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HAVERFORD MIDDLE SCHOOL
SEMINAR: GRADE 7
FIRST QUARTER 2003
MS. D'ANDREA
SCIENCE EDUCATION
ROOM 116
610-853-5900 EXT. 5116

K'NEX Education Classroom
Computer Control/Robotics

This program integrates hands-on learning, experimentation and investigation, facilitating the development of critical thinking and problem solving skills, while making concepts applicable to the real world.

Students work cooperatively to build large functioning models using K'NEX parts, Motors, Lights, and Sensors. They link their model to a computer via an Interface. They then operate the model using computer programs they've written in an icon-based language, downloaded to the interface.

Daily Requirements for Class:

1. Science Journal - folder
2. Pens/Pencils
3. Loose Leaf
4. Paperback Book/Magazine of your choice
5. A Positive Attitude ☺

Student Assessment:

1. Science Journal – evaluated every two weeks (rubric)
2. Group Participation – evaluated every two weeks (rubric)
3. Teacher-Made Quizzes – 30 pts. each
4. SQ3R – 1 pt. each day

I look forward to working with all of you and expect many new and exciting discoveries. Please do not hesitate to ask for extra help if you find that you need it. I will be glad to assist.
Good Luck! Have a wonderful school year ☺

Parent/Guardian Signature A. [illegible]
Date 9/9/03

27 Student

Seventh Grade Seminar
Ms. Theresa D'Andrea, Teacher
(60) 853-5900
Ext. 5116
www.d'andrea@havsd.net

Course Description
K'NEX Education: Computer Control/Robotics
This course integrates hands-on learning, experimentation and investigation, facilitating the development of critical thinking and problem solving skills, while making concepts applicable to the real world.

Students work cooperatively to build large functioning models using K"NEX parts, Motors, Lights, and Sensors. They link their model to a computer via an Interface. They then operate the model using computer programs they've written in an icon-based language, downloaded to the interface.

Performance Outcomes
The student will:
*Strengthen building skills for hand-eye coordination and fine motor skills
*Enhance cooperative learning and communication skills
*Develop problem solving skills e.g. trial and error technique
*Conduct research investigations using a variety of information resources
*Enhance writing, presentation and organizational skills
*Use symbols, measurements, and drawings to promote clear communication by providing a common language to express ideas
*Determine a need and use Software, tools, materials, models and knowledge to fulfill that need
*Propose and implement strategies to address a need
*Define and maintain procedures in order to achieve a given purpose
*Predict and evaluate situations based on prior knowledge
*Demonstrate an understanding of programming by developing concise, ordered procedures to accomplish tasks

Objectives

This course promotes the following cognitive outcomes:

*Enhance logical, ordered sequential thinking and classifying skills
*Develop creative problem solving and inventive thinking skills
*Analyze mistakes to develop understanding of Software capabilities and structured programming
*Use trial and error constructively as a tool to enhance inferential thinking and programming skills
*Employ organizational and classifying skills in solving problems
*Predict and evaluate situations based on prior knowledge

Supplies Needed for Daily Work:

1. Science Folder/Journal
2. Pens/Pencils
3. Loose leaf Paper
4. A Positive Attitude ☺

*Additional supplies are provided by K"NEX Education

Homework

Homework assignments will be posted in class on the day of issuance. Likewise, assignments (or lack of) can be obtained on a daily basis by calling (610)853-5900, extension 5116 after 4 pm.

Communication

Parent-teacher communication is welcomed. Messages may be left via Telephone or Internet using the phone number/extension or e-mail address listed on the top of Page 1.

Michael Plasmeier

Please Sign and Return

SAFETY RULES

1. Always obtain your teacher's permission before beginning an activity.
2. Study the procedure. If you have questions, ask your teacher. Be sure you understand any safety symbols shown on the page.
3. Use the safety equipment provided for you. Goggles and a safety apron should be worn when any activity calls for using chemicals.
4. Always slant test tubes away from yourself and others when heating them.
5. Never eat or drink in the lab, and never use lab glassware as food or drink containers. Never inhale chemicals. Do not taste any substance or draw any material into a tube with your mouth.
6. If you spill any chemical, wash it off immediately with water. Report the spill immediately to your teacher.
7. Know the location and proper use of the fire extinguisher, safety shower, fire blanket, first aid kit, and fire alarm.
8. Keep all materials away from open flames. Tie back long hair and loose clothing.
9. If a fire should break out in the classroom, or if your clothing should catch fire, smother it with the fire blanket or a coat, or get under a safety shower. **NEVER RUN.**
10. Report any accident or injury, no matter how small, to your teacher.

Follow these procedures as you clean up your work area.

1. Turn off the water and gas. Disconnect electrical devices.
2. Return all materials to their proper places.
3. Dispose of chemicals and other materials as directed by your teacher. Place broken glass and solid substances in the proper containers. Never discard materials in the sink.
4. Clean your work area.
5. Wash your hands thoroughly after working in the laboratory.

First aid	
Injury	**Safe response**
Burns	Apply cold water. Call your teacher immediately.
Cuts and bruises	Stop any bleeding by applying direct pressure. Cover cuts with a clean dressing. Apply cold compresses to bruises. Call your teacher immediately.
Fainting	Leave the person lying down. Loosen any tight clothing and keep crowds away. Call your teacher immediately.
Foreign matter in eye	Flush with plenty of water. Use eyewash bottle or fountain.
Poisoning	Note the suspected poisoning agent and call your teacher immediately.
Any spills on skin	Flush with large amounts of water or use safety shower. Call your teacher immediately.

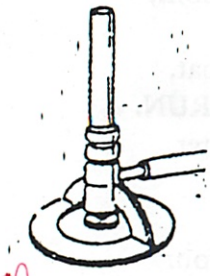
SAFETY CONTRACT

I, Michael Plasmeier, have read and understand the safety rules and first aid information listed above. I recognize my responsibility and pledge to observe all safety rules in the science classroom at all times.

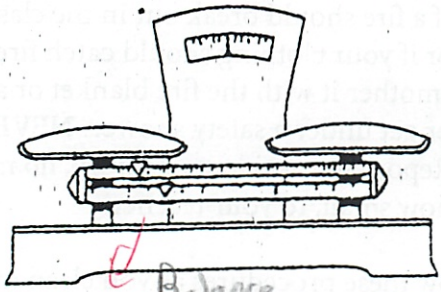
Michael Plasmeier
signature

9/9/03
date

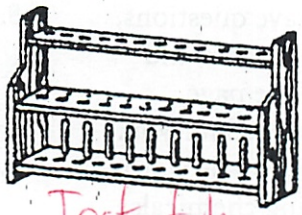
Laboratory Equipment



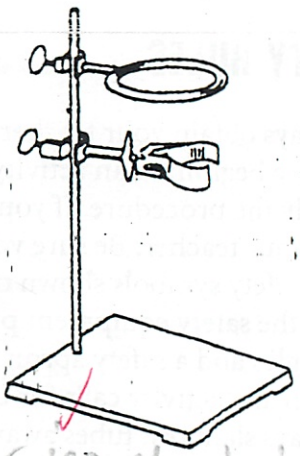
Bunsen Burner



Balance



Test tube rack



ring stand, ring + clasp

test tube

Beaker

Erlenmeyer Flask

Florence Flask

graduated cylinder

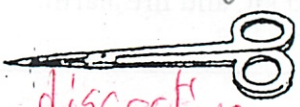
Funnel

culture dish

stopper

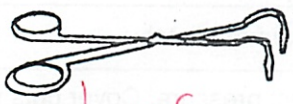
Petri dish

forceps

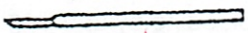


dissecting sissors

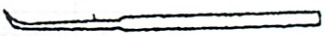
Tongs test tube holder



tongs

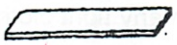


scapple



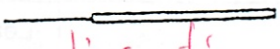
dissecting probe

test tube brush



microscope slide

Cover slip

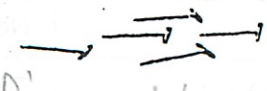


dissecting needle

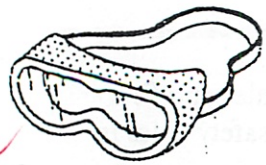
thermometer

hand lense

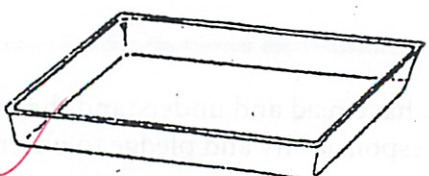
eyedropper



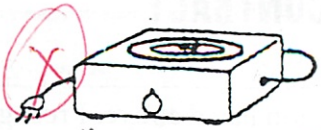
Dissecting pins



Cover goggles



Dissecting pan



~~Bunsen Burner~~ hot plate

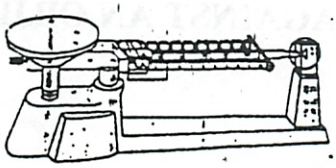
Name _____ Date _____

Directions: Please write the name of the instrument pictured below and the type of units the instrument measures in.

1. 

This instrument is a graduated cylinder

It measures volume in mL.

2. 

This instrument is a pan balance

It measures mass in grams.

3. 

This instrument is a ruler

It measures length in ~~in~~ cm.

4. 

This instrument is a thermometer.

It measures temperature in degrees °C.

Directions: Please write the name of the instrument you would use to measure the following items.

5. I would use the ruler to measure the length of my classroo
6. I would use the graduate cylinder to measure 20 milliliters of milk.
7. I would use the _____ to measure the amount of soda in a soda c
8. I would use the thermometer to measure the boiling point of water.
9. I would use the pan balance to measure the mass of a pencil.
10. I would use the ruler to measure the width of a pencil.

THE SCIENTIFIC METHOD

The scientific method is a logical and systematic approach used be scientists to collect information.

The following steps are used:

1. **IDENTIFY THE PROBLEM**
   State the problem to be solved or the question to be answered.

HOW IS IT POSSIBLE TO THROW AN EGG AGAINST AN OBJECT AND NOT HAVE IT BREAK?

2. **COLLECT INFORMATION ABOUT THE PROBLEM**

3. **FORM A HYPOTHESIS**
   ...a proposed solution - a prediction or "best guess" based on known facts.

4. **TEST THE HYPOTHESIS**
   ...do an experiment.
   ...the hypothesis is tested by making observations.

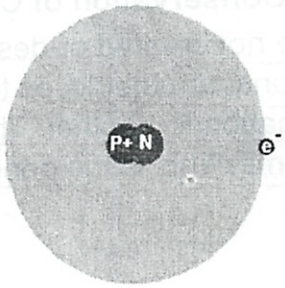
5. **ACCEPT OR REJECT THE HYPOTHESIS**
   If the information obtained from the tests show the hypothesis to be true, the hypothesis is accepted, if not, the hypothesis is rejected.

6. **REPORT THE RESULTS**
   Scientists publish the result of their work in journals so that it can be used by other scientists.

 **DISPOSAL ALERT** This symbol appears when care must be taken to dispose of materials properly.	 **ANIMAL SAFETY** This symbol appears whenever live animals are studied and the safety of the animals and the students must be ensured.
 **BIOLOGICAL HAZARD** This symbol appears when there is danger involving bacteria, fungi, or protists.	 **RADIOACTIVE SAFETY** This symbol appears when radioactive materials are used.
 **OPEN FLAME ALERT** This symbol appears when use of an open flame could cause a fire or an explosion.	 **CLOTHING PROTECTION SAFETY** This symbol appears when substances used could stain or burn clothing.
 **THERMAL SAFETY** This symbol appears as a reminder to use caution when handling hot objects.	 **FIRE SAFETY** This symbol appears when care should be taken around open flames.
 **SHARP OBJECT SAFETY** This symbol appears when a danger of cuts or punctures caused by the use of sharp objects exists.	 **EXPLOSION SAFETY** This symbol appears when the misuse of chemicals could cause an explosion.
 **FUME SAFETY** This symbol appears when chemicals or chemical reactions could cause dangerous fumes.	 **EYE SAFETY** This symbol appears when a danger to the eyes exists. Safety goggles should be worn when this symbol appears.
 **ELECTRICAL SAFETY** This symbol appears when care should be taken when using electrical equipment.	 **POISON SAFETY** This symbol appears when poisonous substances are used.
 **SKIN PROTECTION SAFETY** This symbol appears when use of caustic chemicals might irritate the skin or when contact with microorganisms might transmit infection.	 **CHEMICAL SAFETY** This symbol appears when chemicals used can cause burns or are poisonous if absorbed through the skin.

Background

Matter is made up of atoms. Atoms are made up of smaller particles: protons, neutrons, and electrons. Protons and neutrons are found in the center or nucleus of the atom. The electrons are found in a region around the nucleus that is sometimes called the *electron cloud*.



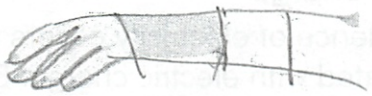
Electric Charge

The science of electricity covers all the behaviors associated with electric charge. Electrons and protons both have electric charge. Therefore, all atoms contain electric charge – *atoms are the origin of electricity.* Electrons have negative charge and protons have positive charge. An atom usually has a balanced (or equal) number of positive and negative charges so the *overall* charge of an atom is neutral. The amount of charge on the electron is equal to the amount of charge on the proton. The neutron has no charge; it is neutral.

The basic unit of charge in the SI (metric) system of measurement is the *coulomb*. One coulomb of charge is equivalent to the amount of charge on 6.24 trillion electrons (or protons).

Principal of Conservation of Charge

Charges are not created or destroyed. When one object gains electrons, another loses them. Electrons are shifted from one location to another. The total amount of charge stays the same. This is the principle of ***conservation of charge***.

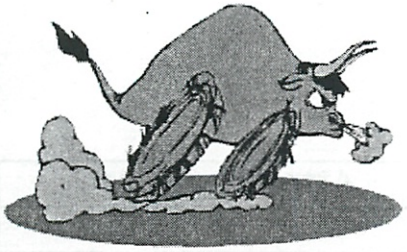


Creating a charge imbalance by rubbing is sometimes called 'charging by friction'. Since the objects already have charge, it's better to say that 'friction causes a charge imbalance'.

Name Michael Plasmeier Period 4

Date 9/15

Student Response Sheet 1



Other People in my Group:

Alex

Tomas

1. Think about a time when there were no electrical devices such as washing machines, lights, or refrigerators. What might your ancestors have done to get along without them?

   a. Washing machines

   soap, wash pan / by hand

   b. Lights

   Candles, oil lamps

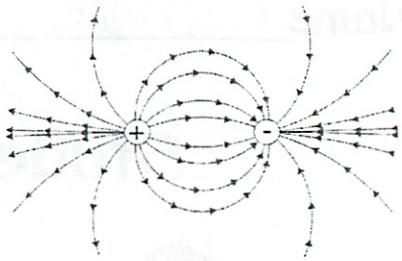
   c. Refrigerators

   Cool houses, basements, snow, ice man, Caving

2. Match the words on the left with the phrases on the right. Some words will have more than one match.

proton	b	c	a) this is negatively charged
neutron	e	c	b) this is positively charged
electron	a	d	c) located in the (center) nucleus of the atom
			d) located in a region called a ~~neutron~~ electron cloud
			e) this is neutral

3. Charged particles exert forces on each other:



Like charges repel each other.

Unlike charges attract each other.

Complete the table

:

Type of Charge	Type of Charge	Attract or Repel?
Positive	Negative	A
Positive	Positive	R
Negative	Positive	A
Negative	Negative	R

4. Charge can be shifted from one place to another. Can charge be created or destroyed? Explain your answer.

Can be shifted, Can't be created or Destroyed. The electrons move around trying to make the atoms neutral. One gains, one loses. Called conservation of charge.

Seminar Homework - Grade 7
Ms. D'Andrea
To Charge or Not to Charge, that is the Question...

Name Michael Plasmeier Date _____

Complete the sentences below, with the proper word or phrase. All of the following information is based on today's lesson.

1. Electricity starts with the ~~smaller~~ charged bits of matter in each atom (sub-atomic particles such as the protons, neutrons and electrons).

2. Like charges repel each other and unlike charges attract each other.

3. A ~~solid~~ neutral object has a balance of ~~equal~~ negitive and positive charges, and ~~negitive~~ most objects are neutral ~~all~~ most of the time.

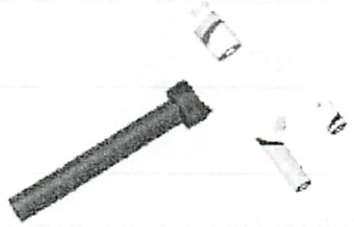
4. A charged object has a charge imbalance - it has more of one kind of charge than the other. A charged object gives or recievers charged particles, usually electrons. A charged object gets back into netural in a relatively short time because it transfers ('borrows' or 'gives up') charged particles to or from ~~other~~ another ~~atoms~~ object.

5. The total amount of charge remains the same. Charge can be shifted from one object to another, but charge cannot be created or distreyed.

Name Michael Plasmeier Period 4

Date 9/16

Student Response Sheet 2



Other People in my Group:

1. What happens when you 'charge an object' by rubbing, conduction, or induction? Which of the following is correct?

You create charges on one object and destroy charges on the other.

OR

You transfer charges from one place to another.

2. A 'charged object' is an object that has ~~more~~ excess or ~~less~~ unbalanced electrons.

3. What does 'charge imbalance' mean?

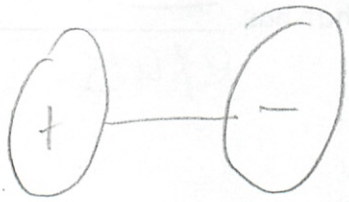
a charge imbalance is when one atom has more or less electrons than protons

4. How do you use rubbing to cause a charge imbalance?

Rubbing causes a charge imbalance because you peel or strip electrons from another object onto another

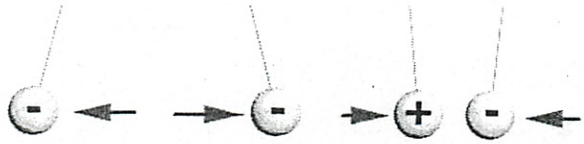
5. How can you use conduction to cause a charge imbalance? (Hint: Draw a diagram.)

6. How can you use induction to cause a charge imbalance? (Hint: Draw a diagram.)

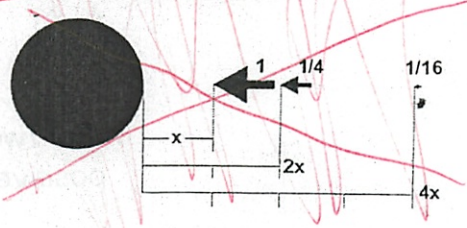


Charge and Force

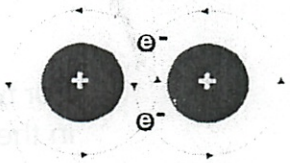
Charged particles exert a force on each other. Like charges repel each other, while unlike charges attract each other.



The strength of the force depends on the amount of charge on the particles and the inverse square of the distance between the particles.



The pulls and pushes between the charged particles of an atom tend to cancel each other. However, the arrangement of electrons in the outer part of the atom may allow one atom to attract and hold on to another atom. This ability of neutral atoms (ones with a balance of negative and positive charges) to attract and hold on to each other is the basis of chemical bonds.

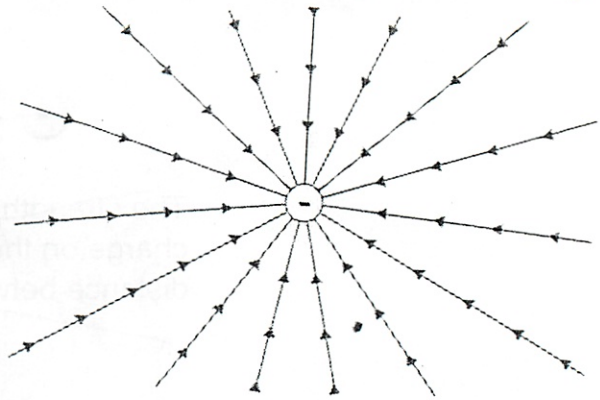


Electric Fields

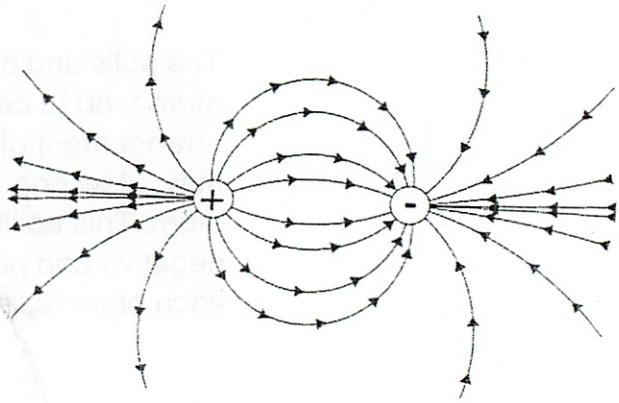
Electrical forces, like gravitational forces, act between bodies that are not necessarily in contact with each other. One way to visualize this is the concept of a *field*. An electric field is a region of space that is under the influence of an electric force produced by an electric charge. The field acts as the go-between for any charged particles. One charged particle interacts with the electric field of another charged particle.

These are diagrams of an electric field. The direction arrows on the lines show which way a small positive charge would move relative to the field.

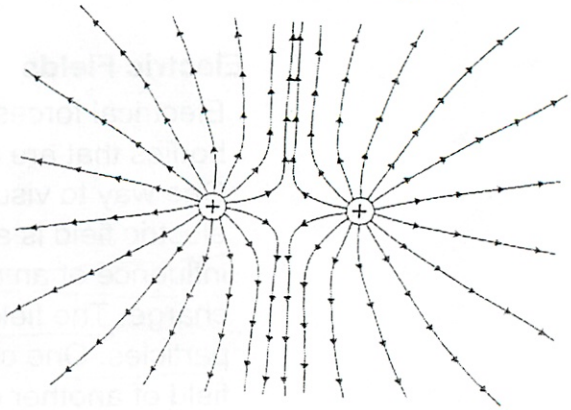
For a single charge, the lines go out to infinity.



For two opposite charges, the lines stretch out from the positive charge to the negative charge.



For two like charges, the lines bend away from each other in the space between the two charges.



The electric field is a storehouse of energy. Electric energy can be transported over long distances in an electric field and the field can be guided by metal wires or other conductors. These concepts will be explored in later activities.

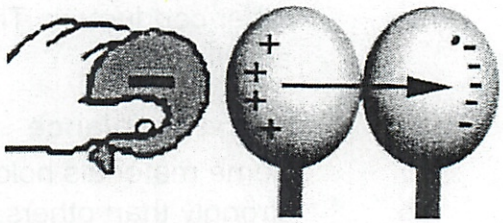
Charge Imbalance

Some materials hold onto their outer electrons more strongly than others. In fact, when you rub two objects together, you may be able to "peel" or "strip" electrons away from one of them in such a way that the electrons stay with the other object temporarily. When you separate the two objects, one will have more than its normal number of electrons (be negatively charged), and the other object will have fewer than its normal number of electrons (be positively charged).

Eventually, the two objects with charge imbalances will become balanced again. The positively charged object may 'borrow' a few electrons from water molecules in the air. The negatively charged object may 'give up' a few electrons to water molecules in the air. In the meantime, the charged object can exert an electric force.

Conduction: Charge by Transfer

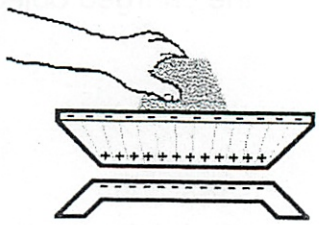
When a charged object comes in contact with a neutral object, some of the extra charge on the charged object may transfer to the neutral object. (Remember, like charges repel, so the extra charges on the charged object are pushing each other away.) After the transfer, the formerly neutral object will be have a charge imbalance that is the same as the charge imbalance on the object that touched it. Both objects can exert an electric force while they remained charged. Since they have the same kind of charge imbalance, they will repel each other.



Charging by conduction or transfer is also called 'charging by contact'.

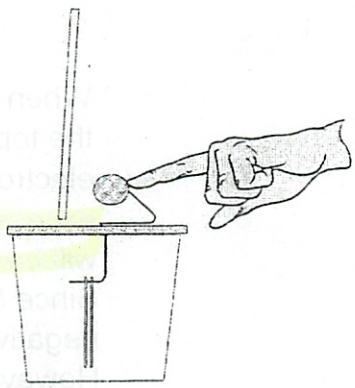
Induction: Charge by Force

When a charged object comes close to but does not touch a neutral object, it can cause the positive and negative charges in the neutral object to shift around slightly. For example, a negatively charged object will repel negatively charged electrons in the neutral object. This can cause the electrons in a neutral object to shift away from the charged object.



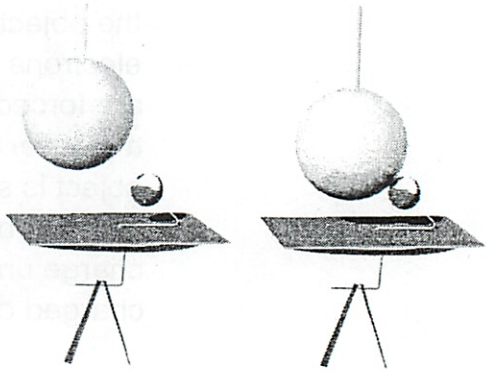
The side of the neutral object that is away from the charged object becomes slightly negative. The side of the neutral object that is closest to the charged object becomes slightly positive. If you touch the negative side of

the neutral object, your finger will allow some of the electrons on that side of the neutral object to escape from the object. The negatively charged object is forcing the electrons to get as far away as possible. After electrons are forced off one side of the object, what is left behind is a *smaller* than normal number of negative charges, so the object is said to be positively charged. Since the formerly neutral object has a charge imbalance that is unlike the charge unbalance on the charged object, it will *attract* the charged object.

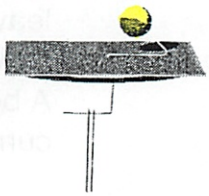


Electroscope

The electroscope is a device that can detect a charged object. It can also tell if charged objects have the same kind of charge imbalance. Typically, an electroscope has a metal rod with a metal ball at the top and thin metal leaves at the bottom. The thin metal leaves hang straight down unless an object with a charge imbalance is nearby. A bottle, jar, or cup may protect the thin leaves from wind currents.



When a charged object comes close to the metal ball at the top of the electroscope, charges shift around on the electroscope. For example, if the charged object has an excess of negative charges, electrons in the electroscope will be pushed away from the ball onto the thin leaves. Since this causes the leaves to have an excess of negative charge, the leaves will repel each other. However, when the charged object is removed the charges on the electroscope shift around again to a more balanced arrangement, and the leaves hang straight down.



If the charged object touches the metal ball of the electroscope and transfers some charges to it, the leaves will repel each other and stay apart when the charged object is removed. If a charged object with a different kind of charge imbalance comes close to the charged electroscope, the excess charges on the leaves will shift from the leaves up to the metal ball, and the leaves will drop downward.

Sparks and Lightning: Balance the Charges

All the extra charged particles on a charged object push each other away (since like charges repel). If conditions are right, charged objects tend to lose excess charge and become neutral (balanced). Sometimes the conditions are right for the charged objects to lose excess charge slowly as on a dry day when there are fewer water molecules in the air. At other times, the conditions may be right for the charged object to lose excess charge very rapidly. As the excess charge is forced off the object, it may produce a small streak of light and a 'click' of sound.

You may have experienced a spark of excess charge jumping from your finger to a metal object after you scuffed your feet on a carpet. The scuffing "peeled" some electrons off the carpet and onto your body. When your finger was close to the metal object, the excess charges were pushed off your finger. The metal object provided a place of escape for the extra electrons.

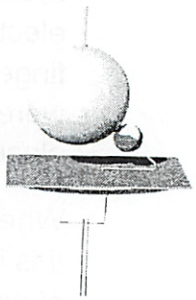
When excess charge leaves the charged object rapidly, this is sometimes called a 'discharge'. The largest place of escape for excess charged particles is the Earth itself! The Earth is so large that it can easily gain or give up electric charges. During a storm, charges in a cloud may become rearranged so that a part of the cloud is negatively charged while another part is positively

charged. Excess charge may move from one place in the cloud to another, or from one cloud to another cloud. Sometimes, excess charge jumps from the cloud to the Earth producing lightning. It is estimated that over twenty million lightning strikes occur every year on Earth.

Conductors and Insulators

Substances that allow excess charge to move relatively easily are called **conductors**. Substances that do not allow excess charge to move easily are called **insulators**. You can use the electroscope to determine whether a substance is a good conductor or a good insulator.

If the electroscope is charged and you touch the metal ball with a good conductor, the excess charge on the electroscope will be forced off the electroscope relatively easily and the electroscope will lose its excess charge quickly. If you touch the metal ball with a good insulator, the excess charges cannot leave as easily and the electroscope will lose the excess charge slowly.



Michael Plasmon

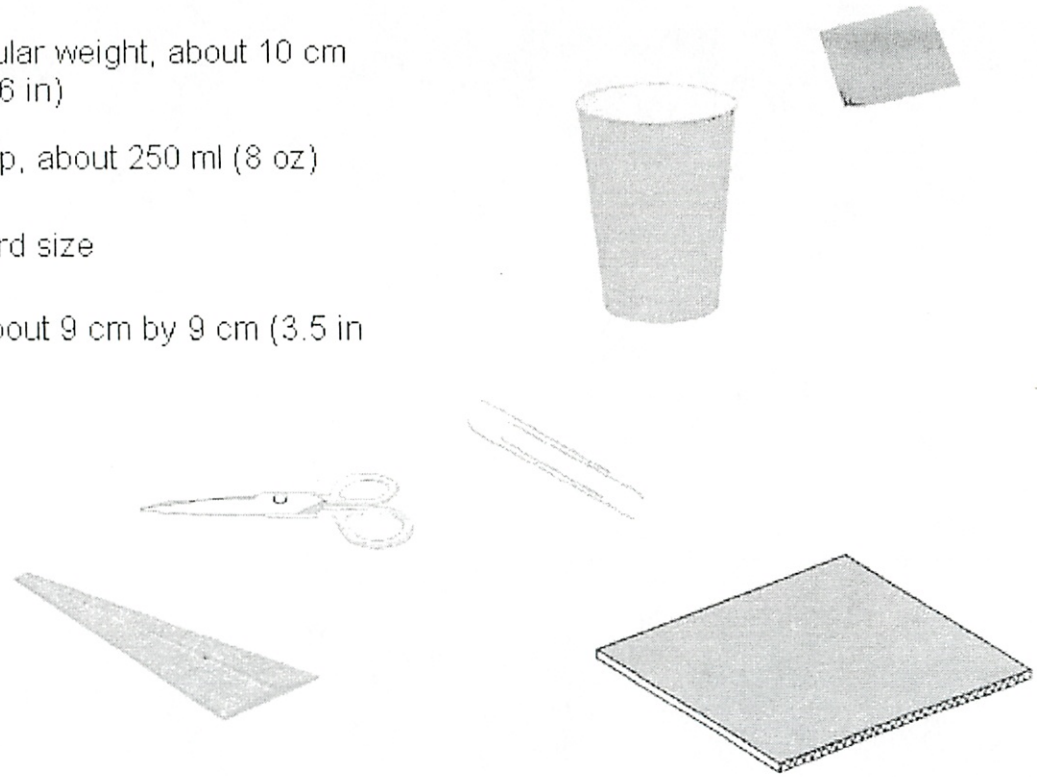
Electroscope

Background

- Atoms usually have a balanced number of positive and negative electric charges.
- The atom usually has no **net** electric charge. It's 'neutral' - at least most of the time.
- An atom can be easily unbalanced just by rubbing two objects together.
- When the objects are rubbed, bits of matter are peeled away from the atoms in the surfaces of the two objects.
- Most often, these are the negatively charged electrons.
- After some of the negatively charged electrons are peeled away from the object, it has **fewer** negative charges than normal and the other object has **more** negative charges than normal.
- The two objects have unbalanced numbers of positive and negative electric charges.
- Each object with an unbalanced number of electric charges is a 'charged object'.
- The electroscope you will make can help you find out if an object is charged.

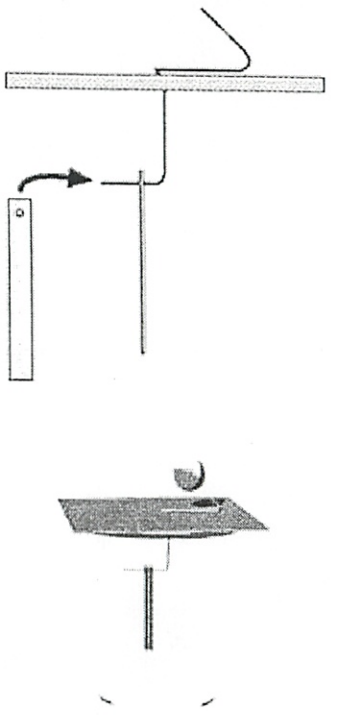
Materials

- Aluminum foil, regular weight, about 10 cm by 15 cm (4 in by 6 in)
- Plastic drinking cup, about 250 ml (8 oz)
- Paper clip, standard size
- Stiff cardboard, about 9 cm by 9 cm (3.5 in by 3.5 in)
- Scissors
- Ruler



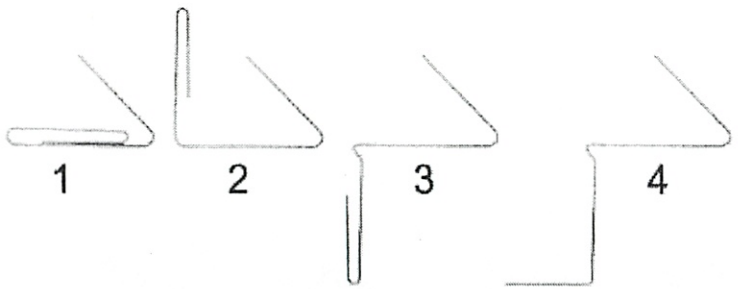
Prodecure

- Cut two strips of aluminum foil about 0.8 cm by 4 cm (0.3 by 1.5 in).
- Poke a hole near one end of each foil strip with a pin or paper clip. (Note: This works best with a piece of cardboard under the foil strips.)
- Hang the two foil strips on the bottom horizontal part of the paperclip.
- Place the cardboard square on top of the plastic cup so that the foil strips are hanging close together inside the cup.
- Cut a 10 cm (approx. 4 in) square of aluminum foil and roll it into a loose ball.
- Carefully push the ball of aluminum foil onto the upper end of the paperclip.
- The finished electroscope should look similar to the illustration.

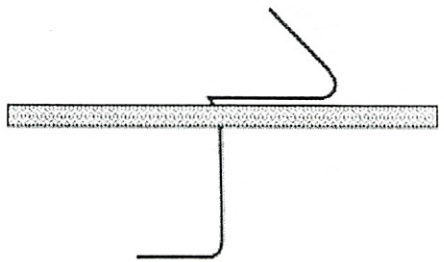


Prodecure

- Bend the paperclip as shown in the illustration below.



- Cut a square of cardboard just large enough to cover the top of the plastic cup.
- Poke a hole in the center of the cardboard square.
- Insert the bent paperclip through the hole in the cardboard.



Synthesize

- In the next activity you will use the electroscope to determine whether or not objects have excess charge on them.

  A basic principle of electricity is that like charges repel each other and unlike charges attract each other.

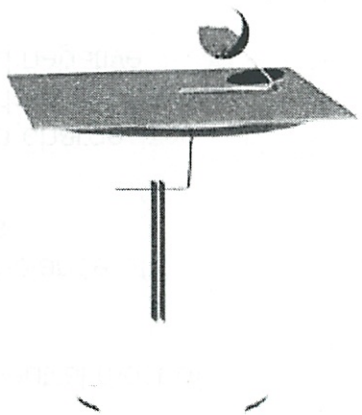
  Question: What do you think will happen to the two strips of aluminum foil inside the electroscope when you touch the ball of the electroscope with a charged object? (Write your answer in the box below.)

Answer (what will happen to the two strips of aluminum foil?):

I think the strips will repel each other

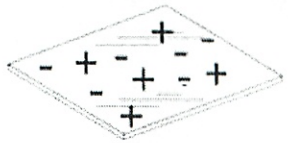
Challenge

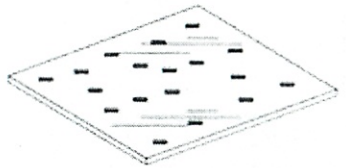
- In this activity you will use the electroscope to test objects that have been charged by:
  - rubbing,
  - by contact, and - conduction
  - by induction.

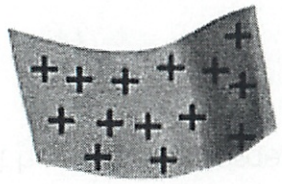


Background

- Most objects are electrically neutral most of the time.
- That means that they have a balance of negative and positive charges.
- It is relatively easy to create a charge imbalance on an object so it does not have equal numbers of positive and negative charges.
- Three methods to create charge imbalances are:
  - rubbing (charge by friction),
  - contact (also called conduction), and
  - induction (charge by force).







Materials

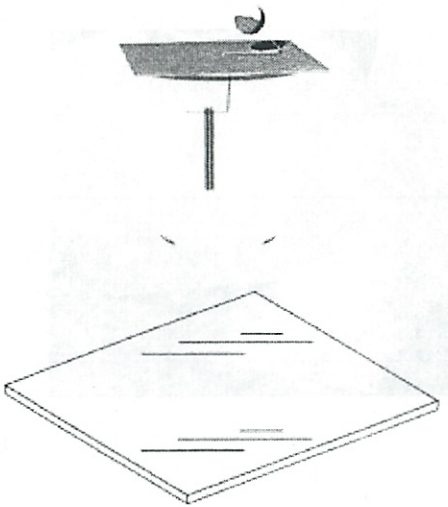
- Electroscope
- Plastic plate
- Wool or felt cloth

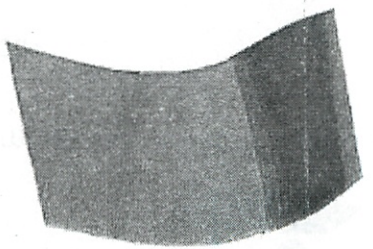
NOTE: Other pairs of objects that work well to create a charge imbalance are:

Fur and rubber rod

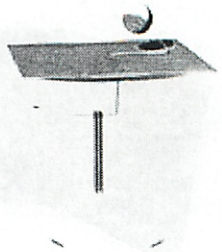
Foam rubber and plastic tube

Plastic food wrap and plastic ruler



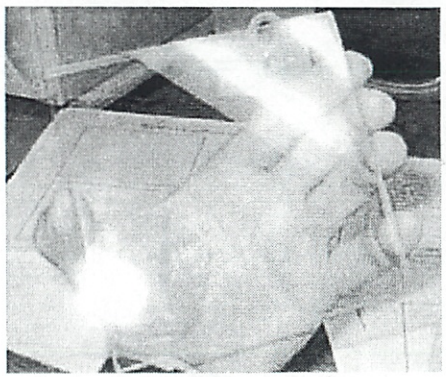


Prodecure: Rubbing

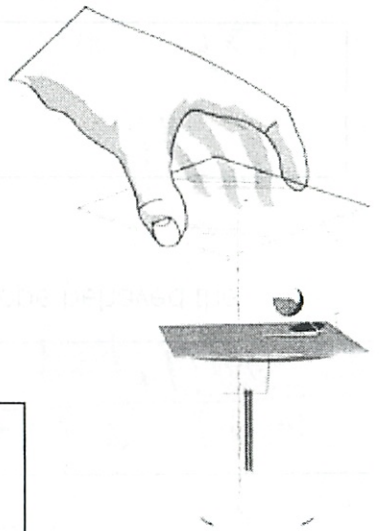


- Set up the electroscope.
- Make sure the foil strips are hanging down and are free to move.
- Create a charge imbalance on the plastic plate and wool cloth.
- Hold the plastic plate by its edges.
- Rub the plastic plate with the wool cloth several times in the same direction.

NOTE: Rubbing the plastic plate with the wool cloth strips away electrons from the wool cloth. Some of the electrons go to the plastic plate. Although the charge imbalance is temporary, it lasts long enough for you to test it.



Explore: Rubbing



- Bring the charged plastic plate near the top of the electroscope, but do not let it touch the foil ball.
- What happens to the foil strips inside the electroscope when the charged object is near? Record your observations below:

Observations:

The strips moves apart

- What happens to the foil strips when the charged object is taken away?

Observations:

The strips move back togheter

Analysis: Rubbing

- A basic principle of electricity is that like charges repel each other and unlike charges attract each other. Assume that the excess negative charges on the plastic plate repel the negative charges in the foil ball on the electroscope.

  Question: Where do the negative charges in the foil ball go when they are pushed by the excess negative charges on the plastic plate? (Write your answer in the box below.)

Answer (Where do the negative charges go?):

The negative charges go to the strips, which push them apart, ~~because~~ their both negative charged.

- **Question**: Why do you think the foil strips inside the electroscope behaved the way they did?

Answer:

The reason they moved is because of the excess negative charges from the foil ball go to the strips and they repel each other because their negative charges both has an excess

Prodecure: Contact

- Set up the electroscope. Make sure the foil strips are hanging down and are free to move.
- Create a charge imbalance on the plastic plate using the wool cloth. Hold the plastic plate by its edges. Rub the plastic plate with the cloth several times in the same direction.

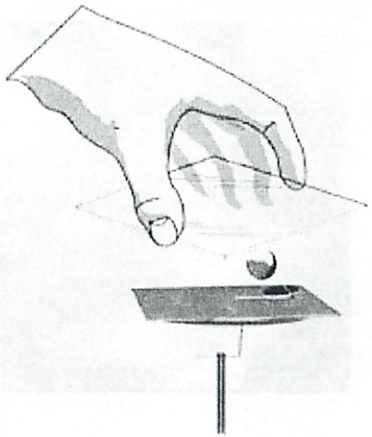
NOTE: The plastic plate will have an excess of negative charges on it.

Question: What are all of these like charges trying to do to each other? Answer below:

Answer:

They are trying to become metal. or they are trying to repel each oter

Explore: Contact



- Bring the charged plastic plate near the ball of foil on the electroscope and **touch the ball with the plate.**
- What happens to the foil strips inside the electroscope? Record your observations below:

Observations

The same thing as if we didn't touch, they shock because of the touch.

- Pull the plastic plate away quickly. What happens to the foil strips when the plastic plate is taken away?

Observations

They go back together

Analysis: Contact

Question: When the plastic plate touched the foil ball on the electroscope, negative charges moved onto the foil ball. Why did this happen? Were the negative charges attracted by the foil ball, or were they forced off the plastic plate by other negative charges? (Write your answer below.)

Answer (Why do the negative charges move?):

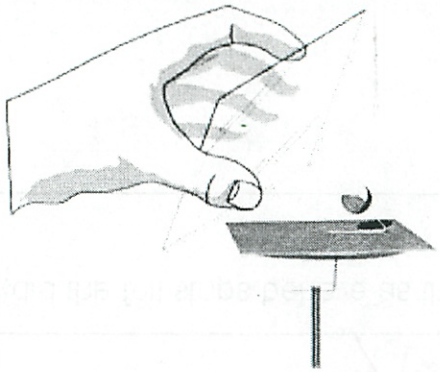
They were attract to the foil ball in an effort to become netural. (!)

Question: When you pulled the plastic plate away, why did the foil strips behave as they did?

Answer (Why do the foil strips behave that way?):

They became netral, so they didn't need to repel.

Prodecure: Induction



- Set up the electroscope. Make sure the foil strips are hanging down and are free to move.
- Create a charge imbalance on the plastic plate using the wool cloth.

  Note: The plastic plate will have an excess of negative charges on it.
- Bring the charged plate **near one side of the foil ball** on the electroscope, but do not touch it.
  Question: Where will the negative charges on the foil ball go, **toward** the plastic plate or **away from** the plastic plate?

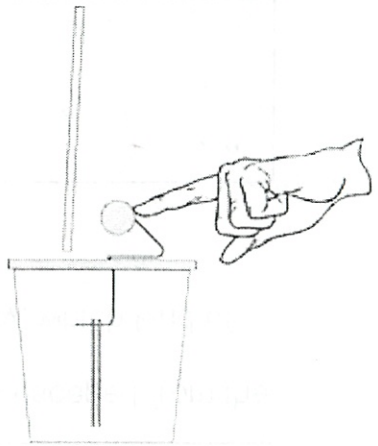
Answer: (Where will the negative charges go?)

The w

Away from the plate ~~to the foil~~

Explore: Induction

- Hold the charged plastic plate near the ball of foil on the electroscope, and then **touch the ball with your finger**. What happens to the foil strips?



Observations:

The strips ~~go back tagther~~ move away slightly

- Next, move the charged plate and your finger away from the ball at the same time. What happens to the foil strips?

Observations:

~~The strips shock~~ should come tagther

Analysis: Induction

- **Question**: When the plastic plate was near the foil ball, negative charges on the ball moved to the other side of the ball away from the plate. Why did this happen?

Answer (Why did the negative charges move?):

The negitive charges on the plate repled the negite charges on the ball

- When you touched the foil ball with your finger, negative charges escaped from the ball onto your body.
  Question: When you pulled the plastic plate and your finger away, which kind of charge (positive or negative) is left behind on the foil ball?

Answer (Which kind of charge is left behind?):

I think that it is now neutral, or positive

Synthesis

- **Question**: When you charged the plastic plate by rubbing it and then put the plate near the foil ball without touching the ball, did you **change the overall balance** of charges on the electroscope?

Answer (Did you change the overall balance of charges?):

No, the charges just moved, Yes

- When you touched the foil ball with the plastic plate, you changed the overall balance of charges on the electroscope.
  Question: Which way was the electroscope charged - positive or negative?

Answer (Which way was the electroscope charged?):

Negative, because negative charges on the ball transferd over to the neutral eletroscope, making it negitive

- **Question**: When you charged the electroscope by induction, which way was the electroscope charged - positive or negative?

Answer (Which way was the electroscope charged?):

~~I think it is netral, because no charges~~

~~more~~ Positive

Notes

◁16

Super Star

A. 1A

Please Sign and Return

Name Michael Plasmeier Date 10/3.

Seminar – Science Journal Quiz

Score 30 /30 pts.

Directions: Use complete sentences to answer each question and place in Seminar wire basket when you are finished. Good Luck ☺ Read Carefully.

Part One: Introduction

1. What safety procedures should you follow as you clean up your work area before leaving class after a laboratory session? 5 pts.

When you leave class you should turn off water and electric and return materials. Dispose of chemicals, and place broken glass in a proper container. You should also clean your work area and wash your hands so.

2. What is the safe response if a spill occurs on your skin while working in the laboratory? 2 pts.

If chemicals spill on your skin, you should flush large amounts of water on it and call your teacher.

3. Sketch and describe the use of each of the following laboratory tools:

   a. graduated cylinder 1 pt.

a device used to measure volume of liquid

   b. triple beam balance 1 pt.

a device used to measure ~~weight~~ or mass. You move the riders (weights) in order to get the balance to reach 0

pic

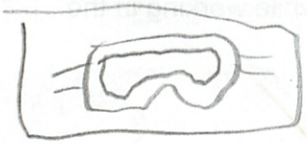
c. test tube 1 pt.

a thin narrow tube to hold liquid and other material in a lab

4. When you **conduct an experiment**, which step in the scientific method are you following? 2 pts.

when you conduct an experment your testing a hypothesis in the Scientific measure

5. **Sketch and describe** the universal safety symbol for eye safety. 2 pts.



This symbol is a pair of safty goggles. This means that you should wear safty goggles when you perform an experiment

Part Two: Electrifying Energy

1. What is the origin of electricity? 3 pts.

The origin of electricty is electric charges from atoms.

2. What are the three parts of an ~~atom~~. ~~Name~~ their charges and where they are found? 3 pts.

Three parts of an atom;

Type	Charge	Location
proton	positive	located in the cater of the atom
neutron	netrial	located in the center of the atom
electron	negative	located in the outer parts of an atom

3. What is the principle of ***conservation of charge***? 1 pts.

Conservation of charge is when charges are only passed around. None are created or destroyed.

4. What kind of charges attract each other? 1 pt.

Opposet charges attract each other,

5. What does '**charge imbalance**' mean? 2 pt.

A charge imbalance is when their is more electron or more protons then their opposet counter parts.

6. **Name and describe** three ways to create a charge imbalance. 3 pts.

3 ways to created a charge imbalance are:

- Rubbing - because you peel or stir electrons from some other object
- Contact - charges that are missing protons or electrons steal them from other objects when they touch
- Induction Negitive or positive charges when they are in excess they may jump or go to other objects to become netral

7. Describe how an electroscope can be used to detect charge imbalances. 3 pts.

Electroscopes can be used to detect charge imbalances because if there is an excess of one type of charge, the leaves will hang apart, this is because the excess charges in the leaves are alike, so they repel each other.

Chlorine is a toxic chemical. It is used in water treatment to reduce and kill forms of biological agents, such as bacteria and viruses found in water systems. Chlorine is harmful to you when you drink it and when it is absorbed into our skin and inhaled into your lungs when you shower. It has been estimated that the "shower steam" in your bathroom can contain up to 100 times the amount of chlorine than the water, because chlorine evaporates out of water at a relatively low temperature. If you bathe or shower in unfiltered tap water you are inhaling and absorbing chlorine into your body.

Conditions contributed to or aggravated by chlorine exposure:

· Respiratory Conditions (nose, throat, lungs, sinuses): Asthma, bronchitis

· Hair: Dry, brittle

· Skin: Dry, flaking, dandruff, itching, rashes (especially with infants and children)

· Eyes conditions

Chlorine is universally used to chemically disinfect water. It kills germs, bacteria and other living organisms. Chlorine readily passes through the cell wall and attaches to the fatty acids of the cell, disrupting the life sustaining functions. The human body is composed of billions of cells. Most people are aware that the quality of their drinking water can be improved by filtering their tap water or buying bottled water. However, many do not realize that they are addressing only a part of the problem.

One half of our daily chlorine exposure is from showering. Chlorine is not only absorbed through the skin, but also re-vaporized in the shower, inhaled into the lungs, and transferred directly into the blood system. In fact, the chlorine exposure from one shower is equal to an entire day's amount of drinking the same water. Drinking filtered or bottled water only does half the job. For people who are concerned about their health and are willing to