GILBERT® EXPERIMENT FILE CARDS

NEW! EXCLUSIVE!

COMPLETE WORKING LABORATORY

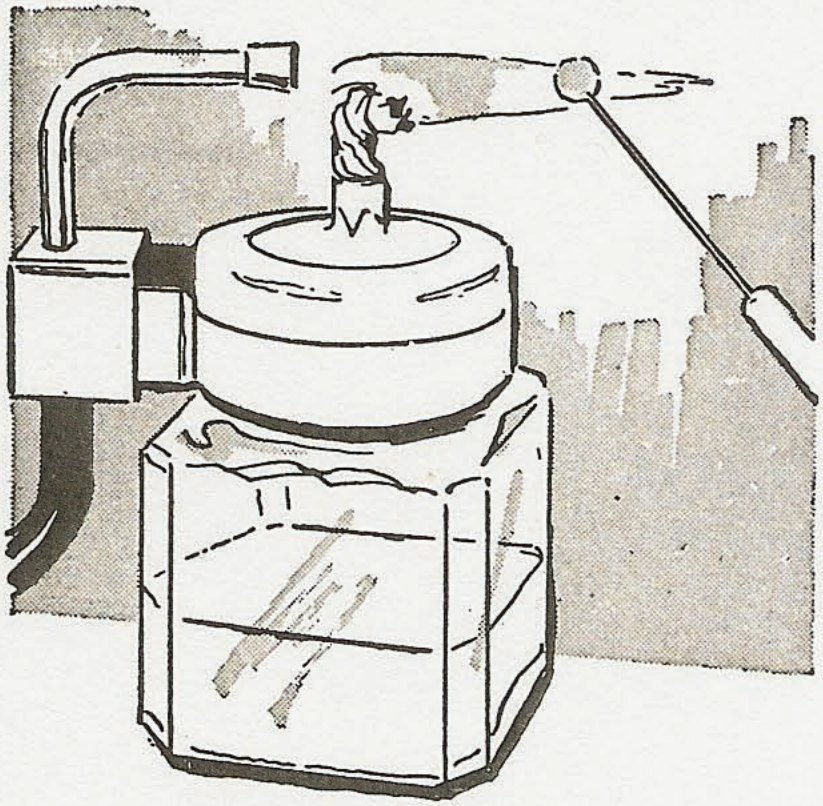
CARD A M6729-1

WARNING – This set contains chemicals that may be harmful if misused. Read cautions on individual containers carefully. Not to be used by children except under adult supervision.

The amount of each chemical supplied is sufficient to perform each experiment as specified.

USE OF THE BLOWPIPE ON YOUR ALCOHOL LAMP CARD AA

Fix the tip of the blowpipe so it is just a little bit above the wick and pointing across the top of it. Blow through the rubber tubing of the blowpipe—real hard. Next blow very gently. You should notice that blowing gently gives the best results. The flame is steady and it is easier for you. Now for a good test of your skill and patience—to keep blowing while you breathe through your nose. First, just close your mouth, puff out your cheeks and breathe through your nose, keeping your cheeks puffed out all the time. This is just about all there is to it. Now keep your mouth closed on the blowpipe with your cheeks puffed out. While you are breathing through your nose, the air in your cheeks will keep a steady flame if you blow gently.



M6729-2

WARNING – This set contains chemicals that may be harmful if misused. Read cautions on individual containers carefully. Not to be used by children except under adult supervision.

The amount of each chemical supplied is sufficient to perform each experiment as specified.

YOUR GILBERT CHEMISTRY SET

CARD B

A REAL SURPRISE PACKAGE

Pretend your Gilbert Chemistry Set is a secret room full of wonderful surprises. Inside the room are stacks and stacks of games—games that are both fun and exciting. To get into this room—and all that fun—you need only to open a magic door. Your Laboratory File Experiment Cards are the key that opens the magic door. It is the key to hours of fun and many exciting surprises. We hope you will have as much fun in the secret room as we have had in making the key for you. Just keep reading, and do just what the key tells you. The further you go the wider the door will open.

TAKING TIME TO SHAKE HANDS

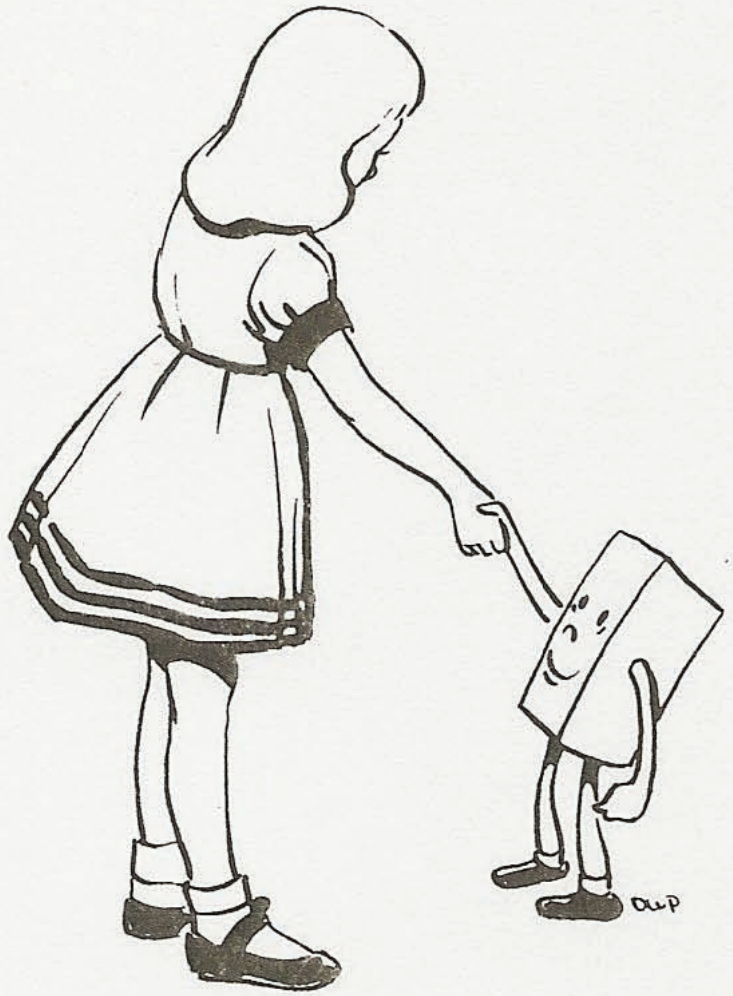
You have already opened the door a little way. Now stop and look around you. Meet and make friends with what you see. Your equipment (the things to work with) have been very carefully chosen. You will not have to go out and buy a lot of extras to have hours of fun. Ask your mother if you can work on the kitchen table. Actually any table will do if you spread old newspapers over it. Some things will stain so you will have to be careful. Besides a table to work on, you should have a place to keep things you make. A shelf in your room, a drawer (cont.)

YOUR GILBERT CHEMISTRY SET—(cont.)

or even a wooden box will do. Just remember this: you don't need a lot of equipment to have fun. You can have a great deal of fun the same way some of our most important discoveries have been made—with very simple equipment.

Benjamin Franklin was made famous all over the world by his experiment proving there is electricity in the clouds. All he used was a kite and a door key! His real fame lay in his being able to prove a point clearly and simply.

The secret of fun is the secret of science—make it clear, keep it simple, and mix in lots of imagination.



HAVING FUN WITH GILBERT CHEMISTRY — CARD C

To have the most fun with your Gilbert Chemistry Set, do the experiments this way:

1. Start with Experiment 1 and read the experiment all the way through to get the whole story. Then, when you start the experiment, you will understand and enjoy it. Be sure to follow directions. (Do the experiments in order because in some of the later experiments, you will need solutions made in previous experiments.)

2. Always place your candle or alcohol lamp in a metal pan when they are being used.

3. Heat liquids carefully. Always point the mouth of a test tube away from you, and never toward anyone who is watching or helping you. Liquid may spurt out when heated.

4. Clean up as you go. Put the caps back on the chemical containers as you use them. Wash your test tubes after every experiment.

5. Put out a flame as soon as you're through using it.

6. Never put chemicals in your mouth. Protect smaller children—never leave chemicals within their reach.

7. Preparing a working surface—spread old newspapers on the surface you intend to use when performing your experiments.

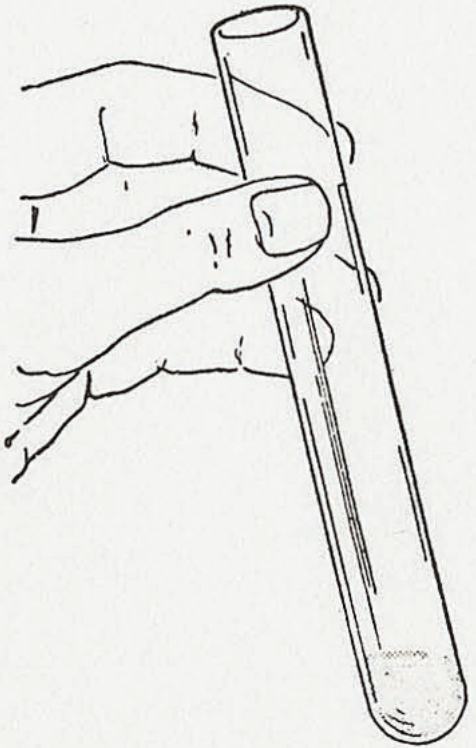
(cont.)

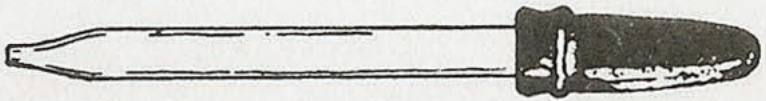
HAVING FUN WITH GILBERT CHEMISTRY—(cont.)

8. Never put hot test tubes in your test tube rack. After you have heated a test tube allow it to cool before placing it into the test tube rack.

When you have finished working with your chemistry set, place all materials back in the plastic frame and place the frame in the box. You will find out what the tools of a chemist are, how to use them, and what chemistry is all about. Take a test tube.

. . . You will use one or more of these in most of the experiments you do. Everything that goes into a test tube must be measured. To measure carefully water or other liquids, use your medicine dropper.





MEASURING LIQUIDS

CARD D

You can check yourself on filling a test tube called for in an experiment. Count out the drops of water, with your medicine dropper, to fill a test tube ⅕th, ¼th, ⅓rd, and ½ full and record the results here.

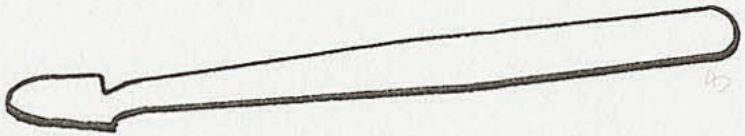
⅕-full = ... drops

¼-full = ... drops

⅓-full = ... drops

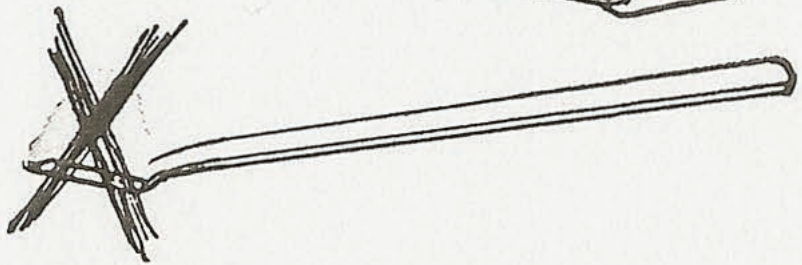
½-full = ... drops

To measure solid chemicals you have a measure . . .



When the experiment says, "Add 1 measure of a chemical," it means just a little bit more than full, like this . . .

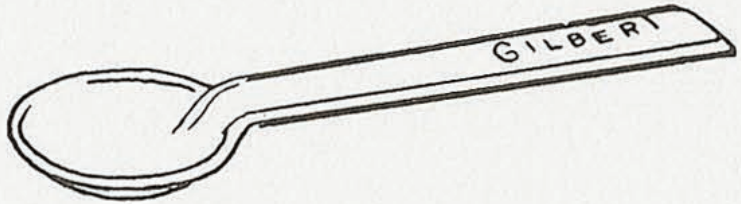
not like this . . .



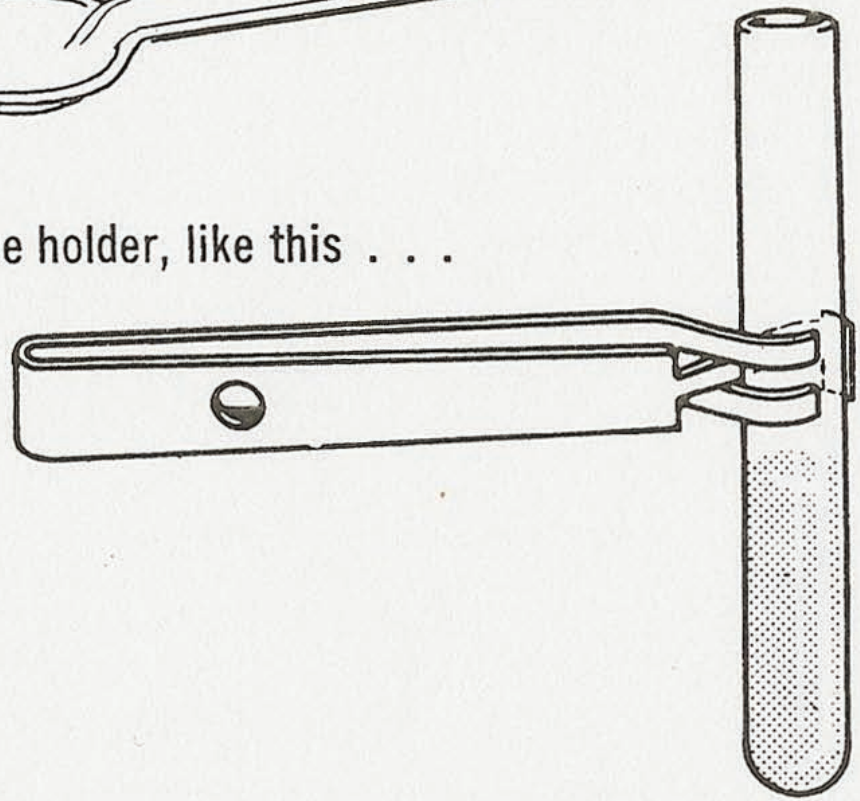
(cont.)

MEASURING LIQUIDS—(cont.)

Solids are heated in your spoon . . .

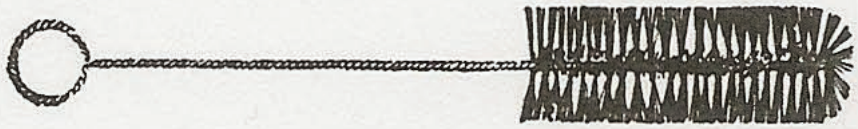


Liquids are heated in test tubes held with a test tube holder, like this . . .



(Do not place hot test tubes
in your test tube rack.)

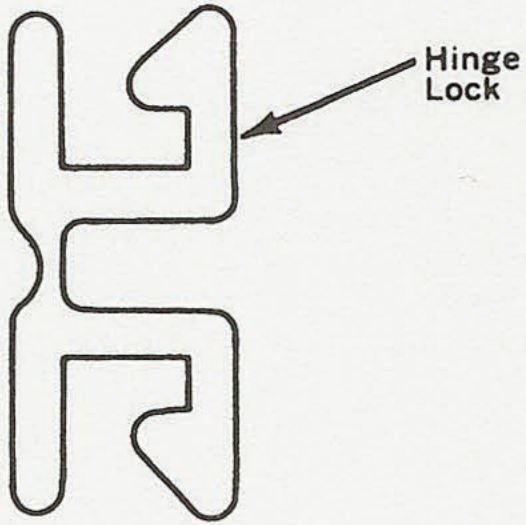
To heat liquids or solids you have a candle or an alcohol lamp. Your alcohol lamp works best when the wick is about ⅜-inch above the metal holder, about as long as your little fingernail. Trim the top of the wick with scissors so it is straight and flat. Fill the lamp ¾ full with denatured alcohol, or better still with isopropyl alcohol. Do not use rubbing alcohol because it might have too much water in it—the flame will not be hot enough.

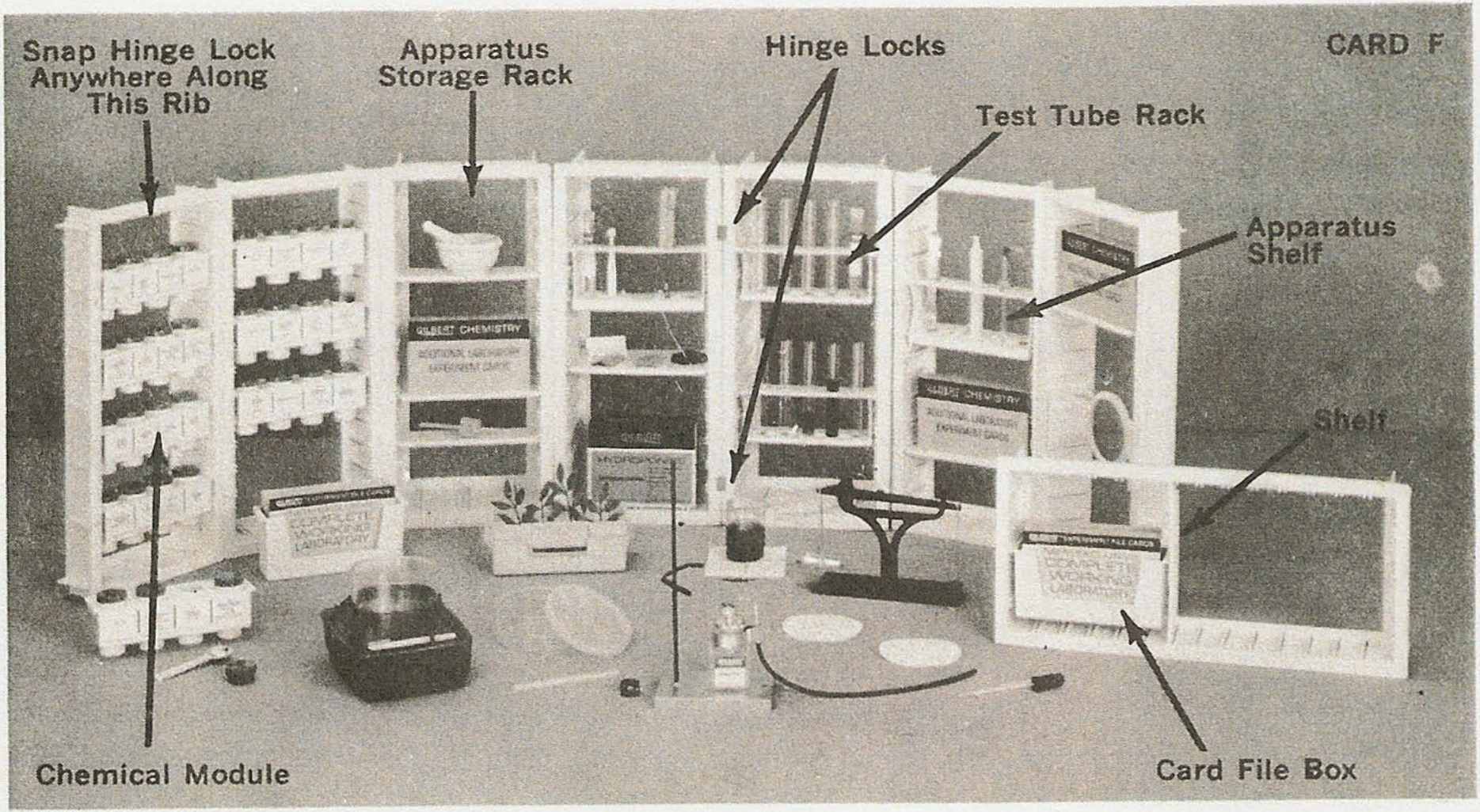


To clean your test tubes after each experiment use your test tube brush.

Your Gilbert Chemistry Lab has two or more apparatus storage frames, like the ones shown in the picture. These frames can be used in an upright position or can be laid on their side. When using the frame in a horizontal position, insert a shelf into the frame, as shown in the picture. You can then insert a test tube rack, card file, etc. between the groove in the shelf and the grooved end of the apparatus frame. Your chemical modules, test tube rack, etc. can be removed from the storage frames when needed and replaced when you have finished.

One opening in the plastic hinge lock is snapped onto the rib around the edge of one frame and the other opening in the lock is snapped onto the rib of another frame. These locks will keep your storage racks together while in use and allow you to place the frames into any position.




Snap Hinge Lock Anywhere Along This Rib
Apparatus Storage Rack
Hinge Locks
CARD F
Test Tube Rack
Apparatus Shelf
Shelf
Chemical Module
Card File Box

EXPERIMENT 1—FINDING OUT WHAT CHEMICALS ARE CARD 1

TO SHOW: That all chemicals are made up of tiny "Building Blocks," called atoms. **NEEDED:** A clean drinking glass, spoon, table salt, water. **WHAT TO DO:** Crush a little table salt with the spoon or mortar and pestle if one is available. Grind it up really fine and examine the salt powder. The pieces are very small but you can still see them. You can't grind chemicals so small that you can't see them. Now take a little more salt and put it in the glass of water. Stir the water and watch the salt. What happens? **WHAT YOU SAW:** The salt disappeared as you stirred the water. The salt is still there. You can taste it if you want to. But it's now in tiny pieces too small to see. This is called a solution.

EXPERIMENT 2

Perform the previous experiment using sugar.

EXPERIMENT 3—RECOVERING THE SALT DISSOLVED IN WATER

TO SHOW: That salt can be recovered. **NEEDED:** Test tube or beaker, alcohol lamp or candle, test tube holder, solution prepared in Experiment 1. **WHAT TO DO:** Fill a test tube ½ full of solution from Experiment 1. Boil the solution gently by heating until the water is all gone. Is there anything left? What does it look like? Taste a little of it. What does it taste like?

EXPERIMENT 4

Perform the previous experiment using the solution from Experiment 2.

EXPERIMENT 5—CHANGE OF STATE

TO SHOW: Molecular motion in the different states of matter. **NEEDED:** Test tube, alcohol lamp or candle, test tube holder, piece of ice. **WHAT TO DO:** Put some small pieces of ice in a test tube and heat the test tube over a flame. The ice melts and becomes water. The molecules in the solid state, where they are fixed in position, acquire enough motion to break free to the liquid state motion. The molecules no longer stay more or less fixed in one place but now move about, though still attracted to one another. Continue the heating until the water comes to a boil. Here the water turns to steam. The liquid state molecules acquire enough motion to break free of one another. The molecules now travel about so rapidly that the attraction between them is negligible and this describes the state of a gas. Try to remember to think about solids, liquids and gases as you do the experiments in this set.

The A. C. Gilbert Company cannot be responsible for any mishap which may occur as a result of using chemicals not contained in this set or specifically called for in an experiment or of using larger quantities than the instructions direct.

EXPERIMENT 6—DEMONSTRATION OF MOLECULAR MOTION IN A GAS CARD 2

TO SHOW: Molecular motion in a gas. **NEEDED:** Can of fresh paint, bottle of perfume or container of any substance with a strong odor. **WHAT TO DO:** Open the container of the substance to be used in one corner of the room. Go to the other corner and see how long it takes for you to smell the substance at the other side. Did it take very long?

EXPERIMENT 7—SURFACE TENSION

TO SHOW: Tension on the surface of water. **NEEDED:** Open container, needle, water. **WHAT TO DO:** Fill the container, a small bowl will do, ½ full of clear water. Take a clean sewing needle after you have washed and thoroughly dried your fingers and carefully place it on the surface of the water. It should float. This is because the attraction downward and sidewards on the molecules of the surface creates an elastic surface. If you look carefully you can see how the surface bends under the weight of the needle.

EXPERIMENT 8—WEAKENING THE SURFACE TENSION

TO SHOW: How surface tension is weakened by oil. **NEEDED:** Open container, clean rubber band, water, oil. **WHAT TO DO:** Place the rubber band on the surface taking the precautions you did in Experiment 7. The rubber band should float having its normal oval shape. Now wet the end

EXPERIMENT 8—WEAKENING THE SURFACE TENSION—(cont.)

of a toothpick with a lubricating oil or mineral oil and touch the surface of the water inside the rubber band. Repeat if necessary. You will see the band take a circular shape. This is because the presence of the oil weakens the surface tension of the water inside the band, whereas outside it is unaffected. The stronger tension outside serves to pull the rubber band equally in all directions so that it assumes the circular shape.

EXPERIMENT 9

Make a solution of soapy water and try to float a razor blade or needle on the surface.

EXPERIMENT 10

Put a drop or two of oil on the surface of clean water and try to float the razor blade or needle.

NOTE: Whenever Litmus Paper is referred to in an experiment, only a very small piece (¼" x ¼") is required.