




CHEMISTRY

# LABORATORY SAFETY



# Learning Targets

- To ensure a safe science classroom
  - To explain the lab safety rules
  - To explain the lab safety equipment locations and uses
  - To know fire drill procedures
- 

# General Guidelines

- Conduct yourself in a responsible manner at all times.



# General Guidelines

- Follow all written and verbal instructions carefully. If you do not understand a direction or part of a procedure, ask your instructor before proceeding.



# General Guidelines

- Never work alone. No student may work in the laboratory without an instructor present.



# General Guidelines

- When first entering a science room, do not touch any equipment, chemicals, or other materials in the laboratory area until you are instructed to do so.



# General Guidelines

- Do not eat food, drink beverages, or chew gum in the laboratory. Do not use laboratory glassware as containers for food beverages.



# General Guidelines

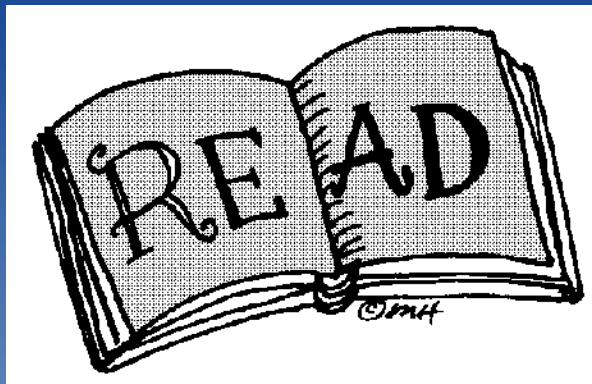
- Perform only those experiments authorized by the instructor. Never do anything in the laboratory that is not called for in the laboratory procedures or by your instructor. Carefully follow all instructions, both written and oral. Unauthorized experiments are prohibited.





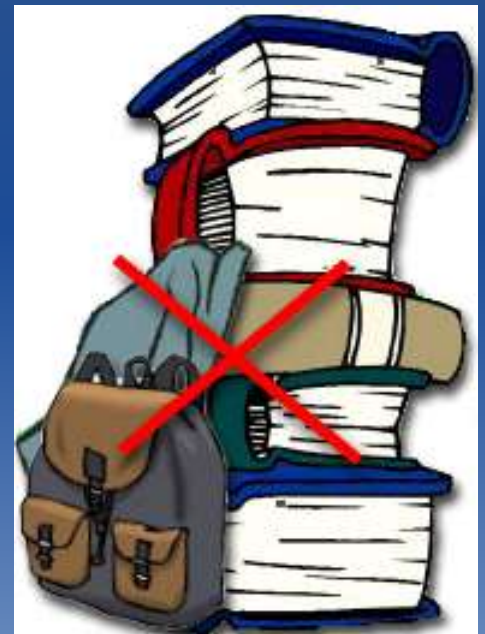
# General Guidelines

- Be prepared for your work in the laboratory. Read all procedures thoroughly before entering the laboratory. Never fool around in the laboratory. Horseplay, practical jokes, and pranks are dangerous and prohibited.



# General Guidelines

- Observe good housekeeping practices. Work areas should be kept clean and tidy at all times. Bring only your laboratory instructions, worksheets, and/or reports to the work area. Other materials (books, backpacks, purses, etc.) should be stored in the classroom area.



# General Guidelines

- Keep aisles clear. Push your chair under the desk when not in use.



# General Guidelines

- Know the locations and operating procedures of all safety equipment including the first aid kit, eyewash station, safety shower, fire extinguisher, and fire blanket. Know where the fire alarm and the exits are located.

<http://www.youtube.com/watch?v=Xx1ZX6UgtgQ&feature=related>

# General Guidelines

- Always work in a well-ventilated area. Use the fume hood when working with volatile substances or poisonous vapors. Never place your head into the fume hood.




# General Guidelines

- Be alert and proceed with caution at all times in the laboratory. Notify the instructor immediately of any unsafe conditions you observe.





# General Guidelines

- Dispose of all chemical waste properly. Never mix chemicals in sink drains. Sinks are to be used only for water and those solutions designated by the instructor. Solid chemicals, metals, matches, filter paper, and all other insoluble materials are to be disposed of in the proper waste containers, not in the sink. Check the label of all waste containers twice before adding your chemical waste to the container.
- 

# General Guidelines

- Labels and equipment instructions must be read carefully before use. Set up and use the prescribed apparatus as directed in the laboratory instructions or by your instructor.







# General Guidelines

- Keep hands away from face, eyes, mouth and body while using chemicals or preserved specimens. Wash your hands with soap and water after performing all experiments. Clean (with detergent), rinse, and wipe dry all work surfaces (including the sink) and apparatus at the end of the experiment. Return all equipment clean and in working order to the proper storage area.

# General Guidelines

- Experiments must be personally monitored at all times. You will be assigned a laboratory station at which to work. Do not wander around the room, distract other students, or interfere with the laboratory experiments of others.



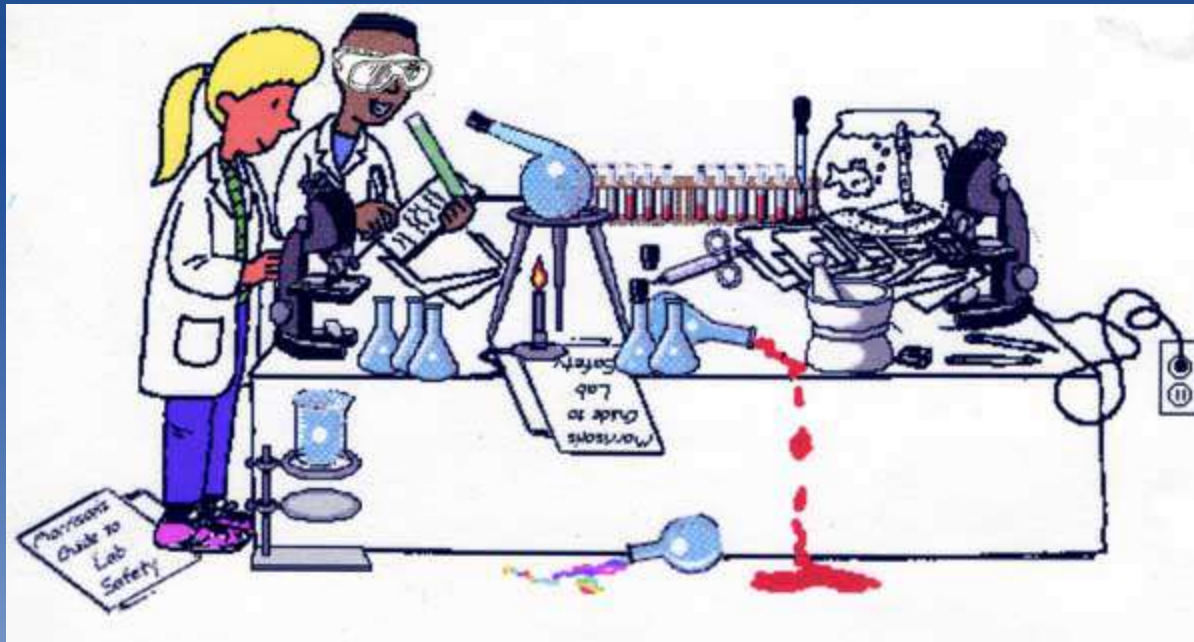
# General Guidelines

- Students are never permitted in the science storage rooms or preparation areas unless given specific permission by their instructor.



# General Guidelines

- Know what to do if there is a fire drill during a laboratory period; containers must be closed, gas valves turned off, fume hoods turned off, and any electrical equipment turned off.



# General Guidelines

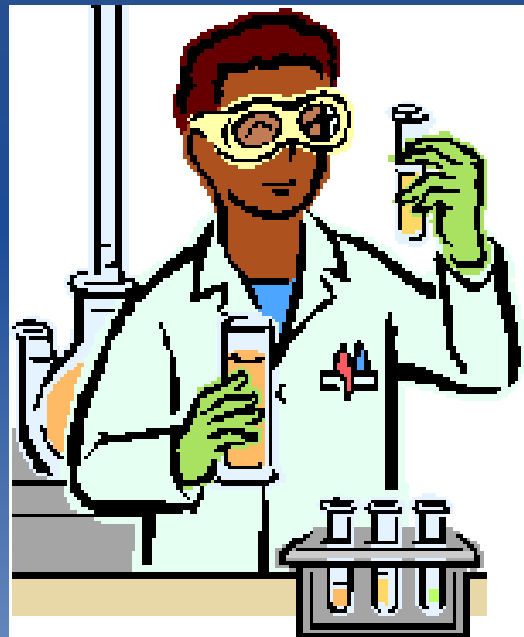
- When using knives and other sharp instruments, always carry with tips and points pointing down and away. Always cut away from your body. Never try to catch falling sharp instruments. Grasp sharp instruments only by the handles.



# Clothing



- Any time chemicals, heat or glassware are used, students will wear laboratory goggles. There will be no exceptions to this rule!



# Clothing

- Contact lenses should not be worn in the laboratory unless you have permission from your instructor.



# Clothing

- Dress properly during a laboratory activity. Long hair, dangling jewelry, and loose or baggy clothing are a hazard in the laboratory. Long hair must be tied back and dangling jewelry and loose or baggy clothing must be secured. Shoes must completely cover the foot. No sandals allowed.



Protective gear has to be comfortable.





# Clothing

- Lab aprons have been provided for your use and should be worn during laboratory activities.



# Accidents and Injuries

- Report any accident (spill, breakage, etc.) or injury (cut, burn, etc.) to the instructor immediately, no matter how trivial it may appear.



# Accidents and Injuries



- If you or your lab partner are hurt, immediately yell out to the instructor until you have their attention.

# Accidents and Injuries

- If a chemical should splash in your eye(s) or on your skin, immediately flush with running water from the eyewash station or safety shower for at least 20 minutes. Notify the instructor immediately.



<http://www.youtube.com/watch?v=ToTPrLh5Kvc&feature=related>

# Accidents and Injuries

- When mercury thermometers are broken, mercury must not be touched. Notify the instructor immediately.

# Handling Chemicals

- All chemicals in the laboratory are to be considered dangerous. Do not touch, taste, or smell any chemicals unless specifically instructed to do so. The proper technique for smelling chemical fumes will be demonstrated to you.



# Handling Chemicals

- Check the label on chemical bottles twice before removing any of the contents. Take only as much chemical as you need.



# Handling Chemicals

- Never return unused chemical to their original container.





# Handling Chemicals

- Never use mouth suction to fill a pipet or other object. Use a rubber bulb or pipet pump on pipets.





# Handling Chemicals

- When transferring reagents from one container to another, hold the containers away from your body.



# Handling Chemicals

- Acids must be handled with extreme care. You will be shown the proper method for diluting strong acids. Always add acid to water, swirl or stir the solution and be careful of the heat produced, particularly with sulfuric acid.

# Handling Chemicals

- Handle flammable hazardous liquids over a pan to contain spills. Never dispense flammable liquids anywhere near an open flame or source of heat.



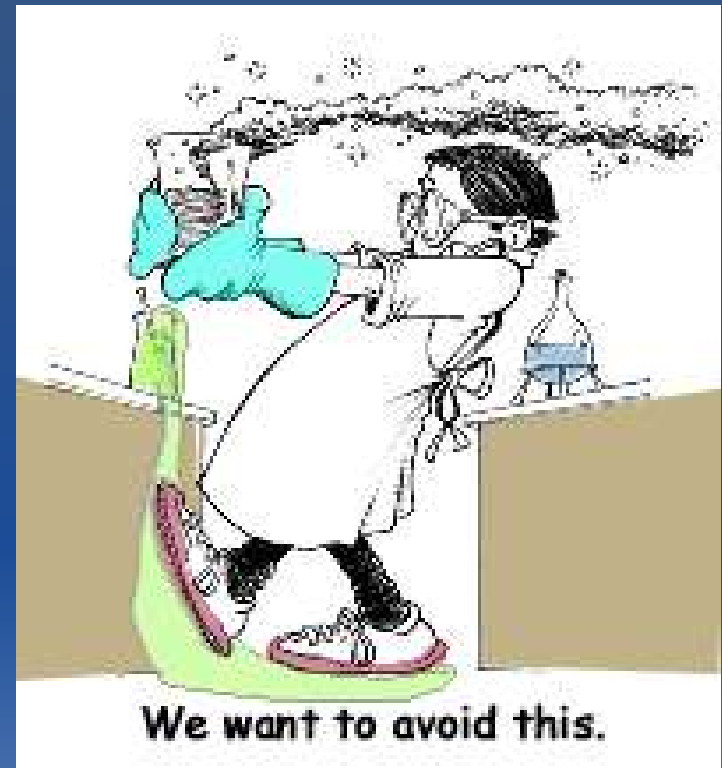
# Handling Chemicals

- Never remove chemicals or other materials from the laboratory area.




# Handling Chemicals

- Take great care when transferring acids and other chemicals from one part of the laboratory to another. Hold them securely and walk carefully.





# Handling Glassware & Equipment

- Carry glass tubing, especially long pieces, in a vertical position to minimize the likelihood of breakage and injury.
- 

# Handling Glassware & Equipment

- Never handle broken glass with your bare hands. Use a brush and dustpan to clean up broken glass. Place broken or waste glassware in the designated glass disposal container.





# Handling Glassware & Equipment

- Inserting and removing glass tubing from rubber stoppers can be dangerous. Always lubricate glassware (tubing, thistle tubes, thermometers, etc.) before attempting to insert it in a stopper. Always protect your hands with towels or cotton gloves when inserting glass tubing into, or removing it from, a rubber stopper. If a piece of glassware becomes “frozen” in a stopper, take it to your instructor for removal.

# Handling Glassware & Equipment

- Fill wash bottles only with distilled water and use only as intended, e.g., rinsing glassware and equipment, or adding water to a container.



# Handling Glassware & Equipment

- When removing an electrical plug from its socket, grasp the plug, not the electrical cord. Hands must be completely dry before touching an electrical switch, plug, or outlet.



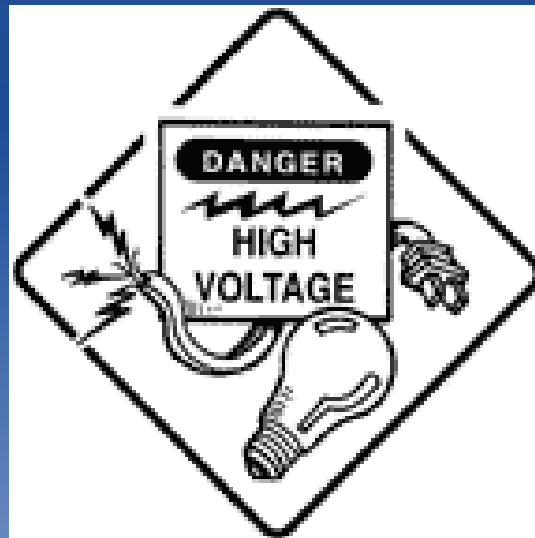
# Handling Glassware & Equipment

- Examine glassware before each use. Never use chipped or cracked glassware. Never use dirty glassware.



# Handling Glassware & Equipment

- Report damaged electrical equipment immediately. Look for things such as frayed cords, exposed wires, and loose connections. Do not use damaged electrical equipment.



# Handling Glassware & Equipment

- If you do not understand how to use a piece of equipment, ask the instructor for help.



**HELP  
WANTED**



# Handling Glassware & Equipment

- Do not immerse hot glassware in cold water; it may shatter.



# Heating Substances

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



# Heating Substances

- Never leave a lit burner unattended. Never leave anything that is being heated or is visibly reacting unattended. Always turn the burner or hot plate off when not in use.



# Heating Substances

- You will be instructed in the proper method of heating and boiling liquids in test tubes. Do not point the open end of a test tube being heated at yourself or anyone else.





# Heating Substances

- Heated metals and glass remain very hot for a long time. They should be set aside to cool and picked up with caution. Use tongs or heat-protective gloves if necessary.

# Heating Substances

- Never look into a container that is being heated.





# Heating Substances

- Do not place hot apparatus directly on the laboratory desk. Always use an insulating pad. Allow plenty of time for hot apparatus to cool before touching it.




# Heating Substances

- When bending glass, allow time for the glass to cool before further handling. Hot and cold glass have the same visual appearance. Determine if an object is hot by bringing the back of your hand close to it prior to grasping it.



# Homework

- Have your lab safety contract signed by both you and your parent/guardian.
  - Return signed safety contract to me.
  - Due: Tuesday – 9/2/2008
- 



# Learning Targets

- To understand how to get an “A” in chemistry class



# KEYS TO SUCCESS IN CHEMISTRY

- STUDY REGULARLY AND OFTEN
  - disciplined study habits
  - do not “cram”
  - review on a daily basis
  - do not become complacent



# KEYS TO SUCCESS IN CHEMISTRY

- USE THE LEARNING TARGETS
  - be sure “you can” complete *all* learning targets
  - exams/quizzes are always based on learning targets
  - make your learning more efficient & focused



# KEYS TO SUCCESS IN CHEMISTRY

- LEARN THE “LANGUAGE” OF CHEMISTRY

- keep up with the key terms
- ask if you don't understand
- chemical formulas and math equations are also part of the “language”



# KEYS TO SUCCESS IN CHEMISTRY

- READ THE TEXT
  - enhance your comprehension
  - write down questions & ask in class



# KEYS TO SUCCESS IN CHEMISTRY

- DO THE HOMEWORK
  - chemistry is not a spectator sport
  - work ALL assigned problems
  - practice additional problems



# KEYS TO SUCCESS IN CHEMISTRY

- WORKING PROBLEMS
  - do not memorize problems
  - understand how to develop a solution



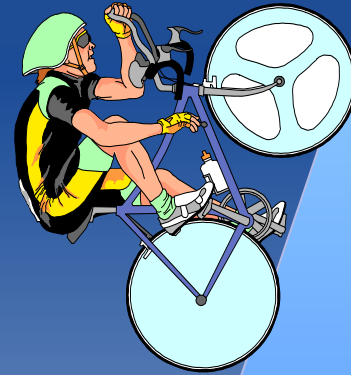
# KEYS TO SUCCESS IN CHEMISTRY

- GET HELP EARLY
  - review day is too late
  - chemistry is cumulative knowledge
  - build a strong foundation



# Learning at too steep of a pace

A more gradual approach gets farther



Too steep of a pace



# Learning at too steep of a pace

- If learning is done in a step by step fashion, it is easy.



# Learning at too steep of a pace

- If steps are skipped, then there is a complaint that a certain step is too difficult.

?#@!!



# Learning at too steep of a pace

How do you get past this barrier?

Return to the step you were doing well and then proceed by making sure you do each step.

