

# EP Physics/Chemistry

## Printables:

### Levels 1-4



This book belongs to:

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Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

H

1

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

He

2

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

C

6

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

O

8

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

Ne

10

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

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Na

11

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

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Mg

12

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

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Al

13

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

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Si

14

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

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Cl

17

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

K

19

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

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Ca

20

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

Fe

26

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

Ni

28

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

Cu

29

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

Zn

30

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

Ag

47

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

Ar

18

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

I

53

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

Au

79

Cut along the outside lines and fold in half. Write the name of the element and information about the element inside the booklet.

Glue this side to the correct periodic table group section.

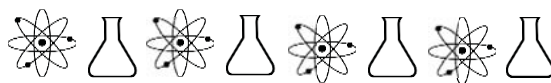
Pb

82



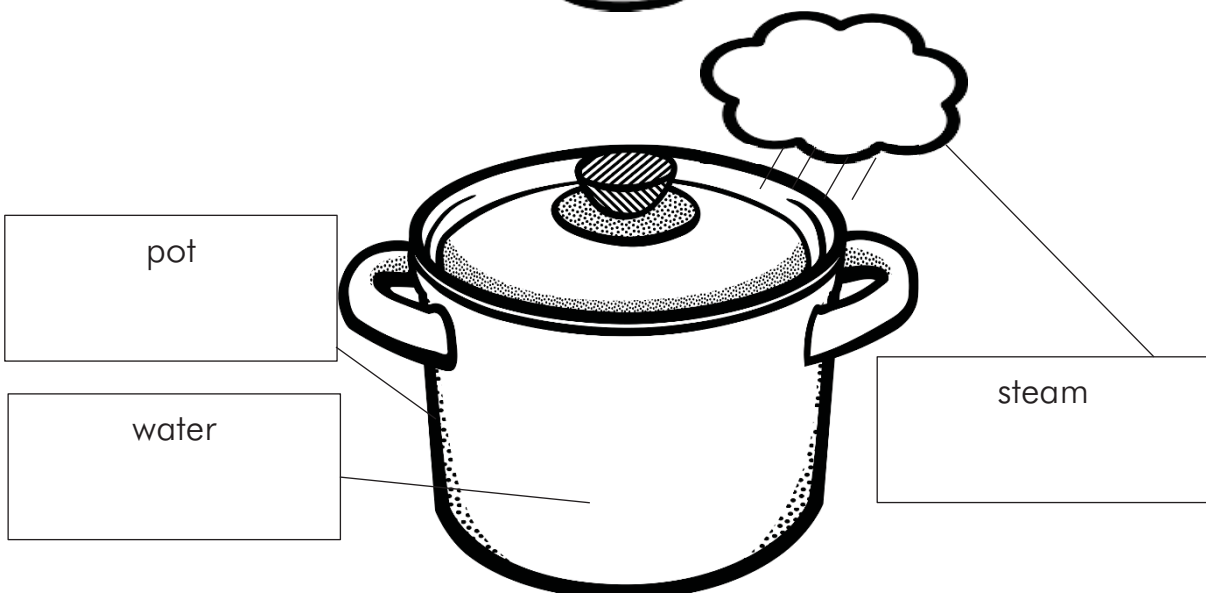
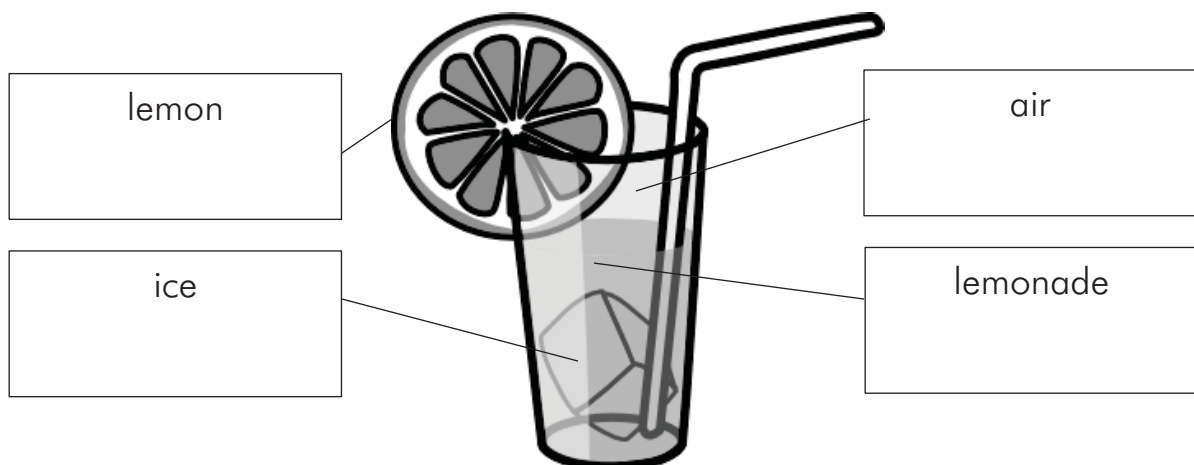
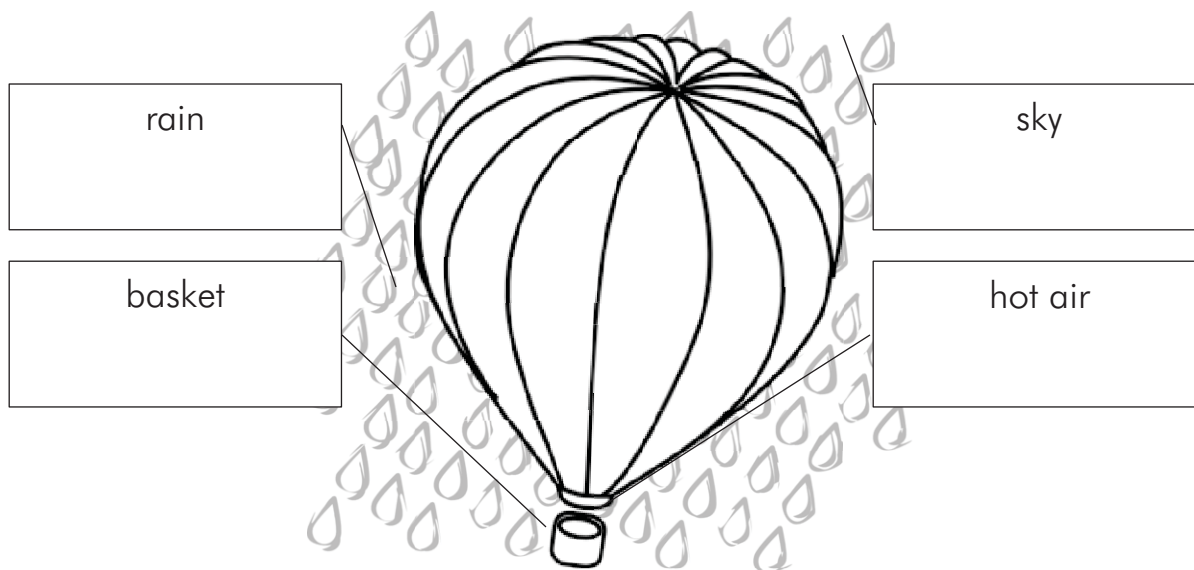
# Periodic Table of the Elements

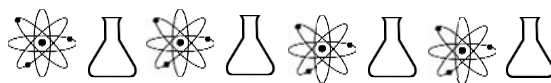
Group→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
↓Period																		
1	1 H												5 B	6 C	7 N	8 O	9 F	2 He
2	3 Li	4 Be												14 Si	15 P	16 S	17 Cl	10 Ne
3	11 Na	12 Mg											13 Al					18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba		72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra		104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Fl	115 Uup	116 Lv	117 Uus	118 Uuo
Lanthanides			57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu	
Actinides			89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr	



## Solids, Liquids, Gasses

Write in each box whether the indicated picture represents a solid, liquid, or gas.





## Experiment Worksheet

Fill out this worksheet as you work through the experiment.

Question: \_\_\_\_\_

Hypothesis: \_\_\_\_\_

\_\_\_\_\_

Materials: \_\_\_\_\_

\_\_\_\_\_

Procedure: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Observations/data: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

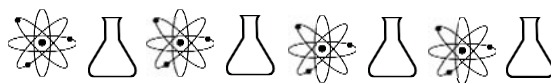
\_\_\_\_\_

\_\_\_\_\_

Conclusion: \_\_\_\_\_

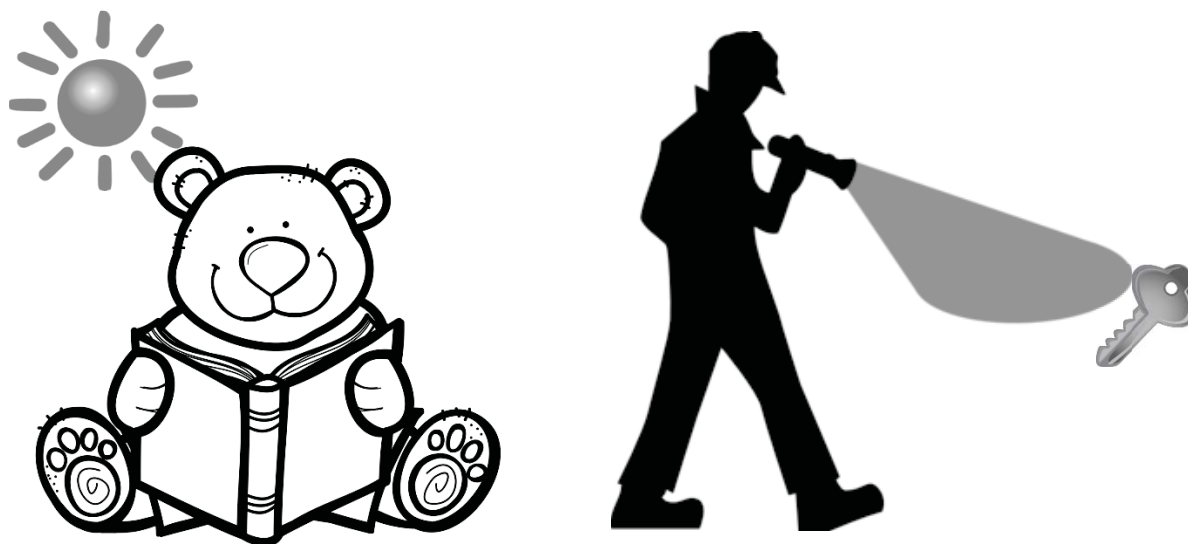
\_\_\_\_\_

\_\_\_\_\_

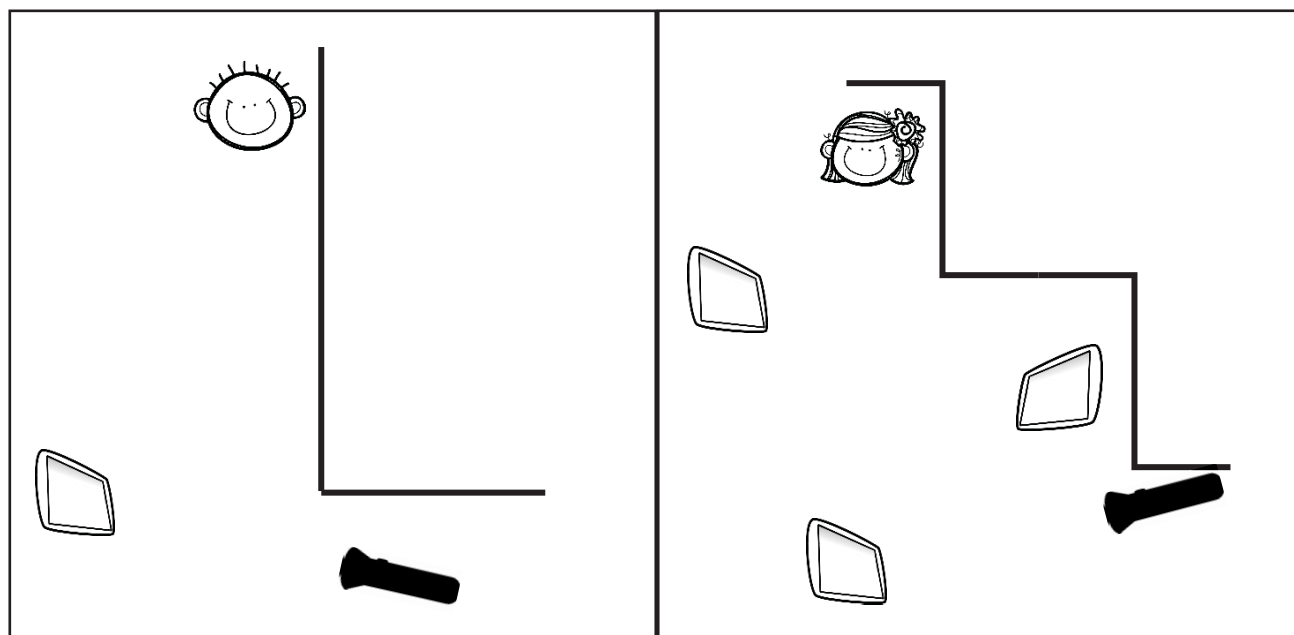


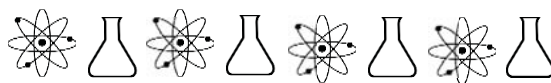
## Reflecting Light

Draw arrows representing light waves to show how the bear can see the book and the boy can see the key.



Draw arrows representing light waves to show how the boy and girl can see their respective flashlight beams. The rectangle objects are mirrors.





## Experiment Worksheet

Fill out this worksheet as you work through the experiment.

Question: \_\_\_\_\_

Hypothesis: \_\_\_\_\_

\_\_\_\_\_

Materials: \_\_\_\_\_

\_\_\_\_\_

Procedure: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Observations/data: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

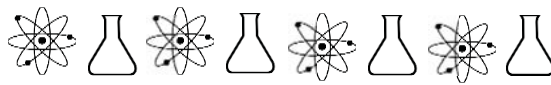
\_\_\_\_\_

\_\_\_\_\_

Conclusion: \_\_\_\_\_

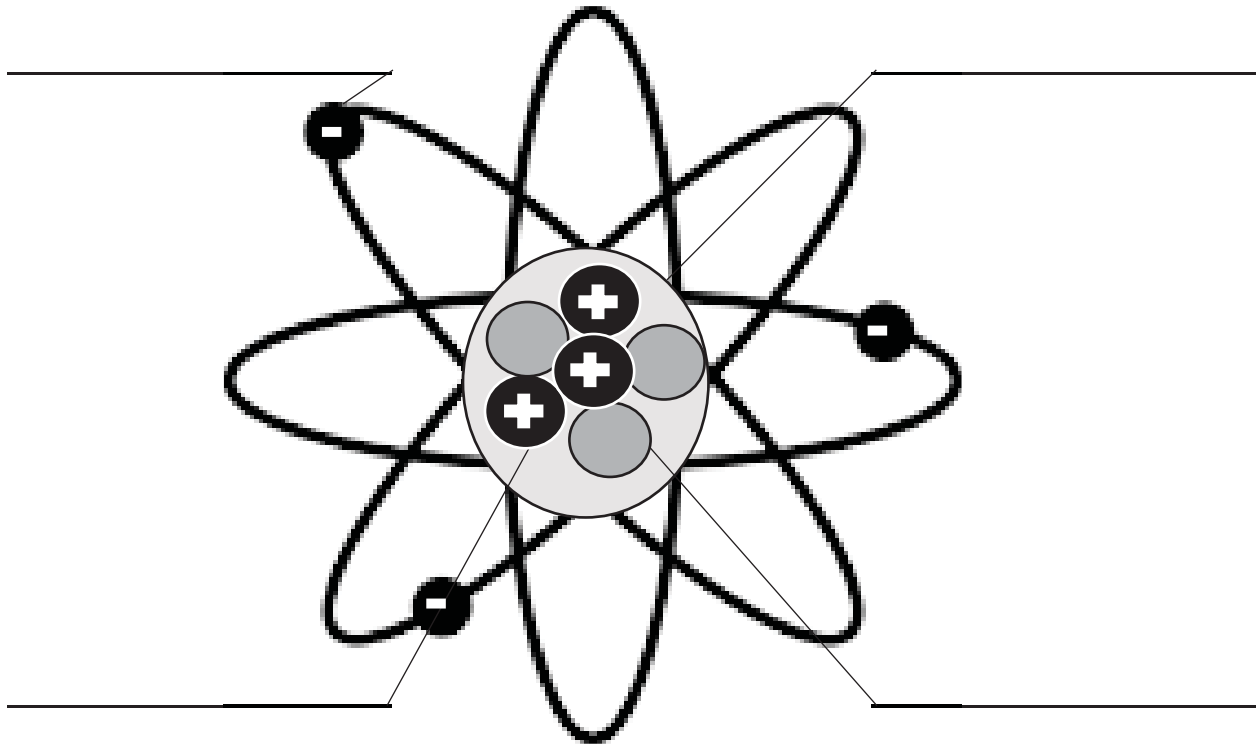
\_\_\_\_\_

\_\_\_\_\_

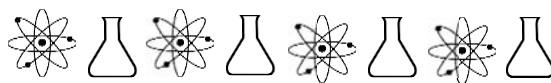


## Atoms

Label the parts of the atom. Then use the bottom of the page to draw a hydrogen atom. A hydrogen atom has one proton and one electron with zero neutrons.



Hydrogen Atom:



## Chemical Reaction

Use this notebooking page to write a simple definition of a chemical reaction.

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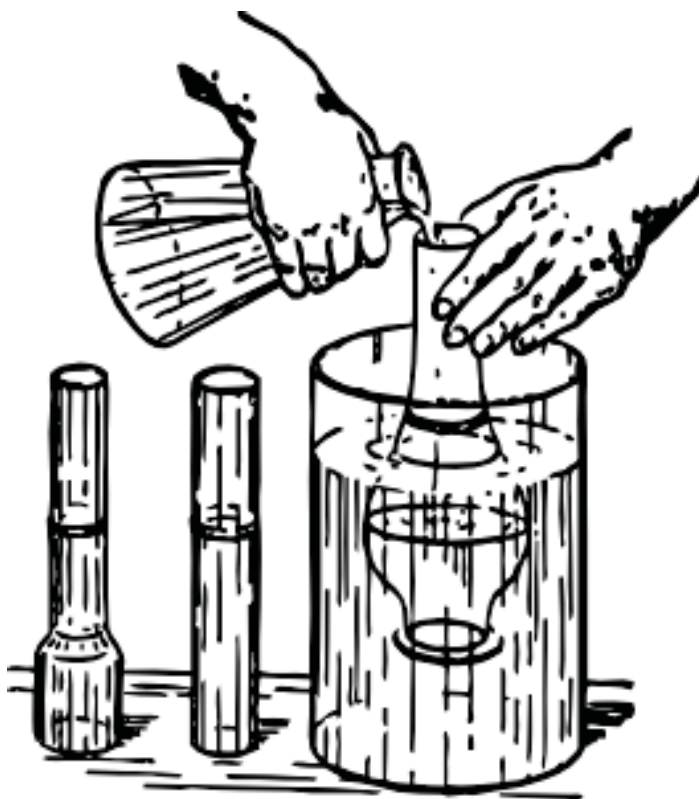
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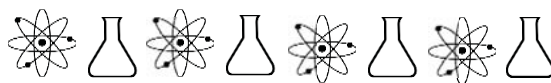
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## Aeronautics

Answer the question, "What is aeronautics?"

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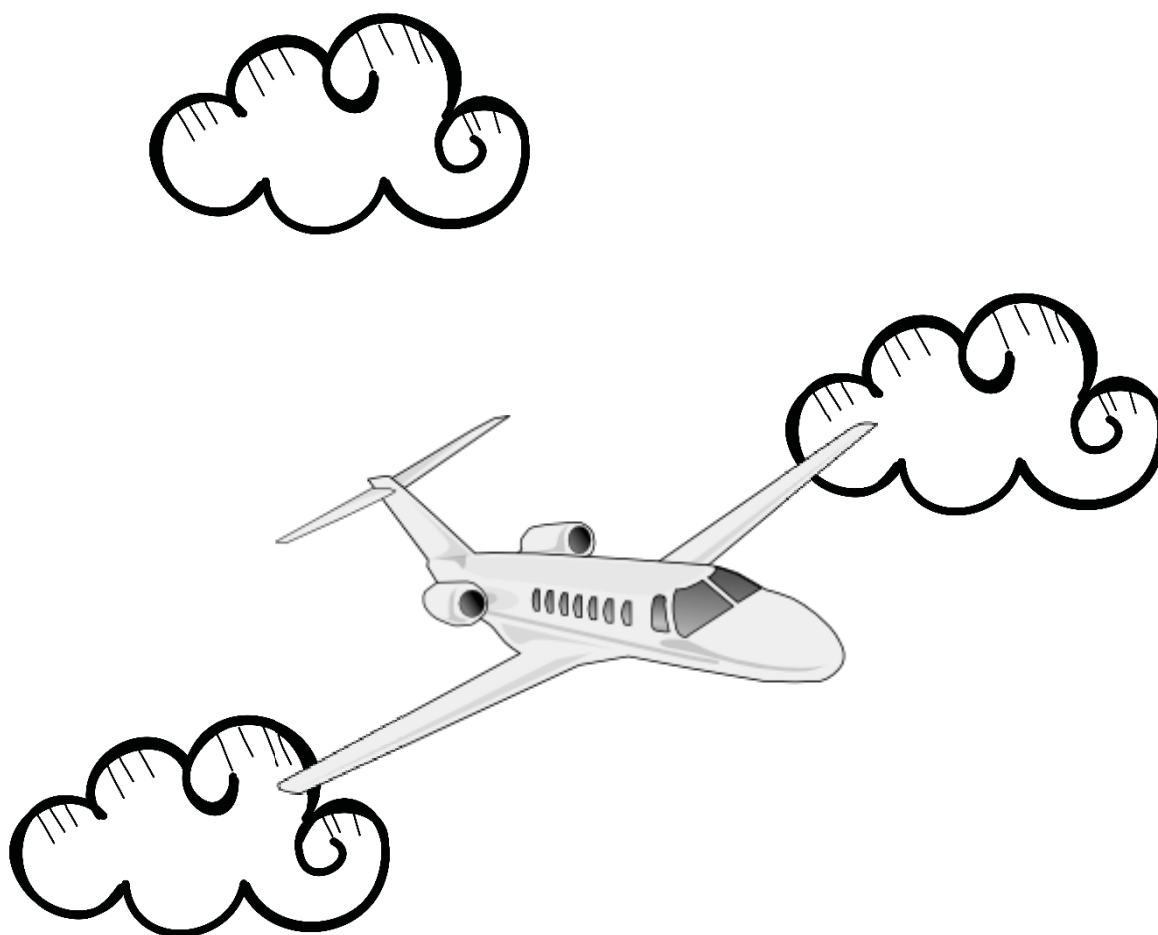
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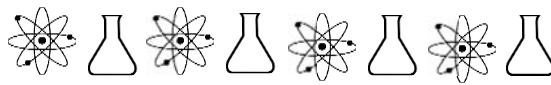
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## Flight Forces

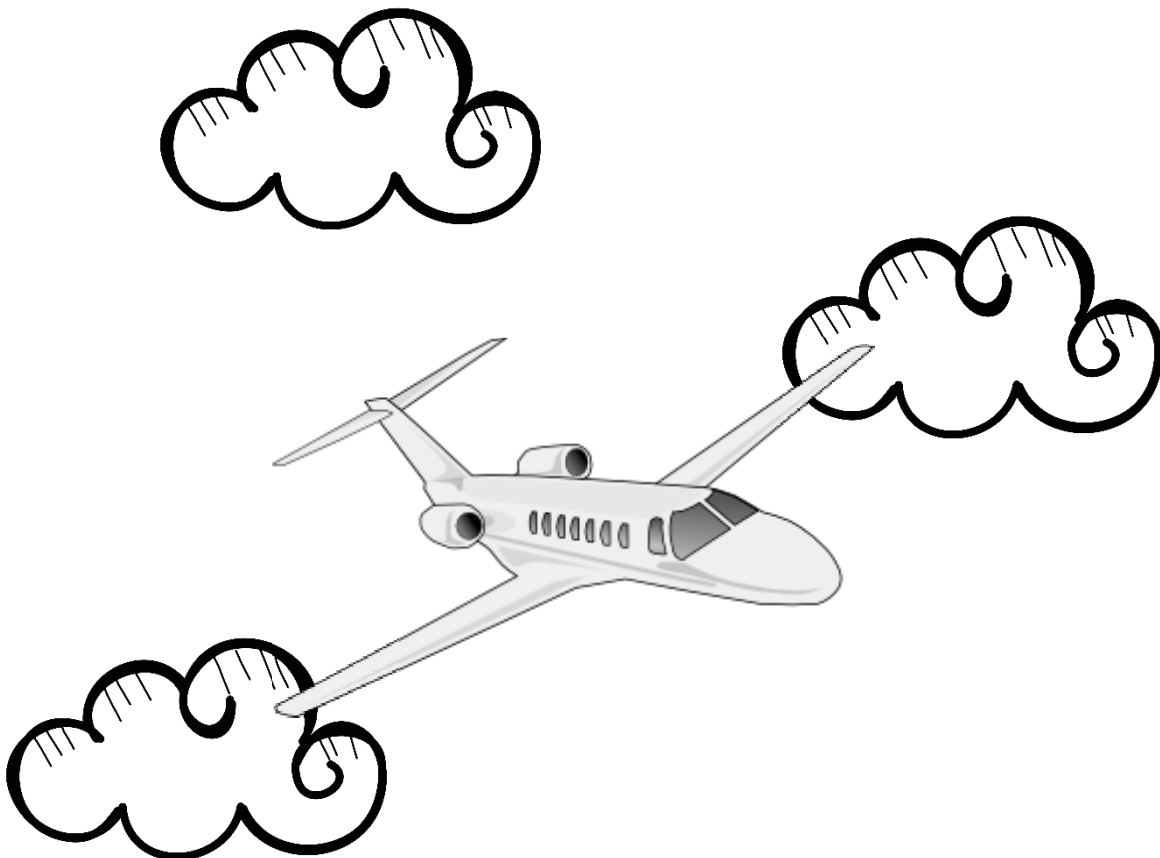
Cut out these labels and tape them onto the string and straw.

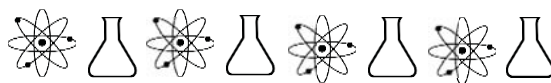
thrust

drag

lift

weight





## Weight on Other Planets

The surface gravity of each planet relative to earth is in its box. Find out your weight on other planets by writing your weight on earth on the line and multiplying it by the surface gravity of the planet.

Mercury

\_\_\_\_\_

x .38

Venus

\_\_\_\_\_

x .91

Earth

\_\_\_\_\_

x 1

Mars

\_\_\_\_\_

x .38

Jupiter

\_\_\_\_\_

x 2.36

Saturn

\_\_\_\_\_

x 1.05

Uranus

\_\_\_\_\_

x .94

Neptune

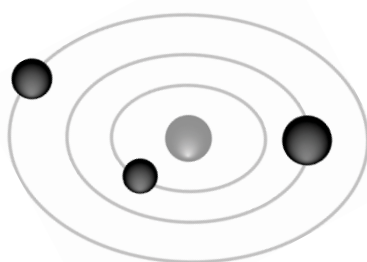
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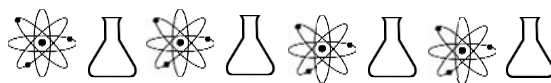
x 1.13

Pluto

\_\_\_\_\_

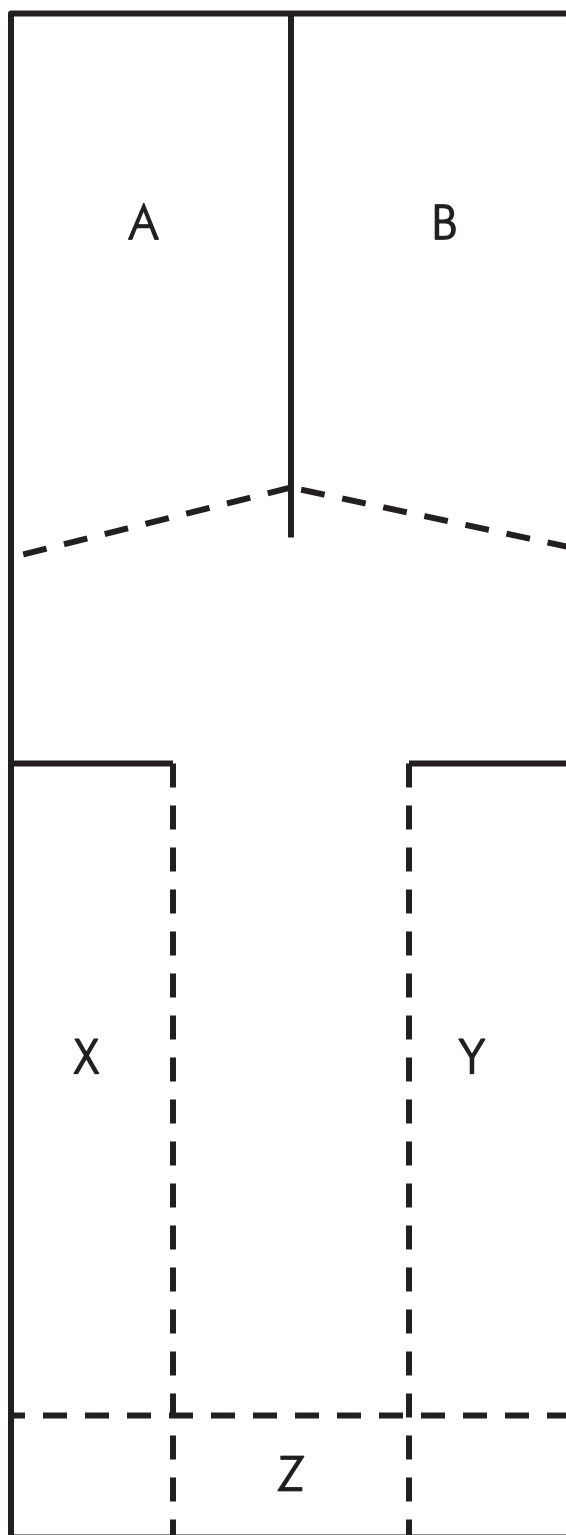
x .07





## Rotor Motor

Use this template to make your rotor motor. Cut on the solid lines and fold on the dotted lines. Fold A and B in opposite directions, fold X and Y toward the center, and fold Z up for rigidity.



Objective: to find if something is an acid by observing its reaction to baking soda

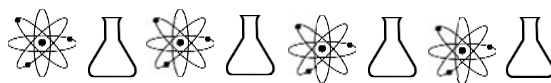
[illegible]

## pH Test

Use this sheet to record your findings.

Objective: to find out if liquids are acid, neutral, or base

[illegible]



## Acids and Bases

Answer the following questions about acids and bases.

What is a characteristic of an acid? \_\_\_\_\_  
\_\_\_\_\_

What is a characteristic of a base? \_\_\_\_\_  
\_\_\_\_\_

List some acids: \_\_\_\_\_

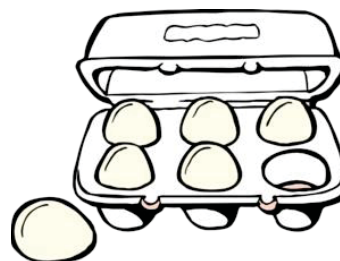
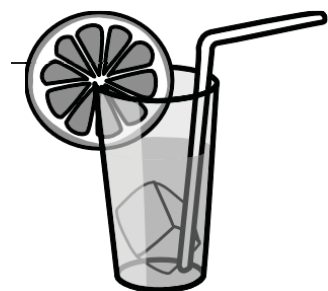
List some bases: \_\_\_\_\_

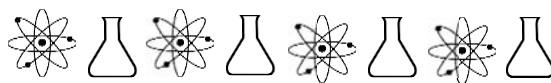
What is the pH of a strong acid? \_\_\_\_\_

What color does a strong acid turn when tested for its pH level? \_\_\_\_\_

What is the pH of a strong base? \_\_\_\_\_

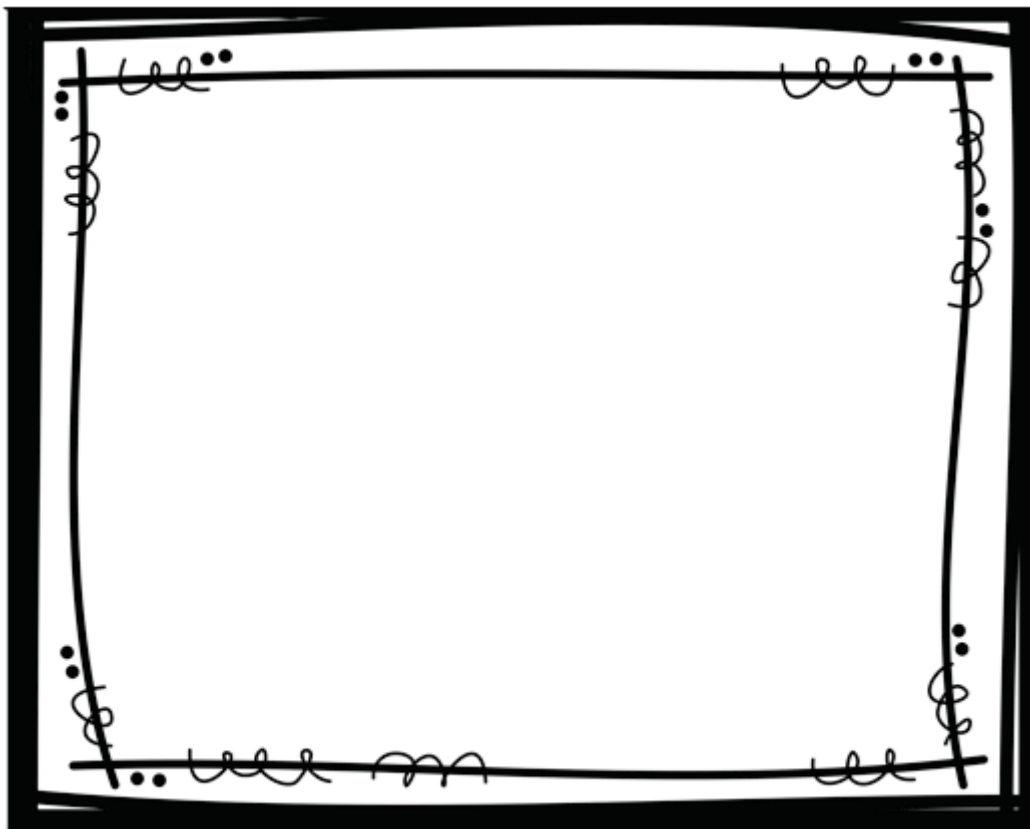
What color does a strong base turn when tested for its pH level? \_\_\_\_\_





## Knotted Bones

Draw a picture of your chicken bone as it looks now and then answer the questions.



What I saw: \_\_\_\_\_

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What I did: \_\_\_\_\_

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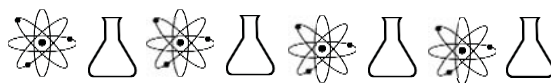
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Objective: to find out if objects are buoyant or not.

[illegible]

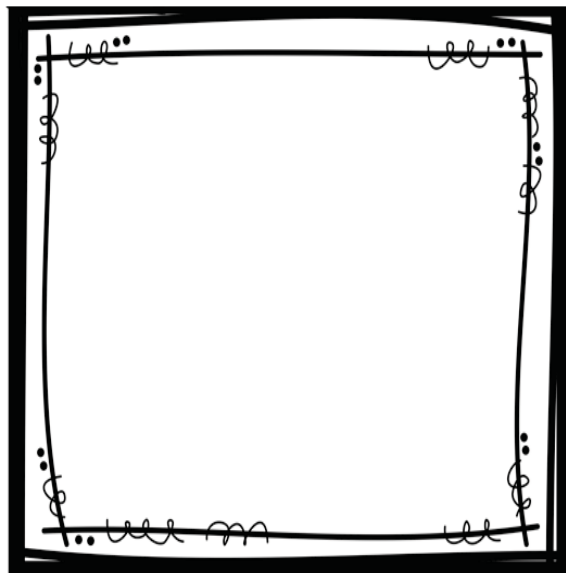




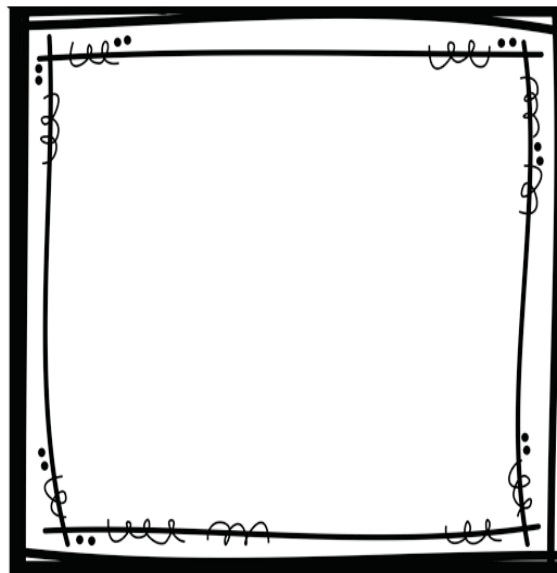
## Properties of Water

Draw pictures of the following terms.

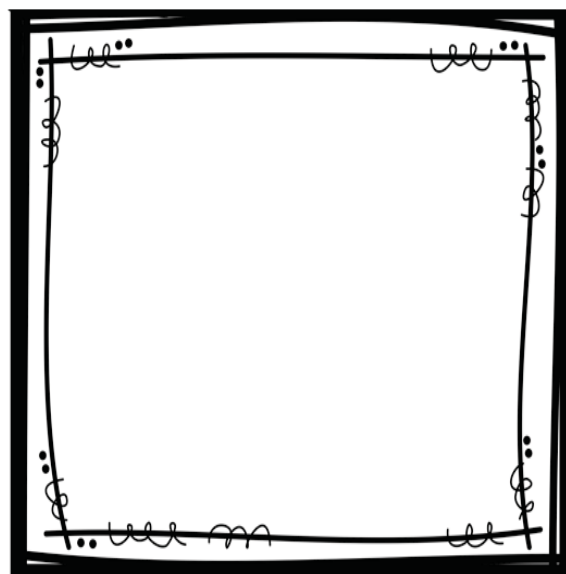
Viscosity



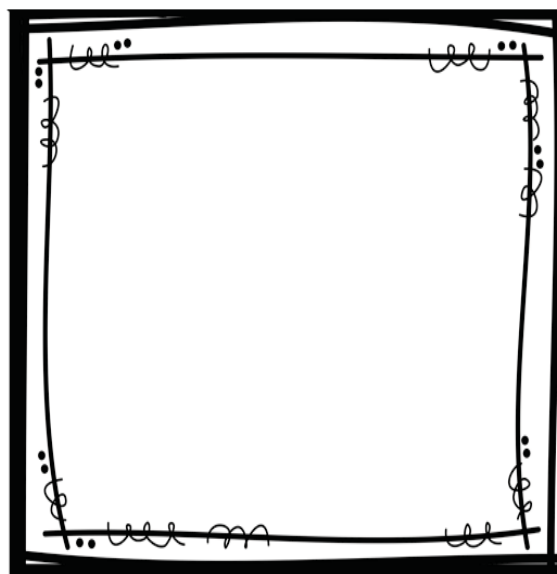
Density

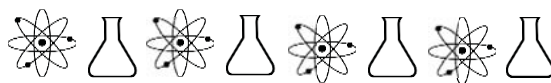


Buoyancy



Capillary Action

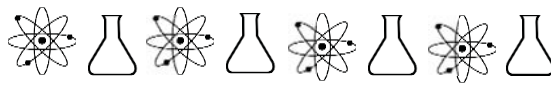




## Electricity Timeline

Use the blanks to fill in a timeline of electricity events you want to remember. Be sure to include the year.

The timeline consists of a central vertical line. On the left side, there are four horizontal lines, each with a lightning bolt icon pointing towards the center. On the right side, there are four horizontal lines, each with a lightning bolt icon pointing towards the center. This layout provides eight blank spaces for recording electricity-related events and their corresponding years.



## Circuits

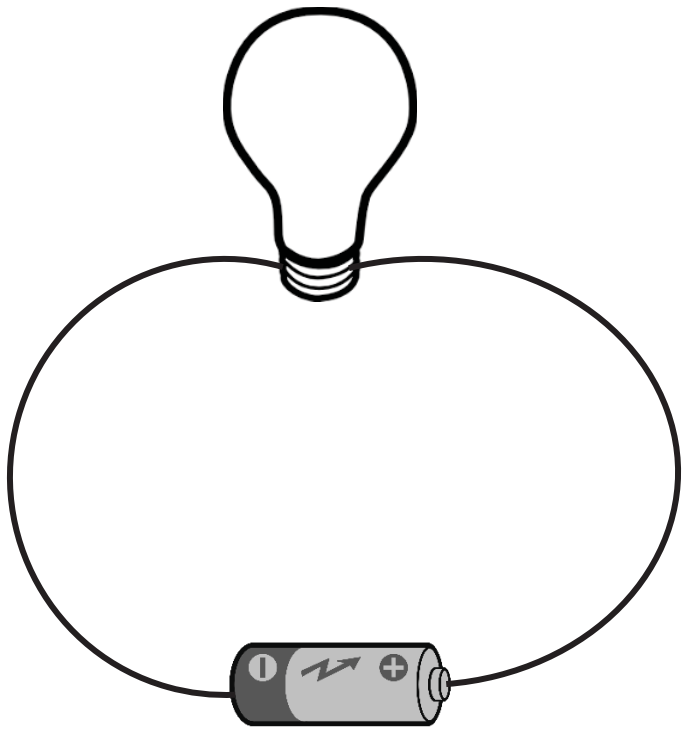
Record observations from your experiment.

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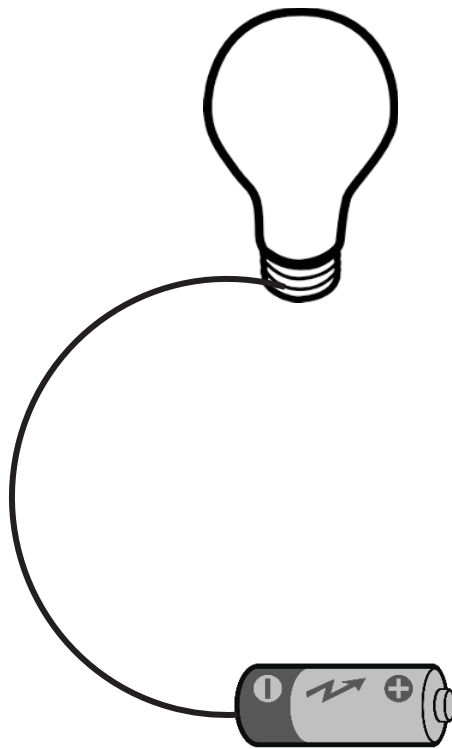
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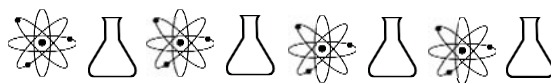
Color in the light bulb that would turn on in the two circuits below. One is a closed circuit, and one is an open circuit. Can you label them?



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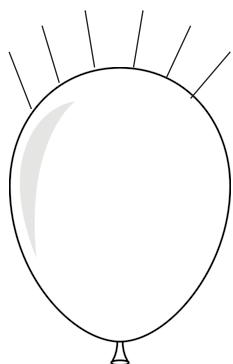
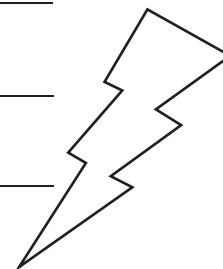
## Types of Electricity

Use this page to define the terms.

electricity\_\_\_\_\_

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static electricity\_\_\_\_\_

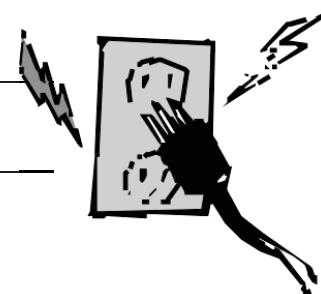
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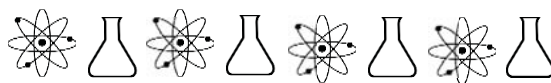
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current electricity\_\_\_\_\_

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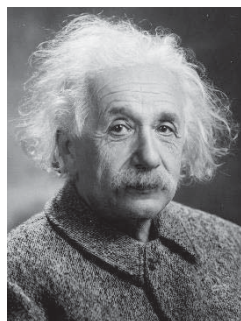
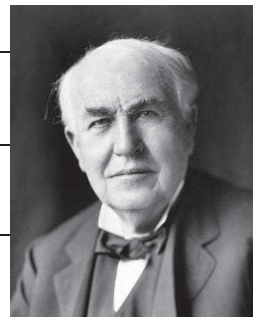
## Famous Electricians

What did each of the following people contribute to the field of electricity?

Thomas Edison\_\_\_\_\_

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Albert Einstein\_\_\_\_\_

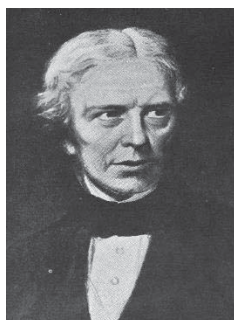
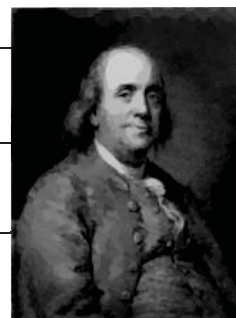
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Benjamin Franklin\_\_\_\_\_

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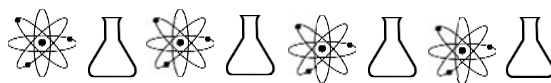
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Michael Faraday\_\_\_\_\_

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## Electricity is Shocking

Why does electricity shock you?

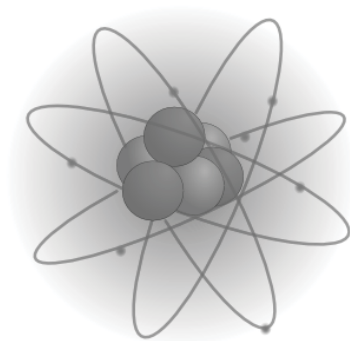
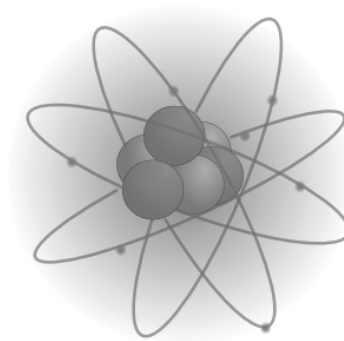
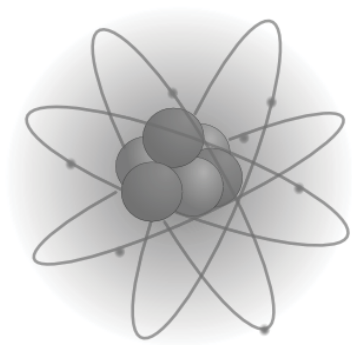
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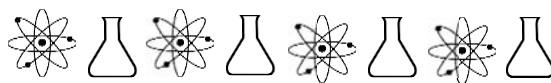
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## Electrical Safety

Match the scenario with the safety tip that helps you know what to do. Put the number of the tip that applies to the scenario on the line beside it. Not all tips will be used, but you should read and know them all!

1. Never climb a utility pole.
2. Never climb trees that are near powerlines.
3. Never pull a plug out by the cord.
4. Never handle taped cords, wires, or switches.
5. Only cords go into outlets.
6. Never go near a downed power line.
7. Don't stick any object into electrical equipment.
8. Never use electrical equipment around water.
9. Always ask for help if you don't understand something about electricity.

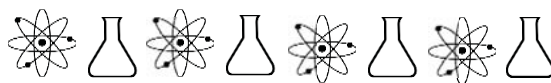


My brother says a dime will fit into the slot on my electrical outlet. Should I see if he's right? \_\_\_\_\_

My bagel is stuck in the toaster. Should I use a knife to dig it out? \_\_\_\_\_

I want to take my radio to the pool so I can listen to my favorite music. There's room on my raft for it. Should I pack it? \_\_\_\_\_

I bought a new lamp, but the old one is plugged in behind my bed and I can't reach the plug. I can reach the cord, though. Should I pull it out that way? \_\_\_\_\_



## Vocabulary

Define these terms.

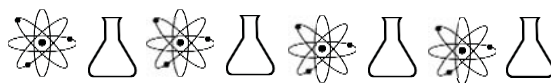
Energy Source

Conductor

Electron

Energy





## Experiment Worksheet

Fill out this worksheet as you work through the experiment.

Question: \_\_\_\_\_

Hypothesis: \_\_\_\_\_

\_\_\_\_\_

Materials: \_\_\_\_\_

\_\_\_\_\_

Procedure: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Observations/data: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

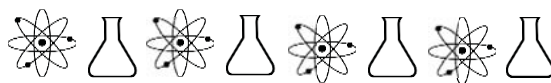
\_\_\_\_\_

\_\_\_\_\_

Conclusion: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## Magnetism

What's the strongest part of a magnet?

the poles

the middle

What's the weakest part of a magnet?

the poles

the middle

What are some metals that are attracted to magnets?

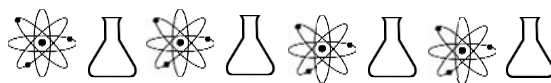
What are some metals that are not attracted to magnets?



What are some natural magnets?

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## Magnets

If you attach a bar magnet to a piece of wood and float it in water, the contraption will slowly turn until the magnet's north pole points

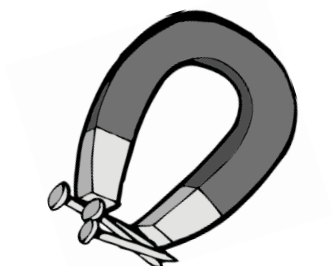
\_\_\_\_\_.

north

south

east

west



A popular piece of navigation equipment that uses a magnet is a

\_\_\_\_\_.



Two north poles or two south poles put together will \_\_\_\_\_ each other.

attract

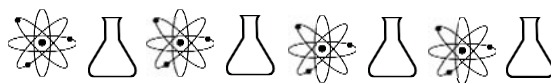
repel



A south and a north pole put together will \_\_\_\_\_ each other.

attract

repel



## Simple Motors

Fill in the missing words from each sentence using the word box.

alternating current

commutator

terminals

brushes

This makes the current change back and forth (much like commuting is to drive back and forth).

\_\_\_\_\_

These feed electric power.

\_\_\_\_\_

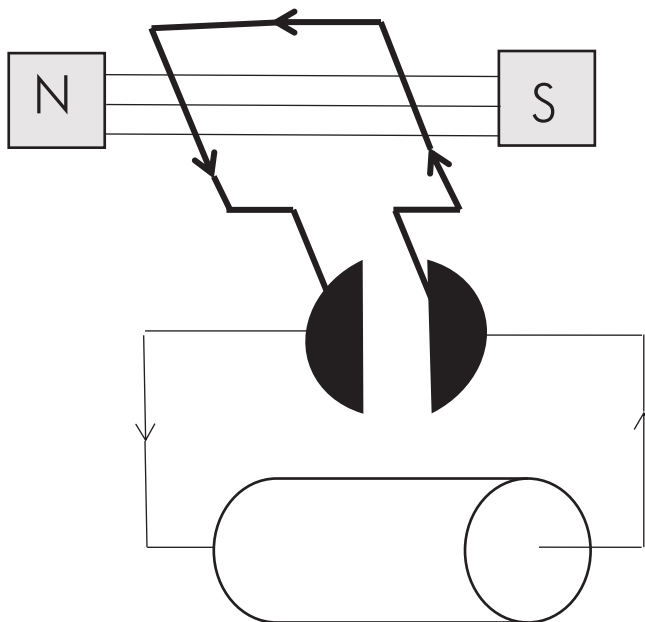
These are made from graphite or springy metal.

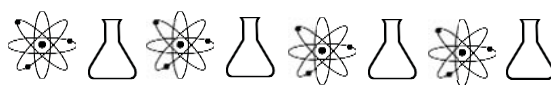
\_\_\_\_\_

Periodically changes direction.

\_\_\_\_\_

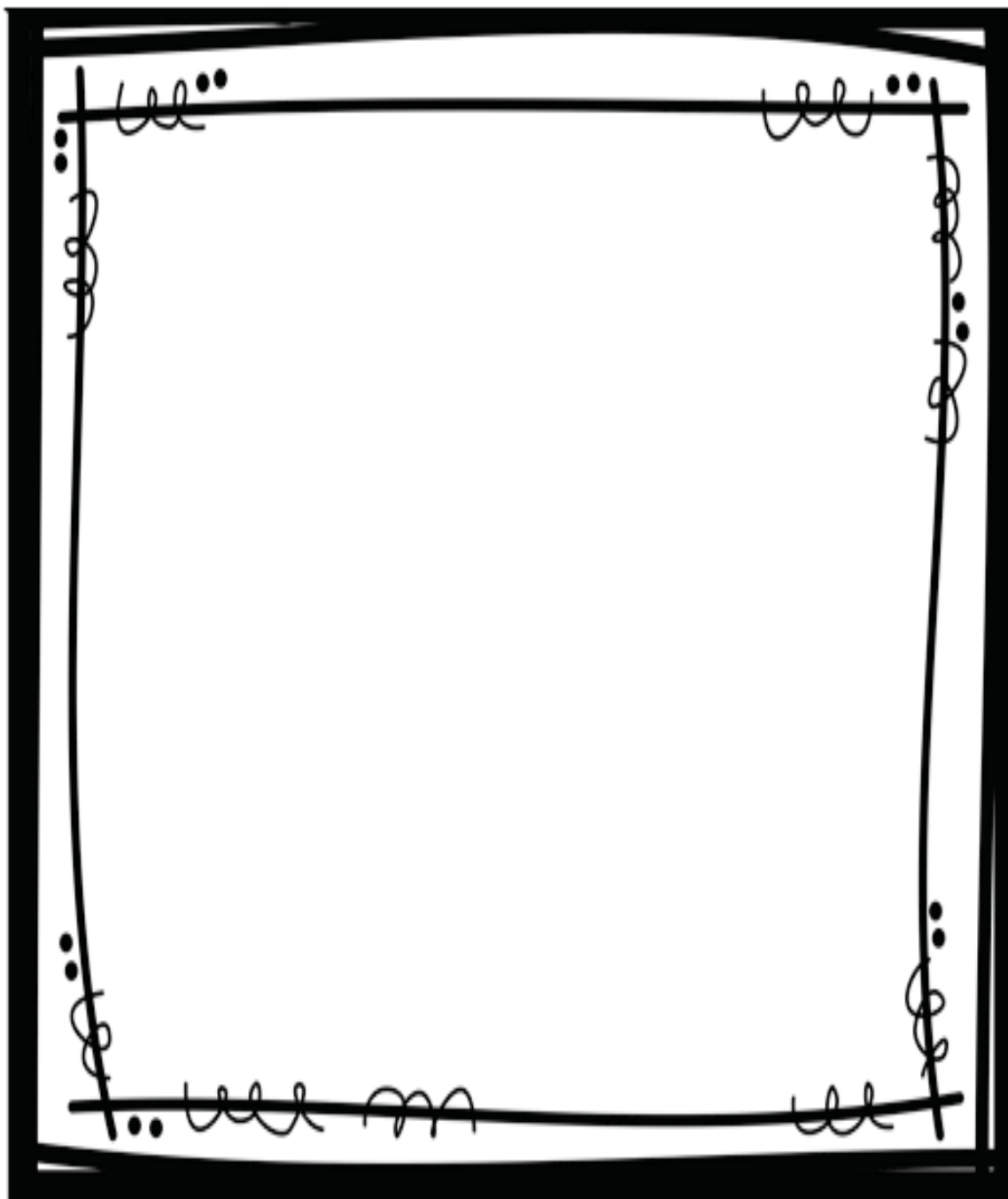
Label this drawing of a simple motor with the following: magnetic field, commutator, brushes, electric current. Draw an arrow in the direction the coil would rotate.





## Everyday Magnets

Use this page to draw a picture of somewhere in your house where you would find a magnet. Try to think beyond the refrigerator! Share with a family member what type of magnet(s) you would find in the place you drew.



Objective: to find out if objects conduct or carry electricity.

[illegible]

Objective: to find out which substances dissolve in water.

[illegible]

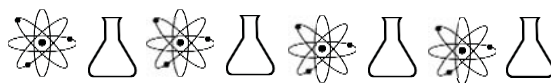
## Dissolving in Hot Water

Use this sheet to record your findings.

Objective: to find if substances dissolve the same in hot water.

[illegible]

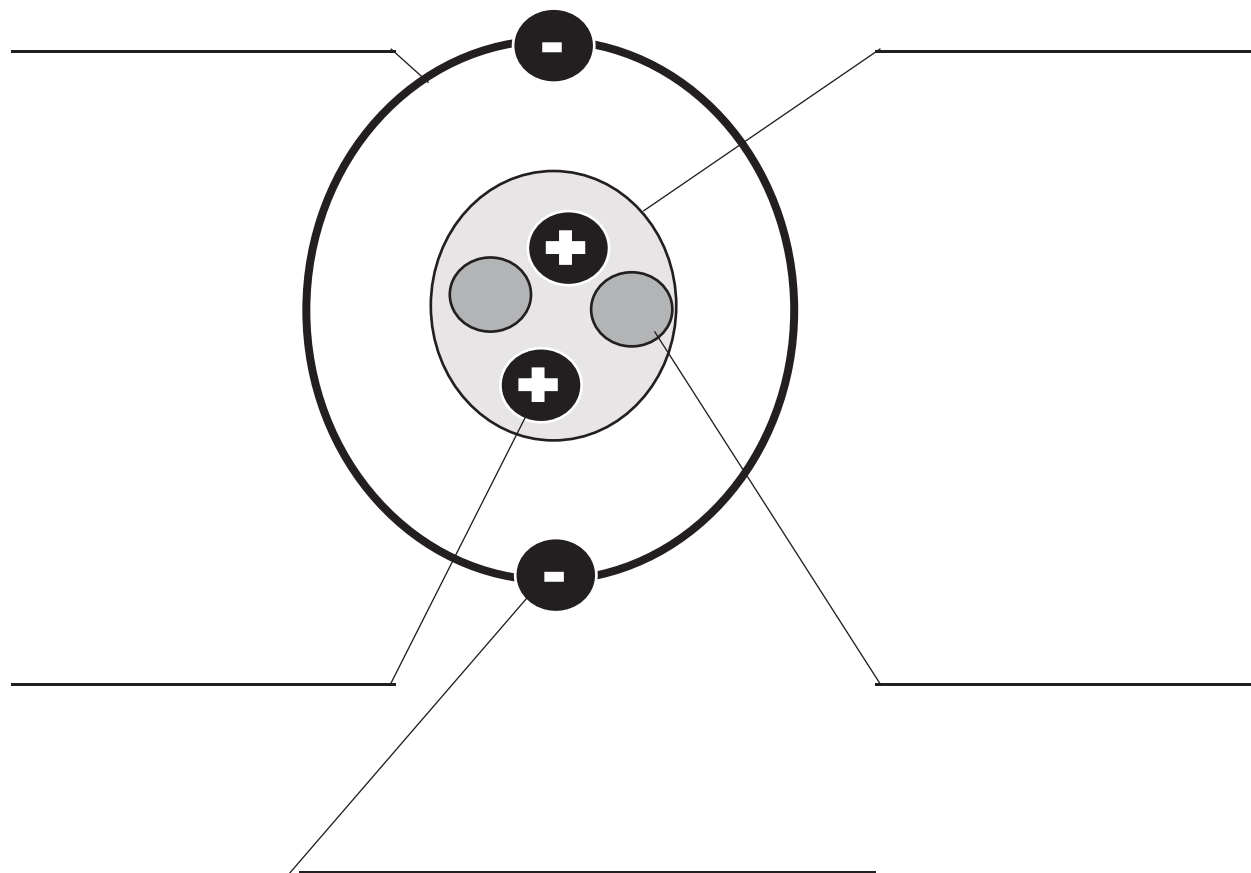


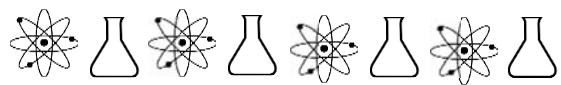


## Atoms

Label the parts of the atom using the words in the box. Then use the line at the bottom to tell what type of atom it is.

proton    neutron    electron    nucleus    orbit (shell)

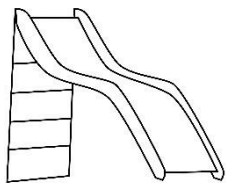
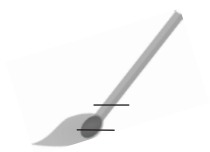


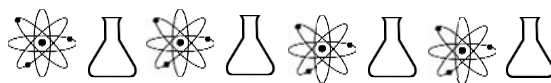


# Friction

Write down some examples of friction in the world around you. You can find some ideas in the pictures if you're having trouble.

	High Friction	Low Friction
Useful		
Not Useful		

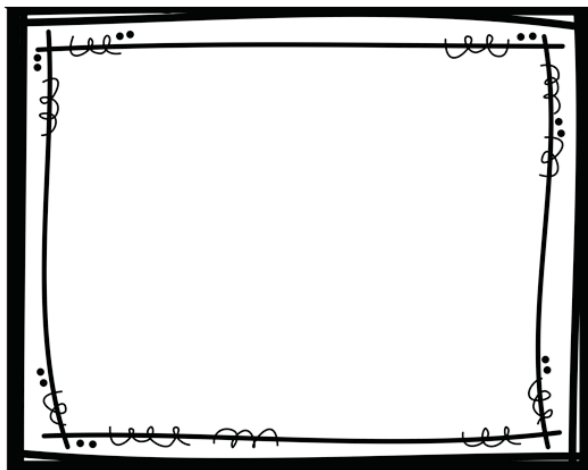




## Newton's Laws of Motion

Write each of Newton's three Laws of Motion on the lines and draw a picture of an example in the boxes.

### 1<sup>st</sup> Law: Inertia



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### 2<sup>nd</sup> Law: Acceleration

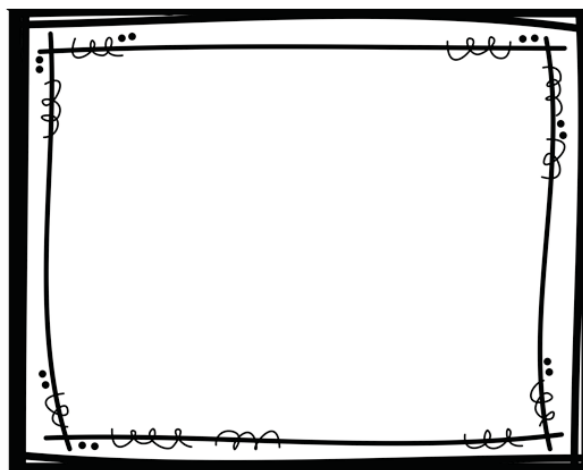
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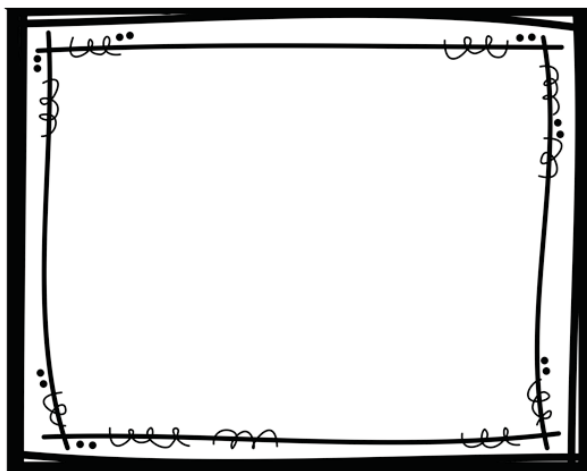
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### 3<sup>rd</sup> Law: Action/Reaction



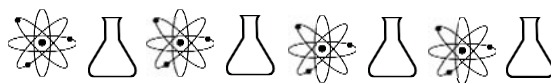
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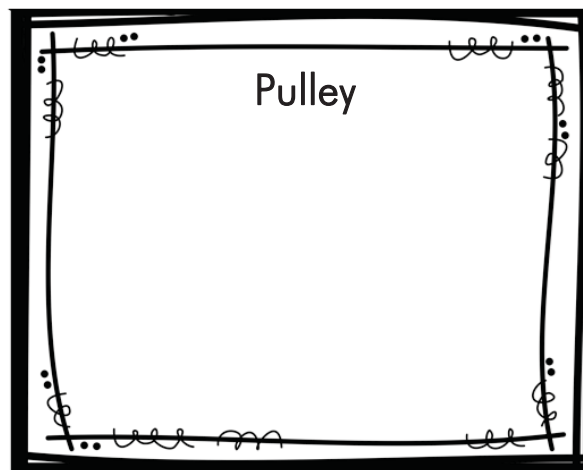
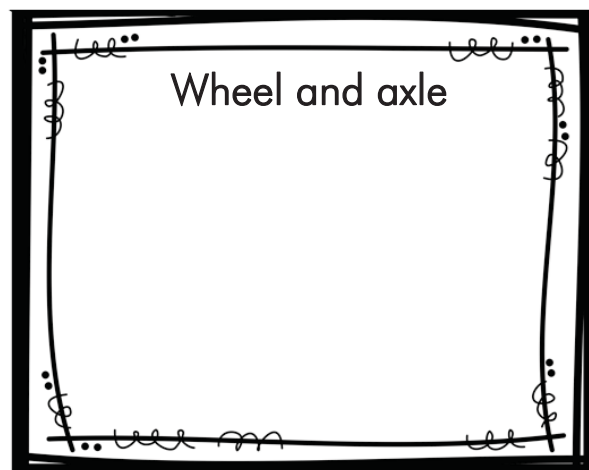
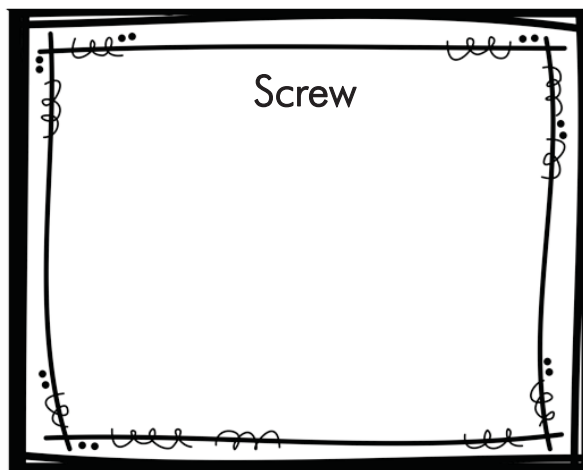
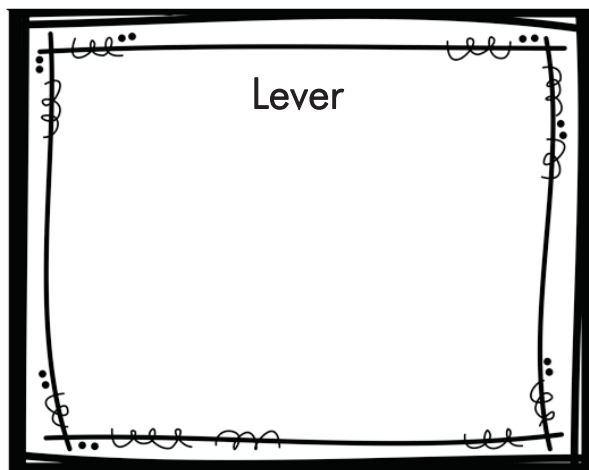
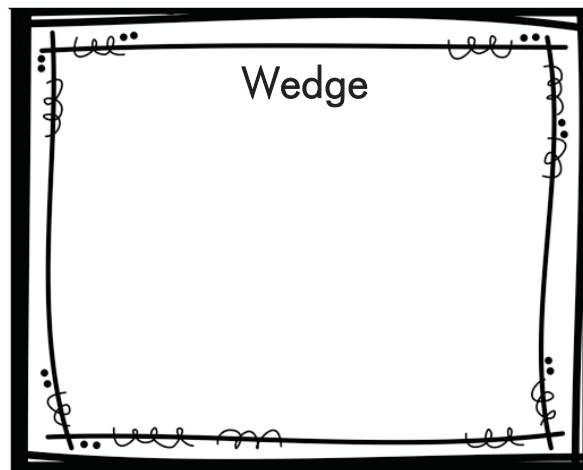
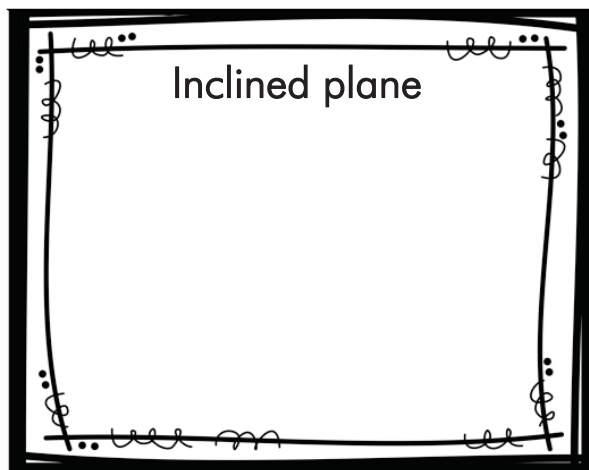
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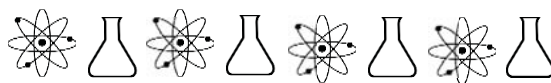
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## Simple Machines

Use this page to draw examples of these simple machines as they are assigned.





## Experiment Worksheet

Fill out this worksheet as you work through the experiment.

Question: \_\_\_\_\_

Hypothesis: \_\_\_\_\_

\_\_\_\_\_

Materials: \_\_\_\_\_

\_\_\_\_\_

Procedure: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Observations/data: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

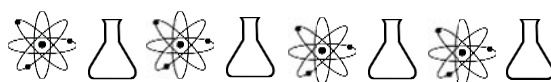
\_\_\_\_\_

\_\_\_\_\_

Conclusion: \_\_\_\_\_

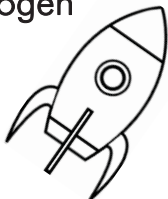
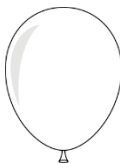
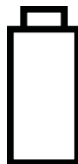






\_\_\_\_\_

\_\_\_\_\_

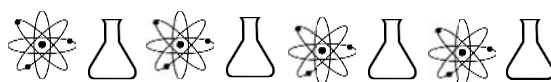


## Element Go Fish

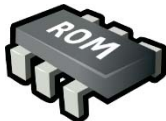

Carefully tear out these pages and cut out the cards (there are 3 sets of 18 cards). Use them to play a game of element "Go Fish." Ask any information on the card to learn more about the elements as you play. You need 3 cards for a set.

<div>H1</div> <div>Hydrogen</div> <div></div> <div><ul style="list-style-type: none"><li>- No neutrons</li><li>- Most common element</li><li>- Used in rocket fuel</li></ul></div>	<div>He2</div> <div>Helium</div> <div></div> <div><ul style="list-style-type: none"><li>- Used in balloons, blimps, and scuba gear</li><li>- Lighter than oxygen</li></ul></div>	<div>Li3</div> <div>Lithium</div> <div></div> <div><ul style="list-style-type: none"><li>- Used in batteries</li><li>- Never found in nature outside of a compound</li></ul></div>
<div>Be4</div> <div>Beryllium</div> <div></div> <div><ul style="list-style-type: none"><li>- Found in emeralds</li><li>- One of the lightest metals</li></ul></div>	<div>B5</div> <div>Boron</div> <div></div> <div><ul style="list-style-type: none"><li>- Used in sports gear</li><li>- Used in heat-resistant glass and nuclear plants</li></ul></div>	<div>C6</div> <div>Carbon</div> <div></div> <div><ul style="list-style-type: none"><li>- Basic element of life</li><li>- Coal, diamonds, and plastics are made of carbon</li></ul></div>
<div>N7</div> <div>Nitrogen</div> <div></div> <div><ul style="list-style-type: none"><li>- Most plentiful gas in the atmosphere</li><li>- Used in explosives</li></ul></div>	<div>O8</div> <div>Oxygen</div> <div></div> <div><ul style="list-style-type: none"><li>- Necessary for breathing</li><li>- Found in air and water</li><li>- Used for combustion</li></ul></div>	<div>F9</div> <div>Fluorine</div> <div></div> <div><ul style="list-style-type: none"><li>- Used as a coolant</li><li>- Used in toothpaste to fight cavities</li></ul></div>

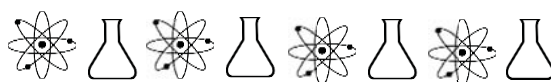
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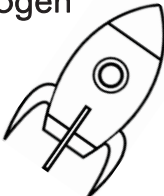
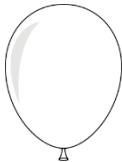






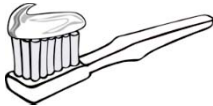
# Element Go Fish

<p>Ne 10</p> <p>Neon</p> <p>OPEN</p> <ul style="list-style-type: none"> <li>- Used in lights, lasers</li> <li>- Never bonds to other elements</li> </ul>	<p>Na 11</p> <p>Sodium</p>  <ul style="list-style-type: none"> <li>- Bonds with chlorine to make table salt</li> <li>- Never found alone</li> </ul>	<p>Mg 12</p> <p>Magnesium</p>  <ul style="list-style-type: none"> <li>- Necessary for plants and animals</li> <li>- Found in sparklers</li> </ul>
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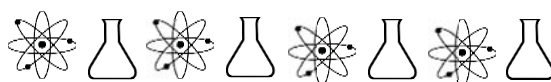


## Element Go Fish




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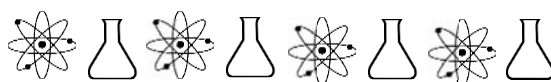




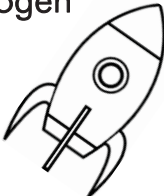
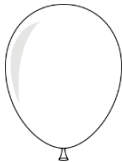






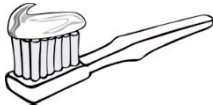
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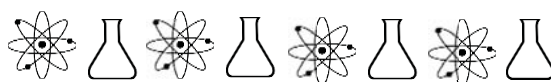
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## Element Go Fish

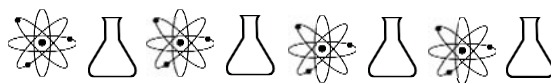
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## Element Go Fish

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## Experiment Worksheet

Fill out this worksheet as you work through the experiment.

Question: \_\_\_\_\_

Hypothesis: \_\_\_\_\_

\_\_\_\_\_

Materials: \_\_\_\_\_

\_\_\_\_\_

Procedure: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Observations/data: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

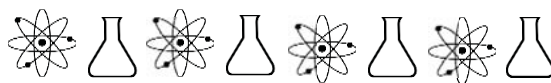
\_\_\_\_\_

\_\_\_\_\_

Conclusion: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## Research Notes

Use these pages to make notes on your topic.

Topic: \_\_\_\_\_

Resource 1: \_\_\_\_\_

Info: \_\_\_\_\_ Info: \_\_\_\_\_

Info: \_\_\_\_\_ Info: \_\_\_\_\_

Info: \_\_\_\_\_ Info: \_\_\_\_\_

Resource 2: \_\_\_\_\_

Info: \_\_\_\_\_ Info: \_\_\_\_\_

Info: \_\_\_\_\_ Info: \_\_\_\_\_

Info: \_\_\_\_\_ Info: \_\_\_\_\_

Resource 3: \_\_\_\_\_

Info: \_\_\_\_\_ Info: \_\_\_\_\_

Info: \_\_\_\_\_ Info: \_\_\_\_\_

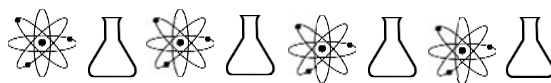
Info: \_\_\_\_\_ Info: \_\_\_\_\_

Resource 4: \_\_\_\_\_

Info: \_\_\_\_\_ Info: \_\_\_\_\_

Info: \_\_\_\_\_ Info: \_\_\_\_\_

Info: \_\_\_\_\_ Info: \_\_\_\_\_



Resource 5: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Resource 6: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Resource 7: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Resource 8: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

Info: \_\_\_\_\_

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Resource 9: \_\_\_\_\_

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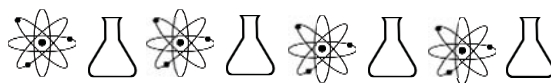
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## Science Report Checklist

Use this checklist to help you as you finish up your science project. Aim for a checkmark in each box.

### Research

- ☐ Facts
- ☐ Sources
- ☐ Bibliography

### Project

- ☐ 3D
- ☐ Neat
- ☐ Teaches all about your topic; shows off all you learned
- ☐ Self-explanatory: someone could look at it and understand what it's all about without you explaining it to them
- ☐ Bibliography displayed with project

### Experiment

- ☐ Demonstrates your topic
- ☐ Neatly written up with all parts of the experiment worksheet
- ☐ Able to be done over and over with the same results

### Demonstration

- ☐ Clearly state what your project is about
- ☐ Tell about what they will learn from your project
- ☐ Explain how the experiment relates to your topic
- ☐ Demonstrate the experiment
- ☐ State your conclusion
- ☐ Ask if anyone has questions

