CHEMICAL HYGIENE PLAN

For

Dysart Unified School District

#89

2025-2026

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I. Chemical Hygiene Plan

For Science Departments of Dysart Unified School District #89

The Chemical Hygiene Plan for Science Departments of Dysart Unified School District #89 is written to comply with criteria applicable to the school science laboratory found in:

OSHA Hazard Communication Standard 1910.1200 of 1984, recently updated to align with the UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Revision 3, issued in the Federal Register, March 26, 2012. This rule became effective May 25, 2012.

and

Laboratory standard of Part 1910 – Occupational Safety and Health Standards Section 191.1450 Occupation exposure to hazardous chemicals in laboratories

and

Appendix A to 191.1450 – National Research Council Recommendation Concerning Chemical Hygiene in laboratory

and

CDC/NIOSH School Chemistry Laboratory Safety Guide

II. Chemical Hygiene Plan Overview

For Science Departments of Dysart Unified School District #89

Purpose: The Chemical Hygiene Plan has been developed to provide employees of Dysart Unified School District #89 with information necessary to safely work in the school science laboratory.

Access: All components of the Chemical Hygiene Plan will be available to all employees as follows:

1. Each school will have copies of the Chemical Hygiene Plan, the school chemical inventory, and the Materials Safety Data Sheets available:
   a) Online
   b) Science Lab

2. Each school science teacher will be given access to a copy of the Chemical Hygiene Plan through a link on Curriculum and Instruction Website. In addition the Chemical Hygiene Plan and Materials Safety Data Sheets will be given to each high school custodian/maintenance department and kept in a location known and accessible to all maintenance workers in school office.

Revisions: All components of the Chemical Hygiene Plan will be reviewed annually by the Science Department Heads or Leads.

Compliance: A copy of the inspection report and any notations will be kept by the school science department chair and the School Principal. These may be viewed by other employees.

III. Safety Duties

Science teachers have the duty and responsibility of monitoring the Chemical Hygiene Plan at their respective classroom(s) or labs. The Instructional Cabinet Science Lead, and the Assistant Principal at K-8 schools, will oversee that the plan is carried out.

Their duties will include:

1. Being familiar with all aspects of the Chemical Hygiene Plan, especially chemical storage and safety provisions in the science area.
2. Being a contact person for disseminating information involving chemical safety to employees of the school.
3. Being a resource for employees at the school on matters involving the use of chemicals in the science laboratory.
4. Inspecting safety equipment at the beginning of each semester and in cooperation with the annual inspection of laboratories and chemical storage areas. See Section III – Compliance and Section VIII – Facilities and Safety Equipment of Science Laboratories. Teachers should inspect their own eye wash, shower, drains, goggles, aprons and gloves every 30 days.
5. Reporting to the school principal and any other persons deemed necessary, any conditions involving chemicals that pose risks to health or safety.
6. Monitoring science chemical inventories and updating the school chemical inventory list when necessary.
7. Making requests for disposal of unwanted chemicals from the science area is the responsibility of all science teams. A request for disposal of unwanted chemicals includes the name of the chemical, the quantity of the chemical, and a copy of the Safety Data Sheet, and should be sent to the school plant manager and/or District Risk Management by **May 1st** of each school year. (see template in Appendix). When a school is ordering chemicals, they will also bear the cost and responsibility of disposal. An annual disposal schedule will be maintained for disposal at the end of the year, but can occur for the district as a whole.
8. Chemical purchase orders will be processed through the Purchasing Department to ensure no chemicals are purchased that do not meet all State and local regulations. The warehouse will send the Safety Data Sheet (SDS) from the company to the school site. If the SDS is not received with the chemical, the science teacher must contact the company and obtain it. If eye wash solution is purchased, the science teacher is responsible to check the expiration date on the container for the eye wash solution and to verify the amount is adequate for the SDS recommended rinsing time. Expired eye solution must be properly disposed and replaced with new eye solution.
9. Each science teacher has the responsibility to learn and practice safe procedures for working and teaching in a school science laboratory. Principals will communicate their plan for training by **August 1st** of every year. The training plan should be kept at the school/site with the school safety plans for the safety committee.

IV. Operating Procedures – General Rules for Employees

All employees involved in the science laboratory environment or teaching a science lesson involving chemicals must read and adhere to the provisions of the Science Safety Rules and Procedures Agreement (Appendix B), the DUSD Chemical Hygiene Plan and model the same correct, safe behaviors expected of students in the Science Safety Rules and Procedures Agreement, Appendix C.

No teacher or other employee should attempt a laboratory experiment unless they are appropriately trained in that science discipline, are fully aware of possible hazards, and are willing to follow all procedures necessary for a safe laboratory experience.

In addition, employees should:

1. Maintain inventories and laboratory check lists.
2. Minimize all chemical exposure.
3. Not underestimate chemical hazards.
4. Know and understand the hazards of each chemical reactant and each of the products of chemical experiments as stated in the MSDS, lab direction, etc.
5. Know how to properly store all chemicals by chemical family name.
6. Appropriate Personal Protective Equipment must be worn as needed when chemicals, glassware, or heat are used in the laboratory.
7. Use protective safety equipment to reduce potential exposure, i.e. nitrile gloves, respirators, fume hood. A safety shield or fume hood must be used when there is any potential risk for harm.
8. Never perform a first-time chemical demonstration in front of your class. Always perform first-time demonstrations in front of other instructors to evaluate the safety of the demonstration.
9. Know the locations for all personal safety and emergency equipment such as eyewash, shower, fire extinguisher, and spill control materials.
10. Know appropriate emergency procedures, waste disposal, spill clean up, evacuation routes, and fire emergency notification.
11. Only teachers/staff may handle concentrated materials requiring mixing or dilution.
12. Exercise great care in moving chemicals from room to room. Use trays or carts with raised edges for moving glassware and chemicals.
13. **Wash hands thoroughly after handling any chemicals or materials**.

V. Chemical Storage Rules and Procedures

No chemicals should be purchased or used in science laboratory exercises unless they:

(a) support the Arizona State Science Standards, AP Science Curriculum and IB Science Curriculum and Cambridge Curriculum

(b) are either basic chemistry labs, published in an appropriate laboratory manual, or based on documented demos.

(c) and are supported by CDC/NIOSH School Chemistry Laboratory Safety Guide

Chemicals are to be purchased from commercial chemical suppliers except for those chemicals listed in Appendix A that may be purchased from local community suppliers. **Under no circumstances** are chemicals to be accepted as gifts or otherwise acquired from private individuals, manufacturing companies, government agencies, etc. The teacher should be familiar with any exercise involving chemicals and follow safe procedures for use and storage of those chemicals.

It is recommended that quantities be limited to amounts no greater than what will be consumed over two academic years. Refer to the CDC/NIOSH or Flinn Scientific Catalog Guidelines for specifications on shelf life and storage directions.

1. An updated inventory of all chemicals, their quantities, and storage location must be kept in each laboratory, the science department, and/or chemical storage area.

2. All chemicals, including solutions you have made, must be clearly labeled. In addition to the contents and concentration, the date of purchase or mixing should be written on the label. **No unlabeled chemicals or solutions** are to be stored.

3. All chemicals should be stored in chemically compatible families. Refer to the CDC/NIOSH for information about compatible families.

4. Store all chemicals (including corrosives, acids, and bases) in a separate, locked, dedicated storeroom in a locked chemical cabinet or corrosives/acids cabinet. All chemical and corrosive/acid cabinet(s) must be securely locked at all times and remain locked even when they are in a locked supply or storage room. The actual cabinet is made to have a pad or key lock to secure it. The science teacher and the plant manager should have a key to access the chemicals and/or corrosives being stored. The keys should never be given to a student and only designated staff should access the chemicals in the cabinet. If chemicals, corrosives, and acids are used in the classroom for lab exercises, they must be returned to the proper storage location at the <u>end of the period</u> unless needed in the next subsequent period.

5. Only designated staff are allowed in the chemical storage area. Students are **<u>never</u>** allowed in storage areas.

6. Store the minimum amount of chemicals needed.

7. When possible consider purchasing ready-to-use products that require no mixing or dilution of concentrated ingredients when appropriate.

8. All flammable materials must be returned and always stored in an approved flammables storage cabinet. Never store flammables in refrigerators unless the refrigerator is explosion proof.

9. The storage area and cabinets should be labeled appropriately with the chemical names displayed on the outside of the cabinet. Whenever possible store liquids on lower shelves. However, chemicals should not be stored on the floor except in approved shipping containers.

10. Storage areas should be well ventilated, and chemical exposure to direct heat or direct sunlight should be avoided.

11. Reduce the accumulation of waste by disposing of it as soon as possible after use. This will eliminate the complications associated with the disposal of large quantities.

12. Metal and glass containers of flammable liquids are limited to a maximum size of one gallon. Approved safety cans are limited to a maximum size of two gallons.
    a. Acetone
    b. Amyl Ethyl Ketene
    c. Cyclohexane
    d. Ethanol
    e. Methanol

13. Compressed gas cylinders must be stored away for heat sources. The cylinder must be properly labeled with the cylinder valve closed, safety cap installed and be properly secured to prevent it from falling or tipping. Cylinders must meet the guidelines for safe storage and handling based on their contents and use.

14. The staff/teacher using the chemicals will conduct an annual inventory and inspection of a chemical storage area using appropriate personal protection equipment. If chemical containers are being rearranged, employees are not to work alone.

15. Follow routine cleanup after each lab and follow proper housekeeping at all times.

VI. Specific Rules and Guidelines for Chemical Safety in the School Science Laboratory

Safety Data Sheets:

Every chemical on campus is required to have an SDS. A Safety Data Sheet (SDS) is a technical information sheet detailing health and safety information concerning a hazardous chemical or chemical substance. Most SDS are divided into the following nine sections:

PRODUCT IDENTIFICATION

This section identifies the chemical and manufacturer. It gives both the chemical and trade names along with any synonyms for the substance.

HAZARDOUS INGREDIENTS

The percentage of each hazardous ingredient in the substance is given and data on its hazards are provided.

Often the concentration of the substance to which a person can safely be exposed is given. The safe exposure limit is reported as the Threshold Limit Value (TLV) or the Permissible Exposure Limit (PEL). Both TLV's and PEL's represent safe exposure limits and are figured for average exposures over a typical eight-hour workday.

TLV's are used to express the airborne concentration of a material to which **nearly** all persons can be exposed day after day without adverse effects. TLV's are expressed in three ways:

> TLV-TWA: The allowable time-weighted average exposure limit calculated for a normal eight-hour workday.
>
> TLV-STEL: The short-term exposure limit or maximum concentration for a continuous fifteen minute exposure period (maximum of four such periods per day with at least sixty minutes between exposure periods provided that the daily TLV-TWA is not exceeded).
>
> TLV-C: The ceiling exposure limit – the concentration that should not be exceeded even instantaneously.

PEL's also may be expressed as a time-weighted average (TWA), short-term exposure level (STEL) or a maximum ceiling exposure level (C).

TLV's and PEL's listed on a SDS are usually expressed as "parts per million" (ppm), that is, parts of a contaminant per million parts of air. TLV's and PEL's may also be expressed as milligrams per cubic meter (mg/m^3).

PHYSICAL DATA

Here the SDS covers the physical characteristics of the chemical or chemical substance. In order to control potential hazards, it is important for employees to be familiar with the physical characteristics of the substances that are used.

FIRE AND EXPLOSION DATA

The section provides information concerning a substance's potential for fire and explosion, plus any special precautions that should be taken during fire fighting activities.

HEALTH HAZARD DATA

This section gives health information, including primary routes of entry for the chemical or chemical substance, signs and symptoms of exposure, medical conditions aggravated by exposure and whether the substance is a known carcinogen (cancer-causing agent). In addition, it gives first aid procedures so employees can be prepared if an emergency occurs.

The toxicity of a substance is usually reported as LS50 (Lethal Dose) for solids and liquids and LC50 (Lethal Concentration) for dusts, mists, gases and vapors. The LD50 is the ingested **dose** of a substance that produces death in 50 percent of a group of laboratory animals. The LC50 is the inhaled **vapor concentration** of a substance that produces death in 50 percent of the animals.

REACTIVITY DATA

This section describes that material's stability, incompatibility with other substances, and hazardous products that may be produced if the substance should decompose. It also lists conditions to be avoided for storage and handling of the substance.

SPILL AND LEAK PROCEDURES

This section gives special information on how the substance should be handled during a spill or leak. It also describes the recommended disposal method. This information is especially important when preparing emergency procedures.

SPECIAL PROTECTION INFORMATION

This section lists any personal protective equipment (respiratory protection, gloves, eye protection) needed to safely handle the substance. If protective equipment is required, this section will list the specific types that are recommended Safe use of some substances may require special ventilation, and this information will be found in this section of the SDS.

SPECIAL PRECAUTIONS

This section lists special precautions to follow when handling the chemical or chemical substance. Health and safety information not covered in other parts of the SDS are listed here.

Specific Rules:

The rules and guidelines below are designed to avoid a number of hazardous situations. Science teachers should be especially aware of the toxicological information on the Safety Data Sheets for chemicals they frequently use.

1. Never perform unauthorized laboratory experiments. Perform chemical experiments from a published procedure with an understanding of possible hazards. Students in IB who write and perform their own experiment must have them prior approval from the teacher in writing. Deviation from authorized lab experiments requires approval from the Department Chair, and site Principal.

2. Each individual teacher is responsible for inspecting all protective safety equipment before use.

3. Have appropriate types and sizes of fire extinguishers. Triclass ABC are appropriate for laboratories. Carbon dioxide fire extinguishers are inappropriate for laboratories. A Class D fire extinguisher or clean, dry sand should be available when working with flammable solids. Fire extinguishers should be inspected every thirty (30) days.

4. Do not block fire exits. Keep all aisles clear.

5. Post emergency telephone numbers in the chemical storage area. Follow Emergency Response Plans in place.

6. Clean up spills immediately and thoroughly. Follow approved spill cleanup procedures; spills should only be cleaned up by trained personnel.

7. Mercury should not be used or allowed on the site or at the school. If mercury is found, immediately contact District Risk Management and/or the Director of Maintenance. If it is there is a spill or it is loose, secure the area, note anyone and anything that came in contact with the mercury and report the situation immediately. Do not handle, touch or remove it. If students or others handled the mercury, retain them at school in one area and immediately, **call 911**. Mercury spills and contamination require special care and clean up by a Hazardous Material Team and the Fire Department will handle all of the decontamination and disposal of contaminated items.

   Call 911 immediately should any amount of mercury be spilled.

8. A spill control kit, dry sand, kitty litter, and other spill control materials, should be readily available.

9. Chemical Disposal/Waste Plan *(note: Follow SDS for proper disposal)*

   a. Due to the periodic disposal of unwanted chemicals by a licensed disposal company, the quantity limits on stored chemicals, and the restrictions on purchasing, the disposal cost of hazardous reagents from the school science department should be minimized.

b. **All unknown chemicals will be considered hazardous. However, there should not be any "unknown chemicals" as all chemicals must be labeled.**

c. District Risk Management will be in charge of the disposal of all hazardous chemicals and once notified of the need to dispose of the chemicals, will work with department heads, plant managers and the disposal companies in the identification and disposal process.

10. Work and floor surfaces should be kept free of clutter.

11. Do not use chipped, etched, or cracked glassware. Glassware that is chipped or scratched presents a serious breakage hazard when heated or handled. Appropriate Personal Protective Equipment must be provided and worn as identified in the Safety Data sheet for each chemical being used and handled.

12. Eye protection must be worn. Chemical splash goggles or face shields should be used when dealing with corrosive liquids, (i.e., full strength acids and bases). Wear gloves that offer protection for all hazards you may find in the lab.

13. The proper protective clothing must be worn at all times, when working with corrosives and acids. Please see Safety Data Sheet and check with the protective clothing company for proper use, type and the protection based on the chemical properties being handled and used.

14. Never inhale chemicals directly. Do not pipette by mouth. Always use a **pipette bulb** or other appropriate suction device.

15. Wash hands thoroughly after any chemical exposure or before leaving the laboratory.

16. Do not allow eating or drinking in the lab, science room, or areas where chemicals are used or stored.

17. Do not apply cosmetics in areas where laboratory chemicals are present.

18. Read all labels carefully; the names of many chemicals look alike at first glance.

19. **No unlabeled products** should be stored anywhere in the science facility.

20. Handle toxic, corrosive, flammable, and noxious chemicals under a fume hood.

21. Do not expose flammable liquids to open flame, sparks, heat, or any source of ignition.

22. At least every semester inspect all shelf clips in your acid cabinet to check for possible corrosion. **Corroded shelf clips can lead to a shelf collapsing and causing dangerous spills**.

23. Use a safety shield when igniting flammable solids.

24. Use extreme caution when handling finely divided (dust-like) material. Finely divided materials may form explosive mixtures with air and also make inhalation of toxic materials more likely.

25. All accidents or near accidents should be reported immediately to Administration, the Instructional Cabinet Lead, and parents of the student(s) involved. Document all important information.

26. In the event of accidental ingestion of a chemical, contact the school nurse and Poison Control (800) 222-1222.

27. In the event of an injury or exposure to a hazardous chemical, the person shall be referred to the school nurse as soon as possible. Fill out an accident report describing the event in detail before leaving campus for the school day. Accident report forms are obtainable from the school principal or the Dysart website.

28. **Any accident or injury resulting in loss of consciousness and/or breathing call 911 immediately.**

29. Practice the District ERP (emergency response plan) with your students.

VII. Facilities and Safety Equipment for Science Laboratories

For the safe operation of the Science Laboratory the following conditions are necessary where chemicals, open flames, heating of glassware, or release of fumes are involved.

1. A properly labeled fire blanket needs to be mounted on the wall and remain accessible at all times. The fire blanket needs to be in the lab/room where open flames or gas is available for use.

2. Clean and functional splash goggles must be available.

3. Adequate laboratory ventilation must be provided when chemical fumes are liberated. Refer to the operating procedure and manuals to ensure non-vented fume hoods are operating properly. **Notify your Plant Manager to contact District Risk Management and/or the Director of Maintenance, if an inspection is needed**.

4. Fire extinguishers must be of the right type, Tri-class ABC, and they must always be properly inspected. A fire extinguisher must be located in each laboratory and chemical storage area.

5. Eyewash stations must be functional and flushed at least once a month. Eyewash bottles should be maintained according to the manufacturers' directions.Contact your plant manager for assistance.

6. A safety shield must be available for demonstrations. This does not remove the responsibility for wearing safety goggles.

7. Full body showers are to be located in high school chemistry labs.

8. Running water should be available for hand washing in laboratories using preserved specimens or handling chemicals.

9. Laboratory exercises involving chemicals and flames should be done in a classroom that is equipped with running water and fire protection equipment. Any reaction that releases fumes must be done in a classroom that also contains a functioning fume hood.

10. School labs that have gas or use open flames must have install a properly labeled Fire Blanket in the room/lab.

VII. Employee Training

At the beginning of each year, the District Risk Manager along with Science Leads will provide an orientation about the Chemical Hygiene Plan to first year employees who will be working in the science laboratory and chemical storage areas, this may be done via an online class see Appendix. Employees hired after this orientation must be presented the same information before they begin work in the science laboratory.

The orientation will include the following:

1. Distribution of the written Chemical Hygiene Plan for Science Departments of Dysart Unified School District.
2. Locations of the chemical inventory & Safety Data Sheets. Copies of SDS sheets should be in a location within the Science Department that is known by & accessible to all teachers who use these materials.
3. Review of all procedures for reporting accidents, unsafe conditions, and documentation of medical treatment.
4. The list of prohibited chemicals should be posted near or on the chemical cabinet in the school science laboratory/classroom or storage area/room.

Additional employee training should be regularly included in Science Department meetings and/or other in-service meetings.

Appendix A

Chemicals Which May be Purchased through District Purchasing Department

approved vendors and if lab is pre-approved by the assistant principal and/or department chair in writing.

Update the school's SDS sheets as needed

- Antacids
- Aluminum
- Aluminum foil
- Aspirin
- Baking soda
- Baking powder
- Chalk – for lab experiments
- Corn syrup
- Copper
- Corn starch
- Dish detergent
- Epsom salts
- Flour
- Food coloring
- Gelatin
- Hydrogen peroxide 3%
- Honey
- Iron
- Pancake syrup
- Plastic wrap
- Rock salt
- Rubbing alcohol
- Salt
- Shampoo/conditioner
- Steel
- Sugar
- Tea bags
- Tylenol
- Vegetable oil
- Vinegar
- Window Cleaner
- Woolite
- Zinc

Appendix B

Science Safety Guidelines for Teachers

Dysart Unified School District #89

The following minimum guidelines must be read and observed by all teachers K-12 who teach science. These guidelines are part of the Chemical Hygiene Plan and are reviewed annually.

General Guidelines:

1. It is the teacher's responsibility to know any hazards that might be associated with a laboratory experiment or demonstration and to take steps to protect themselves and their students against such hazards. Only demonstrate experiments and/or have students perform experiments with which you are familiar.

If there is any doubt about the safety of an experiment, wait until you can find someone who can answer your questions before proceeding.

2. Students must be under the active supervision of a teacher during any science experiment. Teachers will maintain appropriate supervision at all times.

3. Teachers must be familiar with all safety equipment and emergency procedures. Safety equipment (safety goggles, aprons, etc.) appropriate to the laboratory experiment must be provided and worn. The teaching environment should be appropriate for the science activities performed. The teaching environment includes features such as room size, adequate ventilation, the presence of fire extinguishers, eye wash fountains, etc. Student maturity and behavior should be taken into consideration when selecting laboratory exercises.

4. Students know and understand the hazards of each chemical reactant and each of the products of chemical experiments as stated in the MSDS, lab direction, etc before lab activities. **The "Dysart Unified School District Science Safety Rules and Procedures Agreement" is required for high school students enrolled in any science course. (See Appendix C).**.

5. Students must be instructed in procedures for leaving the science room under emergency conditions.

Chemical Guidelines:

Teachers who engage in laboratory activities involving chemicals need to consult the Chemical Hygiene Plan for more specific rules and procedures designed to protect them as employees of Dysart Unified School District #89.

1. Do not acquire or store any chemicals unless they support the Arizona Science Standards, and/or AP/IB Science and Cambridge Curriculum

2. Purchase or receive chemicals only from reliable sources such as science supply companies. Do not accept donations from other sources, private or public.

3. Avoid stockpiling chemicals in order to prevent problems with storage space, deterioration, magnitude of accidental spills, etc.

4. All chemicals must be stored in a locked storage room. Students must not have access unless directly supervised by a teacher.

5. Adequate ventilation is essential. Most elementary school classrooms, or classrooms not equipped as a science lab, do not have adequate ventilation for experiments involving volatile substances.

6. Chemical splash goggles should be worn as needed during all chemical experiments conducted by students. If students are observing a chemistry demonstration, a protective safety shield may be necessary.

Equipment Guidelines

1. Do not operate and do not allow a student to operate any piece of equipment that is not thoroughly familiar to you. Be sure that you have thoroughly explained the operation procedures to the student.

2. Teachers and students must wear eye protection when heating glassware, using chemicals, or performing experiments that could generate flying objects. In addition, a safety shield should be used during demonstrations that pose these hazards.

3. Instruct students in the proper use of flames or heating elements before use in an experiment. Do not allow students to fill burners. Use alcohol burners with caution and fill in well-ventilated areas. **Never** fill when flames are in use; never keep stock containers of alcohol or other flammables in a room where flames are in use. Never transport a lit alcohol burner.

4. Never allow a student to focus direct sunlight through a microscope. Magnifying glasses can also cause eye damage if a student looks through them at the sun.

5. Thermometers, barometers, or other devices containing mercury are not to be present - **ever**.

6. Inspect all electrical cords before use. Keep areas around electrical cord, outlets, and equipment dry.

Biological Guidelines

1. Lab exercises involving the collecting of or use of blood must conform to the current curriculum guidelines. Blood experiments are to be done with commercially available blood substitutes and microscopy of human blood is to be done with commercially prepared slides, and not fresh smears.

2. The deliberate culture of microorganisms should be done only if the teacher is familiar with safe culture procedures in conformance with current curriculum. No cultures are to be made using known pathogens. Human and animal body fluids, including saliva, are not to be cultured.

3. Care and common sense should be used in collecting and handling live insects and other invertebrates.

4. Animals are permitted at school only with prior written approval of the principal.

5. Vertebrate animals should be kept in the classroom only if they can be treated humanely and their handling monitored by the teacher. Animals capable of inflicting bites should be displayed only, not handled. No experimentation that causes pain, malnutrition, thirst, or other stress to an animal is permissible. Staff should read and follow GB Policy 9.47 - Animals in Schools and follow the guidance provided in Procedure 9.47.P.1

6. Students **should not** bring pets from home. If a student brings an animal to school, it should support instruction based on the curriculum and be with the prior knowledge and approval of the teacher and the principal. Proper care and safe display of the animal must be provided.

7. Students and teachers should wash their hands thoroughly after handling chemicals, plants and/or animals.

Appendix C

Dysart Unified School District #89

STUDENT SCIENCE SAFETY RULES AND PROCEDURES AGREEMENT

In order to ensure that science experiments are safe and positive learning experiences, students and their parents should read, discuss, and sign the science safety rules and procedures agreement. No student will be permitted to participate in laboratory work or science field trips until the agreement is signed by a parent and student and returned to the teacher.

Please make sure to read the Student Safety Contract on the back of this form.

I, _____, have read, understand, and agree to follow these science safety rules and procedures. I agree to abide by any additional instructions, written or verbal, provided by my science teacher or adult supervisor.

I agree to use appropriate lab procedures during labs, either at school or during a Science Field trip and in the classroom or laboratory.

_____

Student Signature Date

_____

Parent Signature Date

Please answer the questions below regarding the student. Please also add any medical condition that the teacher should be made aware of.

1. Do you wear contact lenses? ⬜ YES ⬜ NO
2. Are you colorblind? ⬜ YES ⬜ NO
3. Do you have allergies? ⬜ YES ⬜ NO
   If so, list specific allergies _____
4. Other Medical Concerns? ⬜ YES ⬜ NO
   If so, list specifics _____

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.

Student Safety Contract

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 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. 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 area.
9. Keep aisles clear. Push your chair under the desk when not in use.
10. Know the locations and operating procedures, where appropriate, for all safety equipment including first aid kit, eyewash station, safety shower, fire extinguisher, and fire blanket. Know where the fire alarm and exits are located.
11. 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.
12. Be alert and proceed with caution at all times in the laboratory. Notify the instructor immediately of any unsafe conditions you observe.
13. 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.
14. 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.
15. 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.
16. 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.
17. Students are never permitted in the science storage rooms or preparation areas unless given specific permission by their instructor.
18. 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.
19. 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.
20. 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.
21. If you have a medical condition (e.g.,allergies, pregnancy, etc.), check with your physician prior to working in lab.

Clothing:

22. Any time chemicals, heat, or glassware are used, students will wear laboratory goggles. There will be no exceptions to this rule!
23. Contact lenses may be worn provided adequate face and eye protection is provided by specially marked, non-vented safety goggles. The instructor should know which students are wearing contact lenses in the event of eye exposure to hazardous chemicals.
24. Dress properly for lab activities. Long hair, dangling jewelry, and loose or baggy clothing are hazardous. 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.
25. Lab aprons have been provided for your use and should be worn during laboratory activities.

Accidents & Injuries

26. Report any accident (spill, breakage,etc.) or injury (cut, burn, etc.) to the instructor immediately, no matter how trivial it may appear.
27. 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.

Handling Chemicals

28. All chemicals in the laboratory are to be considered dangerous. Do not touch, taste, or smell any chemicals unless specifically instructed to do so.
29. Check the label on chemical bottles twice before removing any of the contents. Take only as much chemical as you need.
30. Never return unused chemicals to their original containers.
31. Never use mouth suction to fill a pipet. Use a rubber bulb or pipet pump.
32. When transferring reagents from one container to another, hold the containers away from your body.
33. Acids must be handled with extreme care. Always add acid to water, swirl or stir the solution and be careful of the heat produced, particularly with sulfuric acid.
34. Handle flammable hazardous liquids over a pan to contain spills. Never dispense flammable liquids anywhere near an open flame or source of heat.
35. Never remove chemicals or other materials from the laboratory area.
36. Take great care when transporting acids and other chemicals from one part of the laboratory to another. Hold them securely and walk carefully.

Glassware and Equipment

37. Carry glass tubing, especially long pieces, in a vertical position to minimize the likelihood of breakage and injury.
38. 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.
39. 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.
40. 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.
41. Examine glassware before each use. Never use chipped or cracked glassware. Never use dirty glassware.
42. Report damaged electrical equipment immediately. Look for things such as frayed cords, exposed wires, and loose connections. Do not use damaged electrical equipment.
43. If you do not understand how to use a piece of equipment, ask the instructor for help.
44. Do not immerse hot glassware in cold water; it may shatter.

Heating Substances:

45. 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.
46. 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.
47. Do not point the open end of a test tube being heated at yourself or anyone else.
48. 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.
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.

Appendix D

Dysart Unified School District #89

Science Chemical Review List

No chemicals should be purchased or used in science laboratory exercises unless they:

(a) support the Essential Understandings and/or the Essential Knowledge found in the Arizona Science Standards, and/or AP/IB Science Curriculum, and

(b) are published in an appropriate laboratory manual with complete instructions.

Chemicals are to be purchased from commercial chemical suppliers. **Under no circumstances** are chemicals to be accepted as gifts or otherwise acquired from private individuals, manufacturing companies, government agencies, etc. The teacher should be familiar with any exercise involving chemicals and follow safe procedures for use and storage of those chemicals.

The quantity of chemicals stored should not be excessive. Quantities should be limited if possible.

Refer to the list of chemicals from a chemical supplier such as the Flinn Chemical Catalog/Reference Manual for reactivity, toxicity, carcinogenic potential, explosiveness, and flammability. Chemicals should be used or stored only with appropriate cautions. The MSDS should be read before using any chemicals.

The Flinn Chemical Catalog/Reference Manual is a good source of information on potential hazards.

Inquiries on the status of any chemical may be directed to the Science Department head or lead or the Assistant Principals at K-8 schools.

Appendix E

Science Department Chemical Storage Inspection Checklist

This checklist describes the conditions for a science chemical storage area to be in compliance with the Chemical Hygiene Plan for Dysart Unified School District #89. Copies of this report and documentation of necessary corrective actions taken are to be kept by:

High School Science Instructional Cabinet Lead
Assistant Principal in charge of safety

School_____ Storage Location_____

Inspection by_____ Date_____

Signature of Assistant Principal_____

Date_____

Conditions within storage area: S = Satisfactory, C = Corrective action needed

1. All chemicals are clearly labeled with all appropriate information. _____
2. Chemicals are stored on secure shelving. _____
3. Chemicals are spaced to allow safe storage and removal of chemicals. _____
4. Stored quantities of hazardous chemicals do not exceed a two-year supply. _____
5. The chemicals stored are only those required for science instruction. _____
6. The appropriate type of storage cabinet is labeled and used for storage of flammables, chemicals, corrosives and acids and has a locked pad or key lock on it, inside the storage room. _____
7. Storage area is free of defective containers. _____
8. Locked doors secure access to the chemical storage area. _____
9. A fire extinguisher is located in the chemical storage area. _____
10. Materials are available for spill control and cleanup. _____
11. Floor area is free from clutter and provides easy exit from storage room. _____
12. Eye wash station and/or shower checked and working properly. Wall mounted eye wash container not expired and easily accessible. _____
13. Fire blanket properly mounted, labeled, and accessible in rooms where gas apparatus or open flames may be used. _____
14. Index of chemicals and the Safety Data Sheets are available and accessible. _____

15. **None** of the following are stored:
    a. Gasoline _____
    b. Mercury _____
    c. Benzoyl peroxide _____
    d. Carbon disulfide _____
    e. Ether _____
    f. Picric acid _____
    g. Perchloric acid _____
    h. Arsenic powder, pentoxide, trichloride, or trioxide _____
    i. Asbestos _____
    j. Benzene or benzidine _____
    k. Chromium powder or chromium (IV) oxide _____
    l. Lead arsenate _____
    m. Sodium arsenate or sodium arsenite _____
16. Safety Data Sheets (SDS) are available in a clearly marked location. _____
17. Metal and glass containers of flammables are limited to one gallon in size. _____
18. Glass bottles are limited to one gallon for any of the following chemicals: acetone, amyl alcohol, methyl ethyl ketone, cyclohexane, ethanol, methanol. _____

Remarks: If more room is needed, please attach additional documents.

Appendix F

Chemical Hygiene Plan Checklist

This chemical hygiene plan checklist is for use in Dysart Unified School District #89 for annual inspections of science departments to ensure effectiveness & compliance with OSHA Standard 29 CFR 1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories. Copies are to be kept by the Department Chair, Science teachers and Administrators.

School_____ Science Safety Specialist_____

Date _____ Inspection by_____

Item #	Compliance: √ indicates compliance with OSHA Standard
	1. Laboratory use of hazardous chemicals complies with OSHA Standard.
	2. Work is performed on laboratory scale.
	3. Employees are not exposed to substances requiring monitoring as defined by the OSHA Standard.
	4. There is a written Chemical Hygiene Plan as defined by OSHA Standard.
	5. The Chemical Hygiene Plan is capable of protecting employees from health hazards associated with chemicals in the laboratory.
	6. The Chemical Hygiene Plan is readily available to employees, employee representatives, and evaluators.
	7. The Chemical Hygiene Plan indicates specific measures to ensure employee protection in the laboratory including the following:
	a) Standard operating procedures relevant to safety and health to be used when working with hazardous chemicals are addressed.
	b) Circumstances that require prior approval are addressed.
	c) There is documentation of employee information and training at the time of employment and/or new assignment.
	d) Employees are given access to a copy of the Chemical Hygiene Plan.
	e) The Chemical Hygiene Plan is reviewed in detail with employees at least annually and any new provisions are explained.

	8. Only chemical processes that do not require use of respirators are used.
	9. Employees are provided the opportunity to receive medical attention under the circumstances defined in the Standard.
	10. Chemicals of unknown composition are assumed hazardous and covered in the Chemical Hygiene Plan.
	11. Labels on incoming containers of hazardous chemicals are not removed or defaced.
	12. Chemical Hygiene Plan indicates particularly hazardous chemicals not allowed for laboratory use or storage.
	13. Procedures for removal of unwanted or hazardous chemicals are explained.
	14. The Chemical Hygiene Plan is reviewed and updated at least annually

Recommended Actions: please attach additional documents

Appendix G

Chemical-Specific Safety Procedures

Reproductive Toxins (such as Toluene) are not permitted on District campuses:

- Notify supervisor/instructor if any old sources of these are found.

High Acute Toxicity Chemicals: (Supplemental rules to be followed in addition to those mentioned above):

- Use and store these chemicals in areas of restricted access that are posted with special warning signs. These areas should include a hood (with appropriate ventilation) or other containment device for procedures that may generate aerosols or vapors containing the substance.
- Use gloves, long sleeves and other protective apparel as needed to avoid skin contact. Always wash hands after working with these chemicals.
- Maintain records of the amounts of these materials on hand, amounts used and the names of the workers involved.
- Assure that at least two people are present at all times if a compound in use is highly toxic or of unknown toxicity.
- Be prepared for accidents and spills. Store breakable containers of these substances in chemically resistant trays. Cover work and storage surfaces with removable, absorbent, plastic backed paper.
- If a major spill occurs outside the hood, evacuate the area; assure that cleanup personnel wear suitable protective apparel and equipment.
- Thoroughly decontaminate or incinerate contaminated clothing or shoes. If possibly, chemically decontaminate by chemical conversion.
- Store contaminated waste in closed, suitably labeled, secondary containers (for liquids, plastic bottles half-filled with vermiculite).

Select Carcinogens: (Further supplemental rules to be followed, in addition to all these mentioned above):

- Conduct all transfers and work with these substances in a designated area--a restricted access hood, glove box or portion of a lab designated for use of highly toxic substances, for which all people with access are aware of the substance being used and necessary precautions. The designated area should be conspicuously marked with warning and restricted access signs. Prepare a plan for use and disposal of these materials and obtain approval of the appropriate lab supervisor or instructor.
- All containers of these substances should be properly labeled with identity and warning labels.
- Store containers of these chemicals in ventilated, limited access areas in appropriately labeled, unbreakable, chemically resistant, secondary containers.
- If using toxicologically significant quantities of a select carcinogen on a regular basis (3 times per week or more), consult a physician concerning desirability of regular medical surveillance.
- Use a wet mop instead of dry sweeping if the toxic substance was a dry powder.
- Use chemical decontamination whenever possible; ensure that containers of contaminated waste (including washings from contaminated flasks) are transferred from the controlled area in secondary container under the supervision of the laboratory supervisor/instructor.
- Decontaminate any equipment, including glassware, in the hood before removing them from the

controlled area. Decontaminate the controlled area before resuming normal work there.

- On leaving the area, remove protective apparel and wash hands, forearms, face and neck.

Flammables:

- Never heat flammable liquids with an open flame or hot plate. Use a heating mantle, steam bath or hot water bath.
- Never use or store flammable chemicals near any source of ignition spark or open flame.
- Handle solvents in an exhaust hood or a well-ventilated area.
- Ground containers when transferring from one container to another if the potential for sparking exists.
- Do not store large quantities of flammable reagents in the laboratory.
- Store flammable liquids in appropriate safety cabinets and/or safety cans.

ADDITIONAL REFERENCE MATERIALS

The National Science Teachers Association

Flinn Safety Data Sheets Searchable Bank

Flinn-Chemistry Lab Storage Room Clean Up

SafeSchools On-Line Videos (The Trust)
(Click on “Resources and Training” tab at the top and select “Streaming Videos”. Scroll down to Preventative Maintenance. Then click on course you are interested in.)

User name: generaluse@dysart.org
Password: wowosi99