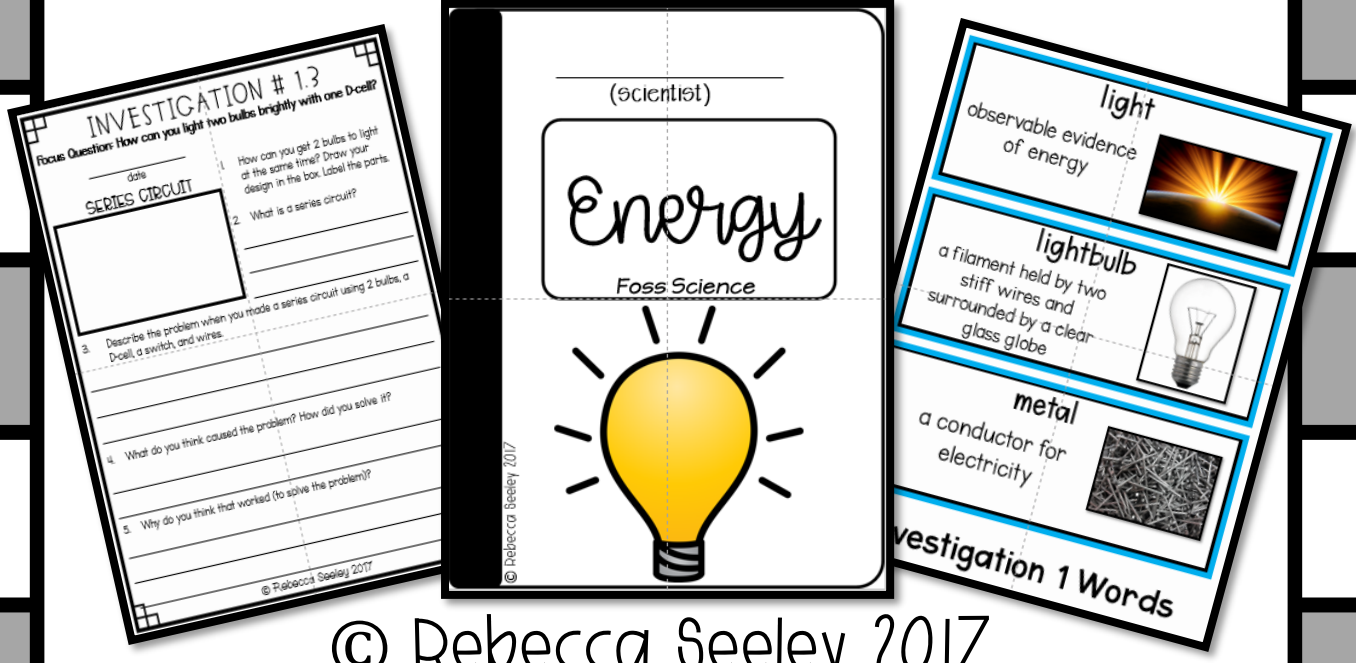
No Prep!

NGSS aligned

Energy

For FOSS Science Kits

A comprehensive student journal that follows all of the focus questions and investigations for the Energy FOSS kit. Over 85 picture supported vocabulary cards included!



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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.]

If you would like to get updates and see when I post new things to my store, make sure you follow me on TPT!!

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.

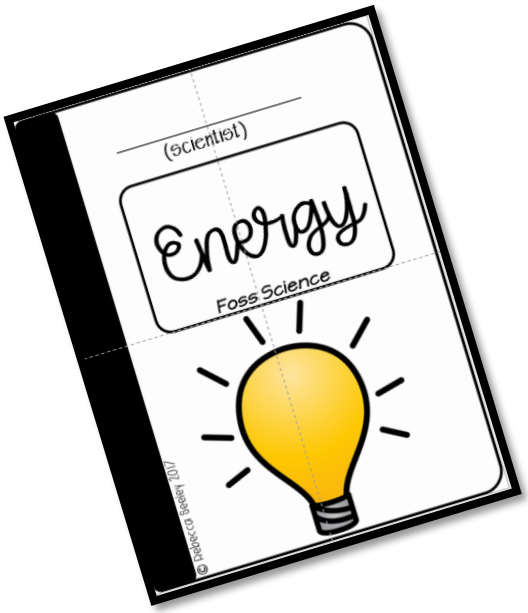
Check out the teacher tips throughout the pack for helpful hints and ideas. ☺

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

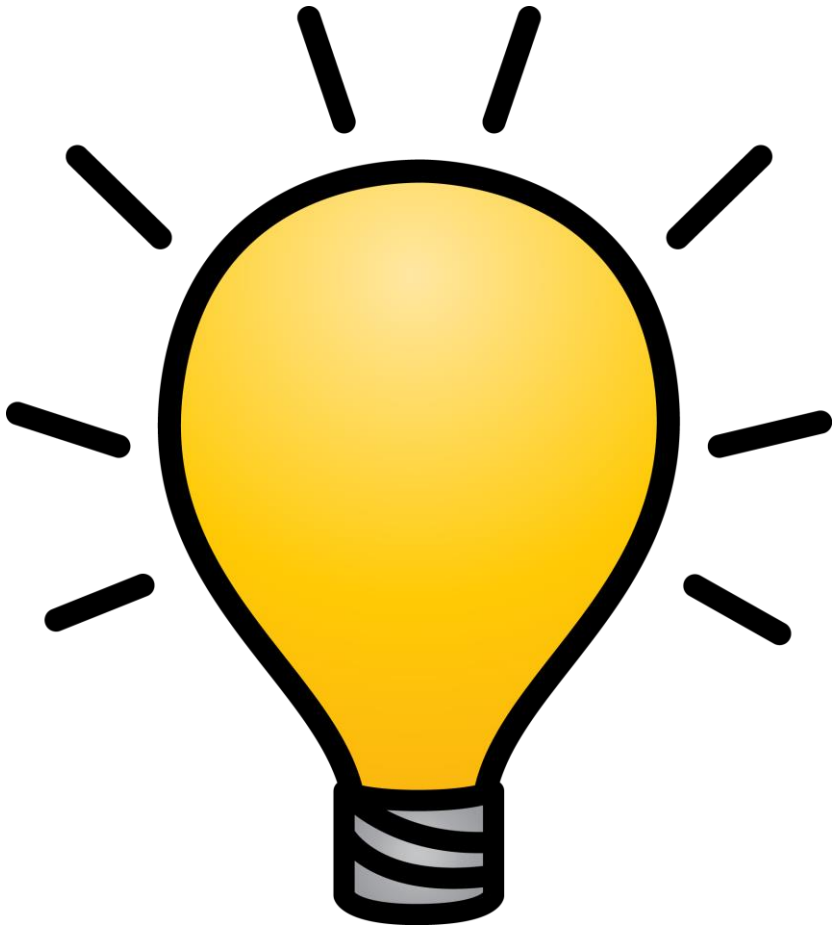


_____

(scientist)

Energy

Foss Science



_____

(scientist)

Energy

Foss Science

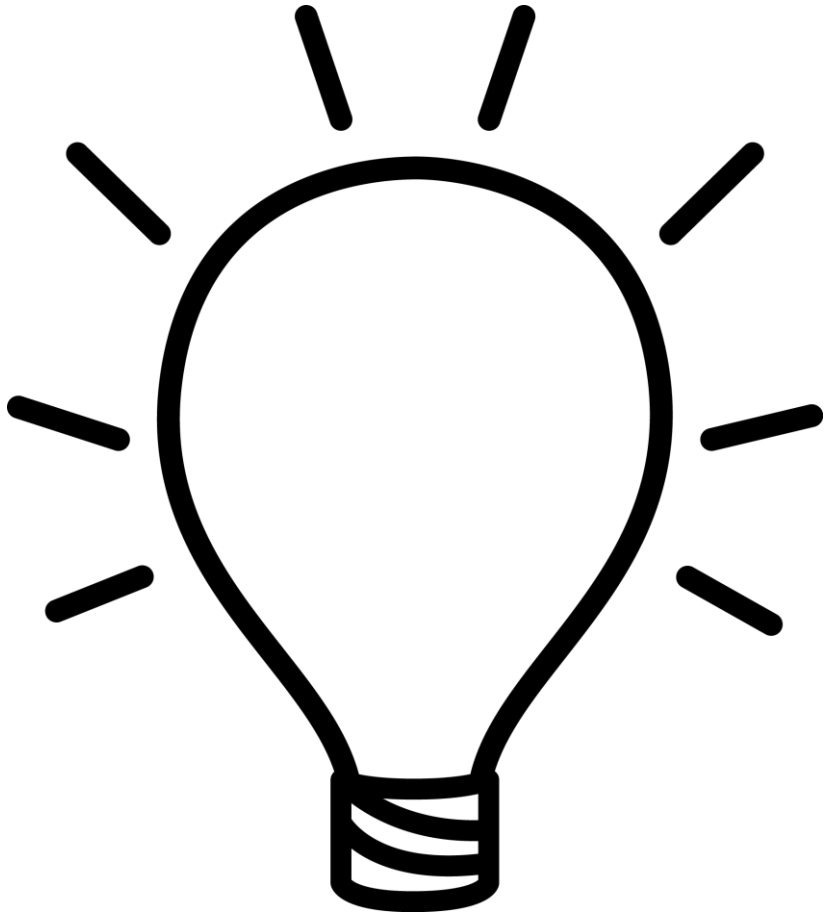
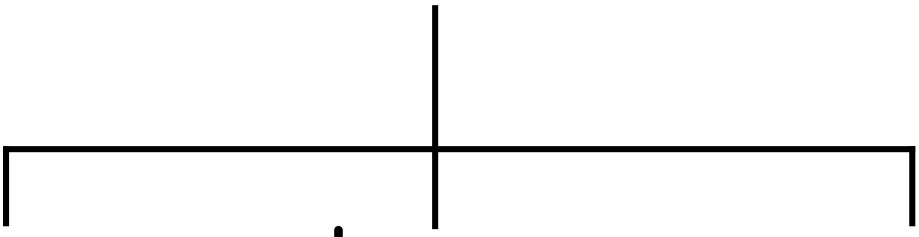


Table of Contents

Title pg

Scientists

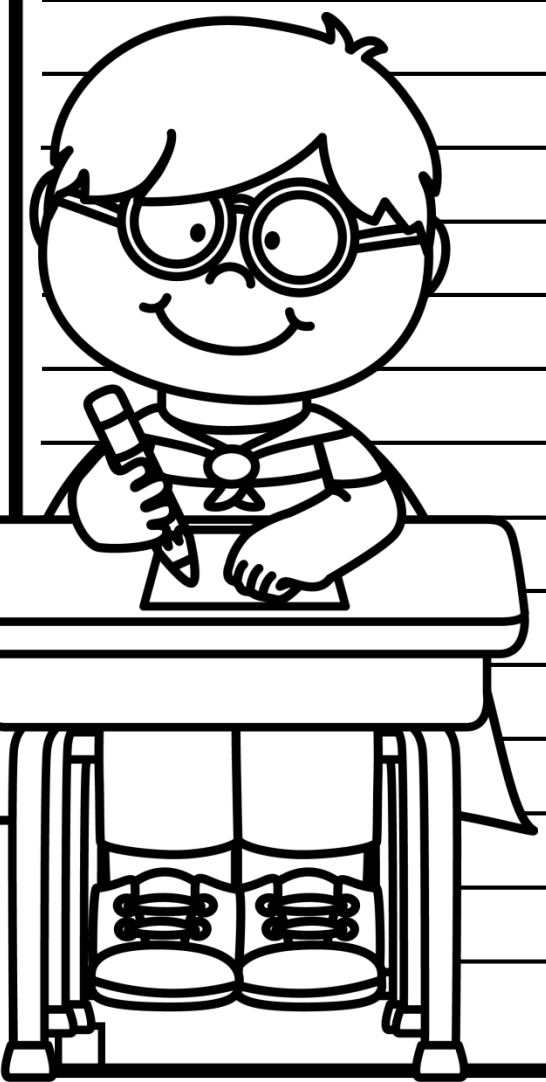


can	have	are

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

7 Minute Quick Write

[What I already know about energy.]



Question, Question...

Who has a question?

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

1

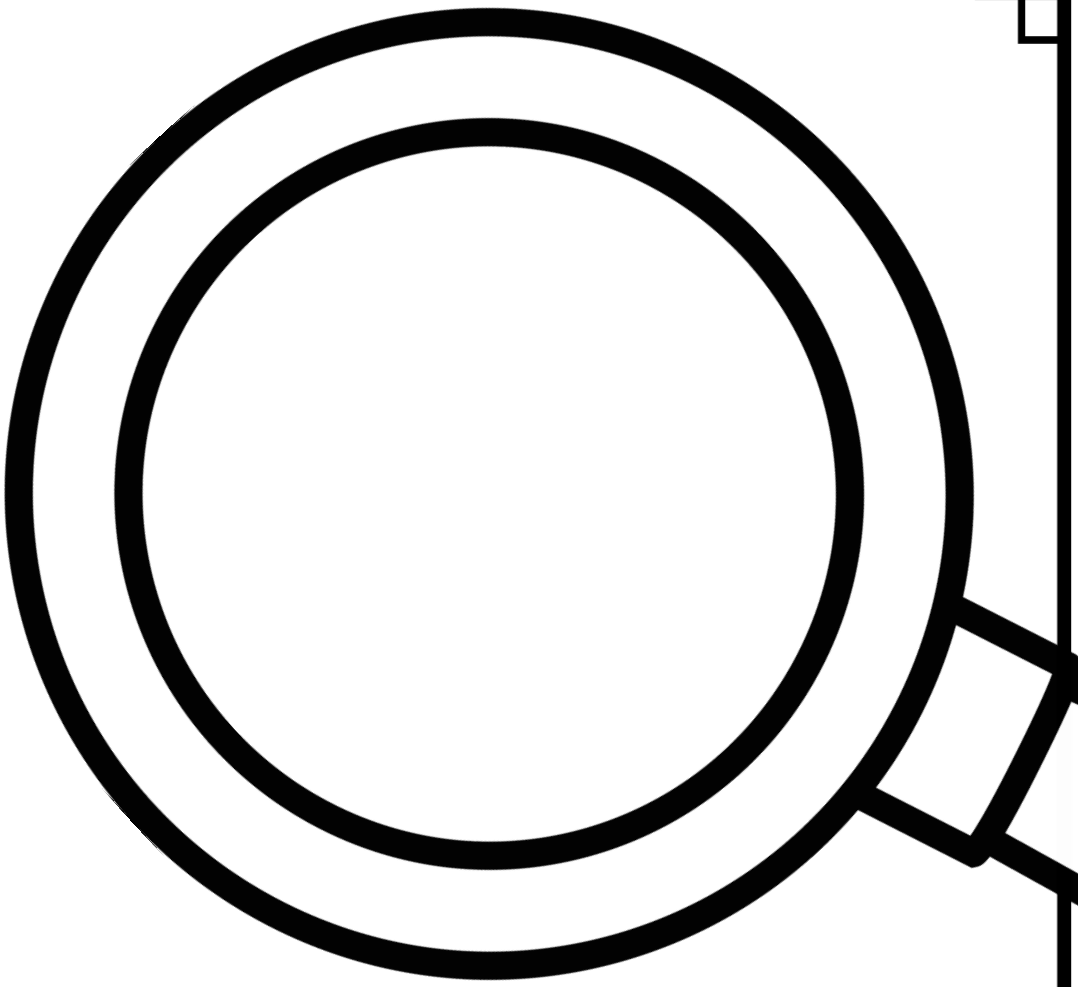
2

3

Teacher Tip

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

What did I learn in this investigation?



Write, Draw, and Label

INVESTIGATION # 1.1

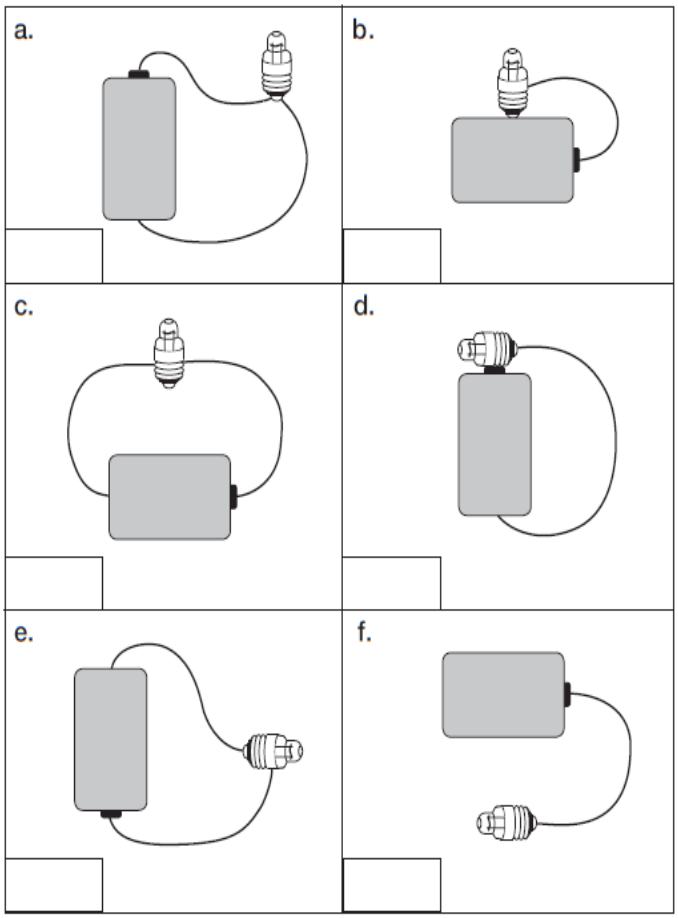
Focus Question: What is needed to light a bulb?

In today's investigation, we made predictions about if different circuits would light. We then investigated the components needed in a circuit in order for the bulb to light. Follow the directions below to show what you observed and learned.

_____
date

Make a prediction...

Write a prediction for each circuit in the small box. If you think it will light, write "yes". If not, write "no".



1. What were the parts of the system you made?

2. What was the source of the energy in the system?

3. What was the evidence that energy transferred in the system?

INVESTIGATION # 1.1

_____
date

Think about it...

1. What is filament? How is filament connected to energy?

2. When you connect a D-cell into a circuit, what contact points do you use?

3. What is needed to light a bulb?

4. Can you get a bulb to light with only one wire? How?

INVESTIGATION # 1.1

Reading: "Edison Sees the Light"

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

_____
date

Question:	Response:
What do you think the dotted lines and arrows show?	
How do you know when energy is being transferred in a lightbulb circuit?	
Describe the path taken by electricity through an incandescent lightbulb.	
What are some of the reasons why lamp technology has changed?	

INVESTIGATION # 1.2

Focus Question: What is needed to make a complete pathway for current to flow in a circuit?

In today's investigation, we worked with a motor and figured out how this new component works in an electric circuit. 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 does the motor do in the system?
2. What is a switch and how does it work in the system?
3. What was the evidence of energy transfer in the motor system?
4. What is needed to make a complete pathway for current to flow in a circuit?

INVESTIGATION # 1.2
Conductors and Insulators

Make a prediction. Which kinds of materials can complete the pathway of an electric circuit?

Object:	Will it conduct? (predictions)	Did it conduct? (test results)
aluminum foil		
aluminum nail		
black rock		
brass ring		
cardboard		
copper foil		
paper fastener		
plastic chip		
plastic straw		
river rock		
rubber band		
sponge		
steel nail		
steel paper clip		
steel screen		
steel screw		
steel washer		
wood stick		

INVESTIGATION # 1.2

Reading: "Energy Sources"

In today's reading we learned more about energy sources. After reading fill out the concept map below to show your learning.

_____
date

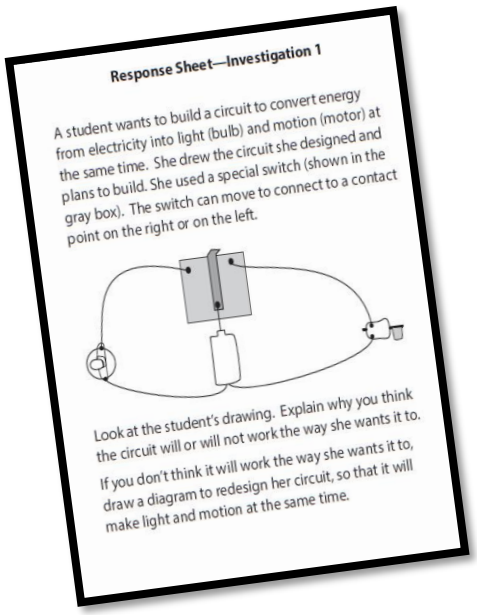
What is it?

What is it like?

ENERGY

What are some examples?

Teacher Tip

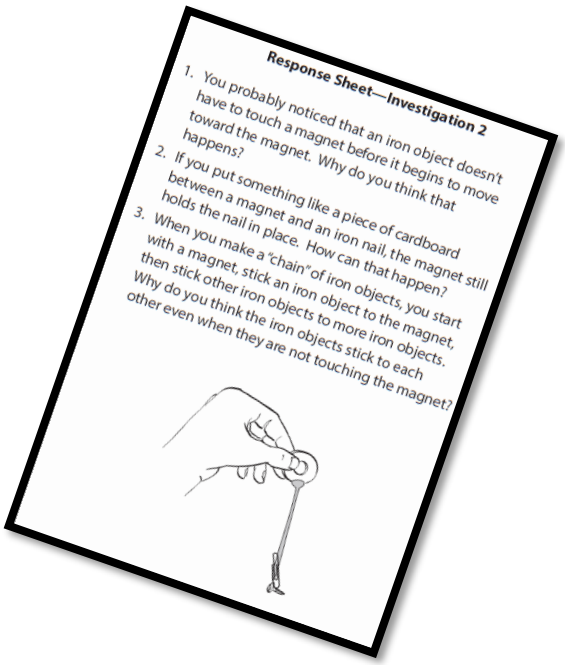


Response Sheet—Investigation 1

A student wants to build a circuit to convert energy from electricity into light (bulb) and motion (motor) at the same time. She drew the circuit she designed and plans to build. She used a special switch (shown in the gray box). The switch can move to connect to a contact point on the right or on the left.

Look at the student's drawing. Explain why you think the circuit will or will not work the way she wants it to.

If you don't think it will work the way she wants it to, draw a diagram to redesign her circuit, so that it will make light and motion at the same time.



Response Sheet—Investigation 2

1. You probably noticed that an iron object doesn't have to touch a magnet before it begins to move toward the magnet. Why do you think that happens?
2. If you put something like a piece of cardboard between a magnet and an iron nail, the magnet still holds the nail in place. How can that happen?
3. When you make a "chain" of iron objects, you start with a magnet, stick an iron object to the magnet, then stick other iron objects to more iron objects. Why do you think the iron objects stick to each other even when they are not touching the magnet?

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: How can you light two bulbs brightly with one D-cell?

_____
date

SERIES CIRCUIT

1. How can you get 2 bulbs to light at the same time? Draw your design in the box. Label the parts.

2. What is a series circuit?

_____

_____

_____

3. Describe the problem when you made a series circuit using 2 bulbs, a D-cell, a switch, and wires.

_____

_____

_____

4. What do you think caused the problem? How did you solve it?

_____

_____

5. Why do you think that worked (to solve the problem)?

_____

_____

INVESTIGATION # 1.3

Focus Question: How can you light two bulbs brightly with one D-cell?

_____
date

PARALLEL CIRCUIT

1. How can you get 2 bulbs to light brightly with one D-cell? Draw and label your design in the box.

2. What is a parallel circuit?

_____

_____

_____

3. Why do you think the two lights are bright when they are parallel?

_____

_____

_____

4. Compare the two designs- series and parallel. How are they alike and how are they different?

_____

_____

5. When might a series circuit be the best design?
   When might a parallel circuit be the best design?

_____

_____

INVESTIGATION # 1.3

Reading: "Series and Parallel Circuits"

_____
date

In today's reading we learned more about series and parallel circuits. Write three things you learned, two ideas you want to remember and one question that you still have about circuits.

3 Things that you learned

2 Ideas you want to remember

1 Question you still have

INVESTIGATION # 1.4

Focus Question: Which design is better for manufacturing long strings of lights- series or parallel?

_____
date

In today's investigation you are going to act like an engineer and figure out which design would be better to use while manufacturing long strings of lights. Below draw and label a quick sketch of your design. Then write about what you designed and why.

How to best design a string of lights...

SCIENCE PRACTICES:

1. **Asking questions-** Scientists ask questions to guide their investigations. This helps them learn more about how the world works.
2. **Developing and using models.-**Scientists develop models to represent how things work and to test their explanations.
3. **Planning and carrying out investigations.-** Scientists plan and conduct investigations in the field and in laboratories. Their goal is to collect data that test their explanations.
4. **Analyzing and interpreting data.-** Patterns and trends in data are not always obvious. Scientists make tables and graphs. They use statistical analysis to look for patterns.
5. **Using mathematics and computational thinking.-** Scientists measure physical properties. They use computation and math to analyze data. They use mathematics to construct simulations, solve equation, and represent different variables.
6. **Constructing explanations-** Scientists construct explanations based on observations and data. An explanation becomes an accepted theory when there are many pieces of evidence to support it.
7. **Engaging in argument from evidence.-** Scientists use argumentation to listen to, compare, and evaluate all possible explanations. Then they decided which best explains natural phenomena.
8. **Obtaining, evaluating, and communicating information.-** Scientists must be able to communicate clearly. They must evaluate others' ideas. They must convince others to agree with their theories.

ENGINEERING PRACTICES:

1. **Defining Problems.**-Engineers ask questions to make sure they understand problems they are trying to solve. They need to understand the constraints that are placed on their design.
2. **Developing and using models.**-Engineers develop and use models to represent systems they are designing. Then they test their models before building the actual object or structure.
3. **Planning and carrying out investigations.-** Engineers plan and conduct investigations . They need to make sure that their designed systems are durable, effective, and efficient.
4. **Analyzing and interpreting data.-** Engineers collect and analyze data when they test their designs. They compare different solutions. They use the data to make sure that they match the given criteria and constraints.
5. **Using mathematics and computational thinking.-** Engineers measure physical properties. They use computation and math to analyze data. They use mathematics to construct simulations, solve equations, and represent different variables.
6. **Designing solutions.-** Engineers find solutions. They propose solutions based on desired function, cost, safety, how good it looks, and meeting legal requirements.
7. **Engaging in argument from evidence.-** Engineers use argumentation to listen to, compare, and evaluate all possible ideas and methods to solve a problem.
8. **Obtaining, evaluating, and communicating information.-** Engineers must be able to communicate clearly. They must evaluate others' ideas. They must convince others of the merits of their designs.

INVESTIGATION # 1.4

Reading: "Engineering a Solar Lighting System"

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

_____
date

Question:	Response:
Why didn't Mr. Aronson want people to plug their TVs and other appliances into the Solar Suitcase?	
Why is it important for engineers to test their prototypes?	
Think of 3 questions you have for Mr. Aronson.	
How else might a Solar Suitcase be used to solve problems in rural areas?	

INVESTIGATION # 2.1

Focus Question: What material sticks to magnets?

In today's investigation we talked about what we already know about magnets and did an investigation to see what kind of material sticks to magnets.

Make a prediction. Which kinds of materials can stick to a magnet?

Object:	Will it stick? (predictions)	Did it stick? (test results)
aluminum foil		
aluminum nail		
black rock		
brass ring		
cardboard		
copper foil		
paper fastener		
plastic chip		
plastic straw		
river rock		
rubber band		
sponge		
steel nail		
steel paper clip		
steel screen		
steel screw		
steel washer		
wood stick		

INVESTIGATION # 2.1

Focus Question: What material sticks to magnets?

_____

date

In today's investigation we learned about magnets. Write your thoughts and observations below. Use the ideas to think about to help guide your writing.

Ideas to guide your thinking:

1. Were you surprised by any of the objects you test?
2. Is there anything you notice that is the same about all the things that stuck?
3. Are there any metals that didn't stick?
4. What things in the room did you find that were made of iron?
5. What did you learn about magnets?

INVESTIGATION # 2.2 (PART 1)

Focus Question: What happens when two or more magnets interact?

_____
date

In today's investigation we learned more about magnets. We observed magnets to see how they interact with each other. We learned many different words today. Write the definition of each word and write a definition.

interact _____

_____

_____

repel/attract _____

_____

_____

compass _____

_____

_____

INVESTIGATION # 2.2 (PART 2)

Focus Question: What happens when a piece of iron comes close to or touches a permanent magnet?

_____

date

In today's investigation we learned about magnets. Write, draw, and label your thoughts and observations below. Use the questions to guide your thinking.

Ideas to guide your thinking:

1. Can a magnet attract a paper clip through materials? What kinds of materials?
2. How can a magnet make a paper clip float in air?
3. What is the effect on a steel nail when a magnet touches it?

INVESTIGATION # 2.2

Reading: "When Magnet Meets Magnet"

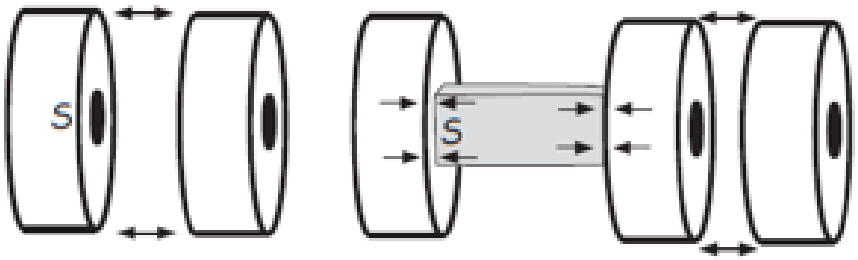
_____

date

In today's reading we learned more about magnets and magnetic poles. Answer the following questions to show what you have learned.

1. Label the poles (north and south) on these two attracting magnet systems.

2. Show where the poles (north and south) are on these two interacting magnet systems.



3. What makes magnets repel each other? (Use the word *poles*.)

4. What makes magnets attract each other?

INVESTIGATION # 2.2

_____
date

Think about it...

1. What happens when 2 or more magnets interact?

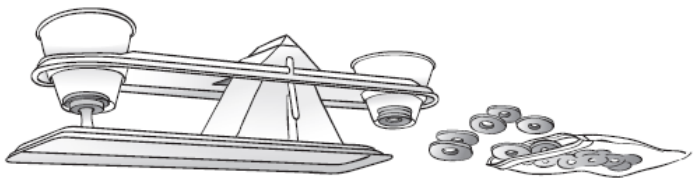
2. What happens when a piece of iron comes close to or touches a magnet?

Teacher Tip

For investigation 2.3 your students will need copies of the Magnetic Force- Procedure page found on FOSSweb- Teacher Resources- Notebook Masters For Print- page 17. This will lead your students through the investigation. You could also pull it up and put it on your smartboard or under the document camera.

Magnetic Force—Procedure

1. Zero the balance. Use the white plastic slider.
2. Insert the magnet-on-a-post in the hole on the base.
3. Position a magnet inside the cup over the magnet-on-a-post. The two magnets should attract.
4. Put washers in the empty cup. Find out how many it takes to break the force between the two magnets. Try to reset the balance each time the force is broken.
5. Test the magnets several times. Be ready to answer the following questions:
   a. Where should you place the washers in the cup?
   b. Does it make a difference whether you place the washers in the cup gently or drop them in?



INVESTIGATION # 2.3

Focus Question: What happens to the force of attraction between two magnets as the distance between them changes?

In today's investigation we will gather data about magnetic force. Record your data in the table below. You will use this data to create a graph on the following page. Don't forget to label the axis's of the graph.

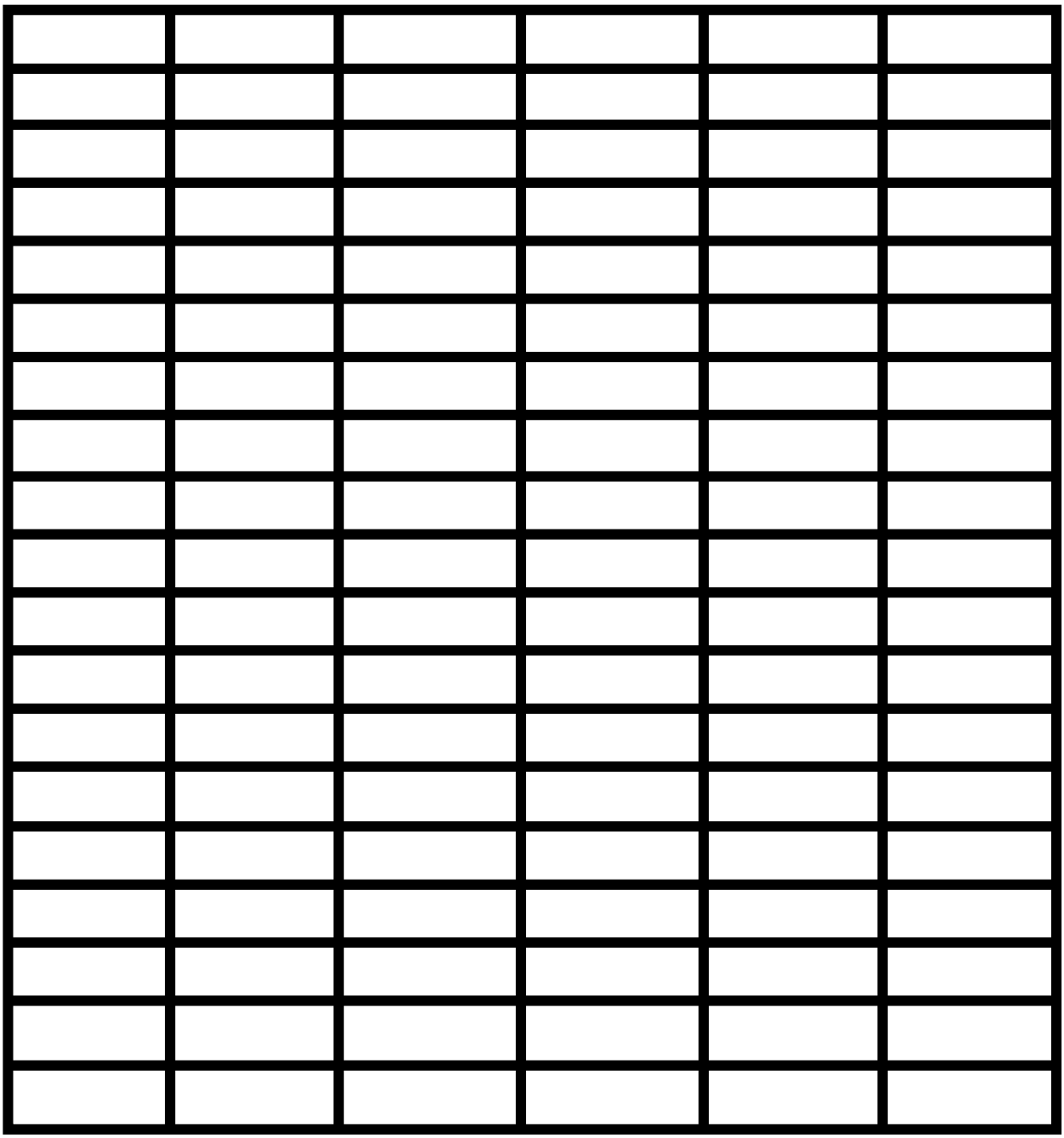
Magnetic Force Data Table

distance	force
0	
1	
2	

INVESTIGATION # 2.3

Focus Question: What happens to the force of attraction between two magnets as the distance between them changes?

Magnetic Force Graph



INVESTIGATION # 2.3

_____
date

Think about it...

1. How much force in washers did it take to break the force with two spacers?

2. How much distance in spacers was used when it took a force of four washers to break the force?

3. How did the graph help you predict?

4. What is the relationship between the distance separating two magnets and the force of attraction between them?

INVESTIGATION # 2.3

Reading: "Magnificent Magnetic Models"

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

_____

date

Question:	Response:
Why do the containers filled with magnets act the way they do?	
Why doesn't the paperclip fall from the bottom of the jar?	
If you wanted to have three magnets dance around each other, how would you orient the magnets?	

INVESTIGATION # 3.1

Focus Question: How can you turn a steel rivet into a magnet that turns on and off?

_____

date

In today's investigation we learned how to make electromagnetics using a steel rivet. Write, draw, and label your thoughts and observations below. Use the questions to guide your thinking.

Ideas to guide your thinking:

1. What are the components you used to make the electromagnetic?
2. What is the function of each component?
3. What part did the steel rivet play in the system?

INVESTIGATION # 3.1

_____
date

Think about it...MAGNETIC FIELDS

1. What do we know about the wire?

2. Is electricity flowing into the core? Why or why not?

3. What is going through the insulated part of the coil of wire? How do you know?

4. What is the effect on the core if the magnetism is being produced by all those wraps of wire?

INVESTIGATION # 3.1

Reading: "Electricity Creates Magnetism"

In today's reading we learned about magnetism and electricity. 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. What was Oersted's historic discovery?
2. How does an electromagnet work?
3. Why did Oersted's compass needle rotate when he ran electric current through thin wire?

INVESTIGATION # 3.2

Focus Question: How does the number of winds of wire around a core affect the strength of the magnetism?

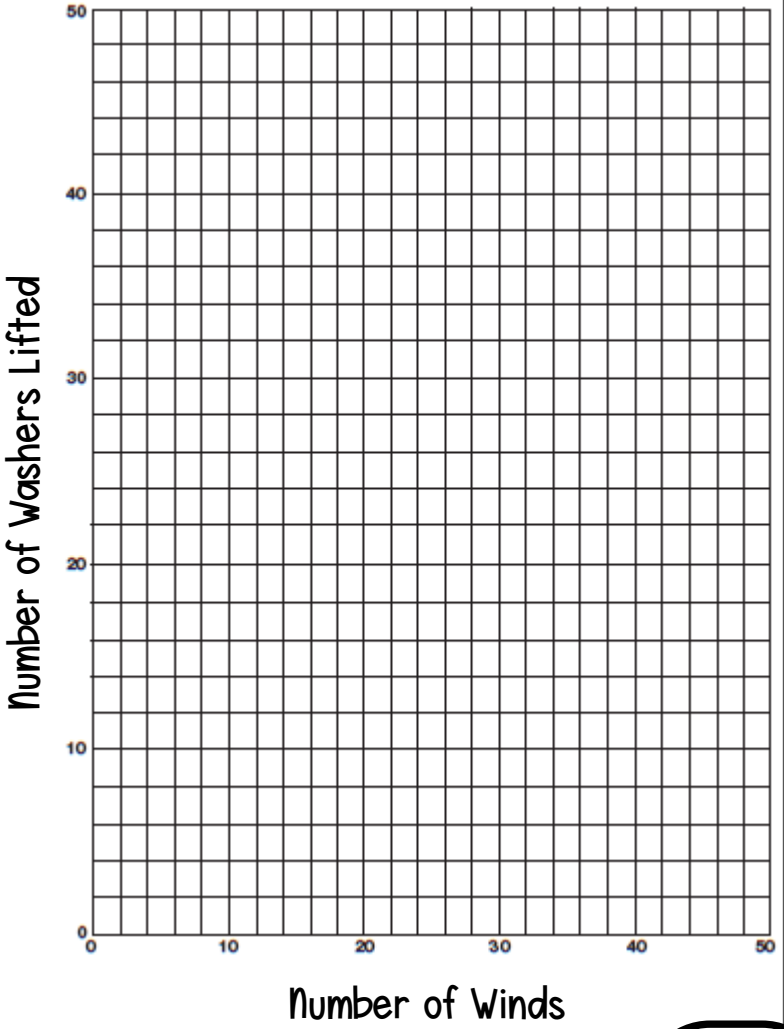
_____
date

In today's investigation we learned how the number of winds of wire around the core affect the strength of magnetism. Put your data into the data chart on the left and then use that data to graph your results.

Data Chart

# if winds	# of washers

Changing Number of Winds



INVESTIGATION # 3.2

Reading: "Using Magnetic Fields"

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

_____

date

Question:	Response:
What is one way to tell if a wire has current flowing through it?	
How do you make an electromagnetic?	
How can you make an electromagnet stronger?	
What is one question you still have about electromagnetics?	

INVESTIGATION # 3.3

Focus Question: How can you reinvent the telegraph using your knowledge of energy and electromagnetism?

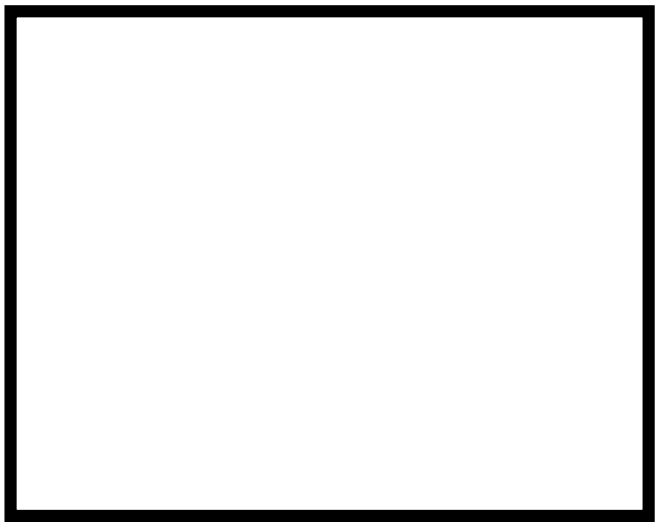
_____

date

In today's investigation we learned about telegraphs. Write, draw, and label your thoughts and observations below. Use the questions to guide your thinking.

Ideas to guide your thinking:

1. How can you use a telegraph to communicate with other people?
2. Could you set up the alphabet grid in a better way? How?
3. Would you still like to use telegraphs today? why/why not?



	1	2	3	4	5
1	A	B	C	D	E
2	F	G	H	I	J
3	K	L	M	N	O
4	P	R	S	T	U
5	V	W	X	Y	Z

INVESTIGATION # 3.3

Reading: "Morse Gets Clicking"

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

_____
date

Question:	Response:
How is an electromagnet used in a telegraph?	
How is the telegraph you made like the one Morse made?	
Would the telegraph be useful in an emergency? Why/why not?	
What is one question you still have about Morse code?	

INVESTIGATION # 4.1

Focus Question: What do we observe that provides evidence that energy is present?

In today's investigation we observed many different energy stations and were able to identify the energy source and the evidence of energy transfer. Fill out the chart below and write your observations.

_____
date

Systems and Energy

System	Energy Source	Evidence of energy transfer

My Observations:

INVESTIGATION # 4.1

Reading: "Energy"

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

_____

date

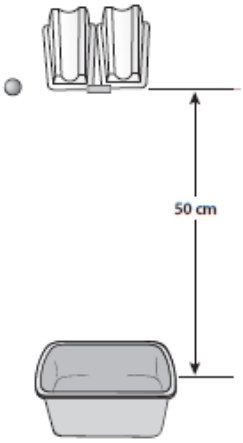
Question:	Response:
What evidence shows that energy is present?	
How are food, fuel, and batteries alike?	
What is the source of most of the energy used by people?	
Give 2 examples of how energy can transfer from one system to another?	

Teacher Tip

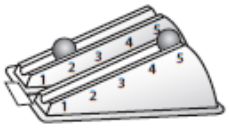
For investigation 4.2 your students will need copies of the Ramp Setup page found on FOSSweb- Teacher Resources- Notebook Masters For Print- page 23. This will lead your students through the investigation. You could also pull it up and put it on your smartboard or under the document camera.

Ramp Setup

Use the procedure to set up two ramps.



1. Tape two ramps side by side so the bottom edges are even.
2. Tape a meter tape to the ground so the "0" is at the bottom of the ramps. Measure 50 cm away from the bottom of the ramps and place the basin at this spot. The basin will mark the finish line.
3. Place one large ball on one ramp so the front of the ball lines up with the line at position 5. Place a second large ball on the other ramp at position 2.



4. One person will count down to start the race. A second person will release both balls at the same time at the signal. Everyone else will watch and listen to determine if the balls reach the finish line at the same time or if one finishes first.
5. Record the data in your notebook. Repeat the process two more times.

INVESTIGATION # 4.2

Focus Question: How does the starting position affect the speed of a ball rolling down a ramp?

_____

date

In today's investigation we learned how to make a ramp and use it to find out how the starting position of a ball affects how fast it rolls down a ramp. Write, draw, and label your thoughts and observations below. Use the questions to guide your thinking.

Ideas to guide your thinking:

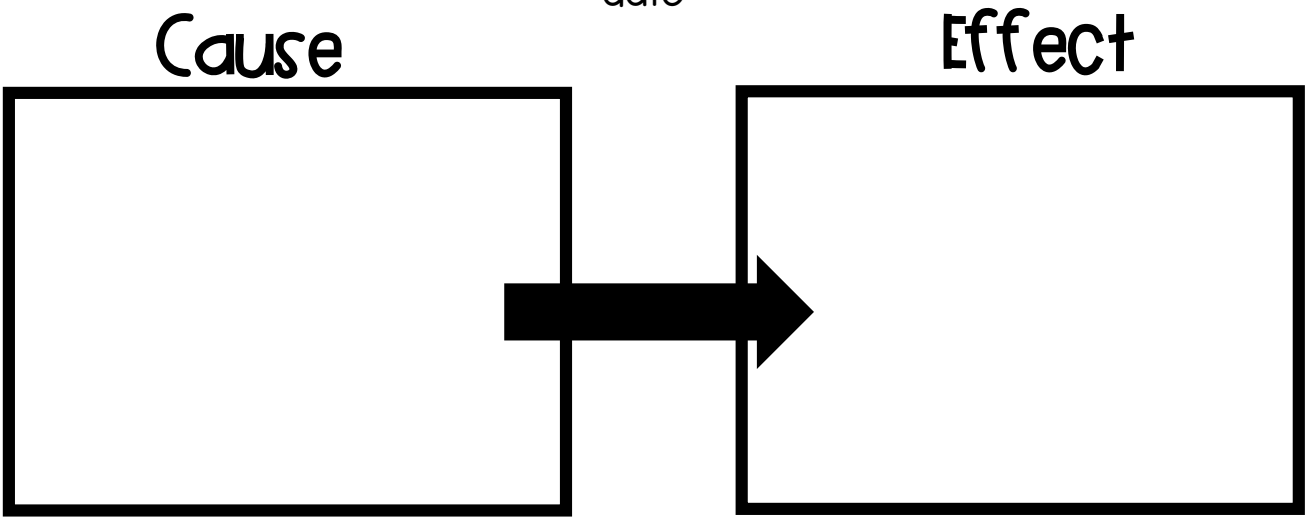
1. How can you describe the motion of the ball?
2. What is the relationship between the starting position and the speed of the ball? What is your evidence?
3. At which position did the ball have more potential energy? Evidence?

INVESTIGATION # 4.2

Reading: "What Causes Change of Motion?"

In today's reading we learned more about change of motion. After reading fill out the cause and effect boxes and 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 a moving object to stop?	

INVESTIGATION #4.3

Focus Question: What happens when objects collide?

In today's investigation we used corks, runways, and balls to see what happens when object collide. Fill out the Energy Transfer Chart below. On the following page you will write your observations and answer the focus question.

_____
date

Energy Transfer

Mass of Ball	Starting Position	Cork Distance (cm)
Large	2	
Large	4	
Large	6	
Medium	2	
Medium	4	
Medium	6	
Small	2	
Small	4	
Small	6	

INVESTIGATION # 4.3

Focus Question: What happens when objects collide?

_____

date

Ideas to guide your thinking:

1. Right before the collision, the ball is moving and the cork is stationary. What type of energy does the ball have? How about the cork?
2. How does the motion of the ball and the cork change during the collision?
3. What statements can you make concerning the kinetic energy of balls rolling down ramps?
4. Which rolling balls transfer the most energy?

INVESTIGATION # 4.3

Reading: "Bowling"

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

_____
date

Question:	Response:
What are examples of potential energy and kinetic energy in bowling?	
What force causes the bowling ball to move?	
How is the energy transferred when bowling?	
Have you ever been bowling? What do you know now that could help you while bowling?	

INVESTIGATION # 5.1

Focus Question: How are waves involved in energy transfer?

_____

date

In today's investigation we learned about waves and waveform. Write, draw, and label your thoughts and observations below. Use the questions to guide your thinking and answer the focus question.

Ideas to guide your thinking:

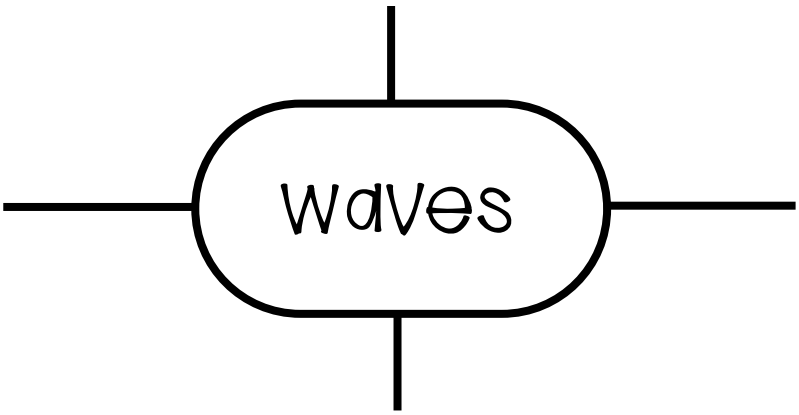
1. What are peaks and troughs?
2. Can you draw a wave and label: amplitude, wavelength, and frequency?
3. How are waves involved in energy transfer?

INVESTIGATION # 5.1

Reading: "Waves"

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

_____
date



1. How do waves transfer energy in the ocean?

_____

_____

2. How does the amount of energy affect a wave pattern?

_____

_____

INVESTIGATION # 5.2

Focus Question: How does light travel?

_____
date

In today's investigation we learned about mirrors. We went outside to investigate how mirrors work and what we can do with mirrors. Make a list of what you did or observed with your mirrors. Answer the questions below to show what you have learned.

My List:

1.

2.

3.

4.

5.

6.

1. What is reflection?

_____

_____

_____

2. What are rays?

_____

_____

_____

3. What can light reflect off of?

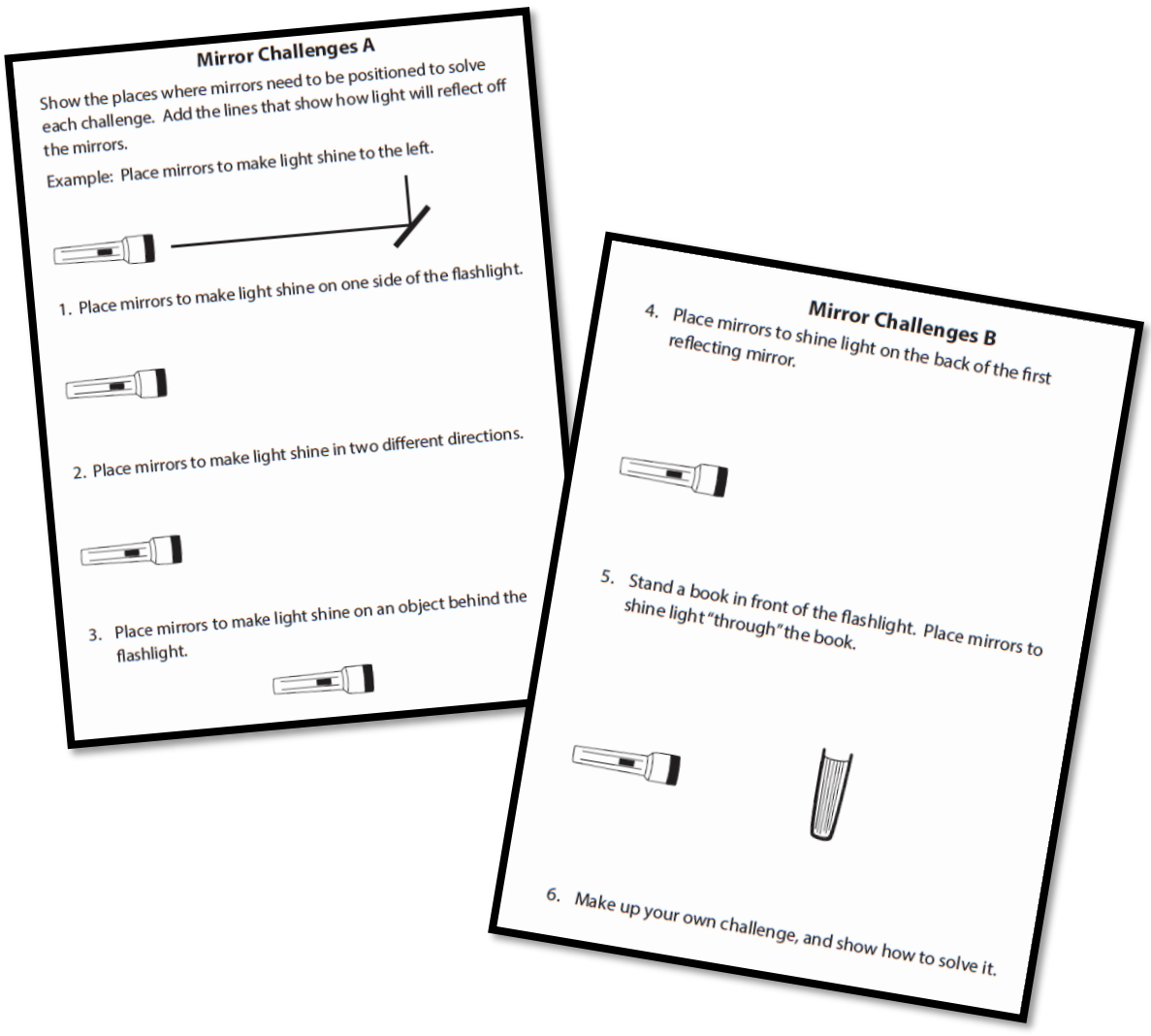
_____

_____

_____

Teacher Tip

For the second part of investigation 5.2 your students will need copies of the Mirror Challenge pages found on FOSSweb- Teacher Resources- Notebook Masters For Print- page 26 and 27. This will lead your students through the investigation. You could also pull it up and put it on your smartboard or under the document camera.



Mirror Challenges A

Show the places where mirrors need to be positioned to solve each challenge. Add the lines that show how light will reflect off the mirrors.

Example: Place mirrors to make light shine to the left.

1. Place mirrors to make light shine on one side of the flashlight.

2. Place mirrors to make light shine in two different directions.

3. Place mirrors to make light shine on an object behind the flashlight.

Mirror Challenges B

4. Place mirrors to shine light on the back of the first reflecting mirror.

5. Stand a book in front of the flashlight. Place mirrors to shine light "through" the book.

6. Make up your own challenge, and show how to solve it.

INVESTIGATION # 5.2

Focus Question: How does light travel?

_____

date

After completing the Mirror Challenges, write, draw, and label your thoughts and observations below. Use the questions to guide your thinking and answer the focus question.

Ideas to guide your thinking:

1. What is refraction?
2. What surprised you about the mirror challenges?
3. How does light travel?

INVESTIGATION # 5.2

Reading: "Light Interactions"

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

_____
date

Question:	Response:
What happens when light reflects?	
What kinds of surfaces reflect light?	
What happens when light refracts?	
What is one question you still have about light?	

INVESTIGATION # 5.3

Focus Question: How can you make a motor run faster using solar cells?

_____
date

In today's investigation we learned about solar cells. Write, draw, and label your thoughts and observations below. Use the questions to guide your thinking and answer the focus question.

Ideas to guide your thinking:

1. What happens when you use more than one solar cell to run a motor?
2. When you wire the solar cells in parallel, what is the effect on the motor?
3. When you wire the cells in series, what is the effect on the motor?

INVESTIGATION # 5.3

Reading: "Alternate Sources of Electricity"

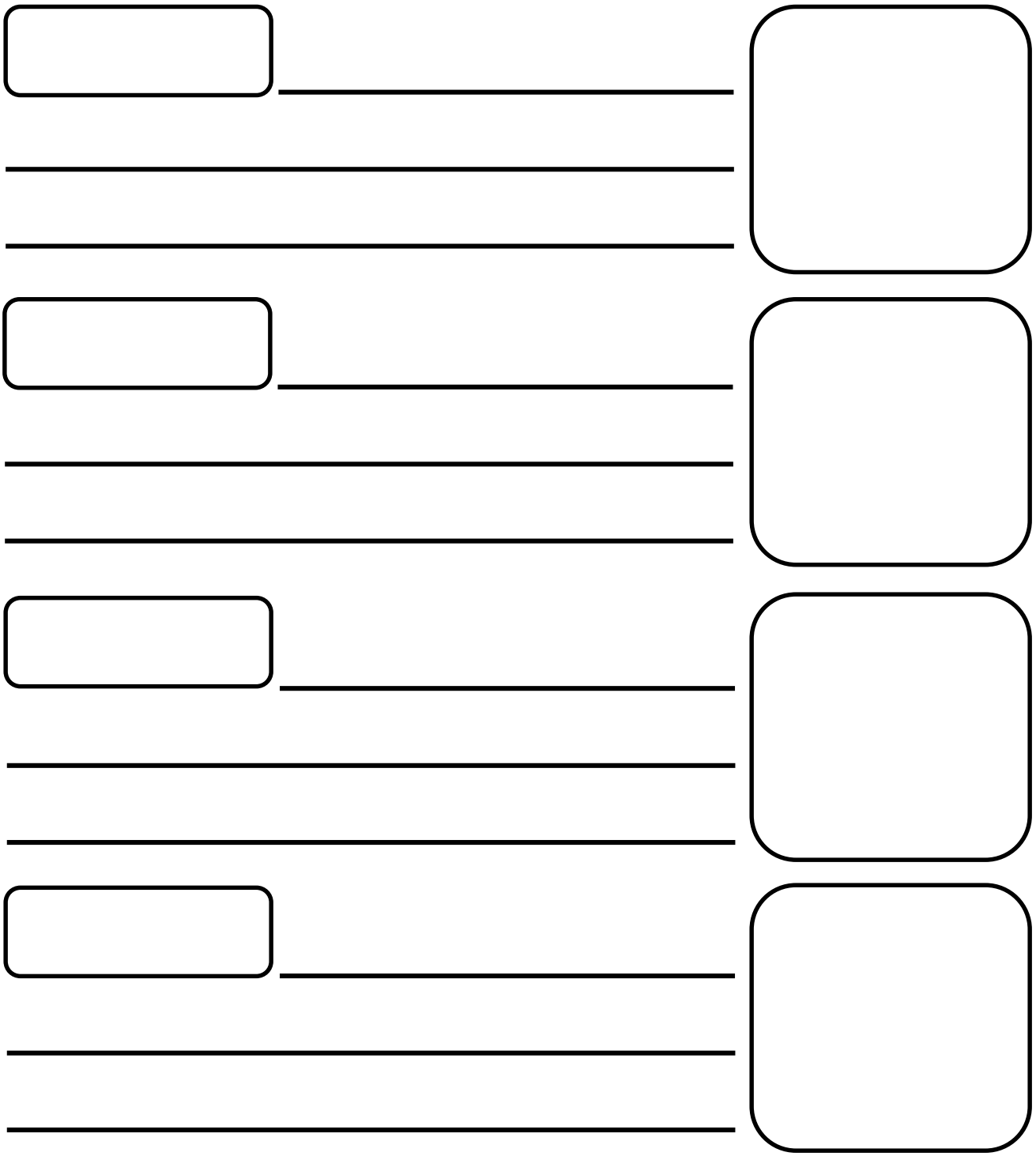
In today's reading we learned more about electricity. After reading record your thoughts and ideas to each question in the response column.

_____
date

Question:	Response:
What do you need in order to generate electricity using light from the sun?	
How can wind be transferred into electric current?	
What do hydroelectric plants do?	
What are some ways you can conserve energy?	

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 blow up 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

battery
bulb base
bub casing
circuit
closed circuit
component
conductor
contact point
D-cell
electric current
electricity
energy
energy source
filament
insulator
light
lightbulb
metal
motion
motor
open circuit
parallel circuit
series circuit
shaft
short circuit
switch
system
terminal
transfer
wire

Investigation 2

attract
compass
force
gravity
induced magnetism
interact
iron
magnet
magnetic field
magnetism
north pole
opposite
permanent magnet
pole
repel
south pole
steel
temporary magnet

Investigation 3

code
coil
core
electromagnet
electromagnetism
key
rivet
telegraph

Investigation 4

collide
collision
friction
fuel
heat
kinetic energy
potential energy
sound
stationary
transfer of energy

Investigation 5

amplitude
compression
cycle
frequency
mirror
peak
ray
reflect
reflection
refract
refraction
solar cell
trough
wave
wavelength

Investigation 1:

Energy and Circuits

Investigation 2:

The Force of Magnetism

Investigation 3:

Electromagnetics

Investigation 4:

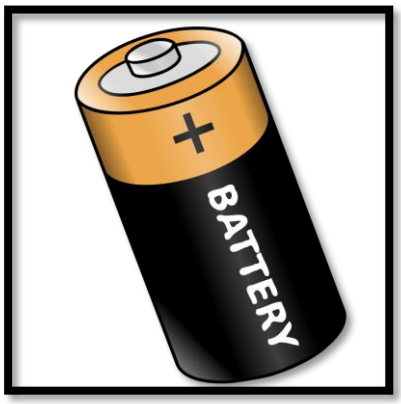
Energy Transfer

Investigation 5:

Waves

battery

a source of stored chemical energy



bulb base

the area on a lightbulb where one of the filament support wires extends down to the metal bead

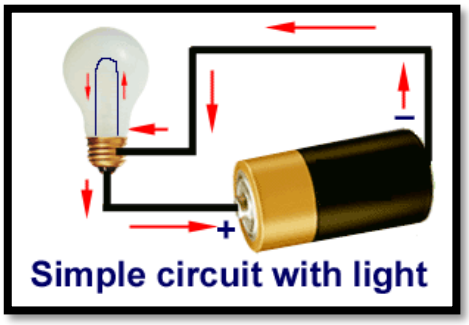
bulb casing

the inside of the metal screw case on a lightbulb where the second filament support wire connects

Investigation 1 Words

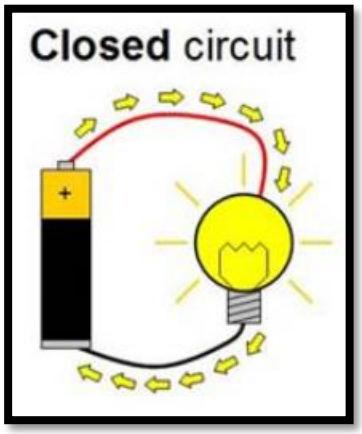
circuit

a pathway for the flow of electricity



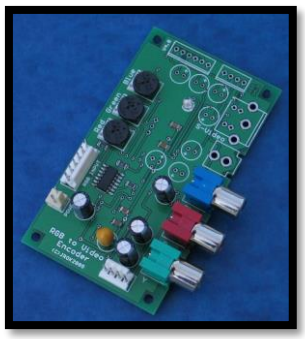
closed circuit

a complete circuit through which electricity flows



component

one item in a circuit



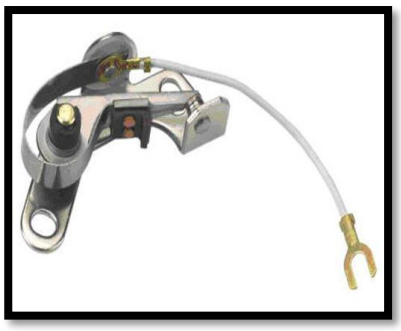
Investigation 1 Words

conductor

a substance, commonly a metal such as copper or aluminum, through which electricity will flow

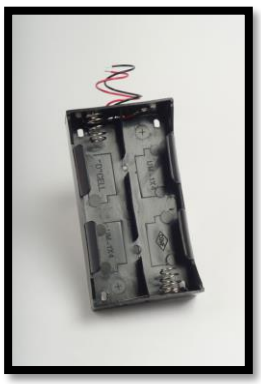
contact point

the place in a circuit where connections are made to allow electricity to flow



D-cell

a source of electricity through a conductor



Investigation 1 Words

electric current

the flow of electricity through a conductor

electricity

energy that flows through circuits and can produce heat, light, motion, and sound

energy

the ability to do work

Investigation 1 Words

energy source

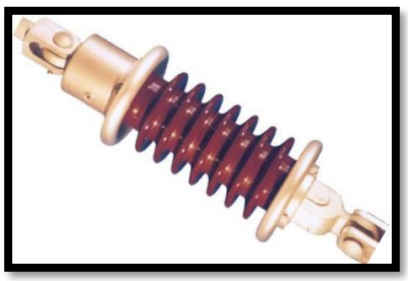
a place where energy comes from; such as batteries, food, fuels, and the sun

filament

the material in a lightbulb that makes light when heated by an electric current

insulator

a material that prevents the flow of electricity, commonly plastic, rubber, glass, or air



Investigation 1 Words

light

observable evidence of energy

lightbulb

a filament held by two stiff wires and surrounded by a clear glass globe

metal

a conductor for electricity

Investigation 1 Words

motion

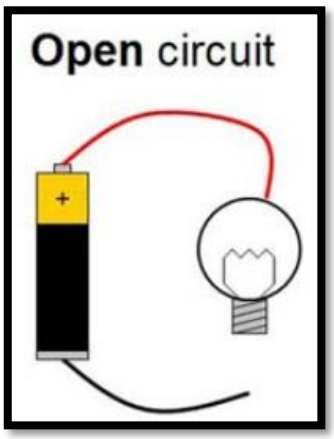
observable evidence of energy

motor

a device that produces motion from electricity

open circuit

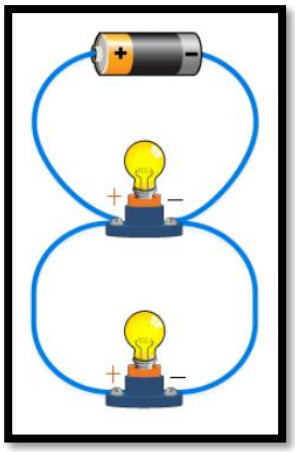
an incomplete circuit through which electricity will not flow



Investigation 1 Words

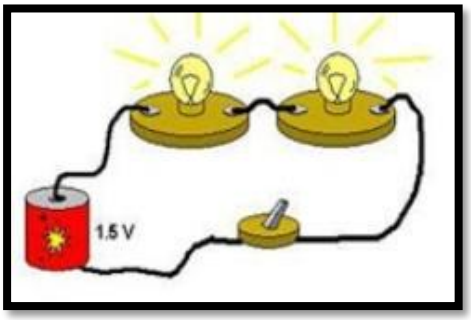
parallel circuit

a circuit that has two or more pathways for current to flow



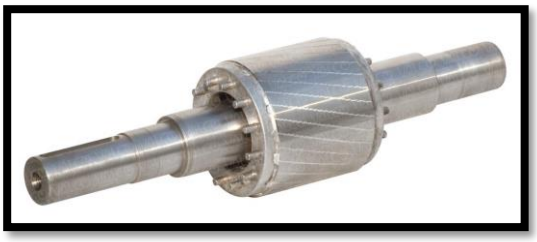
series circuit

a circuit that has only one pathway for current to flow



shaft

the part of a motor that rotates when energy is present



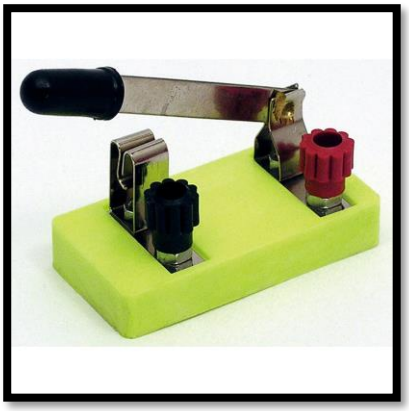
Investigation 1 Words

short circuit

an unintended pathway that allows current to flow from one terminal of an energy source directly to the other terminal without passing through any other component

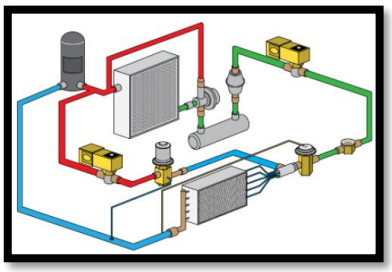
switch

a device used to open and close circuits



system

a set of objects that are related in some way and can be isolated for study



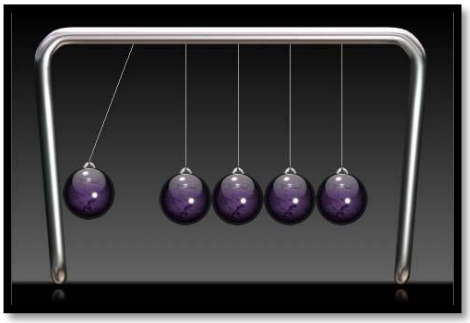
Investigation 1 Words

terminal

the term used to refer to the ends of a battery

transfer

to move from one source to another



wire

a metal or other solid substance through which electric current moves

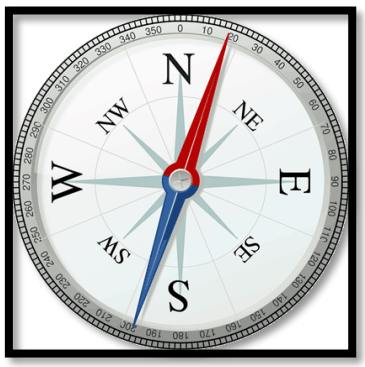
Investigation 1 Words

attract

to pull toward each other

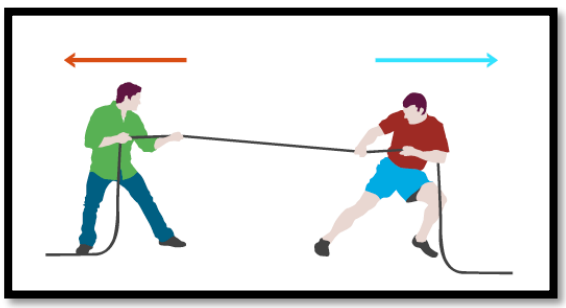
compass

an instrument that uses a free-rotating magnetic needle to show direction



force

a push or pull



Investigation 2 Words

gravity

a force that pulls objects toward each other

induced magnetism

the influence of a magnetic field on a piece of iron, which makes the iron a temporary magnet

interact

to act on and be acted upon by one or more objects

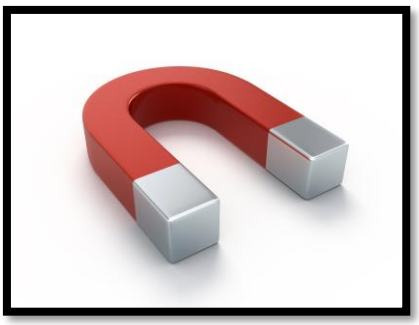
Investigation 2 Words

iron

a metal that sticks to a magnet

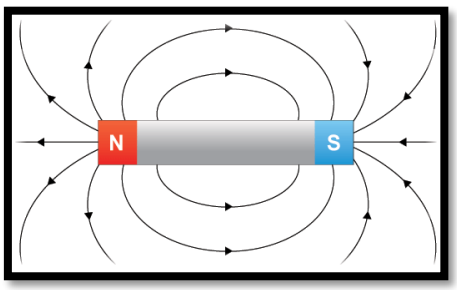
magnet

an object that sticks to iron or steel



magnetic field

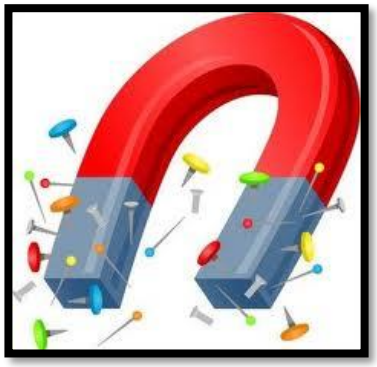
an invisible field around a magnet



Investigation 2 Words

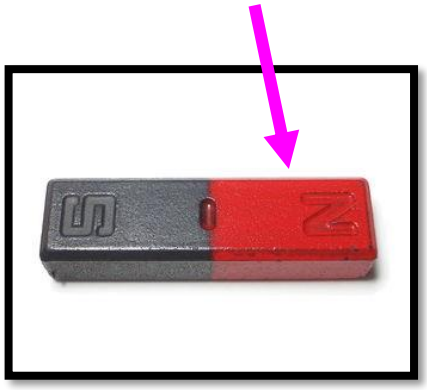
magnetism

a property of certain kinds of materials that causes them to attract iron or steel



north pole

the end of a magnet that orients toward Earth's magnetic north pole



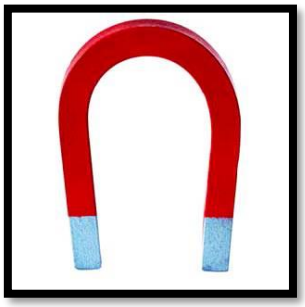
opposite

different as in the two poles of magnets

Investigation 2 Words

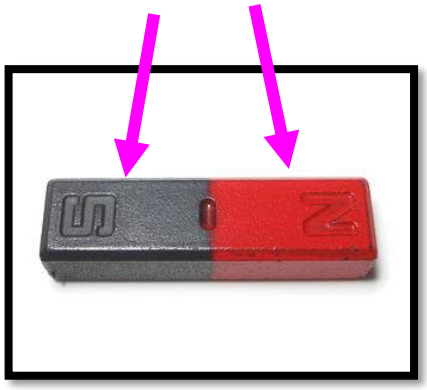
permanent magnet

an object that sticks to iron



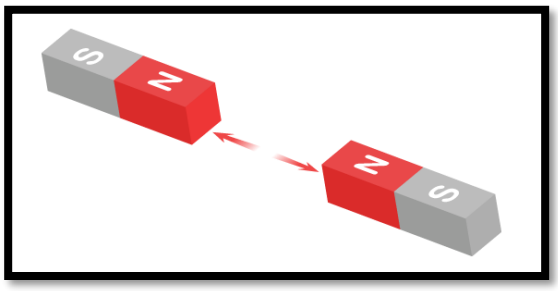
pole

the end of a magnet (there are 2, north and south)



repel

to push away from each other



Investigation 2 Words

south pole

the end of a magnet that orients toward Earth's magnetic south pole

steel

a material made mostly of iron

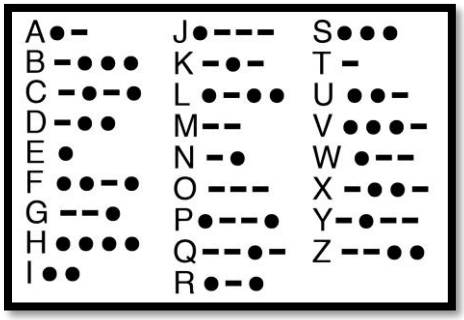
temporary magnet

a piece of iron that behaves like a magnet only when it is surrounded by a magnetic field

Investigation 2 Words

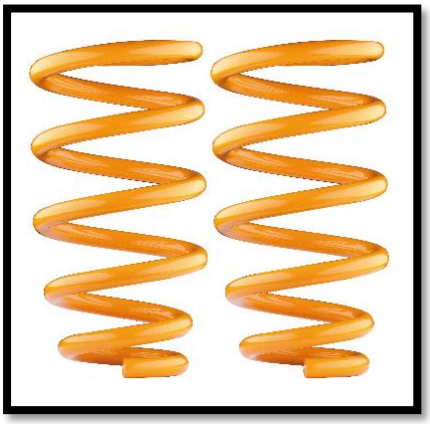
code

a set of signals that represents letters or words for sending messages



coil

a series of loops



core

in an electromagnetic, the material around which a coil of insulated wire is wound

Investigation 3 Words

electromagnet

a piece of iron that becomes a temporary magnet when electricity flows through an insulated wire wrapped around it

electromagnetism

a property of electric and magnetic fields that causes interactions with electric charges and currents

key

a switch that completes the circuit in a telegraph system

Investigation 3 Words

rivet

a piece of iron or steel around which a coil is wound

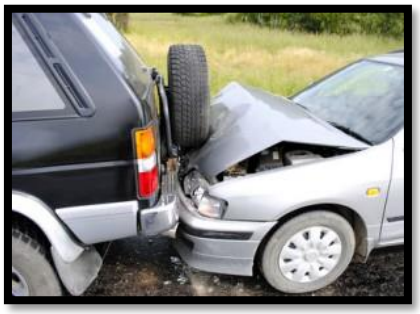
telegraph

a device that uses an electromagnet to send coded messages by closing opening an electric circuit

Investigation 3 Words

collide

to come into contact with another object

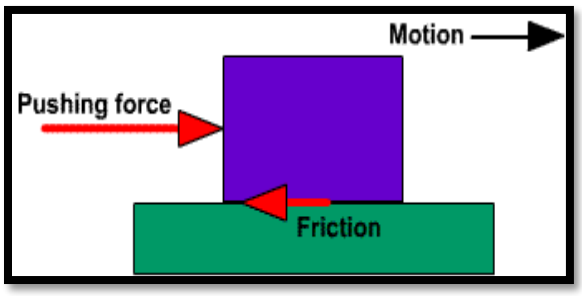


collision

when one object hits another

friction

a force acting between surfaces passing each other



Investigation 4 Words

fuel

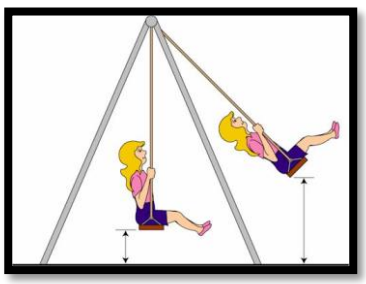
a source of energy when burned

heat

observable evidence of energy

kinetic energy

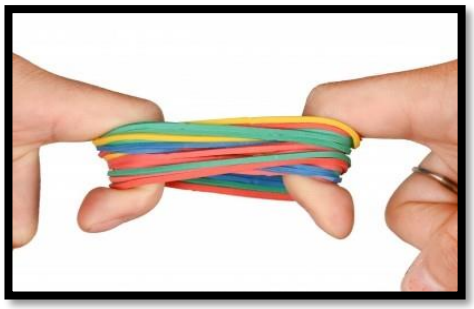
energy that matter has because of its motion



Investigation 4 Words

potential energy

energy that matter has because of its position



sound

observable evidence of energy

stationary

not moving

This is a stationary bike.

Investigation 4 Words

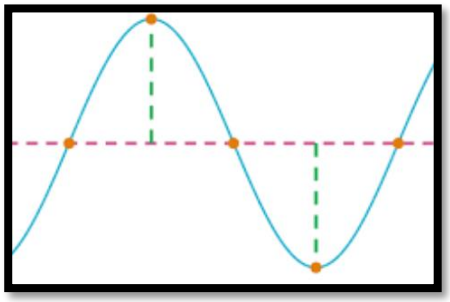
transfer of energy

what happens when objects collide and energy is transformed from the object with more energy to the object with less energy

Investigation 4 Words

amplitude

the height of the peaks in a wave form

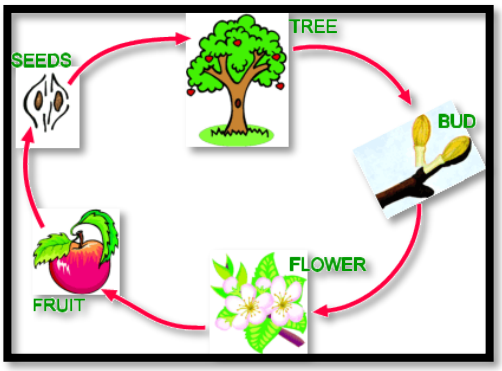


compression

sound waves that move back and forth through vibrations

cycle

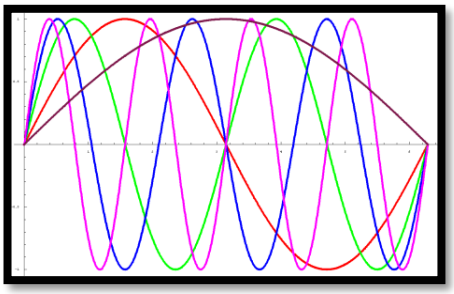
a set of events or actions that repeats



Investigation 5 Words

frequency

the speed at which something oscillates

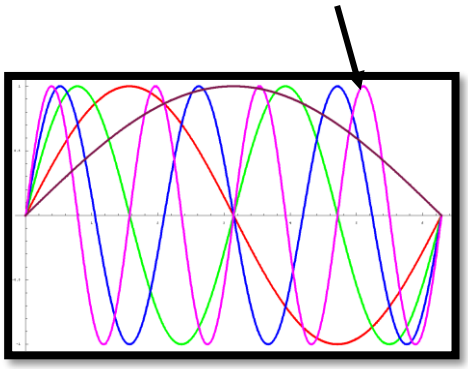


mirror

a shiny surface that reflects light

peak

the high point on a wave form



Investigation 5 Words

ray

an electromagnetic wave of light

reflect

to bounce back

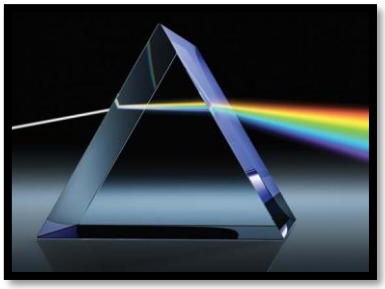
reflection

the bouncing of light rays off an object

Investigation 5 Words

refract

to change the speed and direction of travel

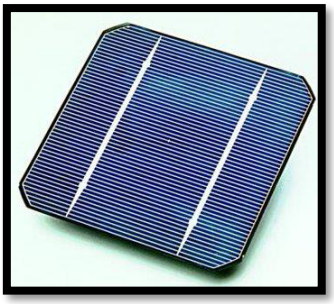


refraction

the bending of light rays

solar cell

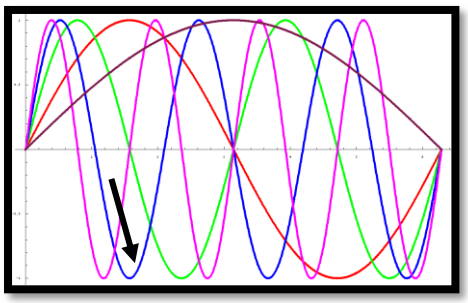
a silicon cell that converts sunlight into electric energy and is used as a power source



Investigation 5 Words

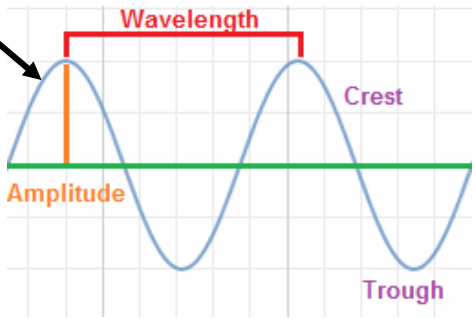
trough

the low point on a wave form



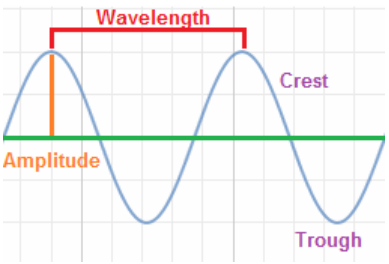
wave

a repeating pattern of motion (up and down or back and forth)



wavelength

the distance from the center of one peak to the center of the next peak on a wave form

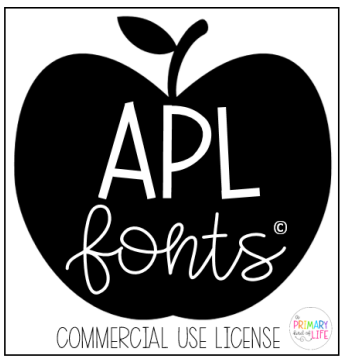


Investigation 5 Words

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.