Environmental Control Systems, Inc.
Environmental Engineers and Management Consultants

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The Downingtown School District's (DASD) CHP was prepared by Environmental Control Systems, Inc. (ECS) exclusively and site specific for DASD.

With the consent of Flinn Scientific, ECS utilized their template "Student Safety Contract and Supporting Appendices" (2004) and modified its content to reflect the current dynamics relating to each building within the DASD Science Departments.

Since the "Student Safety Contract" ECS created for DASD included more site-specific details and calendar appropriate content pertaining to DASD, it therefore modified Flinn's 2004 model and thus, did not require reproduction permission.

In addition, the DASD safety contract was translated to Spanish language by Las Dos Chicas, a 501c (3) organization who was compensated for their work in the translation of this document.

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Appendix A

DASD STUDENT SAFETY CONTRACT

Purpose

Science is a hands-on laboratory class. You will be doing many laboratory activities which require the use of hazardous chemicals. Safety in the science classroom is the #1 priority for students, teachers, and parents. To ensure a safe science classroom, a list of rules has been developed and provided to you in this student safety contract. These rules must be followed at all times. A copy of the contract guidelines will be provided online on the teacher webpage. Before you can participate in the laboratory, the student and parent/guardian must sign two copies of the agreement. One copy will be for the teacher, and the second copy is to be kept in your science notebook as a constant reminder of the safety rules. Proper laboratory technique is essential to the education of a successful scientist. Your success will depend on your attitude and conduct. If you work with an attitude of rushing through, you will profit but little. An interest in your work, an understanding of its purpose and a clear interpretation of your results are necessary factors for a good laboratory course. The chemistry laboratory is a safe place to experiment if your are careful. You must assume responsibility of the safety of yourself and your neighbors. Following are some safety and procedural rules to help guide you in protecting yourself and others from injury in the laboratory.

General Guidelines

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

2. Be familiar with your lab assignment **before** you come to lab. Follow all written and verbal instructions carefully. If you do not understand a direction or part of a procedure, ask the teacher before proceeding.

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

4. 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.

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

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. Safety goggles and aprons must be worn whenever you work in lab. Gloves should be worn whenever you use chemicals that cause skin irritations or need to handle hot equipment. Wear older clothes that cover the maximum amount of skin.

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 area.

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

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

11. 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. Cracked or broken glass should be placed in the special container for "Broken Glass."

12. Labels and equipment instructions must be read carefully before use. Set up and use the prescribed apparatus as directed in the laboratory instructions provided by your teacher.

13. Keep hands away from your face, eyes, mouth, and body while using chemicals. Wash your hands with soap and water after performing all experiments. Clean (with detergent powder), rinse, and dry all work surfaces and equipment at the end of the experiment.

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.

17. If you spill acid or any other corrosive chemical on you skin or clothes immediately wash area with large amounts of water (remember that small amounts of water may be worse that no water at all). After this get the teacher's attention. The spill kit will be used for spills on floor or counter-top.

18. At the end of the laboratory session see that: a) main gas outlet valve is shut off: b) the water is turned off: c) desk top, floor area, and sink are clean d) all equipment is cool, clean, and arranged.

Clothing

19. Any time chemicals, heat, or glassware are used, students will wear laboratory goggles. There will be no exceptions to this rule! Contact lenses should not be worn in the laboratory unless you have permission from your instructor.

20. 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 are allowed.

Accidents and Injuries

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

22. If you or your lab partner are hurt, immediately yell out "Code one, Code one" to get the instructor's attention. **Everyone should turn off burners and prepare to help if needed.**

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

Handling Chemicals

24. All chemicals in the laboratory are to be considered dangerous. Do not touch, taste, or smell any chemical unless specifically instructed to do so. The proper technique for smelling chemical fumes (when instructed to do so by the teacher) is to gently fan the air above the chemical toward your face. Breathe normally.

25. Check the label on chemical bottles twice before removing any of the contents. Take only as much chemical as you need. Smaller amounts often work better than larger amounts. Label all containers and massing papers holding dry chemicals.

26. **Never return unused chemicals to their original containers.**

27. Never use mouth suction to fill a pipit. Use a pipit bulb or pipit filler.

28. Acids must be handled with extreme care. **ALWAYS ADD ACID SLOWLY TO WATER,** with slow stirring and swirling, being careful of the heat produced, particularly with sulfuric acid.

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

30. Never take chemicals or other materials from the laboratory area.

31. Take great care when transferring acids and other chemicals from one part of the laboratory to another. Hold them securely and in the method demonstrated by the teacher as you walk.

Handling Glassware and Equipment

32. 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.

33. 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.

34. Examine glassware before each use. Never use chipped or cracked glassware. Never use dirty glassware. **Do not immerse hot glassware in cold water; it may shatter.**

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

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

Heating Substances

37. **SHOULD THE BUNSEN BURNER GO OUT, IMMEDIATELY TURN OFF THE GAS AT THE GAS OUTLET VALVE.** If you wish to turn off the burner, do so by turning off the gas at the gas outlet valve first, then close the needle valve and barrel. Never reach over an exposed flame. Light gas burners only as instructed by the teacher.

38. 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.

39. 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.

40. Heated metals, glass, and ceramics remain very hot for a long time. **They should be set aside to cool on a trivet** and then picked up with caution. Use tongs or heat-protective gloves if necessary. Determine if an object is hot by bringing the back of your hand close to it prior to grasping it.

41. 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.

42. 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.

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

44. 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.

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

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

47. If you do not understand how to use a piece of equipment, ask the instructor for help. Do not immerse hot glassware in cold water; it may shatter.

48. 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.

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

50. 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. 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.

QUESTIONS

54. Do you wear contact lenses?

_ YES _ NO

55. Are you color blind?

_ YES _ NO

56. Do you have allergies?

_ YES _ NO

If so, list specific allergies

_____

_____

_____

Downingtown Area School District Laboratory Safety Guidelines

Everyone must be responsible for everyone else in lab. No horse-play is ever allowed. Lack of pre-lab preparation is the biggest problem related to lab safety. If you or your group members are unprepared for lab you will waist time and have a good chance of making mistakes.

- Safety Glasses must be worn any time you are in lab.
- Contact lenses should NOT be worn in lab without permission from teacher.
- It is almost impossible to remove contacts after chemicals have been splashed into the eyes.
- Chemicals trapped under contacts will damage the eye even more than normal.
- The plastic used for some types of contact lenses is permeable to vapors found in the laboratory. If these vapors are trapped behind the lens, extensive irritation may occur.
- Long hair, bulky clothing, rings, watches, and dangling jewelry are dangerous in lab.

Accidents Can Happen: Remain calm and report it immediately.

Broken Glass:

- Stop and report it immediately. Do not move until your teacher says it is safe to do so. There may be small slivers of glass that you do no notice.
- Your teacher will collect the broken glass, not you. More minor cuts occur after this type of accident than during it.
- Chemical spills are often involved with glass breakage. Follow those rules if it occurs.

Cuts and Scrapes:

- Report the situation to the teacher and let him help the injured person.
- There is always a possibility of infection. For this reason you should report any cut or scrape, even if there is no visible blood.
- **Do not come into contact with another's person's blood**.
- If there is blood at **any** lab station, **everyone** is to turn off all burners and move to your seat in the classroom area until told it is safe to return to the lab.

Chemical Spills:

- Depending on the chemical spilled, we might just have to clean it up or we might have a more dangerous situation.
- The most potentially dangerous chemicals used in our lab are corrosive acids and bases. Even though you will be using chemicals that have been diluted, you should always treat acids and bases with care.
- **You are to treat all spills as DANGEROUS.**

- **Stay where you are and let your teacher advise you about what to do.**

We will discuss Methods for treating different types of spills in class.

• Remember that broken glass often occurs along with chemical spills. Be prepared to follow those guidelines as well.

Fire:

• Bunsen burners: if a malfunction occurs, turn off the burner and notify your teacher.

• When you are not actively heating something – turn the burner off.

• Someone in your group must always be watching the flame (the watcher of the flame!)

• If a paper fire occurs, push the paper into the lab sink and turn on the water.

• Clothing or Hair: Don't panic: If you are involved, stay where you are – help is coming. Your partners should get the fire blanket. Everyone else should stay away.

• The teacher is the only authorized person to use the fire extinguisher.

Lab Safety Equipment:

Eye Wash Station:

• The station should only be used if chemicals come in contact with the eyes.

• Eyelids have to be forcibly opened to ensure effective washing behind the eyelid.

• Be sure to wash from the nose out to the ear. This will avoid washing chemicals back into the eye or into an unaffected eye.

• Flood eyes and eyelids with water for a minimum of 15 minutes.

• Contacts should not be worn during labs. If you are wearing them when involved with an accident, remove them as soon as possible to rinse eyes of any harmful chemicals.

• After the teacher determines that the eyes are completely flushed, both of the victim's eyes should be covered with a clean or sterile gauze.

Safety Shower:

• It provides an effective means of treatment in the event that large amounts of chemicals are spilled or splashed onto the skin or clothing.

• As long as the handle is pulled down, the safety shower will supply a continuous stream of water to cover the entire body.

• Individuals should remove clothing, including shoes and jewelry, while under an operating shower.

Fire Blanket:

• Fire blankets are not the best means to extinguish a fire. They may be used to extinguish clothing that is burning, but should never be used on any other type of fire.

• Fire blankets are a good means to keep shock victims warm or to cover large chemical spills.

Fire Extinguisher:

- Fire extinguishers are classified according to a particular fire type and are given the same letter and symbol classification as that of the fire.
- Type A – combustible wood, cloth, paper, rubber, and plastics.
- Type B - flammable liquids, oil, grease, and paint thinners.
- Type C - energized electrical equipment
- Type D - combustible metals (Mg, Ti, Na, Li, K)
- Multipurpose Extinguishers are effective against types A, B, and C fires
- To effectively operate an extinguisher, think P-A-S-S

P -- pull the pin

A-- aim the hose a the base of the fire

S – squeeze the handle

S – sweep the hose back and forth

Never use water on a Type B fire. These liquids float on water and, thus, water can spread the burning liquid. Water makes hot grease splatter, and can result in burns. Cover the burning grease with sand, baking soda, or with the metal lid of the frying pan.

Never use water on a Type C fire. Water can cause a severe electric shock.

Being Prepared Checklist for school:

- Know all exits.
- Practice drills seriously.
- Know locations of safety equipment and extinguishers.
- Report any safety hazards to the teacher.
- Be sure smoke detectors work.

Common Sense Guidelines:

Stay calm. Help others to stay calm.

- Notify a teacher immediately.
- At home, call the fire department as quickly as possible without endangering your escape from the fire. You may have to call from outside.
- Avoid smoke-filled passageways. If you must pass through a smoke-filled area, crawl on hands and knees. If possible, wrap a wet towel around your nose and mouth.
- Close doors when leaving an area. Never open a door that is hot to the touch.
- If your clothes do catch fire, DO NOT RUN. Roll on the floor or wrap yourself in a fire blanket or rug.

Fire Hazard Checklist:

- Frayed electric cord, electric cords under rugs, near heat sources
- Many appliances plugged into one outlet
- Combustibles (paper, drapes) near heat source
- Oil-soaked rags in open container
- Flammable liquids in open container
- Lit cigarettes dumped into waste basket or down garbage chute
- Using flammable liquid in unventilated areas
- Using gasoline to start fires
- Adding starter fluid to hot coals

AGREEMENT

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 science 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 science 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:_____