Name: _____ Period: _____

Eighth Grade Summer Activity Packet

Developing scientific thinking in students is important for a solid science education.
To learn how to think scientifically, students need frequent opportunities to practice scientific processes and critical thinking skills as well as other skills that support scientific inquiry. This eighth grade Summer Activity Packet reinforces these mentioned skills as well as checks for understanding.

The science skills in this packet are designed to reinforce and review the important concepts needed by students the day we start school in August. Read the instructions and text carefully and then complete the activities that follow. Please make sure that all of the work is completed and ready to turn in to your science teacher at the start of the 2008-2009 school year.

This Summer Activity Packet includes the following key science skills:

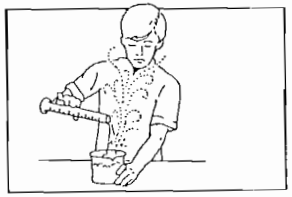
- Safety Procedures
- Identification of Laboratory Equipment and Measurement
- Identification of Characteristics and Properties of Matter
- Critical Thinking
- Construction of Data Tables and Graphs
- Identification of Atomic Structures
- Reading of the Period Table
- Classification of Organisms

SAFETY IN THE LABORATORY

Name _____

What is wrong in the following pictures?

1.



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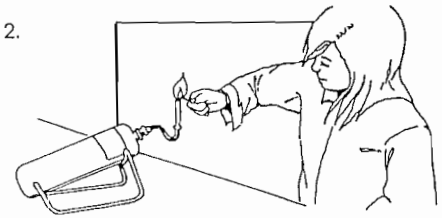

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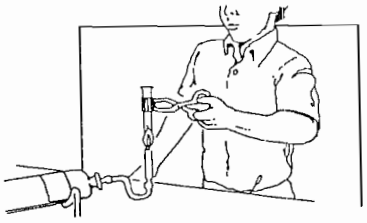
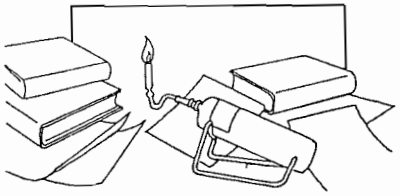


4.



5.

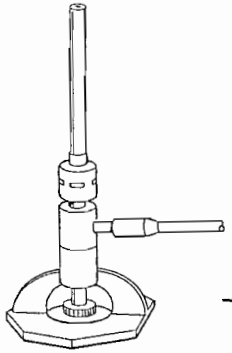
6.

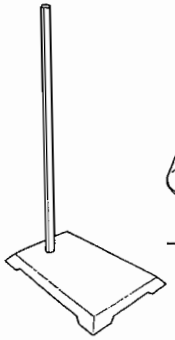
LABORATORY EQUIPMENT

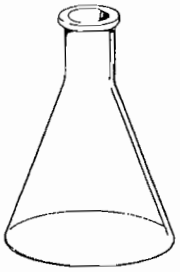
Name _____

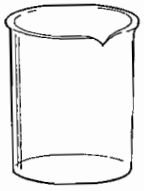
Match the following names of lab instruments and equipment with the correct picture.

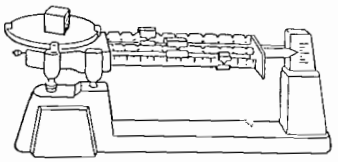
a. beaker
b. graduated cylinder
c. balance
d. Bunsen burner
e. test tube
f. test tube clamp
g. funnel
h. Erlenmeyer flask
i. tongs
j. ring stand









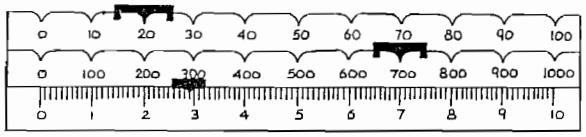


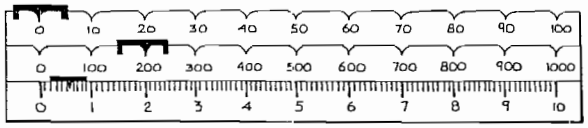
USING THE BALANCE

Name _____

The following balance measure mass is grams. What masses are shown on each of the following balances?

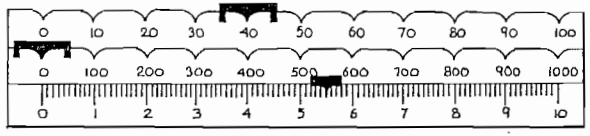
Answer: _____

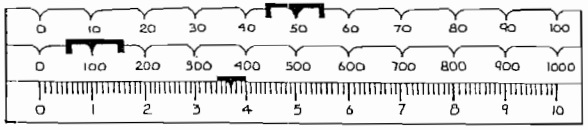




Answer: _____

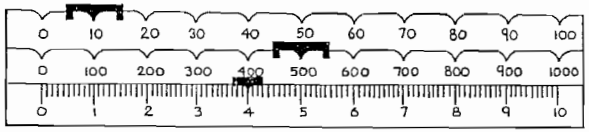
Answer: _____





Answer: _____

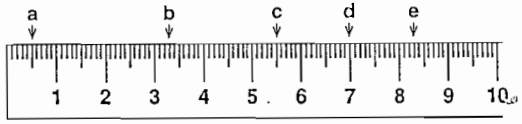
Answer: _____



MEASURING LENGTH

Name _____

What lengths are marked on the following centimeter ruler?



	cm	mm
a)	_____	_____
b)	_____	_____
c)	_____	_____
d)	_____	_____
e)	_____	_____

Measure the following lines with a centimeter ruler.

f) _____

g) _____

h) _____

i) _____

j) _____

k) _____

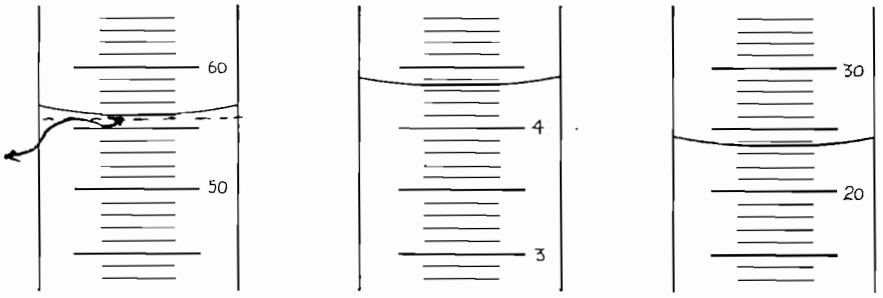
l) _____

MEASURING LIQUIDS

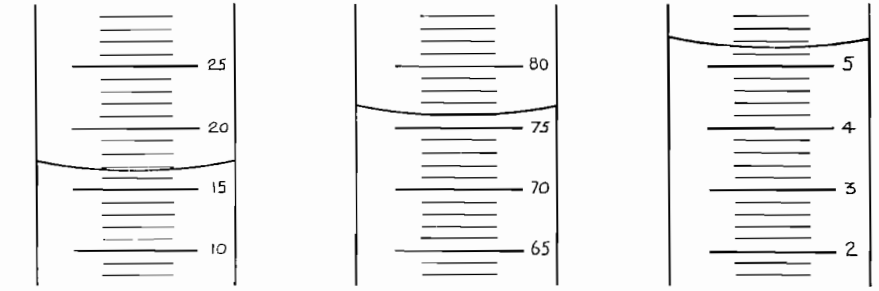
Name _____

What volume is indicated on each of these graduated cylinders? The unit of volume of is mL.

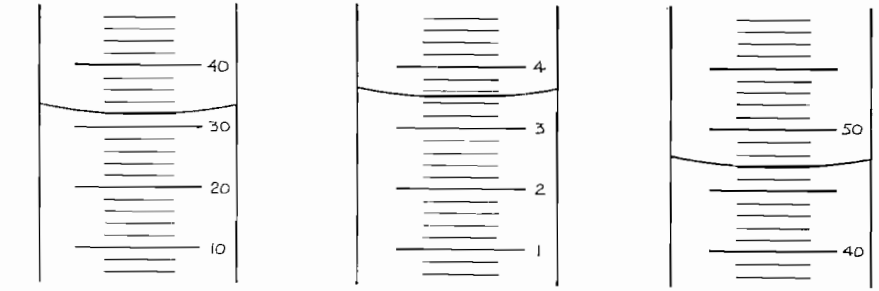
meniscus



a) _____ b) _____ c) _____



d) _____ e) _____ f) _____

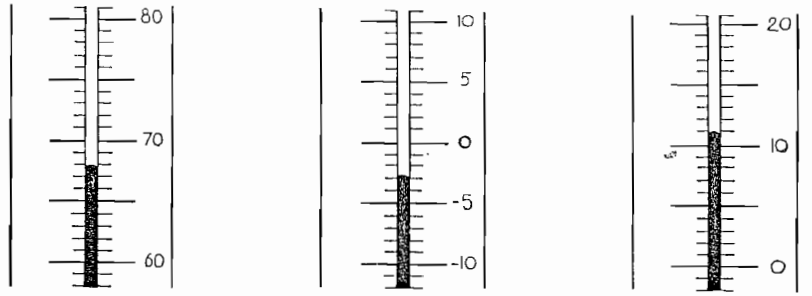


g) _____ h) _____ i) _____

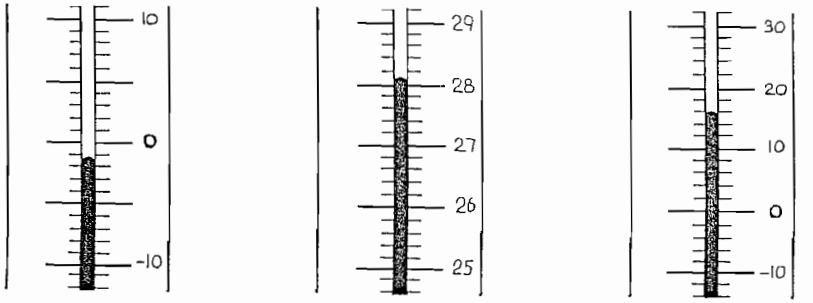
READING THERMOMETERS

Name _____

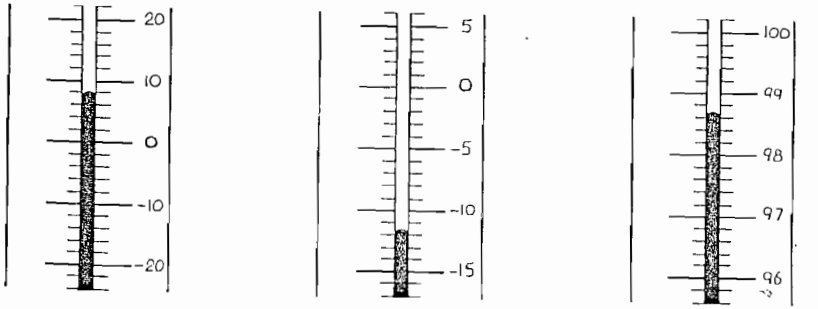
What temperature is indicated on each of these thermometers?



a) _____ b) _____ c) _____



d) _____ e) _____ f) _____



g) _____ h) _____ i) _____

3

Name: _____ Date: _____

What Is Matter?

Look around you. Everything you can see—from stars to dirty socks to washing machines and peanut shells—is made of "stuff" scientists call matter. Many things you can't see—like air and swamp gas and the smells of perfume and dead fish—are also made of matter. Each chunk of **matter** has certain unique **specific properties** that we can describe using our senses—things like color, size, texture, smell, taste, shape, hardness, and so forth. But all matter has two essential general properties: **mass** and **volume**.

Mass refers to the amount of matter an object has. A pygmy hippopotamus has more mass than a hamster. Mass resists being moved. This resistance is called **inertia.** Try pushing both a hippo and a hamster, and you will find that the hippo has more inertia. Mass is typically measured in metric units called **grams** (g) or **kilograms** (kg) (See page 40). A pygmy hippo weighs about 230 kilograms (230,000 grams), whereas a hamster weighs about 600 grams.

Matter also takes up space. It has a certain **volume.** The volume of liquids is measured in **milliliters** (ml) or **liters** (L). The volume of solids is measured in **cubic centimeters** (cm^3). 1 ml is the same volume as 1 cm^3.

1. Select two convenient, nearby objects. Let's get wild and call them A and B. List five specific properties of each:

   A.: _____ _____ _____ _____ _____

   B.: _____ _____ _____ _____ _____

2. Which object has more mass? _____
3. How do you know? _____
4. Which object appears to have a greater volume? _____
5. Will objects of larger mass always have more volume than objects of smaller mass?

   _____

   (Before you answer, think about matter in the form of Styrofoam ice chests, iron balls, cork pads, and balsa wood airplanes.)

6. What has more volume: 1,500 ml of lime soda or 1,700 cm^3 of bellybutton lint?

   _____

Name: _____ Date: _____

Mass and Weight

Weight is another general property of matter that is often confused with mass. An object's mass always stays the same, but its weight can vary. All objects attract one another, but the force of that attraction—a force called **gravity**—depends on both the size of the objects and how far apart they are. Large objects possess more gravity than small objects. When one object, like the earth, is much bigger than the other, like you, the smaller object is pulled toward the larger with a force called its weight, which is measured in newtons (See page 40). A 1 kg object on the surface of the earth is pulled toward the center of the earth with a force of 9.8 newtons (9.8 N).

What? Your bathroom scale doesn't give your weight in newtons? True. On Earth, weight is often measured in grams and kilograms (or pounds) just like mass, because Earth is our "reference planet." But if you hopped a rocket to Jupiter, which has 318 times the mass of Earth, your 150-pound (68.2 kg) body would weigh 47,700 pounds (21,687.6 kg). Between planets, you would feel "weightless" (although you are not. You are still attracted to all the other masses in the universe.), but you would have the same mass. A pygmy hippo would resist being pushed just as much on a spaceship as it would in your backyard.

1. Most of Earth's mass is concentrated below your feet. Will your weight change if you climb a mountain? _____ Why or why not? _____

   _____

2. The moon has only about one-fourth the mass of the earth. Would you expect to weigh more or less there? _____
3. Remember that pygmy hippo? Her mass is 230 kg. What does she weigh in newtons?

   _____

   To find out what you weigh, multiply your weight in kg times 9.8 newtons. _____
4. Assume that Earth's mass is equal to one (1). The planets listed below would then have the following masses: Mercury, 0.055; Venus, 0.815; Mars, 0.108; Saturn, 95.2; Neptune, 17.2. On which planets would you weigh more than you do on Earth?

   _____

5. In a science fiction story, two astronauts are building a space station. A 500 kg mechanical arm threatens to crush one astronaut against the hull of his shuttle craft. The second astronaut comes to the rescue and pushes the mechanical arm away in the weightlessness of space. Why wouldn't the astronaut be able to save his friend in this way?

   _____

   _____

METRICS AND MEASUREMENT

Name _____

Scientists use the metric system of measurement, based on the number 10. It is important to be able to convert from one unit to another.

King Henry Danes while drinking chocolate milk

kilo	hecto	deca	**Basic Unit**	deci	centi	milli
(k)	(h)	(da)	gram (g)	(d)	(c)	(m)
1000	100	10	liter (L)	.1	.01	.001
10^3	10^2	10^1	meter (m)	10^{-1}	10^{-2}	10^{-3}

Using the above chart, we can determine how many places to move the decimal point and in what direction by counting the places from one unit to the other.

Example: Convert 5 mL to L.

Answer: To go from milli (m) to the basic unit, liters, count on the above chart three places to the left. Move the decimal point three places to the left and 5 mL becomes 0.005 L.

Convert the following.

1. 35 mL = _____ dL
2. 950 g = _____ kg
3. 275 mm = _____ cm
4. 1,000 L = _____ kL
5. 1,000 mL = _____ L
6. 4,500 mg = _____ g
7. 25 cm = _____ mm
8. 0.005 kg = _____ dag
9. 0.075 m = _____ cm
10. 15 g = _____ mg

DENSITY

Name _____

Which has the greater mass, air or lead? Most of you would answer lead, but actually this question does not have an answer. To compare these two things you need to now how much of each you have. A large amount of air could have a greater mass than a small amount of lead. To compare different things, we have to compare the masses of each that occupy the same space, or volume. This is called density.

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

Solve the following problems.

1. What is the density of carbon dioxide gas if 0.196 g occupies a volume of 100 mL?

   Answer: _____

2. A block of wood 3.0 cm on each side has a mass of 27 g. What is the density of this block?

   Answer: _____

3. An irregularly shaped stone was lowered into a graduated cylinder holding a volume of water equal to 2.0 mL. The height of the water rose to 7.0 mL. If the mass of the stone was 25 g, what was its density?

   Answer: _____

4. A 10.0 cm^3 sample of copper has a mass of 89.6 g. What is the density of copper?

   Answer: _____

5. Silver has a density of 10.5 g/cm^3 and gold has a density of 19.3 g/cm^3. Which would have a greater mass, 5 cm^3 of silver or 5 cm^3 of gold?

   Answer: _____

6. Five mL of ethanol has a mass of 3.9 g, and 5.0 mL of benzene has a mass of 4.4 g. Which liquid is denser?

   Answer: _____

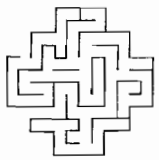
7. A sample of iron has the dimensions of 2 cm x 3 cm x 2 cm. If the mass of this rectangular-shaped object is 94 g, what is the density of iron?

   Answer: _____

4

Name _____ Date _____

Three Kinds of Variables



In a scientific investigation there are three kinds of variables. A *manipulated variable* (sometimes called the independent variable) is a factor or condition that is intentionally changed by an investigator in an experiment. A *responding or dependent variable* is a factor or condition that might be affected as a result of that change. A variable that is not changed is called a *controlled variable*. Consider the example below.

A student wanted to test how the mass of a paper airplane affected the distance it would fly. Paper clips were added before each test flight. As each paper clip was added, the plane was tested to determine how far it would fly. The mass of the plane (number of paper clips added) was the manipulated variable. The responding variable was the distance flown. A controlled variable in the experiment was the fact that the same plane was used for each trial.

For each experiment below, specify the manipulated, responding, and controlled variables.

- Two groups of students were tested to compare their speed working math problems. Each group was given the same problems. One group used calculators and the other group computed without calculators.

  Manipulated variable _____

  Responding variable _____

  Controlled variable _____

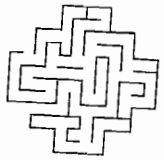
- Students of different ages were given the same puzzle to assemble. The puzzle assembly time was measured.

  Manipulated variable _____

  Responding variable _____

  Controlled variable _____

Name _____ Date _____



- A study was done to find if different tire treads affect the braking distance of a car.

  Manipulated variable _____

  Responding variable _____

  Controlled variable _____

There can be several controlled variables. If an experiment is to be useful, only one variable at a time can be manipulated intentionally. All other variables must be controlled throughout all parts of the experiment. If more than one variable is altered, the results of an experiment cannot be interpreted with any validity.

Here is some practice with experiments having more than one controlled variable.

- An experiment was performed to determine how the amount of coffee grounds could affect the taste of coffee. The same kind of coffee, the same percolator, the same amount and type of water, the same perking time, and the same electrical source were used.

  Manipulated variable _____

  Responding variable _____

  Controlled variable _____

  Controlled variable _____

  Controlled variable _____

- A study was done with an electromagnet system made from a battery and wire wrapped around a nail. Different sizes of nails were used and the number of paper clips that the electromagnet could pick up was measured.

  Manipulated variable _____

  Responding variable _____

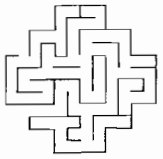
  Controlled variable _____

  Controlled variable _____

  Controlled variable _____

5

Name _____ Date _____



A study was attempted to find if the length of the string in a string telephone affected its sound clarity.

Manipulated variable _____

Responding variable _____

Controlled variable _____

Controlled variable _____

Controlled variable _____

Controlled variable _____

In your own words, define manipulated, responding, and controlled variables.

_____

_____

_____

_____

_____

_____

_____

Observing

All human beings share a desire to explore and understand the world around us. Science developed out of this curiosity. Science is based on empiricism—a search for knowledge based on experimentation and observation. Sometimes observations are made directly with the human senses. Sometimes technological devices, such as microscopes, are used to help. Scientists believe that without meaningful observations based on thoughtful use of experience, the evidence or data needed to understand a problem will be incomplete.

There are two basic types of observations—*qualitative* and *quantitative*. Qualitative observations describe and quantitative observations measure. Scientists usually try to use quantitative observations because they are more precise. Thoughtful observation communicates. It is clear and detailed and it takes practice. The following activities will give you a chance to practice making clear, thoughtful observations.

Inferring

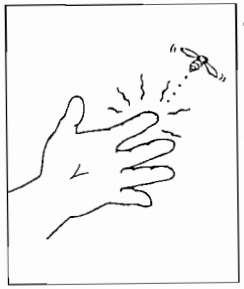
The world is a lot more enjoyable when the things that happen around us are understandable. When we observe patterns that are similar or events that remind us of experiences we've had previously, a new experience can be appreciated more fully. The explanations we use to depict events we experience are often called *inferences*. Inferences are based on observations and are simply explanations of observations. The ability to infer helps us make sense of our environment.

The only rule of inferring is to be logical. Inferences are always tentative. They are not final explanations of an observation. Sometimes there are several logical inferences for a given observation and you cannot be sure which inference best explains the observation. In such instances, you will need additional information. Inferences are often changed when new observations are made.

Name _____ Date _____

Observations and Inferences

Use the pictures that follow to make observations and inferences.



Observations: _____

_____

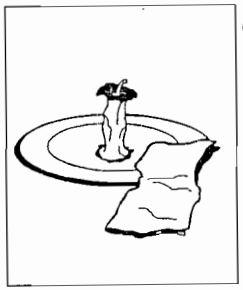
_____

Inferences: _____

_____

_____

_____



Observations: _____

_____

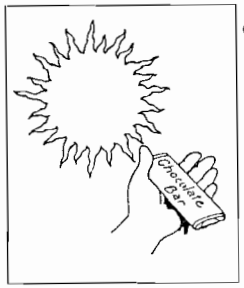
_____

Inferences: _____

_____

_____

_____



Observations: _____

_____

_____

Inferences: _____

_____

_____

_____

Name _____ Date _____

Making Inferences

Read the following observations. Then make inferences that explain each observation. Remember, there may be more than one logical explanation.

Observation 1: You observe that the sky at noon is darkening.

Your inference: _____

Observation 2: The principal interrupts class and calls a student from the room.

Your inference: _____

Observation 3: All middle school students are bringing lunch from home.

Your inference: _____

Observation 4: A former rock-and-roll band member has poor hearing.

Your inference: _____

Observation 5: You leave a movie theater and see that the street is wet.

Your inference: _____

Observation 6: During a handshake, you feel that the palm of the individual's hand is rough and hard.

Your inference: _____

Observation 7: The classroom lights are off.

Your inference: _____

Observation 8: A siren is heard going past the school.

Your inference: _____

Hypothesizing

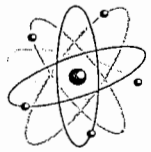
You have learned that variables are important not only in writing research questions but also in making predictions. Predicting is the process of using observations or data along with other kinds of scientific knowledge to forecast future events or relationships. A hypothesis is a special kind of prediction that forecasts how one variable will affect a second variable. These variables are the manipulated variable, which is changed intentionally by the investigator, and the responding variable, which is observed or measured to determine if or how much it is affected. Hypotheses express a logical explanation that can be tested. Investigators find them useful because they specify an exact focus for an experiment. Here is an example of a hypothesis.

If the temperature of sea water increases, **then** the amount of salt that will dissolve in that water increases.

Water temperature and amount of dissolved salt are the variables used in this hypothesis. The investigator is predicting that warmer water will have more dissolved salt than colder water. An investigator can design an experiment that manipulates the temperature of several samples of water from the same source. Dissolved salt levels can then be measured in each sample. Analysis of the data would indicate the extent to which dissolved salt levels are related to water temperature.

Notice that the sample hypothesis is expressed as an "If . . . , then . . ." sentence. This form, while not always necessary, is a helpful way to learn to write a hypothesis. Here are two examples.

Example One
Some students want to find out what kind of pizza is preferred by their classmates.



Teaching Science Process Skills © 1995 Good Apple

Research Question
What kind of evidence indicates that middle school students prefer one kind of pizza more than another? (*type one* question)

Hypothesis
If middle school students are questioned about pizza preference, they will prefer pepperoni over cheese pizza.

Example Two
An investigator has observed that chickens lay more eggs at certain times of the year. It has also been observed that this occurs during the late spring and summer months. An inference has been made that the extra eggs are due to longer daylight hours. Amount of daylight and chicken egg production are the variables the investigator has decided to investigate.

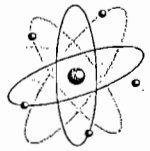
Research Question
To what extent does the length of daylight affect chicken egg production? (*type two* question)

Hypothesis
If the length of daylight increases, then chicken egg production will increase.

Steps for Writing a Good Hypothesis

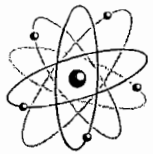
- Identify variables in a given event or relationship.
- Identify a pair of variables that might be logically related.
- Identify the manipulated and responding variables.
- Write the hypothesis using the following format.

If the [manipulated variable] increases or decreases, then the [responding variable] will increase or decrease.



Name _____ Date _____

Writing Hypotheses



PART ONE Write hypotheses for the following.

1. Manipulated variable: length of paper helicopter blades

Responding variable: rotational speed

Hypothesis _____

_____

2. Manipulated variable: length of string telephone

Responding variable: clarity of sound

Hypothesis _____

_____

3. Manipulated variable: baseball batting practice

Responding variable: batting average

Hypothesis _____

_____

4. Manipulated variable: amount of gas bubbles

Responding variable: number of raisin round-trips

Hypothesis _____

_____

5. Manipulated variable: temperature of solution

Responding variable: dissolving time of powdered drink mix

Hypothesis _____

_____

6. Manipulated variable: depth of Lake Conroe

Responding variable: water temperature

Hypothesis _____

_____

_____ Date _____

7. Manipulated variable: number of recycling posters

Responding variable: amount of aluminum cans in courtyard

Hypothesis _____

_____

PART TWO Try writing your own variables and hypotheses.

1. Manipulated variable _____

Responding variable _____

Hypothesis _____

_____

2. Manipulated variable _____

Responding variable _____

Hypothesis _____

_____

3. Manipulated variable _____

Responding variable _____

Hypothesis _____

_____

4. Manipulated variable _____

Responding variable _____

Hypothesis _____

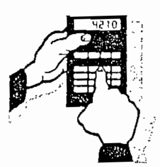
_____

Organizing and Interpreting Data

Before conducting a meaningful investigation, it is important to learn how to organize the data you have collected. By organizing data, a scientist can more easily interpret what has been observed. Making sense of observations is called *data interpretation*. Since most of the data scientists collect is quantitative, data tables and charts are usually used to organize the information. Graphs are created from data tables. They allow the investigator to get a visual image of the observations which simplifies interpretation and drawing conclusions. Valid conclusions depend on good organization and clear interpretation of data.

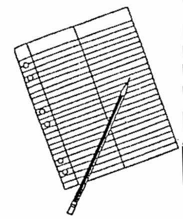
Two types of graphs are typically used when organizing scientific data—bar graphs and line graphs. Descriptive data requires a bar graph. This is the type of data that comes from research questions asking about variables that will be counted. For example, "To what extent do the children in Sawmill School prefer tacos over pizza?" Continuous data requires a line graph. This type of data comes from research questions that ask about variables to be investigated over time. For example, "What evidence indicates that students at Old Turnpike School will gain weight if they eat pizza daily for a month?"

Since drawing conclusions is the final step of any investigation, tables, charts, and data interpretation are extremely important.



Name ______________________ Date ______________

Making Data Tables



Make data tables for the data collected in the six investigations below. When making data tables, place the manipulated variable in the left column and the responding variable in the right column.

Investigation 1

A seed was planted. As the plant grew, it was measured over a six-day period.

day one - 0 centimeters, day two - 2 centimeters, day three - 5 centimeters, day four - 7 centimeters, day five - 8 centimeters, day six - 10 centimeters

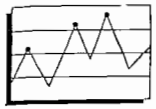
Investigation 2

Tomato plants were grown at various temperatures. The number of tomatoes that grew on each plant was counted.

8°C - 4 tomatoes, 12°C - 10 tomatoes, 16°C - 14 tomatoes, 18°C - 18 tomatoes, 22°C - 24 tomatoes, 24°C - 16 tomatoes

Name _____ Date _____

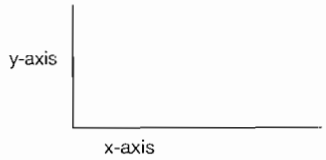
Graphing Procedures



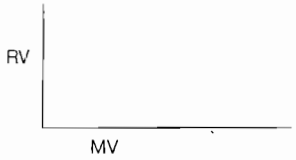
Graphs convert data sets into pictures, which are often better understood than narratives or columns of numbers. Line graphs are often used when data has taken place over time, such as population changes or one person's growth. Bar graphs are often used for descriptive data, such as car colors or food preferences of a given population.

General Procedures for Line and Bar Graphs

1. Draw a horizontal and a vertical line that meet at a right angle. The horizontal line is the x-axis and the vertical line is the y-axis.



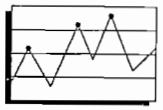
2. Look at the data set to be graphed. Determine the manipulated variable (MV) and the responding variable (RV). The manipulated variable is written on the horizontal or x-axis. The responding variable is written on the vertical or y-axis. (Writing is more legible when written horizontally, even to label the vertical axis.)



3. Write an appropriate title for the graph at the top of the page. The title should contain the names of both variables.

4. Decide whether you will need a line graph or a bar graph. An easy way to figure this out is to look at the manipulated variable. If the manipulated variable represents passage of time, you will need a line graph. If the manipulated variable is types of things, you will need a bar graph.

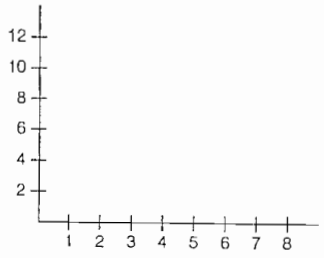
Name _____ Date _____

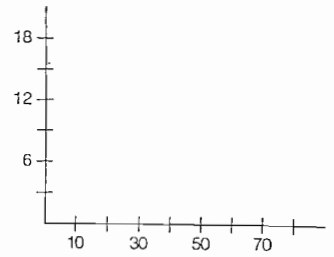


Making Line Graphs

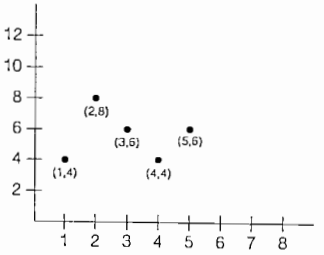
1. Determine how to number the x-axis and y-axis. These numbers are called *increments*. While the increments for the x-axis and y-axis may be numbered differently, the numbering progression on each axis must be consistent. Looking at the range (highest and lowest numbers) for your data will help determine how to set up the increments for each axis. Make sure the graph fills the page.

2. Number the graph. It is not necessary to number every increment.

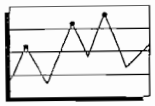




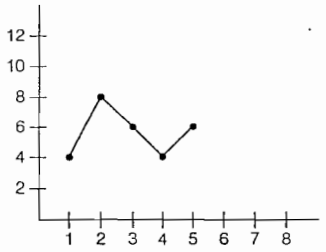
3. Plot your data. For each manipulated variable number in your data there will be a corresponding responding variable number. This matched pair of numbers represents the coordinates for one point on the graph line. Find the manipulated variable number on the x-axis. Then move up that line until you find the responding variable number on the y-axis. Place a point at the location. The point can be represented by (X,Y) or (MV, RV). This process is repeated for each pair of numbers.



Name _____ Date _____



4. Connect the points on the line graph.



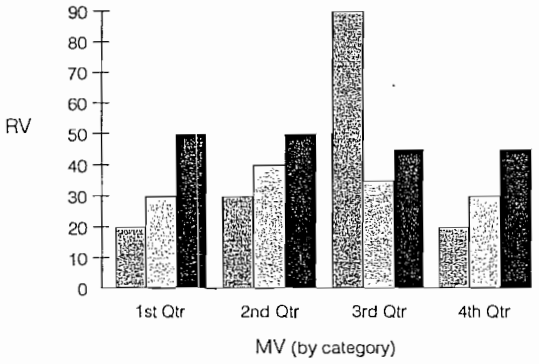
Making Bar Graphs

1. Number the increments for the responding variable on the y-axis only.

2. Write the categories for the manipulated variable on the x-axis.

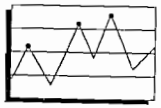
3. Decide how wide each bar should be.

4. The height of each bar should correspond with the number counted on the y-axis.



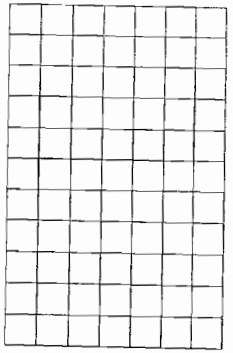
Name _____ Date _____

Graphing

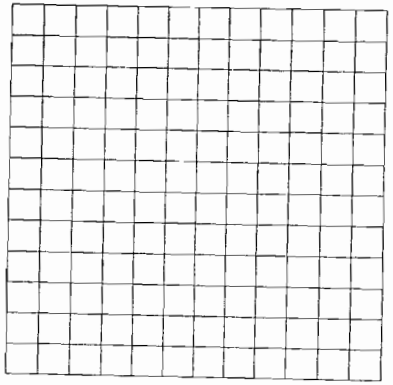


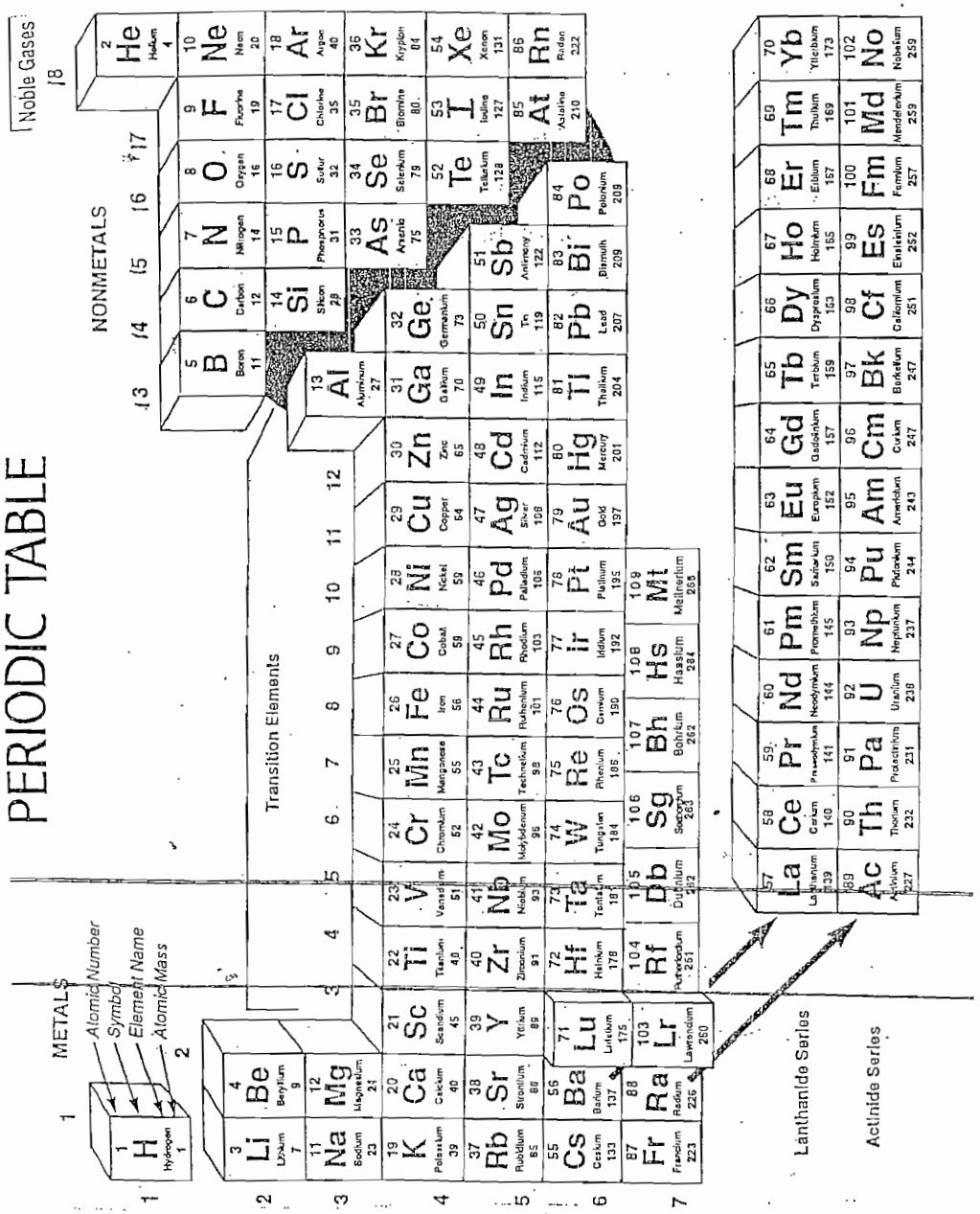
Use the six data tables you created in the previous activity to make line or bar graphs. Remember to give each graph a title and to label each axis. Fill the space as completely as possible.

Investigation 1



Investigation 2





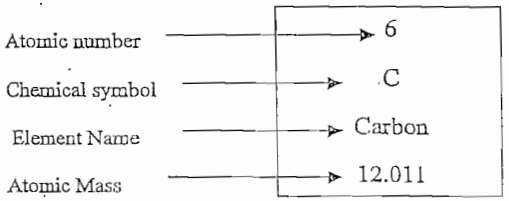
Name _____ period _____

Date _____

Exploring the Periodic Table

Back in 1869, Russian chemist Dimitri Mendeleev organized all the known elements into a chart according to their physical and chemical properties. Today that chart is known as the periodic table of elements.

The periodic table is made up of horizontal rows and vertical columns of boxes. Each box contains specific information about a single element. This information includes the element's name, the chemical symbol for the element, the element's atomic number and the element's atomic mass.



Look at the periodic table your teacher has given you.

1. Element symbols are written with the first letter a capital letter and any other letters as lower case letters. Write the symbols for 5 different elements. _____

2. Find the numbers across the top. These vertical columns are called groups because the elements in them tend to have the same chemical and physical properties. How many groups are on the periodic table? _____

3. Find the numbers down the left side. These horizontal rows are called periods because they fall in order like a calendar. How many periods are on the periodic table? _____

4. Most of the elements are known as metals. Metals are located on the left side of the periodic table. The only element on the left side of the periodic table that is **NOT** a metal is hydrogen. Use a colored pencil to color hydrogen yellow.

5. Use a colored pencil to color the metals green. (Don't color them so dark that you can't read the information.)

6. Find the zigzag line that starts in the group 13. These seven elements (Boron, Silicon, Germanium, Arsenic, Antimony, Tellurium, Astatine) are the metalloids. They sometimes act like metals and at other times like nonmetals. Color them purple. polonium

7. On the right side of the zigzag line are the nonmetals. Color the nonmetals yellow.

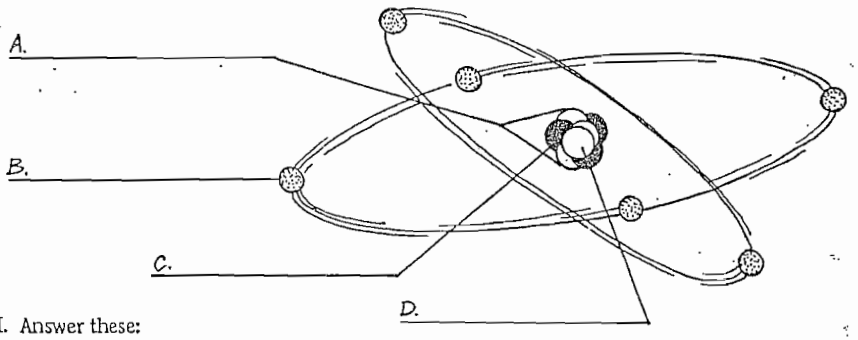
8. What pattern can you see in the atomic masses of the elements? _____

9. What pattern can you see in the atomic numbers of the elements? _____

ON THE INSIDE

A Greek philosopher called Democritus, who lived over 2000 years ago, taught people that all things were made of grains which could not be divided. He called these grains *atoms* because in Greek *atom* means *indivisible*. Today, *atom* is the common name for the tiny particles of matter that cannot be further divided (and still be the same substance). If you could look inside an atom, you'd find that it looks like a miniature solar system, with something in the center and other things orbiting around it.

I. Label the parts of this atom (nucleus, protons, electrons, neutrons).



II. Answer these:

_____ 1. the part of the atom that carries no electric charge

_____ 2. the part of the atom that carries a positive charge

_____ 3. the part of the atom that carries a negative charge

_____ 4. the number of electrons that can be held in the first orbit (closest to the nucleus)

_____ 5. the number of electrons that can be held in the second orbit

_____ 6. the number of electrons that can be held in the third orbit

_____ 8. the atomic number is the same as the number of these particles

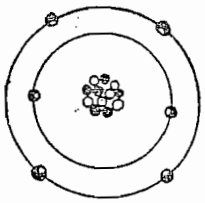
Draw your own model of an atom with eight protons, eight neutrons, and eight electrons (an oxygen atom).

Name _____

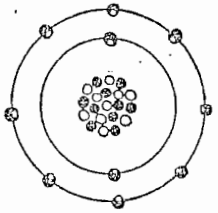
WHICH ATOM IS WHICH?

Every kind of atom has its own unique look. All the atoms of an element have this same look. Here's a chance for you to look at some atoms and tell what elements they are. Write the name of the element next to each atom. You may need to use the Periodic Table to help you out. (You can find one on page 52 of this book.)

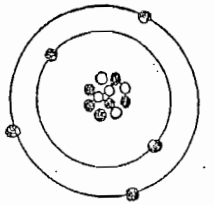
A. _____



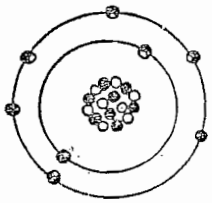
B. _____



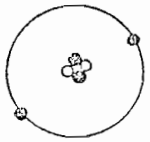
C. _____



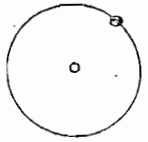
D. _____



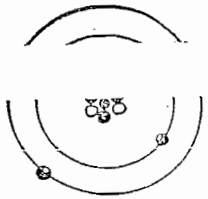
E. _____



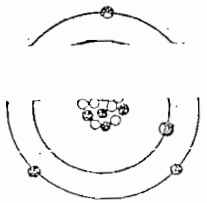
F. _____



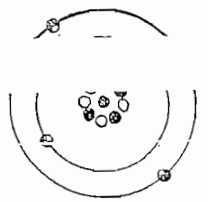
G. _____



H. _____



I. _____



Name _____

PHYSICAL VS. CHEMICAL PROPERTIES

Name _____

A physical property is observed with the senses and can be determined without destroying the object. For example, color, shape, mass, length, density, specific heat and odor are all examples of physical properties.

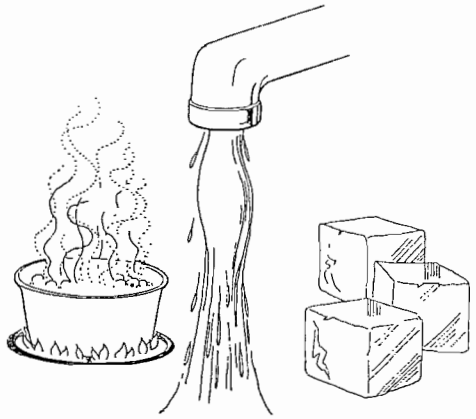
A chemical property indicates how a substance reacts with something else. When a chemical property is observed, the original substance is changed into a different substance. For example, the ability of iron to rust is a chemical property. The iron has reacted with oxygen and the original iron metal is gone. It is now iron oxide, a new substance. All chemical changes include physical changes.

Classify the following properties as either chemical or physical by putting a check in the appropriate column.

	Physical Property	Chemical Property
1. red color		
2. density		
3. flammability		
4. solubility		
5. reacts with acid to form hydrogen		
6. supports combustion		
7. bitter taste		
8. melting point		
9. reacts with water to form a gas		
10. reacts with a base to form water		
11. hardness		
12. boiling point		
13. can neutralize a base		
14. luster		
15. odor		

PHYSICAL VS. CHEMICAL CHANGE

Name _____



In a physical change, the original substance still exists, it has only changed in form. Energy changes usually do not accompany physical changes, except in phase changes and when substances dissolve.

In a chemical change, a new substance is produced. Energy changes always accompany chemical changes. Chemical changes are always accompanied by physical changes.

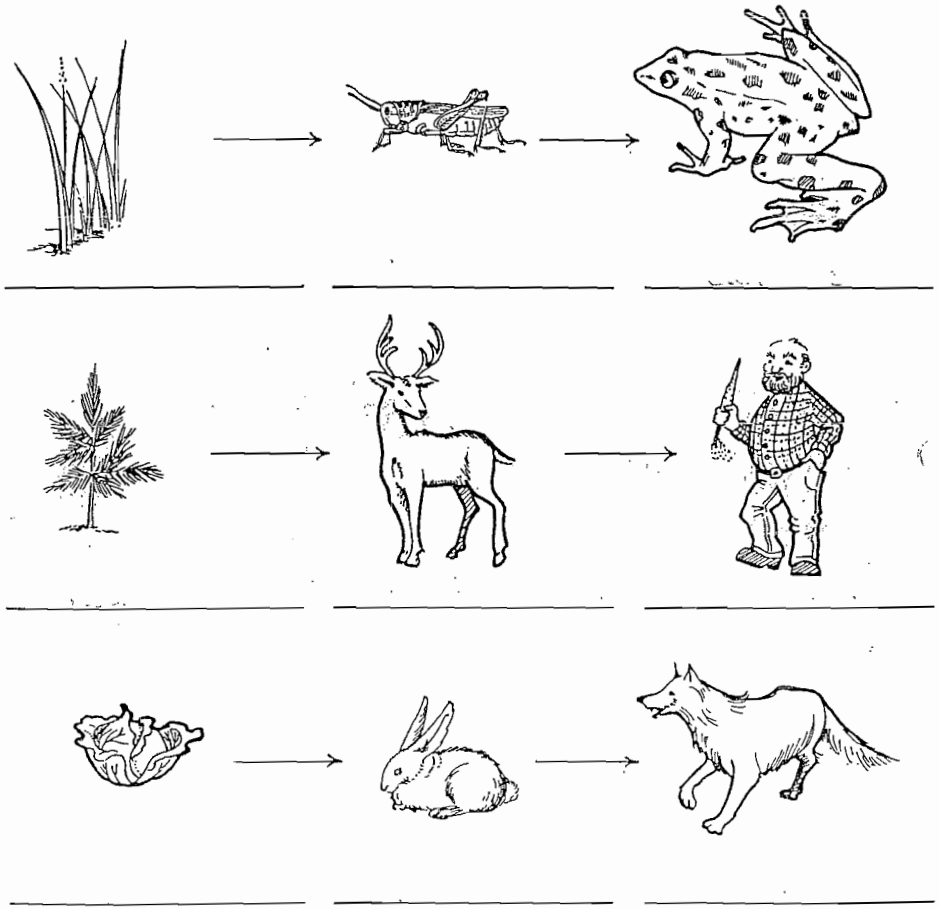
Classify the following as examples of a physical change, a chemical change or both kinds of change.

1. Sodium hydroxide dissolves in water. _____
2. Hydrochloric acid reacts with sodium hydroxide to produce a salt, water and heat. _____
3. A pellet of sodium is sliced in two. _____
4. Water is heated and changed to steam. _____
5. Potassium chlorate decomposes to potassium chloride and oxygen gas. _____
6. Iron rusts. _____
7. Ice melts. _____
8. Acid on limestone produces carbon dioxide gas. _____
9. Milk sours. _____
10. Wood rots. _____

Producers and Consumers

Name _____

Organisms are either producers or consumers, depending upon the source of their energy. Consumers are either herbivores, carnivores or omnivores. Label the producers, omnivores, herbivores and carnivores in each food chain.



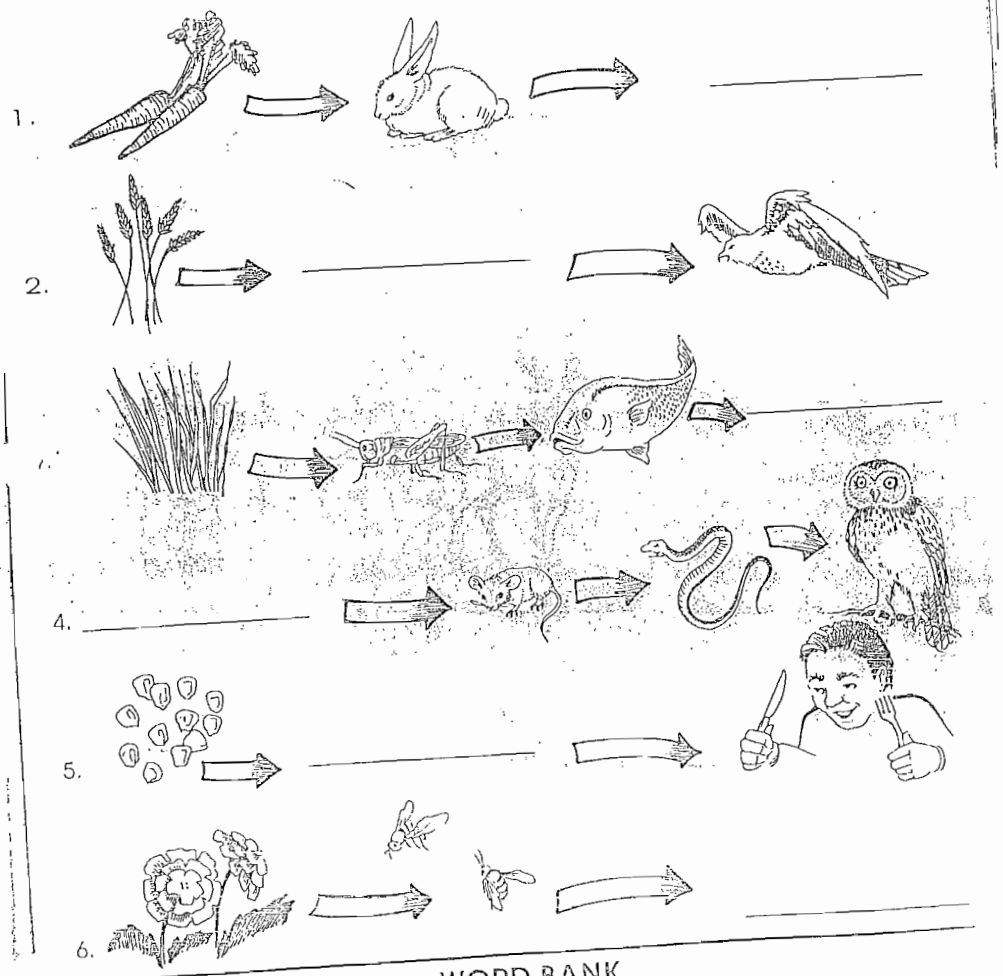
WORD BANK

carnivore herbivore omnivore
producer

Find the Missing Link

Name _____

Write the missing organism in each food chain



WORD BANK

bear skunk eagle
mouse cow grass