Name _____ date _____ period _____

Laboratory Safety and Equipment

You will perform a variety of activities to help you become familiar with working in the lab. This assignment should be kept in your lab notebook permanently after it is graded and returned to you. Please turn in the agreement page with student and parent signatures.

Activity 1
Draw a map of the lab room and label the location of the following items.

1. Broken glass receptacles
2. Chemical Hygiene Plan
3. Emergency phone numbers
4. Exit route
5. Eye wash
6. Fire blanket
7. Fire extinguisher
8. First aid kit
9. Gloves
10. Garbage Cans
11. Lab coats
12. MSDS sheets
13. Safety goggle cabinet
14. Safety shower
15. Sharps containers
16. Sinks
17. Spill kit
18. Standard operating procedures
19. Telephone
20. Towels

Activity 2 Read the safety contract and answer the following questions

_____ 1. You and your lab partner are using dull razors to cut rubber tubing. The razor slips and gives your lab partner a small cut, but there is not much bleeding. You should:

a. Rinse the cut with soap and water
b. Blow on the cut to get bleeding to stop faster
c. Tell your teacher before you do anything
d. Get a Band-Aid from the first aid box

_____ 2. You are working with four mystery liquids. They are all clear and you know that one of the liquids is water. While moving the test tubes from one counter to another a small amount of one of the liquids gets splashed on your skin. It does not itch or burn. You should:

a. Wipe the liquid off your skin with a wet towel
b. Tell your lab partner to be more careful than you
c. Wipe the liquid off your skin with a dry towel
d. Tell your teacher before you do anything

a. _____ 3.

_____ 4. You are working with an open flame during a class lab. You notice that the group of students next to you is taking turns lighting things (paper, hair, and trash) on fire while the teacher is not looking. You should:

a. Quietly sneak away to tell your teacher
b. Ignore them. You know that they are like this in every class
c. Join in the fun! It's wicked cool to see stuff on fire
d. LOL. Those guys are SOOOO funny

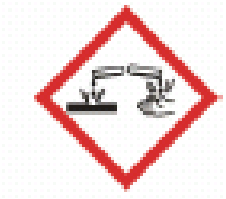
Activity 3

Match the following safety symbols with the correct safety warning (some warnings may be used more than once).

1. _____ Biohazard
2. _____ Compressed gas
3. _____ Corrosive
4. _____ Environmental hazard
5. _____ Explosive
6. _____ Flammable
7. _____ General (low level) hazard
8. _____ Gloves required
9. _____ Health hazard
10. _____ Oxidizer
11. _____ Poison
12. _____ Radioactive
13. _____ Reactivity
14. _____ Severe chronic hazard
15. _____ Special notice

A. 

B. 

C. 

D. 

E. 

F. 

G. 

H. 

I. 

J.  (yellow)

K.  (white)

L.  (red)

M.  (blue)

N. 

O. 

P. 

LABORATORY SAFETY

Fire and Emergency- Know the locations of the following:
Telephone in room 408
Fire and Emergency: **9-911**
Other important numbers**:**
GTI Office 385-646-4350 (9-4350)
Biomanufacturing Office 385-646-4341
Jelena Jensen ext 7032
Kevin Hanly ext _____
Vivian Ngan-Winward ext 7031
Granite District Compliance Officer Scott Winn 801-646-4272

Fire Extinguishers in room 408 are Type ABC
Type A - For wood, paper, etc.
Type B - Chemical
Type C - Electrical

Fire Alarm: Located next to _____

Deluge and eyewash showers are in each lab

First Aid Kit is by the main exit door

Injury, Illness, and Incident Reporting: Within 24 hours of an incident, an Incident Accident Report must be filled out. Obtain these from Kathy Roos in the GTI Office 385-646-4389.

Personal Protection
Know the safety precautions and disposal methods for each chemical used in lab.
Use common sense. Control your own exposures.
Ask any questions about Lab Safety before you act.

Chemical Hygiene Plan is available on the reference shelf of the Laboratory in Room 408. All Students should familiarize themselves with contents of the Plan. MSDS sheets are also located in the binder.

Standard Operating Procedures
See the appropriate procedures (SOPs) in the Chemical Hygiene Plan Notebook.

Common Safety Symbols


Flammable


Poison


Explosive


Radioactive


Corrosive


Compressed Gas

The above safety symbols may be replaced by the following symbols that are internationally accepted*:


Flammable

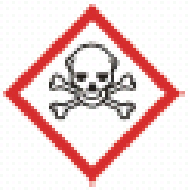

Oxidizer


Explosive


Low Level Hazard


Corrosive


Severe Chronic Hazard


Poison


Environmental Hazard

Globally Harmonized System of Classification and Labelling of Chemicals, United Nations New York and Geneva, 2005

National Fire Protection Association Hazard Labels

The National Fire Protection Association (NFPA) has developed a visual guide (right) for a number of chemicals pertinent to the MSDS. The ANSI/NFPA 704 Hazard Identification system, the NFPA diamond, is a quick visual review of the health hazard, flammability, reactivity, and special hazards a chemical may present.



The diamond is broken into four sections (blue, red, yellow, and white). The symbols and numbers in the four sections indicate the degree of hazard associated with a particular chemical or material.

Health Hazard (Blue)

4	Danger	May be fatal on short exposure. Specialized protective equipment required
3	Warning	Corrosive or toxic. Avoid skin contact or inhalation
2	Warning	May be harmful if inhaled or absorbed
1	Caution	May be irritating
0		No unusual hazard



Flammability (Red)

4	Danger	Flammable gas or extremely flammable liquid
3	Warning	Combustible liquid flash point below 100 °F
2	Caution	Combustible liquid flash point of 100° to 200 °F
1		Combustible if heated
0		Not combustible



Reactivity (Yellow)

4	Danger	Explosive material at room temperature
3	Danger	May be explosive if shocked, heated under confinement or mixed with water
2	Warning	Unstable or may react violently if mixed with water
1	Caution	May react if heated or mixed with water but not violently
0	Stable	Not reactive when mixed with water



Special Notice Key (White)

~~W~~	Water Reactive
OX	Oxidizing Agent



Student Safety Contract

PURPOSE

This is a hands-on laboratory class. You will be doing many laboratory activities which may require the use of hazardous chemicals or equipment. Safety is a priority for students, teachers, and parents. To ensure safety, a list of rules has been developed and provided to you in this student safety contract.
These rules must be followed at all times. Two copies of the contract are provided. One copy must be signed by both you and a parent or guardian before you can participate in the laboratory. The second copy should be turned in to your teacher. When it is returned to you, keep it in your science notebook as a reminder of the safety rules.

GENERAL RULES

1. Conduct yourself in a responsible manner at all times in the laboratory.

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

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

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

5. Do not eat food, drink beverages or chew gum in the laboratory. Do not use laboratory glassware as containers for food or beverages. Do not apply on cosmetics, lotion, etc in the lab.

6. 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.

7. Never fool around in the laboratory. Horseplay, practical jokes, and pranks are dangerous and prohibited.

8. 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, purses, backpacks, etc.) should be stored in the classroom.

9. Keep aisles clear. Push your stool under the counter when not in use.

10. Keep your lab bench organized and free of apparel, books, and other clutter.

11. 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.

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

13. 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 all work surfaces and apparatus at the end of the experiment. Return all equipment clean and in working order to the proper storage area.

14. 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.

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

16. 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.

27. Handle all living organisms used in a laboratory activity in a humane manner. Preserved biological materials are to be treated with respect and disposed of properly.

28. 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.

19. Wash hands thoroughly following experiments.

20. Leave laboratory bench clean and neat.

21. If you have a medical condition (e.g., allergies, pregnancy, etc.), check with your physician and inform your instructor prior to working in lab.

PREPARE FOR LABORATORY WORK

22. Read all procedures thoroughly <u>before</u> entering the laboratory. Complete any prelab assignments before beginning the experiment.

23. 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.

CLOTHING

24. Wear safety goggles during all laboratory sessions, especially when chemicals, heat, or glassware are used. There will be no exceptions to this rule!

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

26. 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.

27. Lab coats have been provided for your use and should be worn during laboratory activities. Lab aprons may also be required when working with acids or other chemicals.

28. Wear gloves when using chemicals that irritate or can be absorbed through skin.

ACCIDENTS AND INJURIES

29. If an accident or injury occurs, neighboring students should stay clear of the spill, break, or injury and make sure the instructor has been notified and assured the safety of everyone before continuing their own experiment.

30. Report all accidents (spill, breakage, etc.) or injuries (cut, burn, etc.) to the instructor immediately, no matter how trivial it may appear.

31. If you or your lab partner are hurt, immediately yell " _____ is hurt" to get your classmates and the instructor's attention.

32. If a chemical splashes 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. Do not remove contact lenses unless instructor or emergency personnel instruct you to do so.

33. Wash all acids and bases from your skin immediately with plenty of running water. Use the safety shower, and remove any clothing that has come in contact with the acid or base.

34. Mercury thermometers should not be used in the lab. If a mercury thermometer is broken, mercury must not be touched. Notify the instructor immediately.

HANDLING CHEMICALS

35. All chemicals in the laboratory are to be considered dangerous. Never touch, taste, or smell any chemicals unless specifically instructed to do so. The proper technique for smelling chemical fumes is called 'wafting' and will be demonstrated to you.

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

37. Never return unused chemicals to their original containers.

38. Never use mouth suction to fill a pipette. Use a rubber bulb or pipette pump.

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

40. Keep caps on reagent bottles. Never switch caps.

41. 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.

42. If a small amount of chemical spills or splashes on you, notify the instructor immediately, identify the chemical if possible, and rinse the area with water for 15 minutes.

43. 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.

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

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

46. Take great care when transporting acids and other chemicals from one part of the laboratory to another. Hold them securely and walk carefully. Use a secondary container when appropriate.

47. Consult teacher for proper disposal of chemicals. 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.

HANDLING GLASSWARE AND EQUIPMENT

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

49. Do not bend or cut glass unless appropriately instructed by teacher.

50. 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.

51. 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. Use glycerin and twist slowly at the base when inserting glass tubing through stoppers. 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.

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

53. 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.

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

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

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

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

HEATING SUBSTANCES

58. Keep combustibles away from open flames.

59. 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.

60. 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.

61. 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.

62. 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.

63. Never look into a container that is being heated.

64. 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.

65. When bending glass, allow time for the glass to cool before further handling.

66. Use caution when handling hot glassware. Hot and cold glass look the same! Determine if an object is hot by bringing the back of your hand close to it.

67. Turn off burners when not in use.

Other safety instructions regarding specific equipment or materials will be given as appropriate throughout the course. Reminders of the rules given in this contract that pertain to a particular activity will also be given prior to the activity.

Student Safety Contract Agreement
Due date _____

I, _____ , (student's name) have read and agree to follow all of the safety rules set forth in this contract. I realize that I must obey these rules to ensure my own safety, and that of my fellow students and instructors. I will cooperate to the fullest extent with my instructor and fellow students to maintain a safe lab environment. I will also closely follow the oral and written instructions provided by the instructor. I am aware that any violation of this safety contract that results in unsafe conduct in the laboratory or misbehavior on my part, may result in being removed from the laboratory, detention, receiving a failing grade, and/or dismissal from the course.

Student Signature _____ Date _____

Dear Parent or Guardian:

We feel that you should be informed regarding the school's effort to create and maintain a safe classroom/laboratory environment. With the cooperation of the instructors, parents, and students, a safety instruction program can eliminate, prevent, and correct possible hazards. You should be aware of the safety instructions your son/daughter will receive before engaging in any laboratory work. Please read the list of safety rules above. No student will be permitted to perform laboratory activities unless this contract is signed by both the student and parent/guardian and is on file with the teacher. Your signature on this contract indicates that you have read this Student Safety Contract, are aware of the measures taken to ensure the safety of your son/daughter in the laboratory, and will instruct your son/ daughter to uphold his/her agreement to follow these rules and procedures in the laboratory.

Parent/Guardian Signature _____ Date _____

Emergency contact information:

Print Parent/Guardian Name _____

Home phone _____

Work phone _____

Cell Phone _____

Other:

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QUESTIONS

1. Do you wear contact lenses? _ NO _ YES
2. Are you color blind? _ NO _ YES
3. Do you have allergies? (Latex, peanuts, lactose, etc) _ NO _ YES list _____
4. Do you have any health conditions that the instructor should be made aware in order to ensure your safety? _ NO _ YES list
   _____
5. If you are pregnant, please notify the instructor. Some chemicals are not safe for unborn babies.