

G. Grambo

CHEMISTRY 88

Chemistry

Grade Eight

Begin the chemistry unit with the "powder puzzle" experiments. This experiment can be used with six groups of six children. Through experimentation on five powders, the children will determine, after five experiments, which of the five powders have been hidden in an unknown powder mixture. Before beginning this experiment have students bring home the letter telling the parents what you are doing. The object is to give each group a powder in order to determine what the five powders are.

Unit 2 contains experiments on solutions, suspensions, colloids, acids, and bases. There are two tests for this unit, a midterm and a final.

Have students buy a composition or spiral notebook to be used as a log book.

Gregory Graybo
The Louis Armstrong Middle
School

Contents

Unit One

Experiment 1- Observing Physical Properties	4
Experiment 2- Water Test	5
Experiment 3- Heat Test	6
Experiment 4- Iodine Test	7
Experiment 5- Vinegar Test	8
Experiment 6- Powder Puzzle Mixtures	9

Unit Two

Experiment 1- What is a solution?	11
Experiment 2- How can we make a solute dissolve faster?	13
Experiment 3- What is a strong solution?	14
Experiment 4- How can we make things that will not dissolve in water, dissolve?	15
Experiment 5- Why do some water mixtures settle?	17
Experiment 6- How can we recover a solute from a solution?	18
Experiment 7- What happens to a solute when it comes out of a solution?	20
Experiment 8- How can we get pure drinking water from the sea?	22
Experiment 9- What happens to the molecules in a liquid as I freeze or boil that liquid?	25
Experiment 10-How do you know when you have a suspension?	27
Experiment 11-How can you separate a suspension?	29
Experiment 12-How can we make the particles in a suspension not settle?	31
Experiment 13-Milk looks like a suspension, why doesn't it settle?	32
Experiment 14-How can we make colloids settle?	34
Experiment 15-Why do some foods taste sour?	35

Experiment 16-	Why is soap slippery and why does it taste bitter?	37
Experiment 17-	What happens when we mix an acid and a base?	39
Experiment 18-	How do acids and bases change the electrical properties of water?	41
Experiment 19-	How do salts change the electrical properties of water?	43

Appendix

Test- Midterm	45
Test- Final	49
Materials list- Unit 1	53
Materials list- Unit 2	54
Letter to parents	55
How to set up room for group work	56

Powder Puzzle

1
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M
M

Name _____

Class _____ Box No _____

Experiment I

Group and Individual Investigation Sheet

I. Observing Physical Properties

Materials: magnifying glasses, wax paper, black construction paper.

How are the powders alike?

How are they different?

Do they all feel the same?

Do they smell alike?

Are all the powders the same shade of white? (use black paper as a background)

List 3 physical properties of each powder? Any more?

Does the magnifying glass tell us more?

Describe the particles that each powder consists of.

How do they differ when rubbed on black paper.

Data Sheet

Physical Properties				
Powder	Color	Smell	Feel	Other words used to describe powder
A				
B				
C				
D				
E				

Name _____

Class _____ Box No _____

Experiment 2

Group and Individual Investigation Sheet

II Water Tests

Materials: containers of water, medicine droppers, small mixing cups, measuring spoons.

What happens when we mix water with each powder?

Do they all mix the same?

Which ones dissolved?

Did you use the same amount of powder each time?

Why is this important? What about the amount of water?

Vary the amounts of water used. (10, 20, 60 drops)

What effect does this have on each powder?

If a powder disappeared, where did it go? Is it still in the cup?

How can we find out?

Leave the cup overnight--what happened?

Has the powder changed--compare with the original source?

If one of the powders dissolves in water can you identify it? Are additional tests needed?

Can you eliminate any of powder as a result of the water test?

Data Sheet

Water Tests				
Powder	What happens after adding			Additional Comments
	10 Drops	20 Drops	60 drops	
A				
B				
C				
D				
E				

Name _____

Class _____ Box No _____

Experiment 3

Group and Individual Investigation Sheet

III Heat Test (supervise closely)

Materials: candles, flame-proof base (metal or asbestos-pad), long aluminum foil spoon, measuring spoons.

What changes occurred in each powder after heating?

What controls did you use? Why?

Did any powder produce an odor after heating?

Did the physical appearance of any powder alter when cooled? Check with original source.

Were any new substances formed?

Data Sheet

Heat Tests			
Powder	After Heating How did it		
	Smell	look	Other Observations
A			
B			
C			
D			
E			

Name _____

Class _____ Box No _____

Experiment 4

Group and Individual Investigation Sheet

IV Iodine Test

Materials: diluted tincture of iodine, medicine droppers, mixing cups, measuring spoons.

Have you set up controls? Why?
Do all powders react similarly when iodine solution is added to them?
How can this test help us to distinguish one powder from the other?
Test other substances with the iodine solution (material, leather, metal, vegetables, paper, etc.) Record the reactions on a group chart.
If a substance blackens as a result of the iodine test what does this tell us?

Data Sheet

Iodine Tests		
Powder	What happened	Describe Color
A		
B		
C		
D		
E		

Name _____

Class _____ Box No _____

Experiment 5

Group and Individual Investigation Sheet

V Vinegar Test

Materials: white vinegar, medicine droppers, mixing cups, measuring spoons.

Have you set up controls?

How did each powder react to vinegar?

Did those powders that dissolved in water also dissolve in vinegar?

Which powder will dissolve with the least amount of vinegar? Devise an experiment to test this.

If a powder bubbles when vinegar is added, does it mean it is baking soda?

Data Sheet

Vinegar Tests	
Powder	What happened?
A	
B	
C	
D	
E	

Name _____

Class _____ Box No _____

Experiment 6

Group and Individual Investigation Sheet

VI Powder Puzzle Mixtures

Materials: teacher prepares mixtures of 5 powders (number cups, note mixtures, e.g. (1)=A,D; (2)=B,C,E; etc.)
all materials necessary for testing.

Performing any combination of tests, can you identify the mixtures by letter?

Data-Sheet (information is simulated)

Try to find out what powders you have in your mixture. Test mixture with Iodine, Vinegar, Water, Heat, and look at its physical properties. Can you tell one powder from another?

Unknown Mixture of powders A-E			
Test	What Happened	What do you have?	What don't you have?
Observation			
Water			
Heat			
Iodine			
Vinegar			

Solutions
Suspensions
Colloids
Acids
Bases

2
M
M
M
M

Chemistry - Grade 8 - 1

Name _____
Class _____ Box NO. _____

Problem- What is a Solution?

Materials- Test tube rack, test tubes, coffee, alcohol, sand, corn oil

Hypothesis-

Q-How are materials affected when they are added to water?

Procedure-1) Mix coffee with $\frac{1}{2}$ a test tube of water

Q-How is the water affected by the coffee?

Q-What happened to the crystals of coffee?

Q-Why can't you see them any more?

2) Mix sand with water

Q-How does sand affect the water?

Q-Why does sand react differently with water than coffee does?

When one thing disappears into another, we say it dissolves. The thing that does the dissolving is called the solvent, the thing that gets dissolved is called the solute.

Things that dissolve are soluble. Things that do not dissolve are insoluble.

Q-Is coffee the solute or the solvent? How do you know?

Q-Is sand soluble? Is coffee soluble?

Q-How can you tell?

3) Add three drops of corn oil to a test tube $\frac{1}{2}$ filled with water.

Q-Describe what happens?

Q-Is oil soluble in water? How do you know this?

4) Add three drops of alcohol to a test tube $\frac{1}{2}$ full of water

Chemistry - Grade 8 - 1^②

Name _____
Class _____ Box No. _____
Grade 8

Describe what happens.

Conclusions-

- Q-What is a solution?
- Q-What is a solute and a solvent?
- Q-How can we make a solution?

Chemistry-Experiment 2

Name _____

Class _____ Box No. _____

Grade 8

Problem- How can we make a solute dissolve faster?

Materials- Sugar cubes, powdered sugar, test tubes, bunsen burner, test tube holder, striker or matches, stirring rod

Hypothesis-

Q-Why does sugar dissolve when it hits hot coffee?

Procedure-

- 1) place a sugar cube in one test tube $\frac{1}{2}$ full of water
- 2) Place powdered sugar in another test tube $\frac{1}{2}$ full of water.

Q-Describe what happens.

Q-Why is the powdered sugar disappearing faster than the sugar cube?

Q-How can we make the sugar cube disappear faster?

Q-How might heating affect the sugar cube?

- 3) Place a sugar cube into a test tube $\frac{1}{2}$ full of water and heat it.

Q-Describe what happens.

Q-How did heating affect the sugar cube?

Q-Why do you think this happened?

- 4) Place a sugar cube into each of two test tubes $\frac{1}{2}$ full of water.
- 5) Try crushing one sugar cube with a stirring rod.
- 6) try stirring the other.

Q-How did breaking apart the solute affect our experiment?

Q-How did stirring the solution affect our experiment?

Q-Why did this happen?

Conclusion

Q-What are three ways to make a solute dissolve faster?

Chemistry - Experiment 3

Name _____

Class _____ Box No _____

Grade 8

Problem- What is a strong solution?

Hypothesis- How can you tell that coffee is too strong just by looking at it?

Materials- coffee, test tubes, test tube rack, stirrer

Procedure- 1) Place a pinch of coffee into a test tube $\frac{1}{2}$ full of water.
2) Place 1 measure of coffee into another test tube $\frac{1}{2}$ full of water.

Q-How are these two solutions different?

Q-Why are they different?

Q-What is the solute? Solvent?

Q-How can I make four completely different solutions of coffee so that no two are alike?

Q-Which solution has the most solute? Which has the least?

Q-Why do the colors differ?

Q-How can you tell which has the most solute by the color?

WEAK SOLUTIONS ARE CALLED DILUTE
STRONG SOLUTIONS ARE CALLED CONCENTRATED

3) Add coffee to water until no more dissolves.

Q-Describe how it looks.

Q-Why do you think no more coffee dissolves?

○ WHEN A SOLUTION WILL HOLD NO MORE SOLUTE IT IS CALLED SATURATED

Conclusions-

Q-How can we tell if a solution is saturated?

Q-How does a solute differ from a solvent?

Q-How can we make a concentrated solution dilute?

①

Chemistry-Experiment 4

Name _____
Class _____ Box No _____
Grade 8

Problem- How can we make things that will not dissolve in water dissolve?

Hypothesis-

Materials- Iodine, Alcohol, thermometer, test tubes, test tube rack, acetone, cotton, glass plate with nail polish.

Procedure- 1) Place iodine in water in a test tube

Q- Describe what happened?

2) Try your methods of making things dissolve faster.

Q- Describe what happened

3) Place an iodine crystal into alcohol in a test tube.

4) place a thermometer in the test tube.

WE CALL THIS A TINCTURE- when something is dissolved in alcohol.

Q- Describe what happened.

Q- Why did this happen?

Q- Why is the temperature of the solution rising?

5) Pick up the glass plate and clean it.

Q- Why doesn't water remove the marks?

Q- How can we remove this mark?

Q- How can we remove oil paint off a paint brush? Why can't we use water?

Q- How can we dissolve oil paint or nail polish?

There are many solutions in which water can not be used as the solvent

(2)

Chemistry - Experiment 4

Conclusions-

Q - List three solvents other than water?

Q - Below are solutes. List solvents which will dissolve them

Solute	Solvent
Iodine	
Salt	
Paint	
Nail Polish	

Q - Why did the temperature of the alcohol solution rise ?

Chemistry - Experiment 5

Name _____

Class _____ Box NO. _____

Problem- Why do some water mixtures settle?

Hypothesis-

Materials- chalk, water, salt, test tubes, test tube racks

Procedure- 1) Place a small amount of salt in a test tube $\frac{1}{2}$ full of water.
2) Place a small amount of chalk (Calcium carbonate) in another test tube $\frac{1}{2}$ full of water.

Q-How is A different From B? (list at least two differences)

Q-What makes them different from each other?

Q-Why can you see one powder and not the other?

3) let them stand for two minutes

Q-What happened to the contents of the test tubes?

Q-Why did this happen?

Q-Is salt and water a solution when mixed?

Q-How do you know this?

Q-What might you call the other?

When particles float around in a liquid, but eventually settle we have a suspension.

Q-LIST THREE CHARACTERISTICS OF A SUSPENSION.

Q-Is a suspension like a solution? Why?

Q-If it is different, how is it different?

Q-Why can't you see particles in a solution?

Conclusion-

Q-What is a suspension?

Chemistry-Experiment 6

Name _____

Class _____ Box No _____

Grade 8

Problem- How can we recover a solute from a solution?

Hypothesis-

Materials- coffee, muddy water, test tubes, test tube rack, bunsen burner, striker or matches.

Procedure- 1) Put 20 ml of muddy water into a test tube and let stand for a few minutes.

Q-Why did the mud fall to the bottom?

Q-How can I remove the mud from the water?

2) Try filtering the muddy water.

3) Pour more muddy water into a test tube and let stand.

Q-How did filtering affect the muddy water?

Q-How can you clean the water without filtering it?

4) Try it and describe what happens.

5) put coffee into a test tube $\frac{1}{2}$ full of water.

Q-How can we separate the coffee from water?

Q-Why can't you filter it? How do you know this?

Q-How will the test tube of coffee and water be affected if I let it stand for a long time?

6) try it.

Q-Describe what happened.

Q-When cooking food in a pot, why do you have to watch what you are cooking?

Q-How might the test tube of coffee and water be affected if I boil it for a while?

7) Try it.

Q-Describe what happens.

Chemistry - Experiment 6²

Name _____

Class _____ Box No. _____

Grade 8

Conclusions-

Q- What are two ways to separate a solute from a solvent?

Q- Why can't you filter a solution?

Read Chapter Six.

Chemistry - Experiment 7

Name _____

Class _____ Box No _____

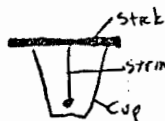
Grade 8

Problem- What happens to a solute as it comes out of solution?

Hypothesis- How do you think they make rock candy?

Materials - Cups, Sticks, 6" string, sugar, microscope, slides, CuSO_4 , eyedropper, coffee

- Procedure-
- 1) Tie the 6" string to the stick.
 - 2) Place stick over cup so string hangs inside cup.
 - 3) Let string touch bottom. Tie a knot in the end of the string.
 - 4) Make a saturated solution of sugar and water, and fill cup.
 - 5) Put your box number on the cup.

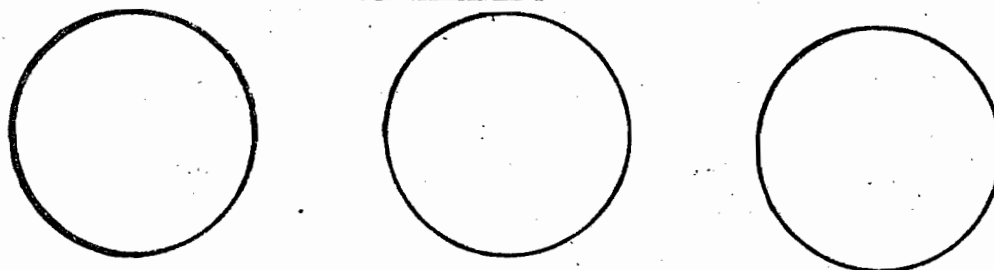


Q- How do you know when the solution is saturated?

- 6) Place cups in the tray provided by the teacher. We will look at these cups in about a week.
- 7) Make saturated solutions (small amounts) in separate test tubes of sugar coffee copper sulfate CuSO_4
- 8) Place one drop of each on a microscope slide. Watch what happens as the water evaporates from the solution.

Q- Describe what happens.

Q- Describe the shapes you see. Draw them



Q- Why do you think the shapes are getting bigger?

As the solvent evaporates, molecules of the solute begin to cling together in a special manner according to the way the atoms and molecules are constructed. The shapes forming are called crystals, and the process of forming crystals is called crystallization.

Conclusion-

Q- How can we recover a solute from a solution?

Q- Why might it look different when it comes out of solution than it

②

Chemistry - Experiment 7

Name _____

Class _____ Box No _____

Grade 8

Q How do crystals form?

You may wish to do an extra credit report on:

Crystal shapes

Crystal Growing

Homework

Read Chapter 7 on page 41 do parts 3 and 4

Chemistry - Experiment 8

Name _____

Class _____ Box No _____

Grade 8

Problem- How can we get pure drinking water from the sea?

Hypothesis*-

Q-How do you think you can get the salt out of sea water?

Materials- glass L bend (get from teacher) plastic beaker of ice, test tube, 10 inch piece of rubber tubing with a glass tube in one end, ringstand, clamp, bunsen burner.

YOU WILL BE WORKING AT THE BLACK TABLES FOR THIS EXPERIMENT

Procedure-

Q-How can we remove a solute from a solution?

Q-What happens to the solvent?

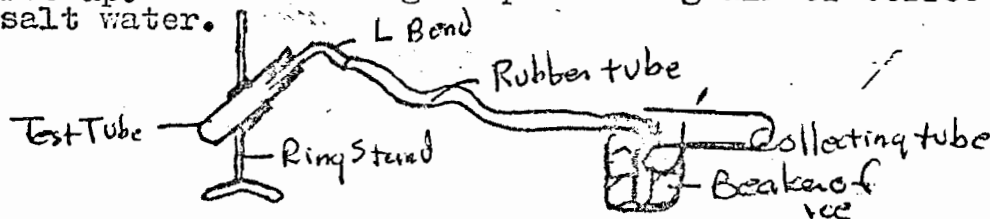
Q-How might you catch the disappearing solvent?

- 1) make a saturated solution of salt in a test tube $\frac{1}{2}$ full of water.

Q-How might the solution be affected if I boil it?

Q-What might happen if I collect and cool the gas that comes off?

- 2) Make the following set up. Have the teacher check your set up. Place boiling chips and a grain of coffee in the salt water.



- 3) Heat the test tube of salt water with the bunsen burner/

Q-What happens to the solvent?

Q-Why is water collecting in the test tube that is in the ice?

Q-Where is that water coming from?

Q-How does the ice help your experiment?

②

Chemistry - Experiment 8

Name _____

Class _____ Box No _____

Grade 8

Q-How does the liquid you are collecting look?

Conclusions

The process of boiling a solution, collecting and cooling the vapor is called distillation. Since things boil at different temperatures, we can separate things by this method.

Conclusions-

Q-How does distillation work?

Q-What happens to the solute when you distill something?

Q-How does the vapor cool off?

Extra Credit Report on:

Distillation of oil- Called Oil Cracking

Winemaking or Liquor Making.

ochem

Name _____

Class _____ Box No. _____

Problem- What happens to the molecules in a liquid as I freeze or boil that liquid?

Materials-Salt, water, two test tubes, test tube holder, thermometer, ice

Hypothesis- How can you tell when a liquid is frozen?

Procedure-

1) Place ice in the beaker and add salt to the ice.

Q-How does the salt affect the ice?

2) Place a test tube $\frac{1}{2}$ full of water into the beaker. Take Temp. readings of the water in the test tube every 30 seconds.

Q-Why does the temperature of the water in the test tube remain the same until all the water freezes?

Q-Where does the heat from the test tube of water go when the temp. lowers?

* Note: the point at which the water or any liquid freezes is called the freezing point of that liquid. This point is read off a thermometer.

Q-How have the molecules of water changed so far in this experiment?

Q-Why do you say this?

3) Place water in a test tube until it is $\frac{1}{2}$ full.

4) Heat it over a burner taking the temp. every 15 seconds. Make a chart in your log book for this.

Q-How does heating affect the water?

Q-How have the molecules in the water been changed now?

Q-How will the water be affected if we continue to heat it? TRY THIS

Q-Why does the temperature of the water stop rising while the water boils.

* Note: The point at which a liquid boils is called the Boiling Point.

Q-How can we tell when we reach a liquid's boiling point? Freezing point?

Chemistry - Experiment 9

Conclusion -

Q Do the molecules in a solid move faster or slower than molecules in a gas?

Q Do the molecules in water move faster or slower when we boil the water?

Q How do you know this?

Q How can we tell when we reach a liquid's freezing point?

Q What does boiling point mean?

Homework -

Design an experiment to figure out the boiling point and the freezing point of vinegar.

How does salt affect ice?

Why does it do this?

Intra Credit -

What is the Kinetic Molecular Theory? What does it mean in terms of boiling points and freezing points?

chem

Name _____

Class _____ Box No. _____

Problem- How do you know when you have a suspension?

Materials - Test tubes, dirt, coffee, CuSO_4 , Sand, water, flashlight,

Hypothesis- In what ways is dirty water different from coffee water?

Why do you say this?

Procedure- 1) Make up the following mixtures in four different test tubes.

- a) sand and water
- b) coffee and water
- c) dirt and water
- d) CuSO_4 and water

Q-Which of the above are solutions?

Q-How do you know this? What told you they were solutions?

Q-What happens to the others after a few minutes?

2) Shine a flashlight through all of them.

Q-Why can you see the path of light through some of them?

Q-Which ones can you see the path of light?

Q-In a movie house, why can you see the projector beam?

* Note: When light can be seen traveling through an object we call this the Tyndall Effect.

Q-Which would settle faster, a liquid that you could barely see the path of light through, or one that you could definitely see the path of light through?

Q-How might you get these particles out of the liquid?

Q-Why do the particles settle out of the liquid?

* Note: When particles fall out of a liquid, and never dissolve, we have a suspension. Suspensions mix for a brief moment, then settle.

Conclusion-

Q-How can you tell the difference between a solution and a suspension?
(list at least three differences)

Chemistry - Experiment 10

Q- From your knowledge of suspensions, try to figure out how a Delta forms at the mouth of a river?

Homework

1) Fill in the following chart:

	Solution	Suspension
Light passes through		
Particles settle		
Particles large		
particles small		
Particles dissolve		
particles visible		
particles are filterable		
Can see through		
Particles never settle		
cloudy		

2) Define Sedimentation-

name class
experiment name

LIGHT MEYER

before

Chemicals inside testtube

DOWNWARDS

fc

light only

: Setup

: Start

STRIP CHART

: Start

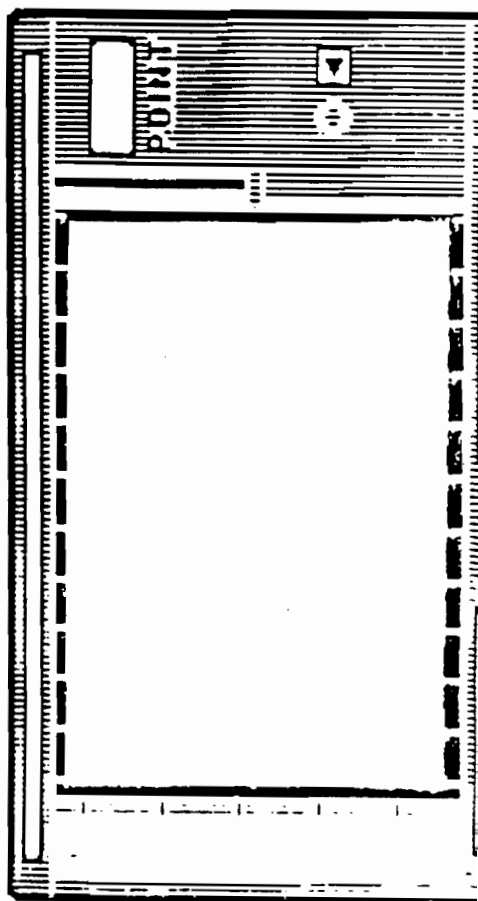
: Back

: Fwd

: Setup

: Reset

: Setup



LIGHT MEYER

Chemicals inside testtube

DOWNWARDS

fc

light and chemical

: Setup

: Start

STRIP CHART

: Start

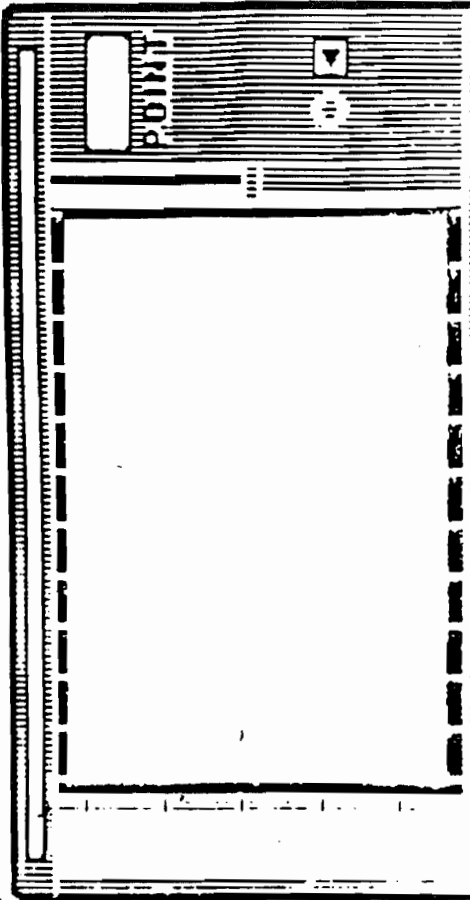
: Back

: Fwd

: Setup

: Reset

: Setup



①
II

Chemistry - Experiment

Problem- How can you separate a suspension?

Hypothesis-

Q- How does a delta form at the mouth of a river?

Q- Why does muddy water settle?

Materials- Test Tubes, two rocks, muddy water, funnel, filter paper, clay(plasticine)

Procedure- 1) Place two rocks in a test tube $\frac{1}{2}$ full of water.

Q- Why do they fall to the bottom?

2) Put muddy water into a test tube and let stand.

Q- In what ways is the mud like the two rocks from the last part of the experiment?

Q- Why does it fall to the bottom of the test tube?

Q- What might happen if you try to pour the water off of the mud?

3) Try pouring off the water.

Q- Can we separate the mud from the water this way.

* Note: This method of separation is called Decanting.

Q- How does a Mr. Coffee machine make sure coffee grounds do not get in your cup of coffee?

4) Try filtering the mud out of the water.

Q- How does the filter affect the muddy water?

Q- How is hail formed?

Q- What might happen to particles in a suspension if they collide and stick together?

5) Roll clay into five even size balls.

(2)

Chemistry - Experiment II

Q- How will the five balls of clay be affected if I squeeze them together?

Q- How will the particles in a suspension be affected if I squeeze them together?

* Note: When particles collide and combine we call this coagulation.

Conclusion-

Q- What are three ways particles in a suspension can be separated?

Q- How does dirt in a river form a delta?

Homework

Define - Sedimentation

Decanting

Coagulation

How do these things play a part in separating a suspension?

Chemistry - Experiment 12

Name _____

Class _____ Box No _____

Problem- How can we make the particles in a suspension not settle?

Hypothesis-

Q- What happens when you mix oil and water?

Q- How might you make them mix?

Materials- Test tubes, vinegar, water, oil, egg whites, soap, flashlight

Procedure- 1) Place $\frac{1}{2}$ inch of oil in a test tube. To this add $\frac{1}{2}$ inch of water.

2) Shake this mixture and let stand.

Q- How is this mixture affected if we let it stand?

3) Add three drops of soap to this mixture. Shake and let stand.

Q- How has the soap affected our mixture?

Note: Soap surrounds particles of oil causing them to stay in suspension. We call this emulsification.

Q- How does soap take oil and grease off your hands?

4) Place $\frac{1}{2}$ inch of oil in a test tube. To this add $\frac{1}{2}$ inch of vinegar. Shake and let stand.

Q- Describe what happens.

5) To this add some egg whites. Shake and let stand.

Q- How has egg whites changed our suspension?

Q- How are the suspensions in this experiment different from those in previous experiments?

Conclusion

Q- How does emulsification affect a suspension?

Q- What are two chemicals we can use to force a suspension to form an emulsion?

Q- Do you think you can see the path of light through an emulsion?

Q- How do you know this?

Chemistry - Experiment 13^①

Problem- Milk looks like a suspension, why doesn't it separate?

Hypothesis- How do you think milk will be affected if you filter it?

Materials- Test tubes, chalk, milk, vinegar, funnel filter paper

Procedure - 1) In one test tube mix chalk and water until tube is $\frac{1}{2}$ full.
2) In a second test tube place milk until test tube is $\frac{1}{2}$ full.

Q- How are the two similar?

Q- How are the two different?

Q- How might these two be affected by a filter.

3) Filter the first tube.

Q- How did the filter affect the chalk and water mixture?

Q- How does a filter affect a suspension?

Q- Why did this happen to the chalk and water mixture?

4) Filter the second tube.

Q- How did filtering affect the milk?

Q- Why did this happen?

Q- Why did one of them go through the filter while the other did not?

Q- How do the sizes of particles in the first test tube compare with the particles in the second test tube?

* Define COLLOID-

Q- In one of the tubes we have a colloid. Is it the first or second test tube?

Q- How do you know this?

Conclusion-

Q- How is a colloid different from a suspension?

Chemistry - Experiment 13

Q-What can you tell me about the size of the particles in a colloid?

Homework-

Read chapter 12 starting on page 71
On page 74 answer parts III and IV

Chemistry - Experiment 14

Name _____
Class _____ Box No _____
Grade 8

Problem - How can we make colloids settle?

Hypothesis - What happens to milk when it sours?

Materials - test tubes, funnel, filter paper, milk, vinegar

Procedure - 1) $\frac{1}{2}$ fill two test tubes with milk.

2) Filter one of the tubes.

Q - How did the filter affect the milk?

Q - Why did this happen?

3) Add $\frac{1}{2}$ inch of vinegar to the second test tube.

Q - Describe what happened to the milk?

Q - How has coagulation (from exp 11) helped settle our colloid?

* Note: You have just made cottage cheese. The liquid portion is called whey. The solid portion, or cottage cheese, is called curds.

Q - Why didn't the particles in milk settle before adding vinegar?

4) Filter the curds and whey.

Q - Why did the pieces get stuck in the filter paper?

Q - How has the addition of vinegar affected the size of the milk particles?

Conclusion -

Q - List the following in order of particle size from smallest to largest. Give a reason, and proof for each one.

Suspension , Solution , Colloid

Q - How does coagulation affect the rate of sedimentation?

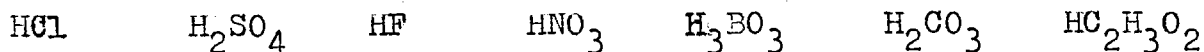
Q - How is emulsification different from coagulation?

Chemistry - Experiment 15

Conclusion-

Q-What are two tests to prove that you have an acid?

Q-Look at the formulas for some acids. What do they have in common?



* Bring in some liquids from home. Test them in class to see if you have an acid.

	Sample	Sample	Sample
pH Test			
Litmus			
Bromthymol Blue			

Acid yes/no

acid yes/no

acid yes/no

Homework

Read chapter 16 on page 96

Where do we get citric acid from?

What is on litmus paper?

What color does pH paper turn when it touches an acid?

What is the formula for nitric acid?

What is the formula for Acetic acid?

What are the names of some acids that are safe to drink?

Make a list of things all acids have in common?

Chemistry - Experiment 16

Name _____

Class _____ Box No _____

Grade 8

Problem- Why is soap slippery and why does it taste bitter?

Hypothesis- In what ways is soap different from an acid?

Materials- Phenolphthalein, ammonia, windex, soap, litmus, test tubes, glass rod

Procedure-

- 1) Place $\frac{1}{2}$ inch of ammonia into a test tube. Add water until the tube is $\frac{1}{2}$ full.
- 2) Put glass rod into the ammonia and touch it onto the red and blue litmus paper.

Q-How does the ammonia affect the papers?

- 3) If you think water had an affect on the paper try it. This is a control.

Q-How did the water affect the paper?

Q-Why did we set up the control?

- 4) Add a few drops of Phenolphthalein indicator to the ammonia.

Q-How was the ammonia affected.

- 5) Do the same tests on windex and soap. Place your findings on the table below.

	Ammonia	Windex	Soap
Red Litmus			
Blue Litmus			
Phenolphthalein indicator			

Q-What do all these things have in common?

- 6) Touch the samples.

Q-How do they all feel?

* Note: Look in your text in the chapter on acids and bases. Are these samples acids or bases? How do you know this?

Chemistry - Experiment 16

Conclusion-

Q-What are two tests to prove you have a base?

Q-Look at the formulas for bases. What do they have in common?

KOH NH_4OH $\text{Ca}(\text{OH})_2$ $\text{Mg}(\text{OH})_2$ NaOH

Bring some liquids from home. Test to see if you have a base.

	Sample	Sample	Sample
Red Litmus			
Blue Litmus			
Phenolphthalein			
	Base Yes/No	Base Yes/No	Base Yes/No

Homework-

Read chapter 17 on page 102

What color does litmus turn in acid? In base?

List as many things as you can that all bases have in common?

How does Soap taste?

What is another name for the OH group?

How do bases change Phenolphthalein?

Chemistry - Experiment 17

Name _____

Class _____ Box No _____

Grade 8

Problem- What happens when we mix an acid and a base?

Hypothesis- What might happen to stomach acid when we add Alka seltzer?

Materials- Vinegar, hydrochloric acid, phenolphthalein, litmus, alka seltzer, test tubes, stirring rod, bromthymol blue.

Procedure-

Q-How can we test to see if we have an acid?

Q-How can we test to see if we have a base?

Q-When you have a stomach ache, the hydrochloric acid in your stomach builds up, causing your stomach to hurt.

Q-Why do we take things like Tums or Alka Seltzer for an upset stomach?

Q-How do you think they get rid of a stomach ache?

1) To a test tube add 1 inch of hydrochloric acid.

2) To another test tube add 1 inch of vinegar.

Q-What does hydrochloric acid have in common with vinegar?

3) Add two drops of bromthymol blue to these two test tubes.

Q-Why do they turn yellow?

4) Put a piece of alka seltzer into each test tube?

Q-Describe what happens.

Q-How has the tablet affected the two chemicals?

5) Place alka seltzer in a test tube $\frac{1}{2}$ full of water.

6) Test with red litmus, and with phenolphthalein.

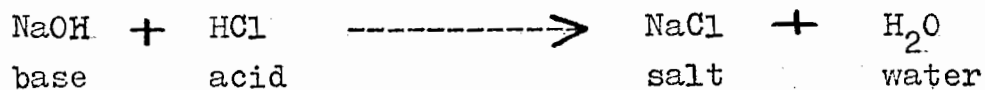
Q-Why did both turn red?

Q-What kind of a chemical is alka seltzer?

* Note: When we add a base to an acid, both are neutralized. A salt and water will form.

Q-Define Neutralization-

Chemistry - Experiment 17



Conclusion

- Q-What happens when we mix an acid and a base?
- Q-If you swallowed ammonia, why might you drink lemon juice?

Homework-

Read chapter 18 on page 107.

COPY THE TWO CHARTS ON PAGE 109.

What two materials are formed in neutralization?

What happens to litmus when both acid and base are added to it?

What is an antidote?

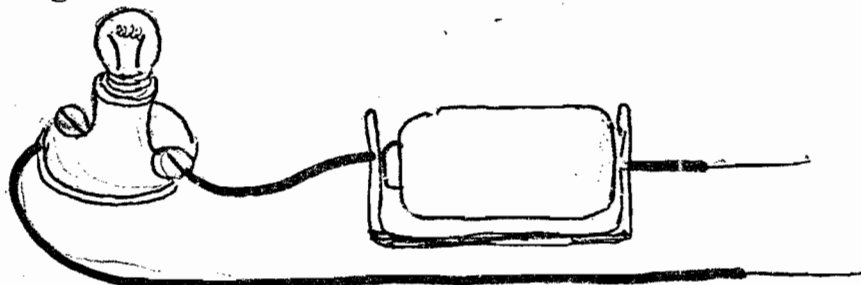
Chemistry - Experiment: 18

Problem- How do acids and bases change the electrical properties of water?

Hypothesis- What happens if you drop a radio in a bath tub and then get in?

Materials- Wood splint, glass rod, battery, battery holder, wires, bulb, bulb holder, vinegar, NaOH, HCl, Measuring spoon

Procedure 1) Set up the following electric circuit.



Q-How can we make the bulb light?

Q-How can we use the measuring spoon to light the bulb?

2) Try laying the measuring spoon, glass stirring rod and wood splint across the wires.

Q-Which ones made the bulb light?

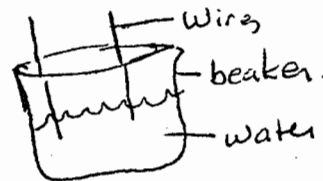


Q-Why didn't the others make it light?

Q-What is needed in order to light the bulb?

Q-Do you think the bulb will light if you put the wires in water?

3) Try putting the wires in water.



Q-Describe what happened.

4) Add acid to the water and try it again.

Q-Why did this happen?

5) Clean beaker, and add a base to water. Try the wires again.

Q-Describe what happens.

Chemistry- Experiment 18

Note- Solutions that conduct electricity are called electrolytes.

6) Try placing wires into dry NaOH.

Q-Why didn't the light go on?

Q-What must happen to the NaOH in order for the bulb to light?

Conclusion-

Q-How do acids and bases affect the electrical properties of water?

Q-How can we find out how other acids affect the electrical properties of water?

Homework-

Read chapter 19 On page 111.

Why can't pure water make the bulb light?

Note the chart on page 113 and copy it here.

Chemistry- Experiment 19

Class _____ Box No _____

Grade 8

Problem- How do salts change the electrical properties of water?

Hypothesis- What happens when you add an acid to a base?

How might this addition affect the electrical properties of water?

Materials- Electric circuit from experiment 18, beaker, Salt, CuSO_4 ,

Procedure

Q-How does pure water affect the tester?

1) Test dry salt with the tester.

Q-How does the dry salt affect the tester?

2) Add salt to water in a beaker and test with tester.

Q-How is the bulb affected now?

Q-Why did this happen?

3) Wipe off electrodes (wires) and test CuSO_4 - Dry and in solution

Q-Why should we wipe off the electrodes?

Q-Why does one conduct electricity while the other does not?

Q-What must happen to salt in order for it to conduct electricity?

Conclusion

Q-How can we make a salt?

Q-How do salts affect the electrical properties of water?

Q-What do we call substances that conduct electricity?

Q-What might we call substances that do not conduct electricity?

APPENDIX

Chemistry - Solutions

Part I. Multiple Choice. (pick the best answer to each question)

- 1) The substance being dissolved in the formation of a solution is
 - a) Solvent
 - b) solute
 - c) clay
 - d) salt
- 2) Which type of solution has the most solute.
 - a) Saturated
 - b) Dilute
 - c) Concentrated
 - d) Supersaturated
- 3) Distillation involves
 - a) condensation
 - b) Evaporation
 - c) both answers a and b
 - d) none of these answers
- 4) In making a tincture our solvent is
 - a) H₂O
 - b) alcohol
 - c) salt
 - d) iodine
- 5) The point where a liquid turns into a vapor is called it's
 - a) freezing point
 - b) boiling
 - c) vapor point
 - d) boiling point
- 6) The big difference between a solution and a suspension is
 - a) particle size
 - b) color
 - c) depth
 - d) concentration
- 7) Adding solute to water
 - a) lowers it's freezing point
 - b) Keeps freezing point at 100° C
 - c) keeps the freezing point at 32° C
 - d) None of these
- 8) A solution is a
 - a) compound
 - b) blue
 - c) powder
 - d) mixture

9) In an endothermic reaction

- a) heat is given off
- b) heat is needed to keep it going
- c) water is produced
- d) SO_2 is produced

10) Molecules in a solid move

- a) slowly
- b) fast
- c) very fast
- d) do not move at all

Part II. True or False

11) You can filter a solution to separate it.

12) Boiling helps remove a solution from a solvent.

13) Iodine will dissolve in H_2O .

14) As a solvent is removed from a solution it's concentration increases.

15) Salt will raise the boiling point of water.

16) In a gas, molecules move very fast.

17) The concentration of a solution has no affect on the freezing point of that solution.

18) Crushing a solute helps it dissolve faster.

19) Solutions are cloudy.

20) Salt and water make a suspension.

Part III. Fill In

21) _____ and _____ are the two major parts of a solution.

22) By adding more solvent to a solution you are _____ it

23) four properties of a solution are.

- _____ 24) _____ forms when a solvent evaporates very slowly from a solution
- _____ 25) What are two different kinds of solvents (other than H_2O)?
- _____ 26) You are at the _____ of a solution when you see ice crystals forming
- _____ 27) A reaction where heat is given off is a _____ reaction.
- _____ 28) Another word meaning the strength of a solution is.
- _____ 29) Impurities can be removed from water by _____ it.
- _____ 30) We can make things go into solution faster by _____ it.

THREE THINGS

IV. Essay questions.

) How does a mixture and a compound differ?

) Explain what happens to the molecules of a solution as I heat it, and continue heating it to boiling?

) Name some chemicals we used in class which will form solutions.

part V. Extra credit.

• As I heat a liquid, the temperature stops rising when I reach the boiling point of that liquid. What is happening to the heat from the burner at that time (since the temperature isn't rising), and what do we call that heat?

Explain the Kinetic Molecular Theory in terms of boiling water.

Chemistry Test (exp. 1 → 10)

Part 1-

1. How can you make a concentrated solution become dilute?
2. How do you know when you have a saturated solution?
3. Describe why crystals grow.
4. How is a solution different from a suspension?

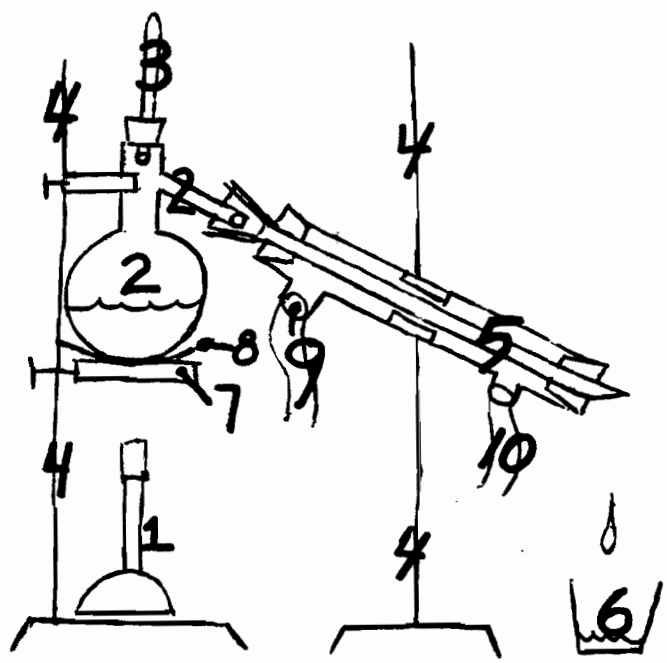
Part 2-

What is this equipment called _____

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____

Where does it go?
Where does it go?

List the parts indicated on these lines



Chemistry- Powder Puzzle

Qualitative Analysis

Materials List

Your Group is responsible for all materials in your box. Keep them neat and clean. Report missing materials to your teacher.

Powders A B C D E

Plastic Cups (for mixing)

Plastic Beaker

Eyedropper

Iodine (bottle)

Vinegar (bottle)

Black Paper

Wax Paper

Magnifying Glass

Mixing Sticks

Candle

Aluminum foil

The Louis Armstrong Middle School
I.S. 227 Q

32-02 Junction Blvd.,
Elmhurst, N.Y. 11369

A. Herman- Principal
B. Alfaut- Asst. Principal

Dear Parents,

Your child is in my eighth grade science class. For the next few weeks we will be working on a chemistry unit. They will be conducting experiments on white powders in class. The children will try to determine what the white powders are, by experimenting on known white powders at home and comparing them to their unknown white powders in school. Your child will need powders like talc, baking soda, chalk, plaster, etc. They will also need vinegar and iodine(If you have any).One experiment involves heating the powders over a candle. Please supervise your child when he/she does this part. Thank you for your cooperation.

Sincerely yours,



Mr. G. Grambo
Science- 246

The Louis Armstrong Middle School
I.S. 227 Q

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Sincerely yours,



Mr. G. Grambo
Science- 246

Chemistry - Grade 8

Materials List

Your group is responsible for all materials in your box. Keep them neat and Clean. Report missing materials to your teacher.

Test tube rack

3 test tubes

Bottle Alcohol

Bottle corn oil

Bunsen Burner

Striker

Test tube holder

Stirring rod

Scooper

Thermometer

eyedropper

Dixie Cup

Stick

String

Plastic Cups

A - Coffee

B - Sand

C - Sugar Cubes

D - Powdered Sugar

E - Iodine Crystals

F - Salt

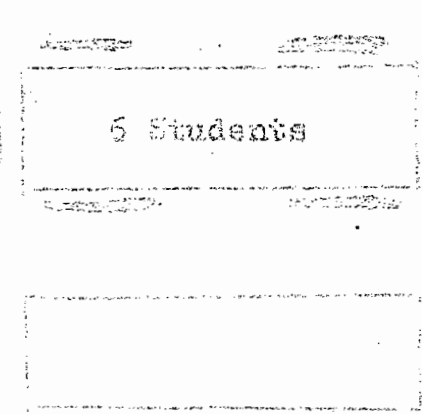
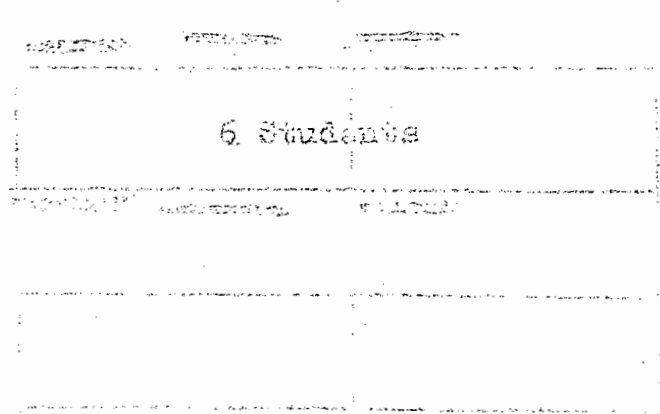
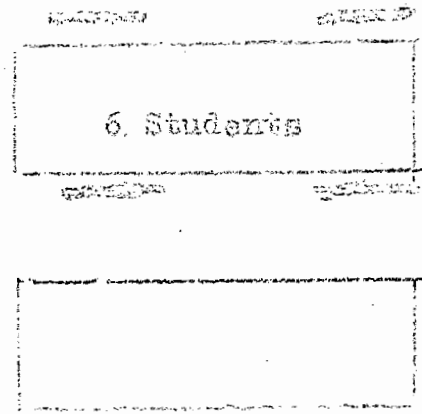
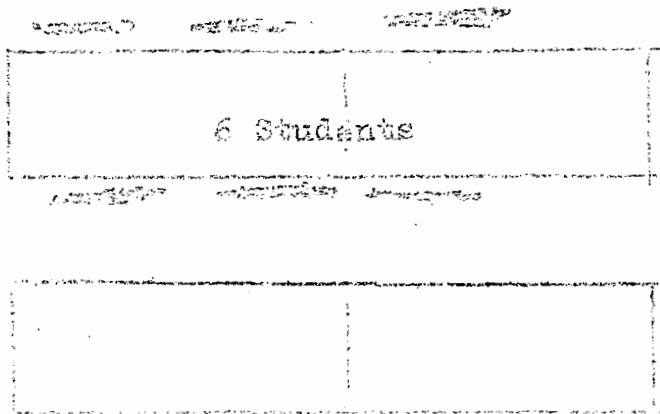
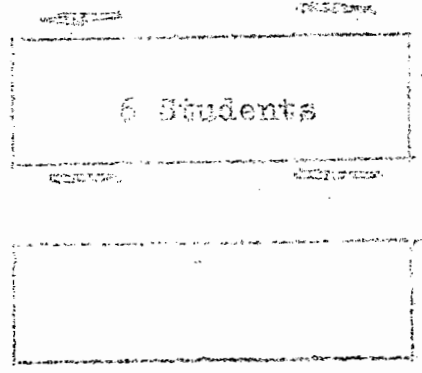
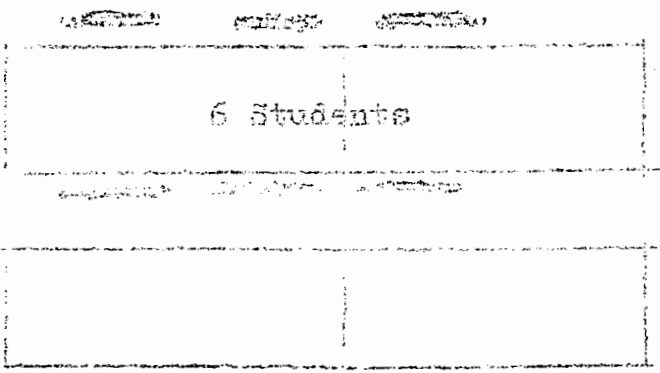
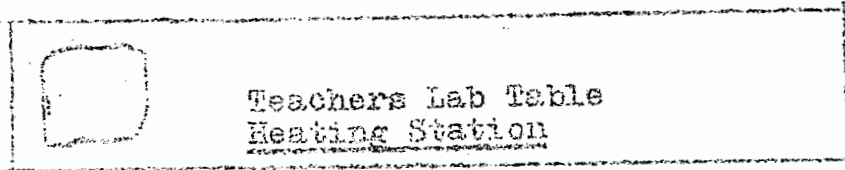
G - Chalk

H - CuSO_4

Funnel

Filter Paper

How to Set Up Room For Group Work



Key
Blue - Tables
Red - Chairs

Chemistry - Grade 8

Materials List

Your group is responsible for all materials in your box. Keep them neat and Clean. Report missing materials to your teacher.

Test tube rack

3 test tubes

Bottle Alcohol

Bottle corn oil

Bunsen Burner

Striker

Test tube holder

Stirring rod

Scooper

Thermometer

eyedropper

Dixie Cup

Stick

String

Plastic Cups

A - Coffee

B - Sand

C - Sugar Cubes

D - Powdered Sugar

E - Iodine Crystals

F - Salt

G - Chalk

H - CuSO_4

Funnel

Filter Paper