

Name _____ period _____ date _____

Lab #1

Bunsen Burner and Glass Bending

Materials:	Glass rod, file, Bunsen burner set-up, striker
Chemicals:	SiO ₂

CAUTION: HOT GLASS HAS THE SAME APPEARANCE AS UNHEATED GLASS!

PROCEDURES:

LIGHTING THE BUNSEN BURNER:

Natural gas enters the burner near the base, rises through a barrel, mixes with air and burns. By making proper adjustments, the most efficient flame can be obtained.

1. Be sure the hose is securely fastened to both the burner and the gas outlet. Place the base flat on the surface of the lab table.
 2. Hold a striker at the edge of the burner and turn the gas on.
 3. Adjust the flow of gas from the bottom valve of the burner.
 4. The color of the flame indicates the amount of air in the gas. A yellow flame indicates the need for more air while a noisy/jumpy flame indicates too much air. The air supply is controlled by turning the barrel (neck) of the burner. Adjust the flame until there is a blue flame with an inner cone. (see diagram)
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5. Turn off the burner until it is needed during fire polishing and glass bending.

CUTTING TUBING: Your teacher will first demonstrate this procedure.

Measure a 30cm piece of glass tubing from one end and cut it at that measurement by using the following technique:

1. Make a deep scratch at a right angle to the tubing by pushing the edge of a triangular file away from your body. **DO NOT** saw the glass. A single scratch should be sufficient. Use a firm, steady stroke.
2. Grasp the tubing with both hands, with the thumbs meeting on the tubing opposite the scratch.
3. Break it by pushing outward with your thumbs.

FIRE POLISHING: The method of smoothing the sharp edges is called fire-polishing. The edges of the cut tubing are very sharp! They must be smoothed out before being used.

1. Hold the end of the tubing in the burner flame and roll the glass in your fingers. Rolling the tubing while heating gives the glass a uniform temperature. As the flame above the tubing yellows, the glass softens and sharp edges become round.
2. Cool on asbestos pad, **NOT ON THE LABORATORY TABLE!**
3. After the first end of the tubing cools, repeat the above procedure to fire-polish the second end.

BENDING TUBING:

1. Place a wing top on the barrel of the burner to spread the flame. This gives a more uniform heat over a larger area. An uneven flame heats the glass unevenly and produces a poor bend.
2. Hold the glass rod with both hands over the wing top flame so that the middle of the tubing will be heated.
3. Rotate the glass in the flame continuously so that the heating is uniform. When the flame above the tubing becomes an intense yellow, the glass will be soft enough to bend easily.
4. Bend it to make a smooth 45-90° angle.
REMEMBER: HOT GLASS LOOKS LIKE COLD GLASS. Glass tubing must be dry or it will crack.

POST-LAB QUESTIONS AND CONCLUSION:

Separate sheet of paper and complete sentences

1. Explain the characteristics of the most efficient flame for lab experiments.
2. What is the purpose of the needle valve at the base of the burner? What is the purpose of the barrel? How does the flame change when each of these burner parts are independently adjusted?
3. Where is the hottest part of the blue flame? (use an illustration if needed)
4. What does a cool flame indicate? What does a noisy flame suggest?
5. When did you know that the glass tubing was ready to bend?
6. What was the most difficult part of the glass cutting and bending portion of the lab?