LABORATORY SAFETY AND PROCEDURES

Proper Dress

1. Safety goggles and aprons should be worn properly at ALL times in the lab. Failure to wear goggles or aprons properly will result in detention.
2. Tie back long hair, remove any dangling jewelry, and secure long sleeves.
3. Closed-toed shoes must be worn during labs. Students who do not wear closed-toed shoes on lab day have the same make-up options that students who are absent from the lab have available. See #13 under General Rules.

General Rules

1. Perform only those lab activities assigned as outlined in the lab handouts.
2. Read all lab directions before coming into the lab and then read them again before doing each part of an experiment.
3. Work expeditiously (*characterized by promptness*). Many labs take the entire period to finish, even when you are working quickly. If you do not complete the lab, you must come after school to finish the work.
4. Do not talk unnecessarily in the lab. Chemistry lab is not a social event. Down time while waiting for specific lab processes to complete does not mean you have a break from chemistry.
5. Do not walk around the room except to get chemicals or as instructed by your teacher. NEVER run or throw items in the lab.
6. Never sit on countertops.
7. No horseplay.
8. Wash your hands before and after the lab.
9. Never eat, drink, or chew gum in the lab. You will swallow noxious fumes if you do so. In fact, you are not allowed to eat or drink anything other than water in class.
10. Know the location of the fire extinguisher, fire blanket, emergency shower, and eyewash station.
11. Be prepared for lab. If you have not completed the pre-lab assignments, you will not participate in the lab. You will then be required to make up the assignment just like absent students and students who do not wear closed-toed shoes. See #13 below.
12. While lab activities and experiments are conducted in small groups, lab assignments are graded individually and each student is required to complete the written work, including data collection, individually. You may not have your lab partner take all the data and plan to get it later. You both write down pertinent information DURING the lab and complete all written work AFTER the lab.
13. If you are absent on the day of the lab, you have three options for making up the lab assignment.
    a. The lab can be made up after school, within one week of the actual lab date. Please check with your teacher to determine availability and to schedule a lab make-up. The teacher is only available on certain days after school, and you will not be able to just show up and make up the lab without advance notice. **After one week, the lab set-up will not be available.**
    b. For many labs, the lab calculations, analysis, and conclusion can be completed with sample data provided by the teacher. While this option allows students to complete certain steps of the lab using actual data, it does not give students the actual laboratory experience.
    c. An alternate assignment can be completed to earn credit for the lab. The alternate assignment will be related to the lab topic but is not designed recreate the laboratory experience for students. The alternate assignment will also be given to students who do not make up the lab within the appropriate time frame.

Working with Glassware

1. Use only clean glassware.
2. Use each piece of glassware only for its intended purpose.
    a. Beakers – mixing, transporting, and reacting chemicals; retrieving *approximate* amounts of chemicals but not measuring amounts accurately; heating solutions

b. Graduated cylinders – measuring liquid volumes precisely; not for heating
c. Erlenmeyer flask – mixing, transporting, and reacting chemicals but not for accurate measurements
d. Volumetric flask – used to make up a solution of precise concentration very accurately
e. Test tubes – for heating and mixing chemicals

3. Do not use chipped or cracked glassware. Tell your teacher and place in the broken glass box, NOT in the trash can!

Working with Fire

1. Never look into a container being heated.
2. Never point the mouth of a test tube towards another person.
3. Never leave anything unattended while it is being heated. **Do not leave a lighted burner unattended.**
4. Use the correct instruments in the fire to hold the substance or glassware being heated.
   a. Only test tube tongs are used to hold a test tube being heated in the Bunsen burner. When the test tube is not being heated, you may choose to hold test tube by hand.
   b. Crucible tongs are used to hold small items in the flame, not beaker tongs which have rubber coatings.
   c. Beakers should NOT be held in the flame but rest upon wire gauze on a ring stand with the burner placed underneath.
5. Do not play with matches or strikers. Light the burner, leave it lit for the entire lab or until you are finished using it. Do not light the burner, turn it off, re-light it, and turn it off again, *etc.* Only burn items you are instructed to burn.

Working with Chemicals

1. Never taste or touch a chemical, unless specifically told to do so.
2. Read and double-check all chemical labels before using.
3. Retrieve chemicals and solutions from chemical bottles and reagent bottles as instructed by teacher (usually on a cart near the fume hood, in the fume hood, or from the teacher lab station), being careful to never contaminate the chemicals and solutions that the whole class will be using. **Students are NEVER to enter the chemical stockroom** (chemical preparation and storage area).
4. Use the correct spatula that is sitting next to chemicals to retrieve that substance and place in weigh boat or in a small beaker from your lab station.
5. Know how much of a certain chemical you need before retrieving that chemical. For liquids and solutions, always bring a beaker from your lab station. Approximate how much you will need for the entire lab, so you do not have to keep coming back.
6. **Keep the chemicals area clean**.
7. To avoid contamination, do not return unused portions of reagents to the stock bottle.
8. When using the labeled pipettes, be careful not to contaminate the tips. Use toothpicks or a stirring rod to stir, not the tip of a pipette.
9. Use a fume hood when instructed to avoid dangerous and unpleasant fumes.
10. Do not inhale vapors directly. **Use a wafting motion to direct odors towards your nose if you are instructed to note the odor**. Wafting involves gently waving your hand over the open container so that the vapors reach your nose.
11. Do not touch your mouth or eyes when in the lab.

Working with Balances

1. Balances can be very expensive, and the electronic balances must be calibrated regularly. Never move balances; leave them where they are positioned.
2. Never place anything hot on the balance. The convection currents will interfere with the weighing process.

3. Use containers to hold chemicals on the balance; do not weigh chemicals directly. Weigh the container or ***tare*** the balance. Taring involves pressing the tare or "zero" button when the container is on the balance and then adding the chemicals to get their mass.

Waste Disposal

1. Broken glass is to be placed in the "Broken Glass" box, NEVER the trash can.
2. **Solids, such as litmus paper, wood splints, metals, insoluble solids, and paper towels are to be placed in the trash can, NOT in the sink!**
3. Place used matches in the metal waste can provided until they have cooled. Once cool, they may be transferred to the trash can.
4. Liquid reagents may be poured down the sink as long as you run the sink for a few moments afterwards.
5. You will be instructed when you may not wash a solution down the sink, as in the case of a solution containing heavy metals.

Concluding the Lab

1. All glassware used must be washed thoroughly with soap and rinsed very well. It does not have to be dried.
2. Lab surfaces must be free of debris and spills. Rinsed all surfaces with a wet paper towel or sponge. They do not need to be dried.
3. Failure to clean up the lab thoroughly will result in a 5-point deduction in the lab. Be sure that all glassware is clean, check to see that no trash is in the sink, and make sure your lab table is organized and clean.

In Case of Accident

1. Tell the teacher immediately, no matter how minor, when an accident occurs.
2. If you receive a minor burn, run cool water over the skin and send another student to tell the teacher. Do not apply analgesics or creams. You may want to take an analgesic later if you have any pain. Call your doctor if the pain is more than slightly uncomfortable.
3. **If you get an acid spill on your skin, immediately flush with water and send another student to tell the teacher. Flush with water for five minutes. Then, put a small amount of baking soda (sodium bicarbonate) on the skin to neutralize the acid.**
4. If you have a base spill on your skin, again flush with water for five minutes and apply vinegar.
5. If you are coughing or having difficulty breathing, tell teacher so you may step into the hallway.
6. If you get chemicals in the eye, immediately go to the eye wash and flush your eyes for 10 – 15 minutes. Send another student to tell the teacher. You will see the nurse.
7. If your hair or clothes catch on fire, use either the emergency shower or fire blanket immediately while another student tells the teacher. If you are not close to these emergency stations, immediately drop and roll. The person closest to the student should bring the fire blanket.

Accidents do not often happen in a well-equipped lab with well-prepared, focused, and alert students.