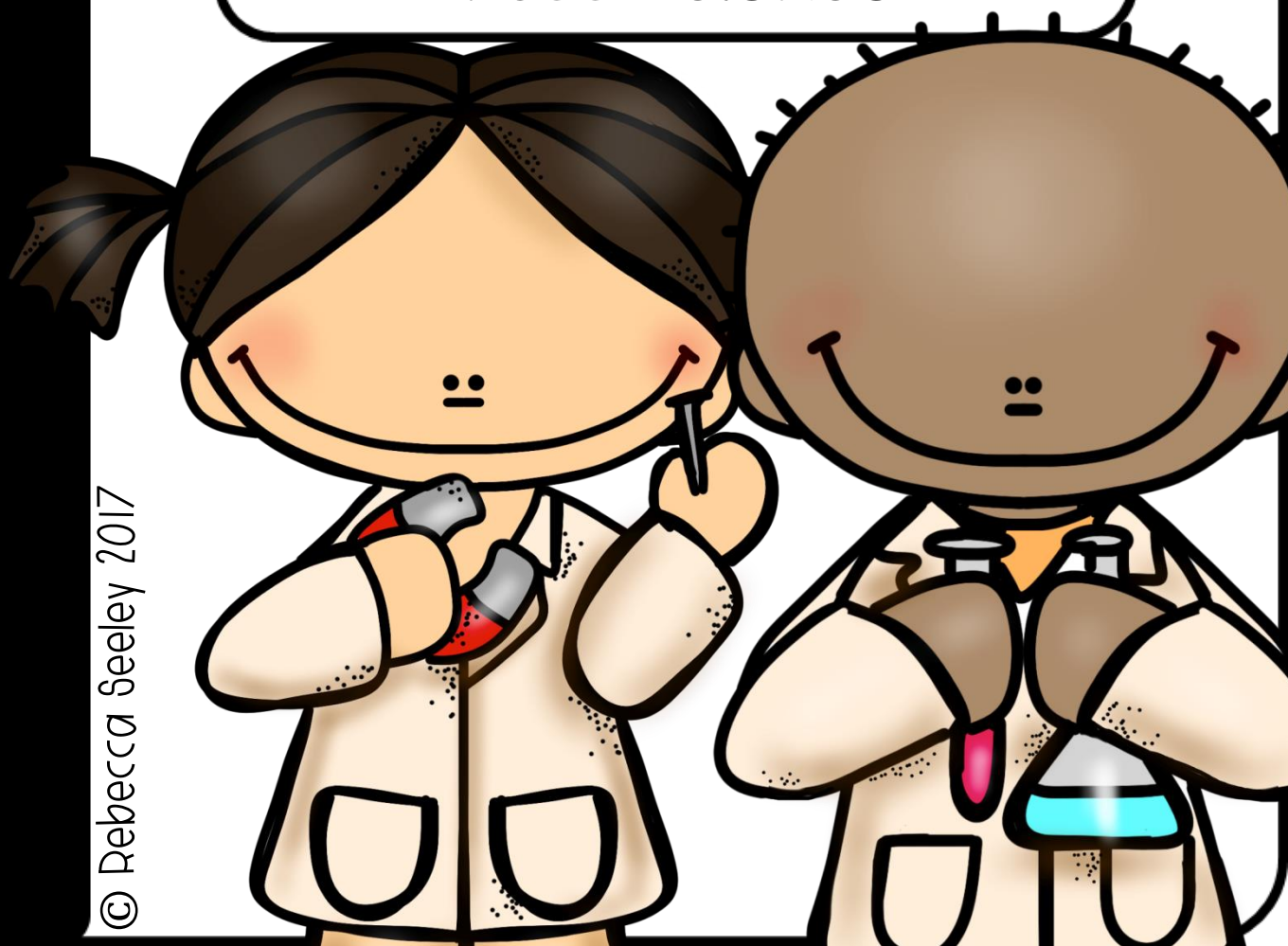
observing with your 5 senses

_____

(scientist)

Motion and Matter

Foss Science



_____

(scientist)

Motion and Matter

Foss Science

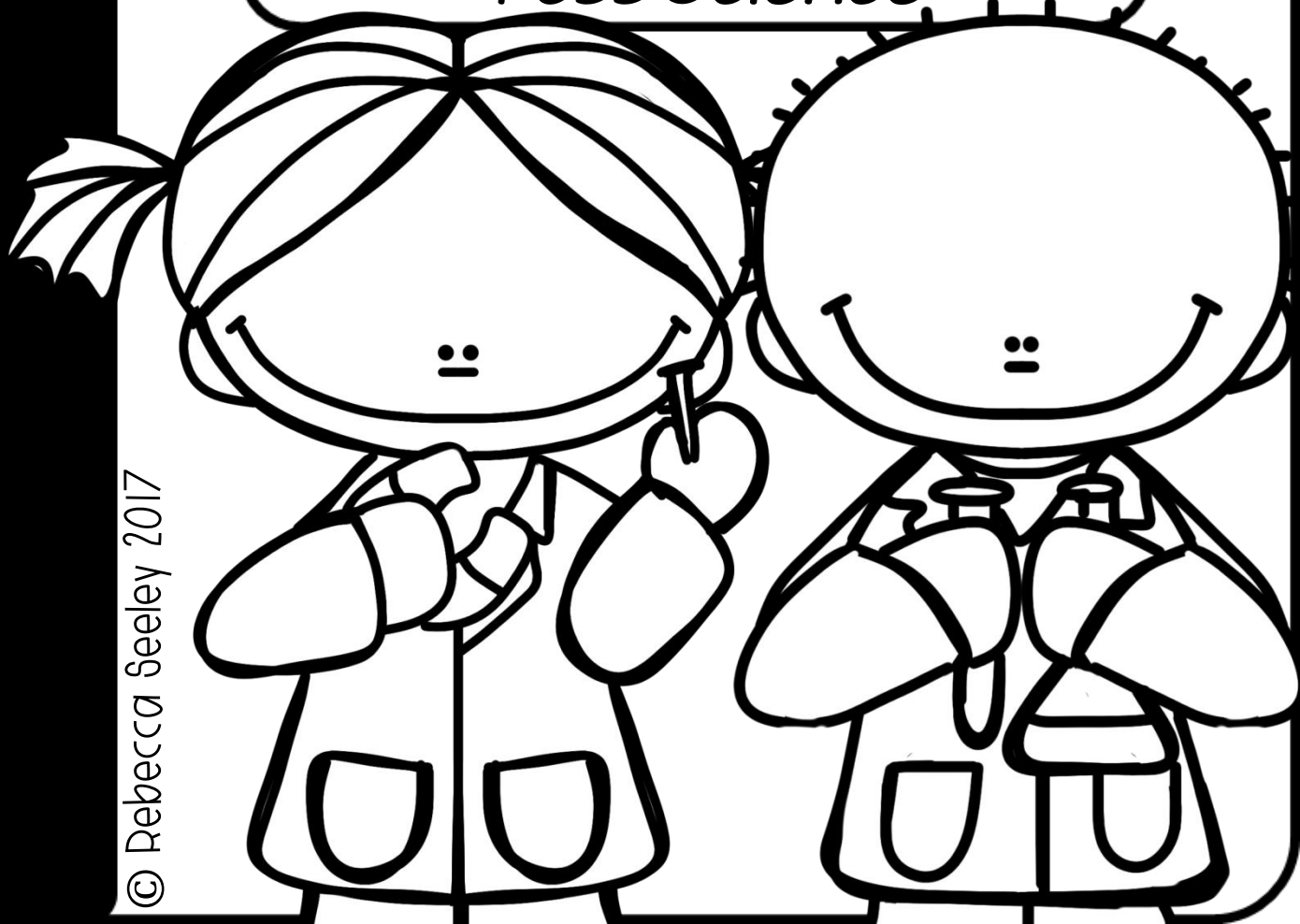
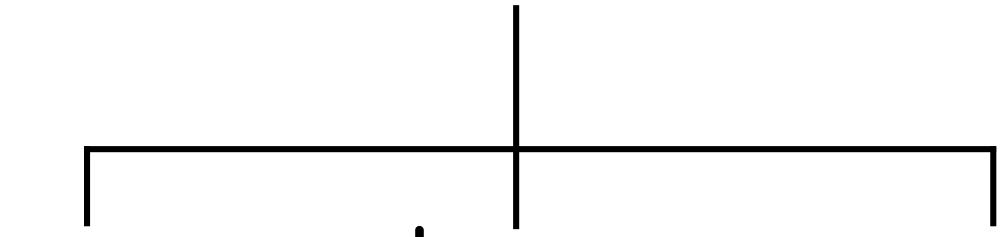


Table of Contents

Title pg

Scientists

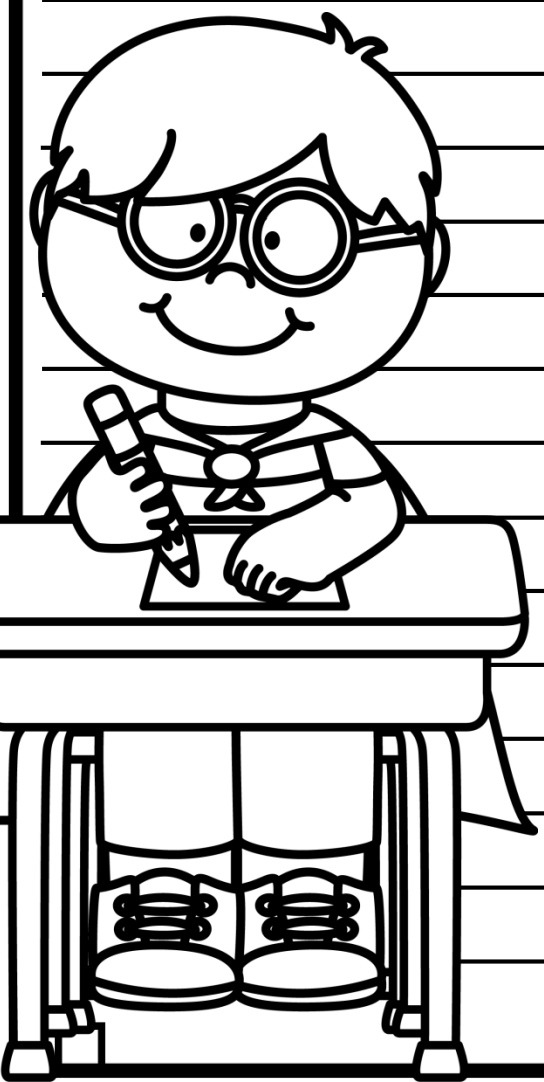


can	have	are

Use your can/have/are chart to write 2 good sentences about scientists.

7 Minute Quick Write

[What I already know about motion and matter]



Question, Question...

Who has a question?

[Write 3 questions you have about this science unit.]

1

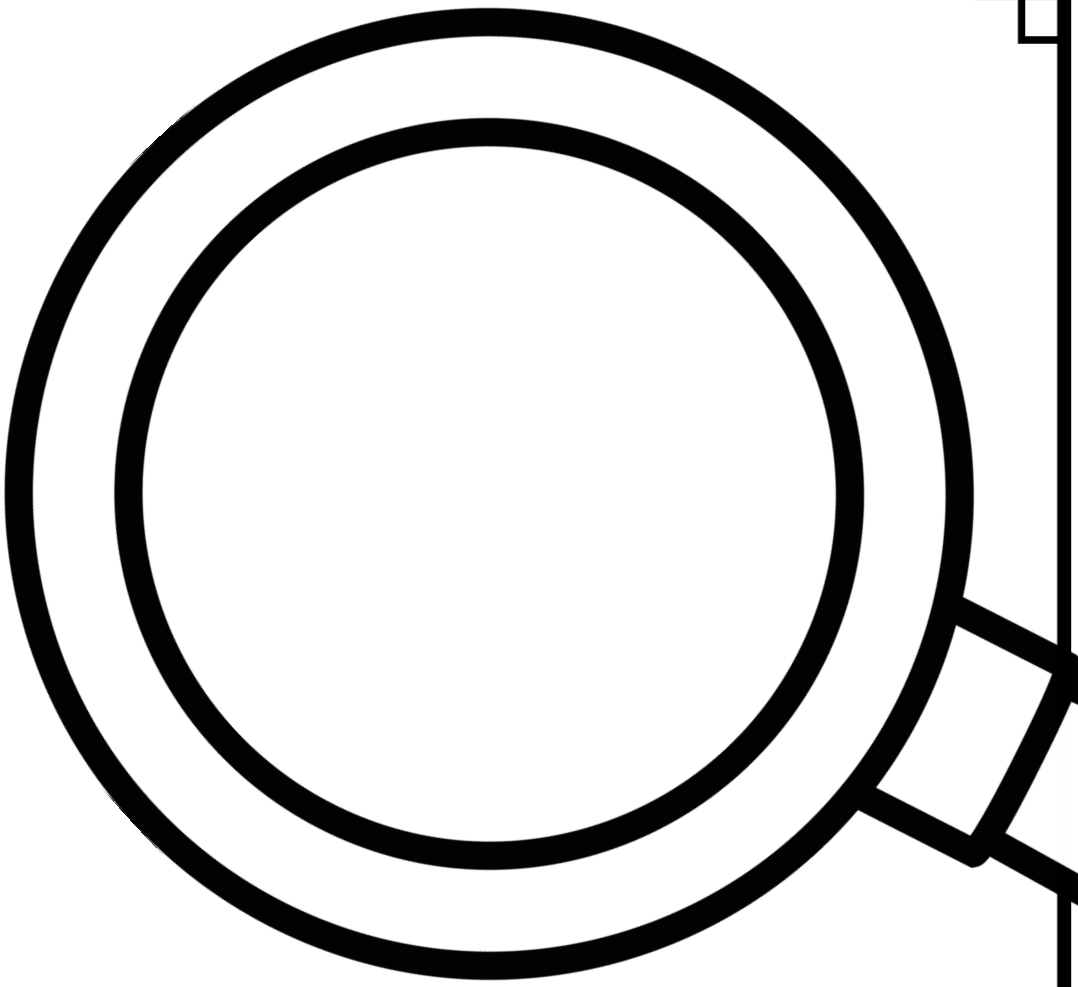
2

3

Teacher Tip

Many teachers have asked for more space for students to write their thinking/learning. I created this page to place after each investigation page. This provides more space for students to write their thoughts and observations down.

What did I learn in this investigation?



Write, Draw, and Label

INVESTIGATION # 1.1

Focus Question: What happens when magnets interact with other magnets and with paper clips?

In today's investigation we learned about magnetic force. We performed multiple experiments with magnets and other materials to see how magnetic force works. Write your observations below.

_____
date

Magnetic-Force Checklist

- ❑ Tie a magnet on a string. Swing the magnet on a string over another magnet sitting on a table. What happens if you tape the magnet to the table?

- ❑ Tie a paper clip on the end of a string. Swing the paper clip on a string over a magnet. What happens?

- ❑ Put several magnets on a straw. What happens?

- ❑ Put magnets on two sides of a stick. What happens?

INVESTIGATION # 1.1
[continued]

Magnetic-Force Checklist

- ❑ Stretch a rubber band the length of a stick. Hang several paper clips from the rubber band. Move the stick over a magnet. What happens?

- ❑ Set up a 'talking magnet' with a partner. What happens?

Follow Up Questions:

1. What force is acting against gravity's downward pull to make magnets float in the air?

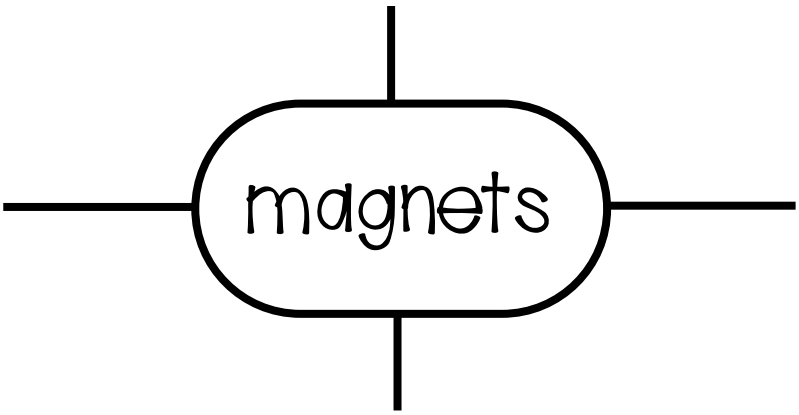
2. Below, draw and label a model that shows the two forces at work: magnetism and gravity.

INVESTIGATION # 1.1

Reading: "Magnetism and Gravity"

In today's reading we learned more about magnetism and gravity. Below, fill in the word web about magnets. Then answer the questions to show what you learned from the reading.

_____
date



1. How are magnetism and gravity the same? How are they different?

_____

_____

2. Why don't magnets need to be touching to push or pull?

_____

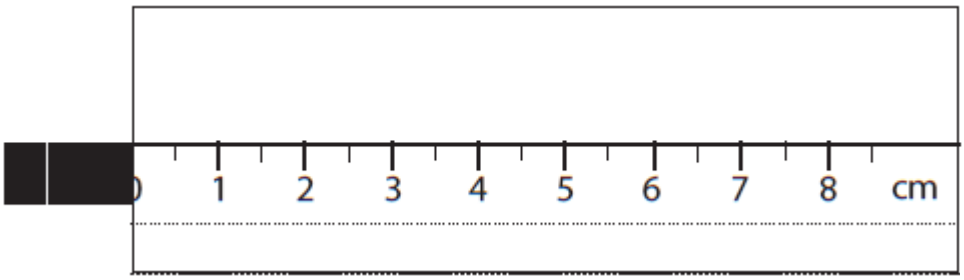
_____

INVESTIGATION # 1.2

Focus Question: How is the magnetic field affected when more magnets are added?

In today's investigation we learned more about magnetism. We used data to predict the outcome of our 2 magnet test. Write your observations below.

_____
date



Magnetic Field Data

Number of Magnets	Test 1	Test 2	Test 3	Test Average	
1 magnet					
2 magnets				prediction	actual
3 magnets					

How is the magnetic field affected when more magnets are added?

INVESTIGATION # 1.2

Reading: "What Scientists Do"

In today's reading we learned about science practices. As you read, write what the article makes you think about in the "What I think" column. Then write a brief summary of the article in the "What the text says" column

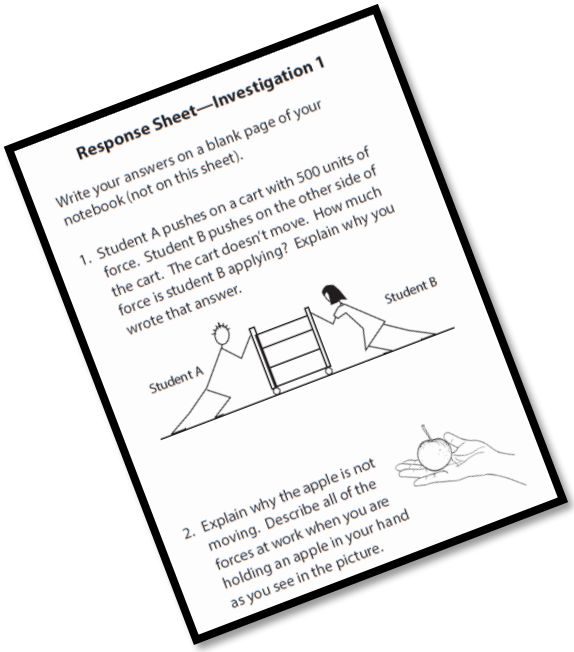
_____
date

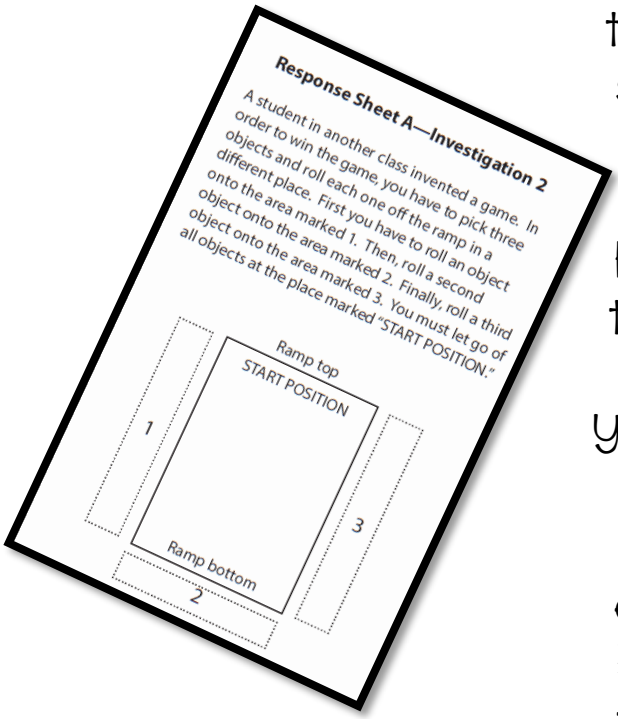
What I think:	What the text says:

Questions to guide your thinking:

1. How do scientists choose the questions they want to study further?
2. How do you think scientists share the results of their investigations?
3. What questions do you have after doing the Magnetic Force Investigation?

Teacher Tip





There are a few response sheets (found on Fossweb) that go with some investigations. These response sheets are for students to read through and look for things they agree and disagree with. The response sheets are "written" by a student. (See example)

I have created a few sheets that can be used with these sheets. One page is almost all blank- this is so you can print the half sheets and have your students glue or tape them into their journal. The other is more guided. You may want to put multiple copies in your journal, or simply have them as an extra. It is whatever works best for your class and the time you have for science.

RESPONSE SHEET Thoughts

date _____

Response Sheet # _____

RESPONSE SHEET Thoughts

date _____ Response Sheet # _____

After reading the response sheet carefully, think about what you agree with and what you disagree with. Record your thoughts in the table below.

I agree with...	I disagree with...

INVESTIGATION # 1.3

Focus Question: What causes change of motion?

In today's investigation we learned more about the different kinds of forces. Write, draw, and label about the investigation we did and what observations you made.

_____

date

In this investigation...

INVESTIGATION # 1.3

Reading: "Change of Motion"

In today's reading we learned more about force. After reading record your thoughts and ideas to each question in the response column.

_____
date

Question:	Response:
How do you get an object to start moving?	
How do you get an object to stop moving?	
Starting and stopping are two changes of motion. Can you think of others?	
What happens when you play baseball and throw the ball high into the air?	

INVESTIGATION # 2.1

Focus Question: How can we change the motion of wheels rolling down ramps?

In today's investigation we learned about the motion of wheels. We built wheel and axle systems to observe their motion. Write and draw your observations below. Use the ideas to think about to help guide you.

_____

date

Ideas to guide your thinking:

1. Draw a picture and describe the system you worked with.
2. Describe the pattern of the motion of the system as it rolls down the ramp.
3. Explain how the arrangement of the wheels and axles affects the way the system rolls.

INVESTIGATION # 2.2

Focus Question: What rules help predict where a rolling cup will end up?

In today's investigation we learned more about the motion of rolling. We used weight to help our cups end up "parked" under the ramp. Write a summary below of the rules that helped you predict the motion of the cup. Draw and label a picture to go along with your summary.

_____

date

Summary of the rules...

INVESTIGATION # 2.2

Reading: "Patterns of Motion"

_____
date

In today's reading we learned more about the patterns of motion. Write three things you learned, two ideas you want to remember, and one question that you still have about motion.

3 Things that you learned

2 Ideas you want to remember

1 Question you still have

INVESTIGATION # 2.3

Focus Question: What happens to the motion of a twirly bird when the design changes?

In today's investigation we made and changed the design of twirly birds to see how the motion changes. Below you will draw, label, and explain your original twirly bird. You will then make changes to the design of your twirly bird and will draw, label, and explain your new twirly bird on the following journal page.

_____
date

ORIGINAL TWIRLY BIRD

1. Draw and label your twirly bird.

2. Predict its movement.

_____

_____

_____

_____

3. How did your twirly bird move?

_____

_____

4. What changes could you make to your twirly bird to make it fly better?

_____

_____

INVESTIGATION # 2.3

Focus Question: What happens to the motion of a twirly bird when the design changes?

NEW TWIRLY BIRD

1. Draw and label your new twirly bird.

2. What variables did you change?

3. Predict- how do you think your new twirly bird's motion will change?

4. After flying your new bird describe the result. Compare your original twirly bird with your new bird. Which bird flew better? Why?

INVESTIGATION # 2.4

Focus Question: What is the best design for a top?

In today's investigation, we learned about the motion of tops. We built tops to observe their motion. Write and draw your observations below. Use the ideas to think about to help guide you.

_____

date

Ideas to guide your thinking:

1. Draw a picture and describe the system you worked with.
2. What is the best design for a top that spins fast? Spins slowly?
3. Does it make a difference if you use the big or small disks?
4. How do you get a top to spin?
5. How does the surface affect the spinning of a top?

INVESTIGATION # 2.4

Reading: "What Goes Around"

In today's reading we learned more about motion. After reading, record your thoughts and ideas to each question in the response column.

_____
date

Question:	Response:
Name 3 things that spin.	
What do all tops have in common?	
How would you design a top and what would be your goal for its spinning motion?	

INVESTIGATION # 3.1

Focus Question: What are some important features of a cart that will roll from here to there?

In today's investigation we acted like engineers by building carts to observe their motion. Write and draw your observations below. Use the ideas to guide your thinking.

_____

date

Ideas to guide your thinking:

1. Draw and label a picture to describe the cart you worked with.
2. How did you get your cart to roll (not slide)?
3. What parts of the cart work together to allow the system to move?
4. What are some changes you would make to your cart in order for it to move better?

INVESTIGATION # 3.1

Reading: "What Engineers Do"

In today's reading we learned about engineers. After reading, record your thoughts and ideas to each question in the response column.

_____
date

Question:	Response:
What do train engineers do?	
What problems do train-design engineers work on today? Why are solutions to these problems important?	
Why must engineers think about criteria and constraints for their designed solutions?	

INVESTIGATION # 3.2

Focus Question: How can you improve the design of your cart?

In today's investigation we made improvements to our carts and began measuring how far they will travel down ramps. Record your observations below.

_____
date

MY IMPROVED CART

1. Draw and label your new cart

2. What changes did you make?

_____

_____

_____

_____

3. Fill out the table below to show your results.

Cart/Ramp Data Table

Start position:	Trial 1	Trial 2	Trial 3	Trial Average

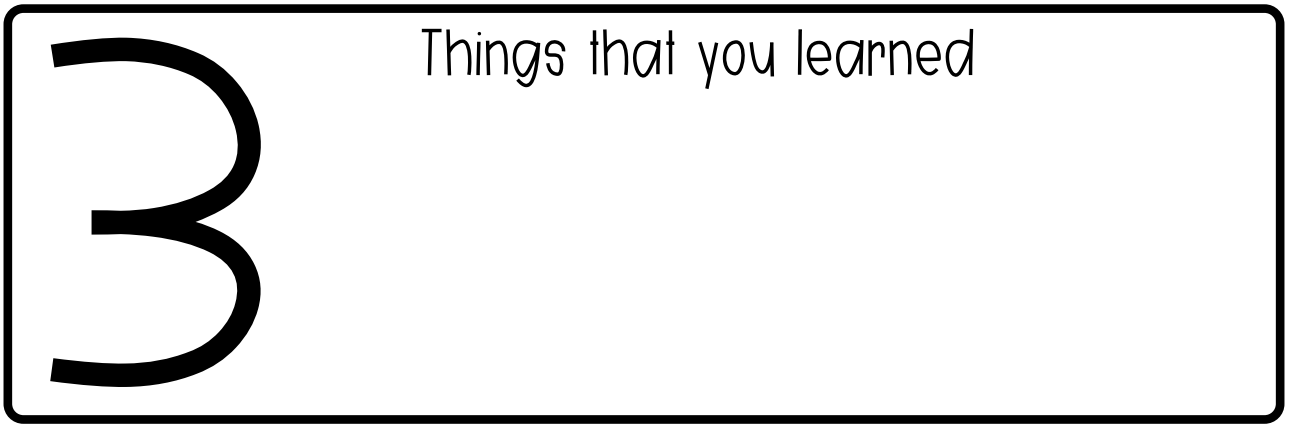
INVESTIGATION # 3.2

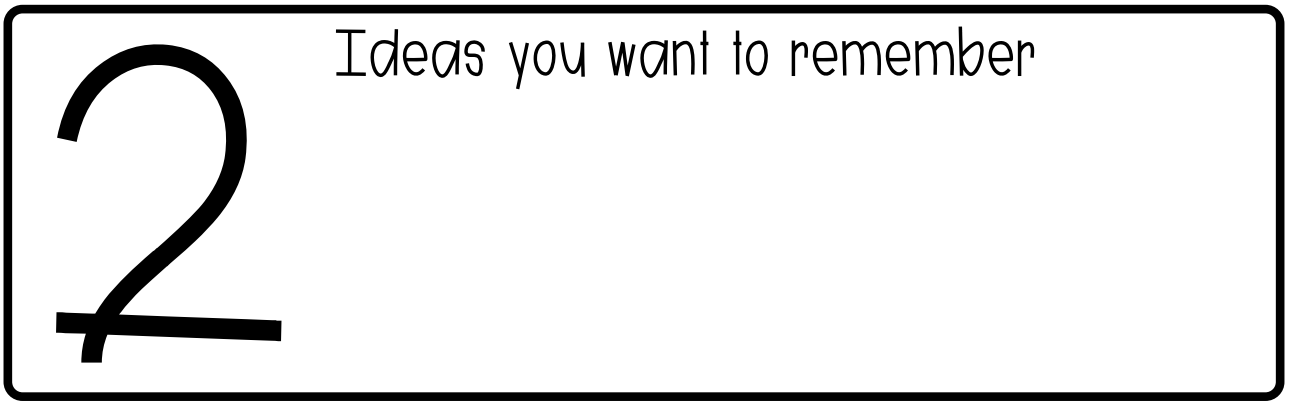
Reading: "Soap Box Derby"

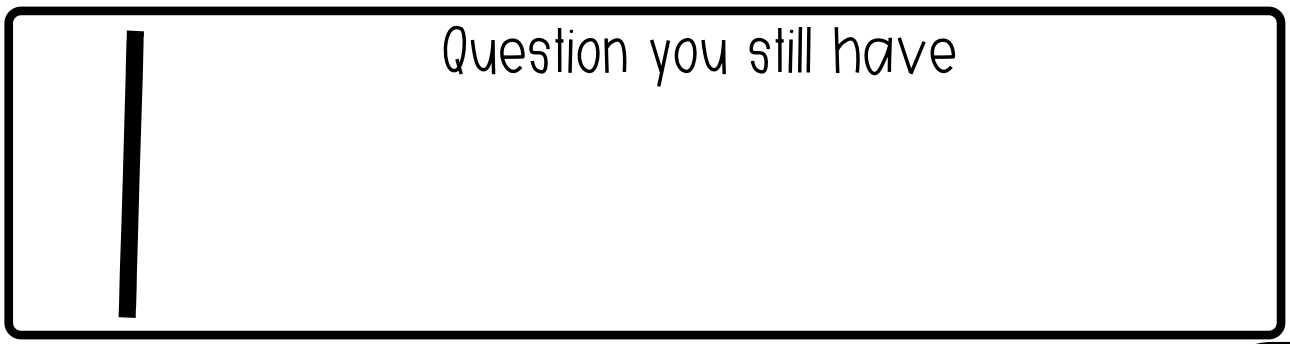
_____

date

In today's reading we read about a soap box derby. Write three things you learned, two ideas you want to remember, and one question that you still have about a soap box derby.







INVESTIGATION # 3.3

Focus Question: _____

_____

You are in charge of today's investigation. Write a focus question. Write and draw what you learned from investigating that focus question. There are tools below to help if needed.

_____
date

Cart/Ramp Data Table

Start position:	Trial 1	Trial 2	Trial 3	Trial Average

INVESTIGATION # 3.3

_____
date

Think about it...

1. What is important to remember when doing an investigation like this?

2. What are some things that you did well in this investigation?

3. What was the hardest part about doing this investigation?

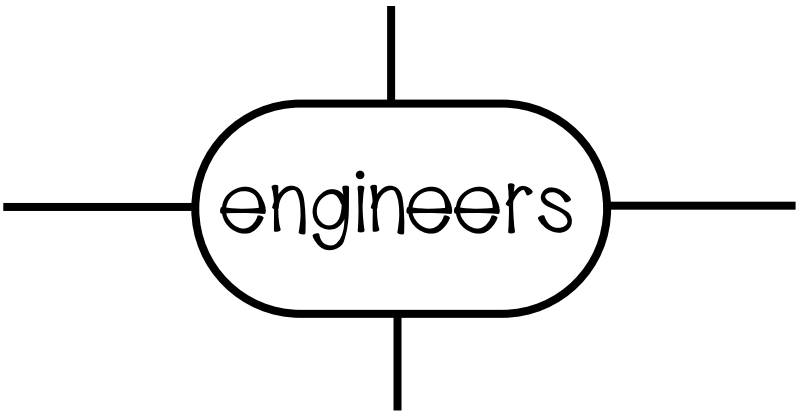
4. Did you run into any problems? How did you solve them?

INVESTIGATION # 3.3

Reading: "How Engineers and Scientist Work Together"

In today's reading we learned more about engineers and scientists. Fill in the word web about engineers. Then answer the questions to show what you learned from the reading.

_____
date



1. How do scientists and engineers help each other?

_____

_____

_____

2. Did the students in the article get results like the ones you got?

_____

_____

INVESTIGATION # 3.4

Focus Question: How can you use magnets to do cart tricks?

In today's investigation we used magnets to help our carts do tricks. Draw and label a picture to show how magnets helped your cart do tricks. Write what went well and what problems you had during this investigation.

_____

date

What went well...

_____

_____

_____

What problems I had...

_____

_____

INVESTIGATION # 3.4

Reading: "Magnets at Work"

In today's reading we learned more about how magnets are used to solve problems. Think of a problem you could solve using the magnetic field that surrounds a magnet. Describe the problem, the solution, and make a diagram of your design.

_____

date

The problem is...

I solved it by...

INVESTIGATION # 4.1

Focus Question: What happens when you mix two different materials?

In today's investigation, we looked at what happens when you mix two materials. Fill in the Mixture Observation Chart below to show what you observed.

_____
date

Mixture Observation Chart

mixture	my observations
1 spoon of sand + 1 spoon of gravel	
1 spoon of sand + 50 mL of water	
1 spoon of salt + 50 mL of water	
1 spoon of calcium carbonate + 50 mL of water	

INVESTIGATION # 4.1

Reading: "Mixtures"

In today's reading we learned about mixtures. After reading, record your thoughts and ideas to each question in the response column.

_____
date

Question:	Response:
What is a good way to separate a sand and rock mixture:?	
How would you separate a mixture of marbles, corks, and nails?	
What are 3 things that could happen if you mixed a solid with a liquid?	
What is a solution and what are some examples of solutions?	

INVESTIGATION # 4.2

Focus Question: What happens when you mix two materials?

In today's investigation we mixed more materials together to observe what would happen. Think about the investigation and write, draw, and label your findings below. Use the ideas to guide your thinking.

_____

date

Ideas to guide your thinking:

1. What did you observe when you added vinegar to baking soda?
2. Where did the bubbles come from?
3. What patterns did you notice?
4. Why do you think the mass of the baking soda/vinegar was less than the mass of the starting substances?
5. What happens when you mix two materials?

INVESTIGATION # 4.2

Reading: "Reactions"

In today's reading we learned about chemical reactions. While you read, fill out the graphic organizer below to show what you have learned.

_____

date

Definition:	Characteristics:
chemical reaction	
One thing you learned:	One question you have:

INVESTIGATION # 4.3

Focus Question: What is the importance of accurate measurements for a metric field day?

In today's investigation we planned and carried out a metric field day. Write your thoughts about the day below. Draw and label your field day event plan to help explain your thinking. Remember to answer the focus question.

_____

date

Metric Field Day

INVESTIGATION # 4.3

Reading: "Careers You Can Count On"

_____

date

Today we read about different careers. Write three things you learned, two ideas you want to remember, and one question that you still have.

3

Things that you learned

2

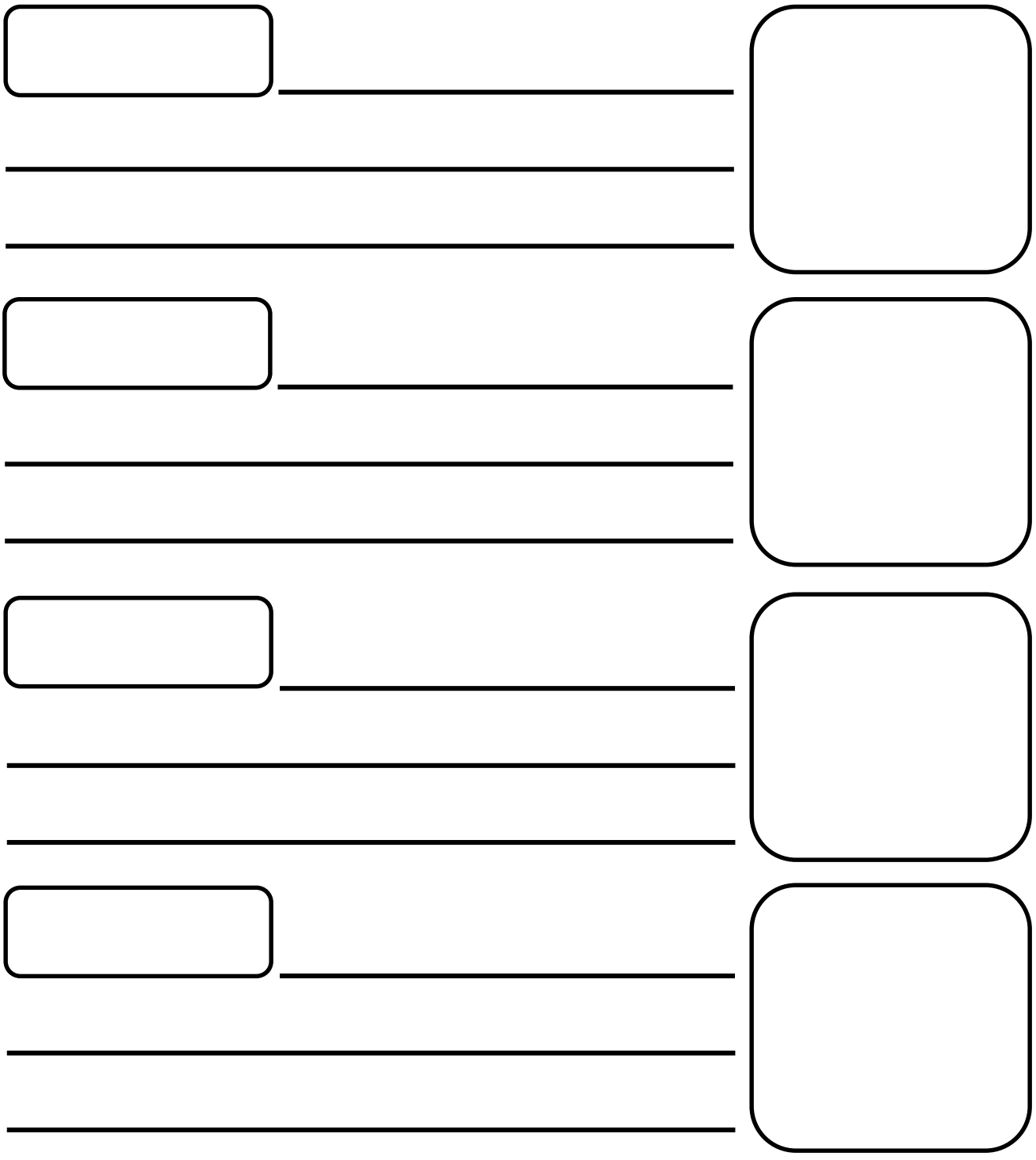
Ideas you want to remember

1

Question you still have

Glossary

Write the word, define, and draw a picture to go with it.



Teacher Tip

You could have kids put each vocabulary word into their glossary as you put them up on your word wall!! Kids love to add a detailed picture as well!

Use the following black checkered pages to enlarge and turn into your word wall for each investigation. Just print the vocab cards at a slightly reduced size so more will fit on the page

Vocabulary:

Investigation 1

attract
balanced
change of motion
data
direction
evidence
force
gravity
magnet
magnetic field
magnetic force
magnetism
model
motion
observe
pattern
practice
predict
prediction
pull
push
repel
science practices
strength
unbalanced

Investigation 2

axis
axle
friction
outcome
pattern of motion
ramp
rotate
shaft
slope
standard
system
top
twirly bird
variable
wheel

Investigation 3

bearing
centimeter
constraint
criterion
engineer
meter
metric system
solution
standard unit
start position

Investigation 4

baking soda
calcium carbonate
carbon dioxide
chalk
chemical reaction
cloudy
conservation of mass
dissolve
mixture
salt
solution
suspend
transparent
vinegar

Investigation 1:

Forces

Investigation 2:

Patterns of Motion

Investigation 3:

Engineering

Investigation 4:

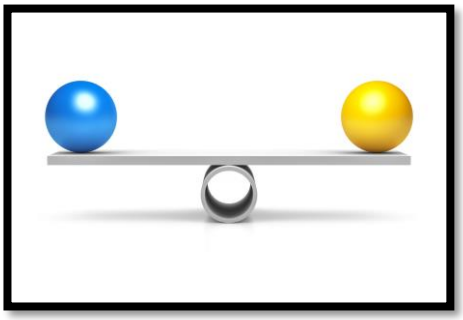
Mixtures

attract

to pull towards

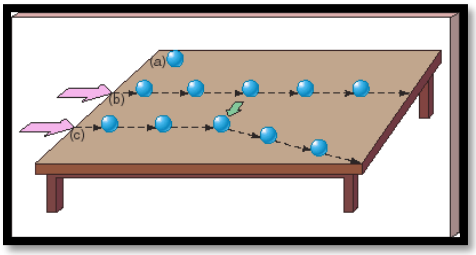
balanced

to be in a stable position



change of motion

caused when forces (pushes or pulls) are unbalanced



Investigation 1 Words

data

information collected and recorded as a result of observation

Favorite Pets		
Pet	Tally Marks	Number
	𝍸 𝍸	10
	𝍸	4
	𝍸 I	6

direction

the path on which something is moving or pointing

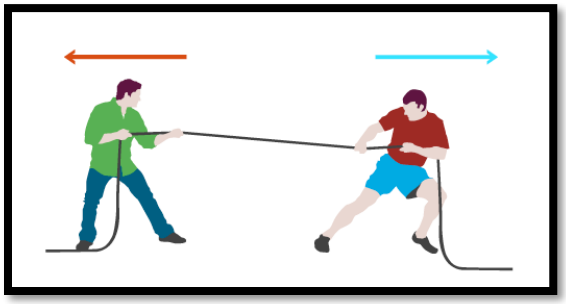
evidence

data used to support claims

Investigation 1 Words

force

a push or a pull

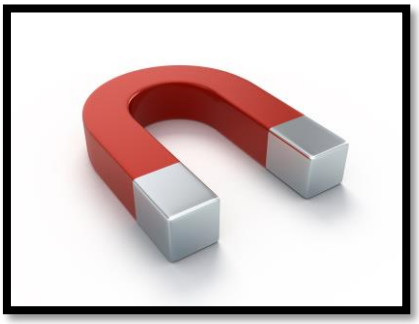


gravity

a force that pulls objects toward each other

magnet

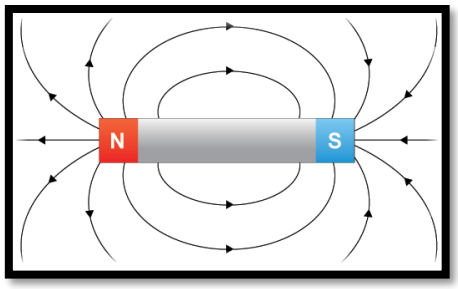
an object that sticks to iron or steel



Investigation 1 Words

magnetic field

an invisible field around a magnet

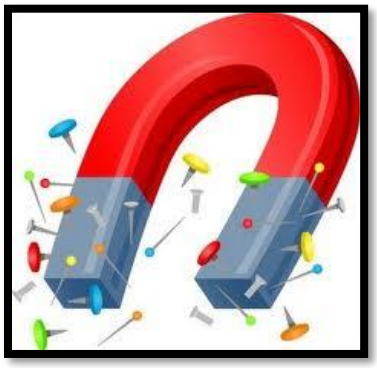


magnetic force

the force produced by a magnetic field

magnetism

a force that attracts iron and steel



Investigation 1 Words

model

an explanation or representation of an object, system, or process that cannot easily be studied

motion

the act of moving

observe

to watch and study

Investigation 1 Words

pattern

a consistent and repeating combination of qualities or behaviors

practice

to do something repeatedly in order to become better at it

predict

to estimate a future even based on data or experience

Investigation 1 Words

pull

when you make things move toward you

prediction

an estimate of a future even based on data or experience

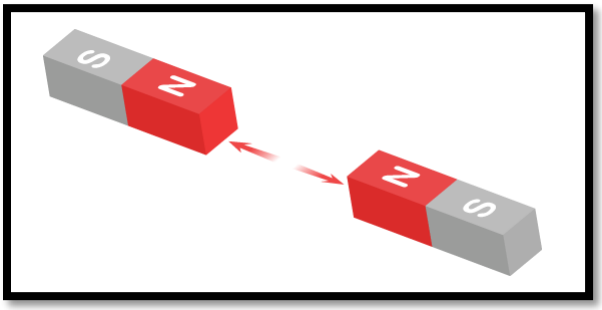
push

when you make things move away from you

Investigation 1 Words

repel

to push
away from



science practices

guidelines used when conduction an investigation to collect data to reveal a pattern and make a prediction

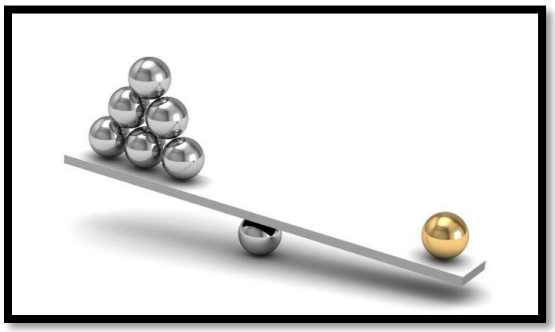
strength

the quality of being strong

Investigation 1 Words

unbalanced

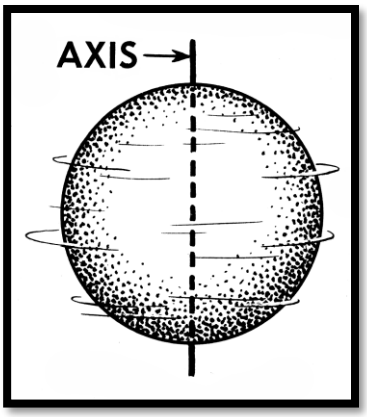
to be in an unstable position



Investigation 1 Words

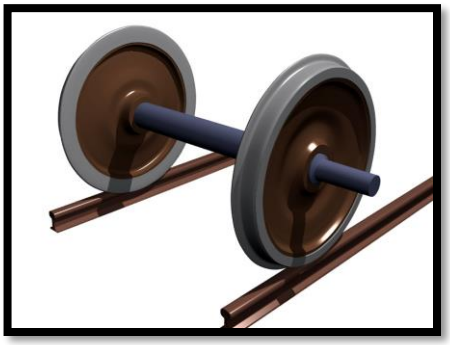
axis

a straight line around which something turns



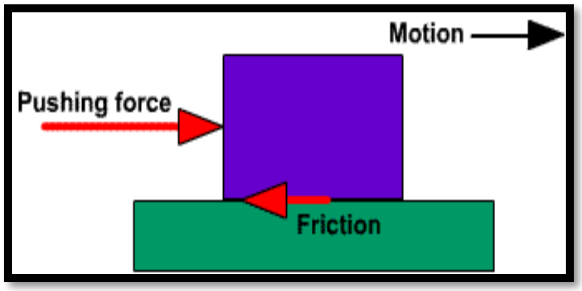
axle

a shaft that runs through the center of a wheel



friction

a force between objects that are touching each other that opposes their motion, slowing them down



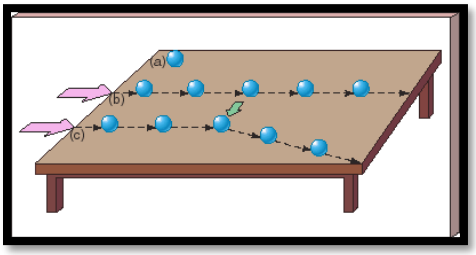
Investigation 2 Words

outcome

result

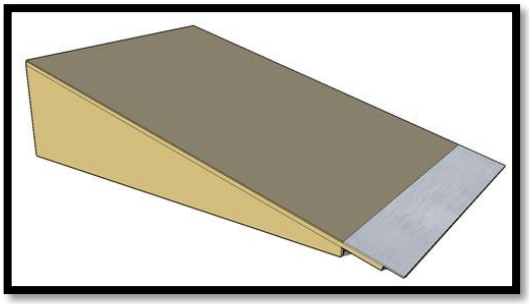
pattern of motion

the manner in which objects move due to their structure



ramp

an object that has a slope



Investigation 2 Words

rotate

to turn or spin

shaft

a long, thin structure that can be used as an axis or axle

slope

a surface that is higher on one end than then other

Investigation 2 Words

standard

a model established to compare the effect of changing a variable in an experiment

system

two more objects that work together in a meaningful way

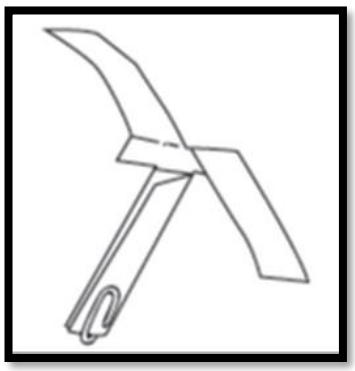
top

a toy that spins

Investigation 2 Words

twirly bird

a simple winged system that spins when it interacts with air



variable

anything you can change in an experiment that might affect the outcome

wheel

a circular object that revolves on an axle and is fixed below a vehicle or other object to enable it to move easily over the ground; can fall over when standing alone or not on an axel

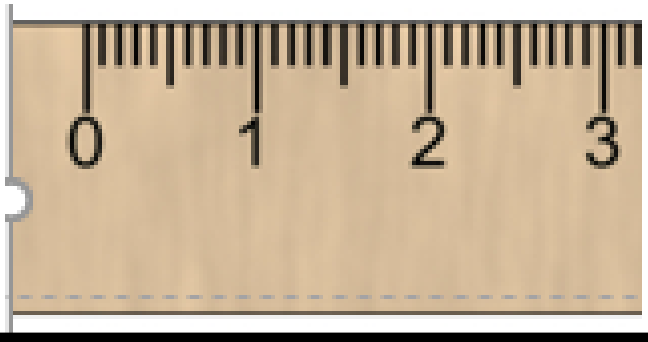
Investigation 2 Words

bearing

a part in a machine that supports or guides a rotating part

centimeter

one 100th of a meter



constraint

a restriction or limitation

Investigation 3 Words

criterion

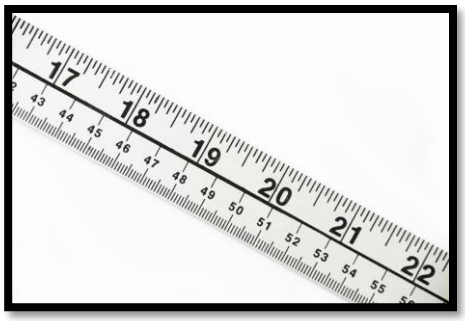
a rule for evaluating or testing something

engineer

a scientist who designs ways to accomplish a goal or solve a problem

meter

the basic unit of distance or length in the metric system



Investigation 3 Words

metric system

a measuring system based on multiples of 10

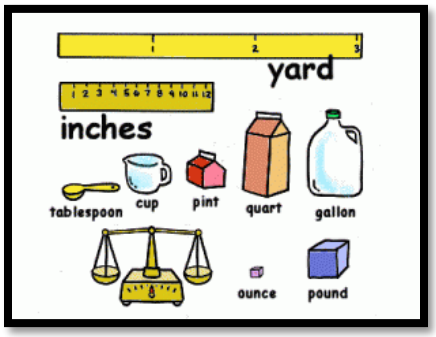
1 centimeter = 10 millimeters
10 centimeters = 1 decimeter
100 centimeters = 1 meter
10 decimeters = 1 meter
1,000 meters = 1 kilometer

solution

the act of solving a problem

standard unit

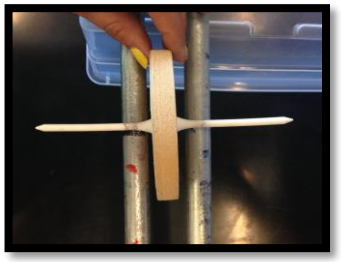
a unit that never changes



Investigation 3 Words

start position

where an object begins its descent



Investigation 3 Words

baking soda

a solid material in the form of a powder that undergoes a chemical reaction when combined with vinegar

calcium carbonate

a solid material; powdered chalk

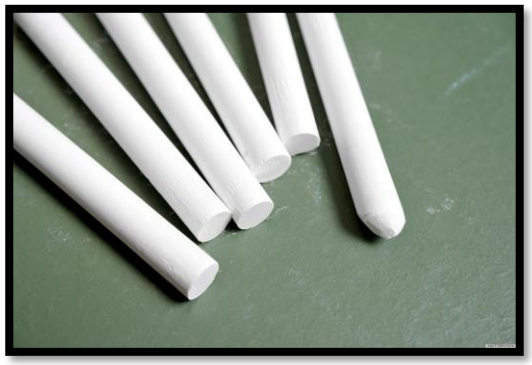
carbon dioxide

a gas made of carbon and oxygen

Investigation 4 Words

chalk

one form of material calcium carbonate



chemical reaction

an interaction between two materials that produces one or more new materials that have different properties than the starting materials

cloudy

not clear

Investigation 4 Words

conservation of mass

the concept that no mass is lost or gained when mixing and separating materials

dissolve

to mix a material uniformly into another

mixture

two or more materials together

Investigation 4 Words

salt

a solid white material that dissolves in water; also known as sodium chloride

solution

mixing 2 materials together to form another, like salt and water

suspend

to hang in a liquid or a gas

Investigation 4 Words

transparent

clear, see through

vinegar

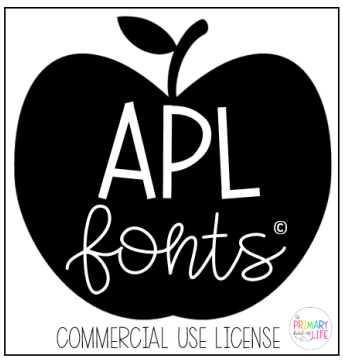
a liquid substance that undergoes a chemical reaction when combined with baking soda

Investigation 4 Words

Many Thanks:

Graphics by the amazingly talented:

Fonts by the lovely:



Thank You!

If you find you need more pages for an investigation, please email me at rebecca.seeley81@gmail.com! I would be happy to add anything that is needed. I have not taught this kit however I have spent a long time going through the manuals and creating what I thought would be needed in addition to what my own students used. Please let me know if I missed anything that you would find helpful in your classroom.