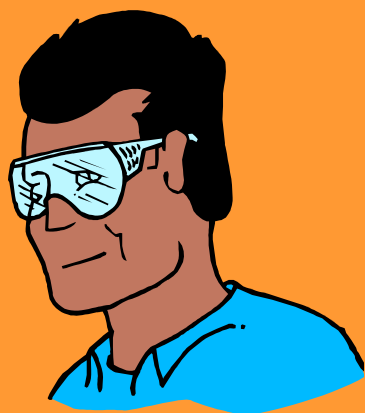


Lab Safety

Section 2L

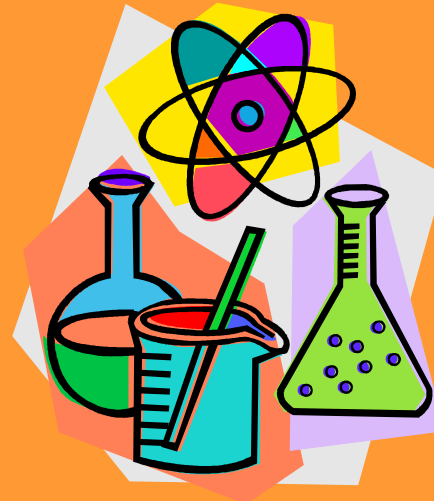


Chemistry I & II



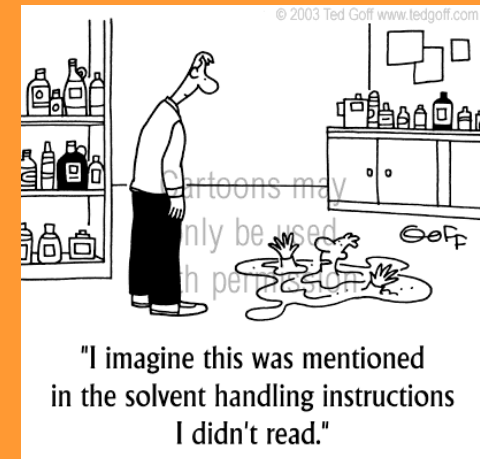
Lab Safety Topics

- General Rules
- Clothing
- Accidents and Injuries
- Handling Chemicals
- Handling Glassware and Equipment
- Heating Substances
- First Aid



General Rules

1. Conduct yourself in a responsible manner at ALL TIMES!
2. Follow all written and verbal instructions carefully.
 - a. If you do not understand a direction, ASK BEFORE PROCEEDING!
3. Never work alone.



General Rules

4. Do not touch any chemicals or equipment unless instructed to do so.



5. Do not eat food, drink beverages, or chew gum in the lab.

a. Do not use laboratory glassware as containers for food or beverages.



General Rules

6. Perform only those experiments authorized by the instructor.
 1. Unauthorized experiments are prohibited!
7. Be prepared for your work in the laboratory.
 1. Read the procedure **BEFORE** coming to class.
8. Never joke around in the lab
 1. This can be very **DANGEROUS!**



General Rules

9. Observe good housekeeping practices
 - a. Work areas should be kept clean and tidy at all times.
 - b. Bring only required material to the lab station
 1. Lab Notebook
 2. Pen/Pencil
 3. Calculator
10. Keep aisles clear. Push your chair under your desk.

General Rules

11. Know the locations and operating procedures of all safety equipment
 - a. First Aid Kit
 - b. Eye wash stations
 - c. Safety shower
 - d. Fire extinguisher
 - e. Fire blanket
 - f. Fire alarm
 - g. Emergency shut off buttons (gas/electricity)
 - h. Exits

General Rules

12. Always work in a well-ventilated area

- a. Use the fume hood if needed – never place your head into the fume hood.

13. Be alert and proceed with caution at ALL TIMES.



General Rules

14. Dispose of all chemical waste properly.
- a. Never mix chemicals in sink drains.
 - b. Solid chemicals, metals, matches, filter paper, and other insoluble materials are to be disposed of in the proper waste containers.
 1. Check the label of all waste containers twice!



General Rules

15. Labels and equipment instructions should be read carefully before use.
16. Experiments must be personally monitored at all times.
 - a. You should remain at your lab station, with your specified lab group, at ALL TIMES.
 - b. No wandering around the room or distracting other students.

General Rules

17. Keep hands away from face, eyes, mouth, and body while using chemicals.
- Wash your hands with soap and water after all experiments – **HAND SANITIZER IS NOT A SUBSTITUTE!**
 - Clean all work surfaces/equipment at the end of the experiment.
 - Return all equipment/containers to their designated location.



General Rules



18. Students are NEVER permitted in the storage room unless instructed by the teacher.
19. Know what to do if there is a fire drill.
 - a. Containers must be closed
 - b. Gas valves turned off
 - c. Fume hoods turned off
 - d. Electrical equipment turned off

General Rules

21. When using sharp instruments or glass, always carry with the sharp end pointing down and away.
 - a. Never try to catch falling sharp instruments
 - b. Grasp instruments only by the handles.
22. If you have a medical condition, check with your physician prior to working in the lab.
 - a. Allergies
 - b. pregnancy



Clothing



1. Any time chemicals, heat, or glassware are used, goggles must be worn.
 - a. There will be NO EXCEPTIONS to this rule!
2. Contact lenses should not be worn in the lab without permission from teacher.
3. Gloves should be worn during designated lab experiments.
 - a. Nitrile (non-latex) and powder free

Clothing

4. Dress properly during all lab experiments.
 - a. Long hair must be tied back
 - b. No dangling jewelry
 - c. No loose or baggy clothing
 - d. Shoes must cover the foot –
**NO SANDALS/FLIP-FLOPS
PERMITTED!**



Accidents and Injuries

1. Report any accident (spill, breakage, etc.) or injury (cut, burn, etc.) to the instructor immediately!
2. If a chemical splashes in your eye(s) or on your skin, immediately flush with running water from the eye wash station or safety shower for at least 20 minutes.



Handling Chemicals



1. All chemicals in the lab are to be considered dangerous.
 - a. Do not touch, taste, or smell any chemicals unless directed to do so by the teacher.
 - b. Wafting - proper way to smell any chemical.
2. Check the labels on all chemical bottles twice before removing any contents.
 - a. Take only as much chemical as you need.

Handling Chemicals



3. Never return unused chemicals to their original containers.
4. Never use mouth suction to fill a pipet.
 - a. Use a rubber bulb
5. When transferring reagents from one container to another, hold the containers away from your body.

Handling Chemicals

6. Acids must be handled with extreme care.

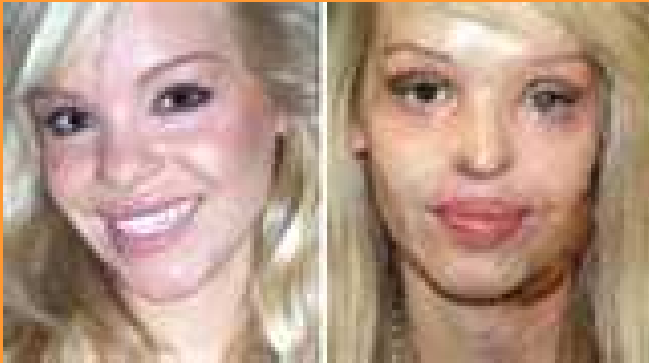
a. ALWAYS ADD ACID to water to dilute an acid

Handle flammable hazardous liquids over a pan to contain spills

a. Do not use near an open flame or source of heat

b. NEXT SLIDE HAS GRAPHIC IMAGES!

Chemical Burns



Handling Chemicals

8. Never remove chemicals or other materials from the lab.
9. Take great care when transporting acids and other chemicals from one part of the lab to another.
 - a. Hold them securely and walk carefully

Handling Glassware & Equipment

1. Carry glass tubing, especially long pieces, in vertical position to minimize the likelihood of breakage and injury.
2. Never handle broken glass with your bare hands.
 - a. Use a brush and a dustpan to clean up broken glass.



Handling Glassware & Equipment



3. Inserting and removing glass tubing from rubber stoppers can be dangerous
 - a. **ABSOLUTELY DO NOT TRY TO DO THIS!**
4. Fill wash bottles only with **DISTILLED WATER** and use only as intended.
5. When removing an electrical plug from its socket, grasp the plug, not the electrical cord.
 - a. Hands must be dry!

Handling Glassware & Equipment

6. Examine glassware before each use.
 - a. Never use chipped or cracked glassware.
 - b. Never use dirty glassware.
7. Report damaged equipment immediately.
8. If you do not understand how to use a piece of equipment, **ASK FIRST!**
9. Do not immerse hot glassware in cold water – **IT MAY SHATTER!**

Heating Substances



1. Exercise extreme caution when using a gas (bunsen) burner.
 - a. Take care that hair, clothing, and hands are a safe distance from the flame at all times.
 - b. Do not put any substance into the flame unless specifically instructed to do so.
 - c. Never reach over an exposed flame.
 - d. Light the burner as instructed.

Heating Substances

2. Never leave a lit burner or anything being heated unattended.
 - a. Always turn the burner or hot plate off when not in use.
3. Do not point the open end of a test tube being heated at yourself or anyone else.
 - a. Move the test tube around slowly to distribute the heat evenly
4. Heated metals and glass remain heated for a very long time.
 - a. They should be set aside to cool
 - b. Use tongs or heat-protective gloves to move

Heating Substances

5. Never look into a container that is being heated.
6. Do not place hot apparatus directly on the lab desk or into water.
 - a. Always use an insulating pad
 - b. Allow plenty of time for hot apparatus to cool before touching it.

First Aid

Injury: Burns

What to do:

- Immediately flush with cool water until the burning sensation is lessened.
- See Nurse

First Aid

Injury: Cuts

What to do:

- Do not touch an open wound without safety gloves.
- Allow the cut to bleed for a few seconds.
- Press directly on minor cuts to stop bleeding
- See Nurse

First Aid

Injury: Eyes

What to do:

- Flush eyes immediately with plenty of water for 15 to 20 minutes (eye wash station)
- If a foreign object is lodge in the eye, do not rub the eye.
- See Nurse

First Aid

Injury: Poisoning

What to do:

- Find out what substance was responsible for the poisoning and alert the teacher immediately.
- See Nurse
- Call Poison Control

First Aid

Injury: Spills on the skin

What to do:

- Flush with large quantities of water
- For serious acid spills, rinse with baking soda solution
- For serious base spills, rinse with vinegar.
- See Nurse

First Aid

- Injury: Electrical Shock
- What to do:
 - Shut off the electrical current at the source (emergency stop button)
 - See Nurse
 - Call 911

What's Wrong?



What's Wrong?



What's Wrong?



What's Wrong?



What's Wrong?



What's Wrong?



What's Wrong?

