

Dare County Schools

CHEMICAL HYGIENE PLAN FOR INSTRUCTIONAL AREAS

February 2006

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SECTION 1 PURPOSE

1.1 Safety

This Chemical Hygiene Plan has been developed to establish safety procedures for all classrooms and laboratories in Dare County Schools that store or use potentially hazardous chemicals. The procedures and guidelines in this plan apply to all areas where hazardous chemicals are used and stored, including, but not limited to, science, art, and photography instructional areas. More specifically, this plan has been established in order to:

- Provide employees and students of Dare County Schools with guidelines and information for conducting **safe** work practices with hazardous chemicals
- Standardize the safety procedures, guidelines, and practices used within Dare County Schools' laboratories, chemical storage areas
- Provide information and training to all appropriate teachers concerning specific hazards of chemicals used and stored in their classrooms and laboratories

1.2 Regulatory and Other Requirements

The procedures and guidelines in this Plan ensure compliance with Federal and State regulations that are applicable to all instructional areas where hazardous chemicals are stored and used, along with “best management practices” for these areas. These regulations and best management practices include, but are not limited to, the following:

- The Department of Labor, Occupational Safety and Health (OSHA) mandates that a Chemical Hygiene Plan be “developed and carried out where hazardous chemicals are used” in school laboratories. [29 CFR 1910.1450(e)]
- OSHA *Hazard Communication Standard* [29 CFR 1910.1200]
- National Research Council Recommendations Concerning Chemical Hygiene in Laboratories [Appendix A to 29 CFR 1910.1450]
- The Uniform Fire Code [UFC 80.301(n)]
- NC Department of Labor, *A Guide to School Safety and Health*
- Department of Health and Human Services, Centers for Disease Control and Prevention (CDC), Office of Health and Safety – Lab Safety, *Basic Chemical Safety* (Web site: <http://www.cdc.gov/od/ohs/safety/basicchem.htm>)

SECTION 2 DISTRIBUTION, REVIEW & REVISION

2.1 Distribution

A copy of the Chemical Hygiene Plan will be distributed to all affected Department Chairs, Work Site Supervisors and teachers. These teachers include those who work with, teach with, or store potentially hazardous chemicals. Teachers must keep a copy of this Plan with/near the MSDS (either in a centralized location or in each laboratory or classroom), as information in the Plan may be useful to first responders. A copy of the Plan will also be provided to the Administrative Office of each elementary, middle and high school.

2.2 Review & Revision

The Science Department Chairs and the Industrial Health & Safety Manager will review the Chemical Hygiene Plan at least annually. This review will take place no later than January 30th of each year. Revisions will be made as necessary and updated copies of the Plan will be distributed before the beginning of the following school year.

Teachers are encouraged to provide feedback for suggested additions, edits, and deletions to the Plan to the school Science Department Chair who will in turn inform the Industrial Health & Safety Manager, before the review session each year.

The Industrial Health & Safety Manager will be the only one to make official changes to the electronic copy of this Plan.

When a procedure in Section 6 (Standard Operating Procedures) of this Plan is revised for any reason, the date of revision will be recorded at the top left of the edited procedure.

SECTION 3 ROLES AND RESPONSIBILITIES

3.1 Science Department Chairs

- Role

Dare County Schools will have a designated a Science Department Chair at each school that has a chemical laboratory. The Science Department Chairs will ensure the effective implementation of the procedures in this Plan in Dare County Schools. Utilization of Science Department Chairs is intended to enhance safety for employees, it does not lessen the responsibility of any teacher to learn and practice safe procedures for teaching in a laboratory.

- Responsibility

Science Department Chairs will work with teachers to:

- Ensure an updated version of the Chemical Hygiene Plan is maintained in all schools
- Keep a “Chemical Hygiene Plan” file for Dare County Schools; this file will contain items such as completed Accident Reports, Inspection Reports, etc.
- Remain familiar with all procedures in this Plan, especially the Chemical Storage procedures, Emergency procedures, Safety Guidelines, and Chemical Acquisition Guidelines
- Designate a secondary contact for emergency situations at each school site
- Serve on the Safety/Health Committees as necessary and ensure that their CHP manual is up to date
- Act as a resource for teachers regarding the use of chemicals in laboratories and chemical storage areas
- Participate, as needed, in the Annual Inspection of laboratories and chemical storage areas
- Ensure Corrective Action items cited in Annual Inspections are addressed in a timely manner
- Collect and maintain Laboratory Accident Reports from teachers, as necessary (See Appendix A), and keep these in CHP file
- Ensure teachers complete annual task of inspecting all chemical storage areas at the end of each school year for chemical disposal purposes
- Provide feedback to the Safety/Health Committees for the annual review of the Chemical Hygiene Plan
- Collaborate with School Safety/Health Committees to develop training programs for teachers on the procedures in this Plan
- Ensure newly-trained employees receive and complete training forms, and keep records of training for all employees who have received it

- Lead effort in completing and submitting Hazardous Waste Disposal Form annually for Dare County Schools; keep copies of form in CHP file
- Ensure teachers provide updated copies of MSDS to appropriate/designated location, and that MSDS are in a location accessible to first responders

3.2 Industrial Health & Safety Manager

The Industrial Health & Safety Manager will:

- Inspect the implementation of the Chemical Hygiene Plan procedures annually to ensure effectiveness and compliance using checklist in Appendix B
- Annually review and revise the Chemical Hygiene Plan, as necessary, with the assistance of the Science Department Chairs
- Stay abreast of applicable regulations, guidelines and best management practices that may affect laboratory activities and/or warrant inclusion in the Chemical Hygiene Plan
- Industrial Health & Safety Manager will arrange for disposal of unwanted hazardous chemicals after receiving Chemical Disposal Requests from the Science Department Chairs

3.3 Teachers

All teachers who store and/or use potentially hazardous chemicals in their classroom/laboratories will:

- Follow all procedures outlined in Section 6 of this Plan
- Maintain an inventory of all potentially hazardous chemicals stored or used in their laboratory and classroom, or centralized location
- Ensure MSDS are kept in a centralized location (a location accessible to first responders)
- Ensure that MSDS file/binder is consistently updated
- Collaborate with Science Department Chairs to inspect all chemical storage areas at end of each school year for chemical “clean-out” and disposal purposes
- Cooperate in annual Inspection of Chemical Hygiene Plan procedures
- Stay abreast of all procedures, including changes to procedures, in Chemical Hygiene Plan -- especially emergency-related procedures, chemical spill procedures, and chemical storage procedures
- Complete Laboratory Accident Reports (Appendix A), as necessary, and promptly give copies of these reports to Science Department Chair
- Make copies of individual SOPs in Section 6.0 and post them in strategic, appropriate areas of the laboratory, classroom, and chemical storage areas for safety purposes and quick/easy reference
- Follow Chemical Acquisition Guidelines including obtaining **REQUIRED** signature approval **PRIOR** to placing orders

SECTION 4 COMPLIANCE

4.1 Annual Inspections

The Science Department Chairs will conduct one (1) inspection each year to ensure all laboratories, chemical storage areas, safety equipment, and laboratory safety practices are in compliance with the procedures in this Plan. This annual inspection will occur at the beginning of each school year (beginning in the fall of 2006), no later than October 15th. Advance notice will be sent to each Science Instructor and/or Lead Teacher, including specific dates and timeframes of inspection. Science Department Chairs will communicate this to all appropriate employees at their respective school(s).

The inspection will be conducted using the checklist in Appendix B as a baseline, and will be performed in coordination with the Science Teachers. Inspection results will be summarized in a report at the bottom of each checklist (including any necessary attachments) and provided to the appropriate Science Department and/or Science Lead Teachers. The Science Department Chairs must keep copies of each completed Inspection Checklist, and a copy must be kept in the school's Chemical Hygiene Plan in the Administrative Office.

4.2 Corrective Actions

Mandatory Corrective Actions resulting from each inspection will be issued to the Science Department and included on the inspection report in the "Corrective Actions" section. The Science Department Chairs and affected teachers will be responsible for ensuring the corrective action(s) are implemented in a timely manner, and for listing the steps taken to complete the corrective action(s) on the Inspection Report. Completion of identified corrective action items will be reviewed during the within thirty (30) days following the annual inspection period. **If a corrective action item is not completed by within the thirty (30) days following annual inspection period, this information will be reported to the Principal of the school and appropriate further corrective action measures issued.** A copy of the inspection checklist, report and recommended/completed corrective actions will be kept by the Science Department Chairs and may be viewed by employees of the school upon request.

Note: Corrective actions will not be cited for situations over which teachers have little or no control (i.e., not having an acid cabinet). The corrective actions are meant to target such things as chemical storage hazards and possession of highly hazardous chemicals (i.e., elemental mercury).

SECTION 5 EMPLOYEE TRAINING

5.1 Annual Training

Before each school year begins, the Science Department Chairs, or their designee(s), will provide a training session on the Chemical Hygiene Plan procedures for any new, affected teachers and for all affected teachers in the case of a major change, addition, or deletion to the Plan.

The training session will include, but not be limited to, the following:

- Distribution of the Chemical Hygiene Plan to each new/affected teacher
- Overview of all procedures contained in the Plan

Site or employee-specific training requests on the Chemical Hygiene Plan can be made to the Science Department Chairs at any time throughout the year.

The school site Principal will work with the Custodial Supervisor to inform custodians on the location of the Chemical Hygiene Plan at each school, and of the basic contents of the Plan.

The training form on the following page must be completed for all teachers who have received Chemical Hygiene Plan training. The Science Department Chair must keep copies of these training forms to document and track who has received this training and forward a copy of these training records to the Industrial Health & Safety Manager.

Dare County Schools

Chemical Hygiene Plan Training Form

School Name _____

Date of Training _____

Training Conducted by _____
(Signature of Science Department Chair)

Signature below indicates that the employee(s) have received Chemical Hygiene Plan training, and have received a copy of the Chemical Hygiene Plan. This sheet is to be kept by the Science Department Chair and a copy kept in the school Administrative Office to document employee training.

Teacher/Employee Printed Name Signature

Teacher/Employee Printed Name Signature

Teacher/Employee Printed Name Signature

Teacher/Employee Printed Name Signature

Teacher/Employee Printed Name Signature

Teacher/Employee Printed Name Signature

Teacher/Employee Printed Name Signature

Teacher/Employee Printed Name Signature

Teacher/Employee Printed Name Signature

Teacher/Employee Printed Name Signature

SECTION 6 STANDARD OPERATING PROCEDURES

6.1 Introduction - Standard Operating Procedures (SOPs)

The following procedures and guidelines apply to all areas where potentially hazardous chemicals are used and stored, including science, art, photography instructional areas and work sites.

Teachers must make copies of individual SOPs and post them in strategic, appropriate areas of the laboratory, classroom, and chemical storage areas for safety purposes and quick/easy reference.

The implementation of the procedures to follow will be evaluated once a year as part of the Annual Chemical Hygiene Plan Inspection (See Section 4).

Each SOP will be identified with a title (i.e. "Chemical Disposal Procedure") and an abbreviation (i.e. "SOP-Sci-1") at the top of each page.

	<p style="text-align: center;">Dare County Schools Required Items for Laboratories SOP-Sci-1</p>
Date of Last Revision 3-3-08	Chemical Hygiene Plan

1.0 Required Laboratory Items

The following items must be kept in all laboratories, classrooms, and areas where chemicals are stored and/or used. These items may be centralized where noted. If your laboratory/classroom is missing items listed in 1.3-1.12, please notify the Science Department Chair at your school site.

The Science Department Chair will inspect laboratory equipment annually. Deficiencies shall be recorded and corrected as soon as possible.

- 1.1 Chemical Inventory. A complete and accurate chemical inventory should be created and maintained in each location where potentially hazardous chemicals are stored/used.
 - The inventory must at least include the name of each chemical, the date it was received, and the quantity of each substance stored.
 - A sample chemical inventory form can be found in Appendix D. Chemical Inventories may be kept electronically (in Excel, Word, etc) or in hardcopy (paper) format.
 - The inventory must be consistently updated as new chemicals are received and old chemicals are disposed of.

- 1.2 Material Safety Data Sheets (MSDS). A binder containing all MSDS must be kept for each potentially hazardous chemical stored and used in the lab. This can be kept in each individual laboratory/classroom, or in a centralized location. All students and teachers must be aware of the uses and location of the MSDS.

- 1.3 A working telephone and nearby posting of Emergency telephone numbers. See Appendix E for a list of the appropriate emergency contact information. Appendix E can be directly removed from this Plan and posted on the wall near the telephone for use. The list must include, at a minimum:
 - Fire, Police, Rescue Squad (Contact Principal's Office)
 - Poison Control Center Phone #
 - School Nurse's extension #
 - Principal Office extension #

- 1.4 Working fire extinguisher in each laboratory, or any area where the potential for fire exists (shop, kiln area, etc.)

(Continued) Required Items for Laboratories

- 1.5 Fume hoods, where necessary. Fume hoods must be fully functional. Contact the Science Department Chair if you are unsure whether your laboratory requires a fume hood, or if your fume hood is fully functional
- 1.6 Easily-accessible fire blanket where open flames are used
- 1.7 Safety shower in each dedicated chemistry lab
- 1.8 Eye wash station near areas where students are working. Eye wash equipment should be flushed once a month to ensure functionality.
- 1.9 Spill kit / spill control materials (sand, kitty litter, etc). A centralized storage location for the spill kit is acceptable.
- 1.10 Mercury spill kits should no longer be needed. According to Safe Children's Act passed by the State legislature in 2006, all mercury, mercury compounds and Mercury containing instruments are not allowed in k-12 schools. Should any mercury remain in you lab, you must arrange for proper disposal immediately.
- 1.11 Personal Protective Equipment (PPE) for all employees and students, including, at a minimum:
 - Lab aprons for all chemistry lab users (use if required by MSDS)
 - Clean and functional splash goggles for all lab users
 - Ventless safety goggles for students who wear contacts
 - Gloves for all lab users (use if required by MSDS)
 - Safety shields for purpose of chemical demonstrations and corrosive chemical use
- 1.12 Master utility cut-off valves for gas
 - Ensure these are working and properly labeled at the beginning of every school year, and are easily-accessible in case of an emergency
 - If cut-off valves are not working, place a work order to the Maintenance Department immediately

	<p style="text-align: center;">Dare County Schools General Laboratory Safety Rules SOP-Sci-2</p>
Date of Last Revision: 3-3-08	Chemical Hygiene Plan

All employees involved in the laboratory environment or teaching a lesson involving potentially hazardous chemicals should read and be familiar with the two science guides published by Council of State Science Supervisors. *Science and Safety, Making the Connection* is a guide for science teachers in grades 9 through 12. *Science and Safety: Its Elementary* is a guide for elementary school teachers. Both guides are available in print versions and as downloadable PDF's at <http://www.csss-science.org/safety.shtmlee>.

No teacher or employee must attempt a laboratory experiment unless s/he is appropriately trained in the science discipline, is fully aware of potential hazards, and is willing to follow all procedures necessary for a safe laboratory experience. No experiment is justified if the safety of an employee or student is questionable.

Teachers must communicate these safety rules to the students, and these rules must be consistently enforced.

Any student whose actions endanger them and/or other students (by teacher's professional judgment) must be removed from the laboratory setting *immediately*, and appropriate disciplinary action must be taken (specific nature of disciplinary action to be determined by Dare County Schools Student Code of Conduct) and documented.

1.0 General Lab Safety Rules

- 1.1 Know and understand the hazards of each chemical used in the lab, as stated in the MSDS. This also applies to the products and reactants of chemical experiments.
- 1.2 Goggles must be worn anytime chemicals, glassware, or heat are used in the laboratory, or when dealing with contents under pressure (applies to all classes – biology-fluid when dealing with dissection, etc.)
- 1.3 Inspect all personal protective/safety equipment before use. If defective, do not use
- 1.4 Never taste any chemicals
- 1.5 When smelling chemicals, use hand to “waft” chemicals towards nose, rather than smelling chemical directly
- 1.6 Avoid working alone in the laboratory or chemical storage areas
- 1.7 Never use flammable liquids near any source of ignition, spark, open flame, or chemicals that act as oxidizers
- 1.8 Ensure all students wash hands thoroughly after handling any chemical

(Continued) General Laboratory Safety Rules

- 1.9 Wear gloves if MSDS requires this for any given chemical
- 1.10 Use trays, or carts with raised edges, when moving glassware and chemicals from room to room
- 1.11 Clearly label all personal safety and emergency equipment such as eye washes, safety showers, fire extinguishers, and spill control materials
- 1.12 Never perform unauthorized laboratory experiments. Perform experiments from a published procedure with an understanding of potential hazards
- 1.13 Always perform first-time chemical demonstrations in front of other teachers to determine the safety of the procedure before performing them in front of class
- 1.14 Do not use chipped or cracked glass/porcelain-ware
- 1.15 Do not operate electrical items with damp or wet hands
- 1.16 Do not allow food, drinks or gum in the laboratory
- 1.17 Keep all laboratory aisles clear of debris
- 1.18 Do not allow running in the laboratory
- 1.19 Never block access to exits, emergency equipment, and master controls (i.e. master gas valves)
- 1.20 Do not allow students to pipette by mouth
- 1.21 Use a face/safety shield for demonstrations, when dealing with corrosive liquids (strong acids or bases) and when lighting flammable solids
- 1.22 Do not apply cosmetics in areas where lab chemicals are present
- 1.23 Always handle toxic, corrosive, flammable and noxious chemicals under a fume hood
- 1.24 Use extreme caution when handling finely divided (dust-like) material. These materials may form explosive mixtures with air and also make inhalation of toxic materials more likely (be sure powdered forms of metals are very restricted)
- 1.25 Dispose of all broken glass in a separate receptacle labeled "Broken Glass." This receptacle can be as simple as a cardboard box
- 1.26 Use extreme caution when handling items that have been heated

	<h2 style="text-align: center;">Dare County Schools</h2> <h3 style="text-align: center;">Emergency Response Procedures</h3> <h4 style="text-align: center;">SOP-Sci-3</h4>
Date of Last Revision: 3-3-08	Chemical Hygiene Plan

The following are general procedures to follow in case of a fire, medical emergency, or chemical poisoning in the laboratory/classroom.

1.0 Fire

In the event of a fire in the laboratory or classroom, the teacher shall:

- 1.1 Quickly survey the situation to determine if fire can be contained and rapidly extinguished with fire extinguisher

Note: When making this determination, the teacher must consider not only the actual fire, but also the dangers related to smoke inhalation and toxic fumes, and err on the side of caution.

- If the fire can be extinguished quickly, the teacher shall:
 - Ensure the safety of students and direct them away from the fire
 - Ensure any remaining sources of ignition are secured
 - Extinguish the fire, or supervise the extinguishing, as appropriate
 - **Notify the main office as soon as possible concerning the fire and current situation**
 - Fill out Laboratory Accident Report, once fire is extinguished (Appendix A)

- If the teacher determines the fire **cannot** be controlled with available resources, s/he shall:
 - Instruct the students to evacuate the room immediately
 - Activate the nearest fire alarm. This must automatically contact the local fire department
 - If the fire alarm does not work, Contact the Principal who in turn will call 911
 - Notify school Administrative Office personnel and other building occupants as soon as possible
 - If time and situation permit, the air handling/ventilation system in the lab/classroom must be shut off. This will slow the spread of fumes to other locations during building evacuation
 - If fire involved chemicals, or chemicals are present in the lab/classroom, notify the Administrative Office in the school as to which chemicals may be present. The MSDS book maintained in the main office or classroom/lab must be removed and made available to fire and medical personnel. This information could be critical to first responders
 - Fill out the Laboratory Accident Report Form (Appendix A), once fire is extinguished

(Continued) Emergency Response Procedures

2.0 Medical Emergency

In the event of a medical emergency in the laboratory or classroom, the teacher, or designated student(s), shall:

- 2.1 Call the **Principal's Office** who in turn will contact the **School Nurse** and/or 911 if immediate First Aid or CPR (Cardiopulmonary Resuscitation) is required
 - If the Principal or their designee **Call 911**:
 - Speak slowly and clearly
 - Communicate the nature of the emergency
 - Give the location of the emergency
 - Give the number and condition of victim(s)
 - Give the phone number you are using and your name
 - Hang up last, after the dispatcher does
- 2.2 In event of suspected **Chemical Poisoning**:
 - Call the Principal's Office who in turn will call 911 immediately
 - Call Poison Center at Carolina Medical Center at 1-800-222-1222 for instructions of what to do before paramedics can arrive
 - Send/take appropriate Material Safety Data Sheet (MSDS) with victim if taken to hospital
- 2.3 Fill out Laboratory Accident Report found in Appendix A. Copies of this completed report must be given to the Chemical Hygiene Officer and the Principal of the School, for notification and record keeping purposes
- 2.4 Teachers must familiarize students with these procedures so that students may help the teacher in an emergency, if necessary

	<p style="text-align: center;">Dare County Schools Chemical Spill Procedure SOP-Sci-4</p>
Date of Last Revision: 3-3-08	Chemical Hygiene Plan

1.0 Emergency Chemical Spills

Note: MSDS(s) for all potentially hazardous chemicals used in the laboratory should be thoroughly read *before* chemical use, so that teachers know whether chemicals are flammable, volatile, poisonous, or toxic/caustic. MSDS must be available near laboratory/chemical storage areas. Recommend that the MSDS be reviewed for each chemical student each time chemical is used.

For spills *involving* **FLAMMABLE, VOLATILE, POISONOUS OR TOXIC/CAUSTIC** materials, the teacher shall:

- 1.1 If necessary, consult the MSDS of chemical(s) to determine if chemical is flammable, volatile, poisonous, or toxic/caustic.
- 1.2 **DO NOT ATTEMPT** to handle the spilled substance with bare hands
- 1.3 Immediately alert all room occupants of spill
- 1.4 If spilled chemical is flammable, turn off any sources of ignition
- 1.5 Contain the spill as much as possible using spill kit, kitty litter, sand, etc.
- 1.6 Evacuate the room/area if needed/as soon as possible
- 1.7 Close the door on the way out to prevent further building contamination
- 1.8 Once out of room, notify the Principal's Office who in turn will use professional discretion to decide whether to call 911. Provide your name, school, building name/number, and room number of spill and substance spilled. State whether medical aid is required
- 1.9 As soon as possible, notify the Chemical Hygiene Officer and the Industrial Health & Safety Manager if necessary. Provide name of the chemical spilled, the approximate amount spilled, and other MSDS information.
- 1.10 The Industrial Health & Safety Manager will ensure the spilled material is disposed-of by properly licensed and equipped personnel if needed
- 1.11 No one must enter the contaminated area (for general housekeeping or otherwise) until the area has been declared decontaminated/safe
- 1.12 Fill out Accident Report (Appendix A) for all Emergency Chemical Spills

(Continued) Chemical Spill Procedure

- 1.13 Inform the Principal of spill, so s/he can ensure completed
Appendix A is maintained in school's Chemical Hygiene Plan file

2.0 Non-Emergency Chemical Spills

- 2.1 Read the MSDS of chemical(s) to ensure chemical is not flammable, volatile, poisonous or toxic/caustic. **When in doubt, follow procedure for Emergency Spills in Section 1.1 of this SOP.**
- 2.2 If spilled chemical is determined NOT to pose an immediate threat to human health, do the following:
- DO NOT ATTEMPT to handle the spilled substance, especially with bare hands.
 - Alert all room occupants of spill.
 - Turn off any sources of ignition, just to be safe.
 - Contain spill using appropriate spill kit or substance (sand, kitty litter, etc)
 - Gently pour sand/litter around spill area.
 - Pour absorbent (litter or oil absorbent) on the spill.
 - If spill is inorganic acid or base, apply appropriate neutralizer. Neutralizer must be mixed with the sand and absorbent so that it mixes with all of the spilled material.
 - Clean spill by using broom to sweep up remaining solid.
 - Place swept mass into large plastic garbage bag for disposal.
 - If at any time during the containment or clean up you feel uncomfortable, leave the area and contact the Chemical Hygiene Officer for guidance/help.

3.0 Mercury Spills

Elemental mercury must never be purchased, stored or used. According to the Safe Children's Act passed by the State Legislature in 2006; all mercury, mercury compounds, and mercury containing instruments are not allowed in K-12 schools, therefore, no mercury skill kits are required. Should any mercury remain in your lab, you must arrange for proper disposal immediately.

	<h2 style="text-align: center;">Dare County Schools Chemical Acquisition Guidelines</h2>
<p>Date of Last Revision: 3-3-08</p>	<p>Chemical Hygiene Plan</p>

Note: The following are general guidelines to follow when ordering or acquiring chemicals for laboratory use:

- The quantity of chemicals acquired and stored must be limited to amounts no greater than what will be consumed over a period of two (2) academic years
- Non Household Chemicals must be purchased from commercial chemical suppliers only
- Chemicals listed in Appendix H in **bold** must not be purchased, used or stored in Dare County Schools
- Accepting chemicals as gifts
 - Chemicals may be accepted from various organizations or institutions through the Industrial Health & Safety Manager **only**
 - Chemicals must be inspected before acceptance
 - All accepted chemicals must be labeled and accompanied with MSDS, if lab/classroom does not already (can be obtained on line) have MSDS for particular chemical(s)
 - Chemicals must not be accepted if this will lead to excessive storage/redundancy of certain chemicals in any given lab/storage space
- Avoid bulk purchases – smaller containers, though they may be more expensive, promote freshness, maintain quality, reduce the likelihood of contamination, and lessen severity of spills
- Purchase ready-to-use chemicals when possible, in order to reduce the potential for overexposure to more hazardous materials. Ready-to-use chemicals require no mixing or dilution of concentrated ingredients, and thus pose less of a hazard
- When possible, order biology lab specimens in packaging that uses the minimum amount of preservative
 - Non-formaldehyde preservatives are preferred. Formaldehyde is banned for use - a carcinogen

REQUIRED: All chemical orders must be reviewed and signature of approval obtained from the area High School Science Department Chair:

Manteo Elementary and Manteo Middle – Signature approval of Manteo High School Science Department Chair

First Flight Elementary, First Flight Middle, Nags Head Elementary, and Kitty Hawk Elementary – Signature approval by First Flight High School Science Department Chair

Cape Hatteras Elementary and Cape Hatteras Secondary – Signature approval of Cape Hatteras Secondary Science Department Chair

	<p>Dare County Schools</p> <p>Chemical Storage Procedures</p> <p>SOP-Sci-5</p>
Date of Last Revision: 3-3-08	Chemical Hygiene Plan

1.0 General Chemical Storage Guidelines

- 1.1 Store chemicals in chemically-compatible families
 - If possible, use the **“Suggested Shelf Pattern” published by Flinn Scientific, Inc.** for chemical storage. A copy of this can be found in Appendix F of this Plan
- 1.2 Keep a written copy/sketch of your specific “shelf pattern” *and* room/closet numbers of chemical storage locations on door, or in an easily accessible location; this information could be very helpful to **first responders (Label shelves)**
- 1.3 All chemicals must be stored on shelves or in cabinets so they cannot be easily knocked over. Shelves need a wooden strip nailed on the front (3/4 in) to prevent knocking chemicals off shelves. Shelves that house glassware need the same front strip. Do not store chemicals on floor
- 1.4 Avoid storing chemicals above eye/head level if possible
- 1.5 All potentially hazardous chemicals must be stored in a locked, dedicated storeroom, separate from the laboratory/classroom
- 1.6 Chemicals used in the classroom/laboratory for instructional purposes must be returned to their designated place in the chemical storeroom **immediately after use**, and/or anytime the room is left unsupervised
- 1.7 Only authorized personnel must be allowed in chemical storage areas (i.e., maintenance and custodial staff, appropriate teachers, Chemical Hygiene Officer, Principals)
- 1.8 All chemical storage cabinets must be labeled in order to identify the hazardous nature of the substance(s) stored inside
- 1.9 All stored chemicals must be clearly and appropriately labeled:
 - Include name of chemical (i.e. H₂SO₄) on bottle/jar
 - Include amount and concentration of chemical (i.e. 2 liters; 0.1 mol)
 - Include date of purchase or mixing on label
 - Store chemicals with **labels facing out**
 - This includes chemical solutions made in the classroom
- 1.10 When mixing chemicals, teacher must include “mixed by teacher’s NAME” and date mixed on the label. This will inform the Science Department Chair who to consult before discarding chemical, and provide a contact in case a question arises regarding the mixture

(Continued) Chemical Storage Procedures

- 1.11 Do not overstock chemicals -- store the *minimum* amount of chemicals needed
- 1.12 Do not store chemicals in fume hoods
- 1.13 Keep chemical inventory near or in chemical storage area if possible
- 1.14 Do not leave chemicals that are not being used sitting out for an extended period
- 1.15 Storage areas must be well ventilated at all times
- 1.16 Avoid storing chemicals in location that has direct sunlight
- 1.17 Store compressed gas cylinders secured to wall, with valve closed, and away from heat. Cylinders may be temporarily secured by a bench clamp, for purposes of dispensing samples
- 1.18 Acetylene and liquefied gas cylinders must be stored in an upright position
- 1.19 Ensure all chemicals are stored (and appropriate ones locked away) properly at end of school year. This is especially important due to construction/demolition work, which often occurs during the summer months

2.0 Flammable Substances

- 2.1 All flammable substances **must** be stored in a locked flammable storage cabinet when not in use
 - No cabinet must store more than 60 gallons of Class I flammable liquids or Class II flammable liquids, nor more than 120 gallons of Class III flammable liquids [OSHA, 29 CFR 1910.106(d)(3)(i)(II)]
 - See Section 2.2 below for classification of flammable liquids
- 2.2 Maximum Allowable Size of Containers

Container Type	Flammable Liquids			Combustible Liquids	
	Class IA	Class IB	Class IC	Class II	Class III
Glass or approved plastic	1 pt.	1 qt.	1 gal	1 gal	1 gal
Metal (other than DOT drums)	1 gal	5 gal	5 gal	5 gal	5 gal
Safety Cans	2 gal	5 gal	5 gal	5 gal	5 gal

Flammable Liquids

Class IA Flash Point < 73 degrees F, Boiling Point < 100 degrees F

Class IB Flash Point < 73 degrees F, Boiling Point \geq 100 degrees F

Class IC Flash Point \geq 73 < 100 degrees F, Boiling Point < 100 degrees F

Combustible Liquids

Class II Flash Point \geq 100 degrees F and < 140 degrees F

Class III Flash Point \geq 140 degrees F

- 2.3 Do not store flammables in refrigerators unless refrigerator is explosion-proof

(Continued) Chemical Storage Procedures

2.4 Ensure no oxidizers are stored near flammables or in flammable cabinet

2.5 Examples of common flammable substances include:

- Acetone, Benzene, Ethanol, Methanol, Octane, 2-Propanol, Toluene,
- Most spray paints, aerosols and thinners

3.0 Acids and Bases

3.1 Strong acids and bases must be stored separately from each other (in separate cabinets), and separately from all other chemicals. Nitric acid is separate; separate organic and inorganic acids

3.2 Strong acids must be stored in a dedicated acid cabinet

3.3 Every nine (9) weeks, inspect all shelves (including shelf clips) in acid cabinet to check for possible corrosion

3.4 Strong bases must be stored in a dedicated corrosive chemicals cabinet.

- If a dedicated corrosive cabinet is not available for strong bases, be sure to store strong bases separately from strong acids, which should remain in the dedicated acid cabinet

4.0 Poisons

4.1 All poisonous substances must be stored in a locked cabinet, and appropriately labeled

	<p style="text-align: center;">Dare County Schools Chemical Disposal Procedures SOP-Sci-6</p>
Date of Last Revision: 3-3-08	Chemical Hygiene Plan

1.0 Chemical Disposal Procedures

In general, small, soluble quantities (test tube amounts) of chemical waste generated by laboratory procedures pose no problem for water treatment plants. Chemicals in this small quantity may be flushed with adequate amounts of water to protect plumbing. In general, insoluble chemicals must NOT be disposed of by flushing down the sink. These chemicals may be set aside for end-of-school-year disposal, when Science Department Chair and/or Industrial Health & Safety Manager will decide how to dispose of waste.

If questions arise about a particular substance or chemical, consult the Science Department Chair.

1.1 End-of-School-Year Chemical Disposal

- Prior to last student class day of each year, Science Department Chairs must lead effort to inspect their laboratories for chemicals that are no longer needed. Individual teachers may be involved as needed.
- Chemicals requiring disposal shall be categorized as either:
 - **Hazardous**; or
 - All unknown/unlabeled chemicals must be considered hazardous
 - **Non-hazardous**
 - See Section 1.3 below for disposal procedures
 - If further assistance is needed in classifying chemicals as “hazardous” or “non-hazardous”, call the Science Department Chair

1.2 Hazardous Chemical Disposal

- At end of school year, Science Department Chairs must collaborate with teachers to fill out the ***Hazardous Waste Disposal Form*** in Appendix C
- Fax completed form to the Science Department Chair for review
- The Industrial Health & Safety Manager will coordinate chemical pick-up with a certified hazardous waste disposal contractor upon request of the Science Department Chair

(Continued) Chemical Disposal Procedures

- Update chemical inventory with information regarding chemicals that are disposed of so that inventory remains current

1.3 Non-hazardous Chemical Disposal

Non-hazardous soluble chemicals may be flushed using adequate water to protect plumbing

1.4 Biology-Related Chemicals

- Biological preservatives such as alcohol or formalin may be flushed with water if quantities do not exceed three (3) gallons
- Preserved dissection specimens may be disposed of with regular trash
 - Must be **double-bagged**
 - Dispose of specimens after students have left the room/building
 - Do not allow students to visit dumpster

DARE COUNTY SCHOOLS

Appendix A

Laboratory Accident Report Form

1. Name of School _____
2. Name of Teacher _____
3. Date & Time of Accident _____
4. Room / Laboratory # _____
5. Type of Accident (Spill, Fire, Medical) _____
6. If spill, substance spilled _____
7. Amount spilled (estimate) _____
8. Cause of Accident _____
9. Location of Accident _____
10. Name of student(s) injured (if any) _____
11. Name of staff injured (if any) _____
12. Who responded to accident (if anyone) _____

Signature of Person Completing This Form

Date

School Nurse's Signature (if any injuries)

Date

COPIES OF THIS COMPLETED FORM MUST BE SUBMITTED TO THE SCIENCE DEPARTMENT CHAIR, AND THE SCHOOL PRINCIPAL. The Principal will be responsible for making sure all other accident reports forms are also completed and filed with the appropriate administrative offices.

DARE COUNTY SCHOOLS

Appendix B

Annual Inspection Checklist

This Inspection Checklist is for use in Dare County Schools for the purpose of annual evaluations of laboratories and classrooms to ensure compliance with OSHA standard 29 CFR 1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories, and to ensure compliance with the procedures in this Chemical Hygiene Plan.

SCHOOL _____ ROOM # OF LAB / STORAGE AREA _____

DATE OF INSPECTION _____ SCIENCE DEPARTMENT CHAIR _____

INSPECTOR _____

✓ =Satisfactory; CA= Corrective Action Needed; N = see Note

Category	Item	✓, CA, N	Corrective Action / Notes
Required Lab Items	Updated Chemical Inventory		
	Updated MSDS Binder		
	Safety Equipment required by SOP-Sci-1 Eye wash, chemical shower, fire blanket, first aid kit, etc.		
Emergency Response	Emergency Contact #'s Posted		
Chemical Spill	Spill containment materials		
	Any spills last year? If so, completed Accident Report?		
Chemical Storage	Chemicals stored in chemically-compatible families		
	Chemicals not stored on floor		
	All chemicals appropriately labeled		
	Chemicals not overstocked		
	Chemicals not stored in fume hood		
	Chemical storeroom locked when not in use		
	Storage area well-ventilated		

Appendix B - continued

Annual Inspection Checklist

✓ =Satisfactory; CA= Corrective Action Needed			
Category	Item	✓, CA, N	Corrective Action / Notes
Chemical Storage – (continued)	No unused chemicals left out on tables		
	Compressed gas cylinders secured to wall		
	All flammable chemicals in locked fire-safe/ cabinet		
	No oxidizers stored near flammables		
	Flammable containers do not exceed 1 gallon for glass; 2 gallons for cans		
	Acids and bases stored separately		
	Strong acids stored in locked acid cabinet		
	No corrosion of acid cabinet shelves		
	All “poisonous” chemicals stored in locked cabinet		
	Chemical Disposal	If chemicals await disposal, has Hazardous Waste Disposal Form been filled out?	
All Corrective Actions Cited in Last Inspection Addressed? If not, why?			
Describe plan to address remaining Corrective Actions (from previous inspection) needed:			

The Science Department Chair must maintain a copy of this completed checklist.

DARE COUNTY SCHOOLS

Appendix C

Hazardous Waste Disposal Request

1. Name of School _____
2. Classroom # _____
3. Name of Teacher _____
4. Request Date _____
5. Estimated Quantity of Chemical (specify units) _____
6. Location of Chemicals in Room _____
7. Brief description of chemicals (acids, corrosives, etc)

Please fax this form at the end of the school year to the Science Department Chair for review. The Science Department Chair will contact the Industrial Health & Safety Manager for disposal if needed.

Appendix D

Sample Chemical Inventory Form

The table on the following page is an example of a way to inventory chemicals. You may copy and use the next page to keep your own chemical inventory in this binder; however, Microsoft Excel or any other electronic or hard-copy format is acceptable, as long as it details 1) the name of the chemical, 2) the amount currently stored, and 3) the date the chemical was received and disposed of.

Appendix E

Emergency Contacts

Principal's Office

**Fire, Police, or
Medical.....911**

Poison Control.....1-800-222-1222

School Nurse.....

Science Department Chair...

Appendix F

Suggested Shelf Pattern – Flinn Scientific

Separate chemicals into their organic and inorganic families. Further divide the materials into related and compatible families:

INORGANIC	ORGANIC
1. Metals, Hydrides	1. Acids, Amino Acids, Anhydrides, Peracids
2. Acetates, Halides, Iodides, Sulfates, Sulfites, Thiosulfates, Phosphates, Halogens.	2. Alcohols, Glycols, Sugars, Amines, Amides, Imines, Imides
3. Amides, Nitrates (except Ammonium Nitrate)	3. Hydrocarbons, Esters, Aldehydes, Oils
4. Hydroxides, Oxides, Silicates, Carbonates, Carbon	4. Ethers, Ketones, Ketenes, Halogenated Hydrocarbons, Ethylene Oxide
5. Sulfides, Selenides, Phosphides, Carbides, Nitrides	5. Epoxy Compounds, Isocyanates
6. Chlorates, Bromates, Iodates, Chlorites, Hypochlorites, Perchlorates, Perchloric Acid, Peroxides, Hydrogen Peroxide	6. Peroxides, Hydroperoxides, Azides
7. Arsenates, Cyanides, Cyanates	7. Sulfides, Polysulfides, Sulfoxides, Nitriles
8. Borates, Chromates, Manganates, Permanganates	8. Phenols, Cresols
9. Acids (except Nitric). Nitric Acid is isolated and stored by itself	9. Dyes, Stains, Indicators
10. Sulfur, Phosphorus, Arsenic, Phosphorus Pentoxide	

Flinn Scientific also has suggested shelf storage patterns using the previously numbered, related and compatible families:

INORGANIC SHELF STORAGE PATTERN

INORGANIC # 10	INORGANIC #7
INORGANIC # 2	INORGANIC #5
INORGANIC # 3	INORGANIC #3
INORGANIC # 1	INORGANIC #6
INORGANIC # 4	MISCELLANEOUS

Note: Acids #9 are recommended to be stored in an "Acid Cabinet"

ORGANIC SHELF STORAGE PATTERN

ORGANIC #2	ORGANIC #8
ORGANIC #3	ORGANIC # 6
ORGANIC # 4	ORGANIC # 1
ORGANIC # 5	ORGANIC # 9
ORGANIC # 7	MISCELLANEOUS

Note: Organic #'s 2, 3, 4 & 9 are recommended to be stored in "Flammables" cabinet.

If shelf space is a problem, place a 3" space between each family on the same shelf

Appendix G

Definitions & Acronyms

29 CFR part 1910.1450 - Section of the Code of Federal Regulations: Occupational Exposures to Hazardous Chemicals in Laboratories.

Action Level - A concentration designated in 29 CFR part 1910 for a specific substance, calculated as an eight (8)-hour time weighed average, which initiates certain required activities such as exposure monitoring and medical surveillance.

Chemical Hygiene Plan (CHP)- A written program that sets forth policy and procedures capable of protecting employees and students from the health hazards associated with the classrooms and laboratories.

CFR - Code of Federal Regulations.

Compressed Gas - A gas or gas mixture, which is contained under an absolute pressure exceeding 40 PSI at 70° F (21.1° C) or a gas or gas mixture which is contained under an absolute pressure exceeding 104 psi at 130° F (54.4° C) regardless of the pressure at 70° F or a liquid having a vapor pressure exceeding 40 psi at 100° F (37.8° C) as determined by ASTM D-323-72.

Corrosive Chemicals - Any liquid or solid that can cause visible destruction of human tissue, or a liquid that has a severe corrosive rate on steel. This includes acids and bases.

Combustible Liquids - Liquids which may be ignited and possess a flash point between 100° and 200° F.

EPA - US Environmental Protection Agency; <http://www.epa.gov/>

Flammable Liquids - Liquids that are easily ignitable and possess a flash point below 100° F, and solids liable to cause fire through friction, heat retention or which ignite readily and burn vigorously.

Flammable Gas - A gas that forms a flammable mixture with air at a concentration of 13% by volume or less at ambient temperature and pressure or a gas that forms a range of flammable mixture with air at a concentration of 12% by volume or less at ambient temperature and pressure regardless of the lower limit.

Flammable Aerosol - An aerosol that yields a flame protection exceeding 1 inches at full valve opening or a flashback (a flame extending back to the valve) at any degree of valve opening when tested under conditions specified under 16 CFR 1500.45.

Incompatible Chemicals – Chemicals that could cause dangerous reactions by direct contact with one another.

Appendix G - continued

Definitions & Acronyms

Hazard Classifications - Classification of a chemical hazard based on the physical properties and potential health effects that a chemical expresses (e.g. flammable, combustible, corrosive, toxic, etc).

Material Safety Data Sheet (MSDS) - Information sheets produced by a chemical manufacturer, which specify hazard components, physical and health hazards associated with the chemical, first aid procedures necessary for accidental exposures, spill clean-up, and waste disposal procedures.

NIOSH -- **National Institute for Occupational Safety and Health**, US Public Health Service, US Department of Health and Human Services (DHHS), which among other activities, tests and certifies respiratory protective devices and air sampling detector tubes, recommends occupational exposure limits for various substances, and assists OSHA and MSHA in occupational safety and health investigations and research;
<http://www.cdc.gov/niosh/homepage.html>

OSHA -- **Occupational Safety and Health Administration**, US Department of Labor;
<http://www.osha.gov/>

Oxidizers - Substances that readily give off oxygen to aid combustion.

Organic Peroxides - A hydrogen peroxide-like substance with one or more of the hydrogen atoms replaced by organic radicals. Organic peroxides are unstable and contain both oxygen and fuel within the same molecule. They may react with themselves or decompose producing a violent reaction.

Personal Protective Equipment (PPE) - Equipment utilized to protect laboratory workers from exposure to hazards associated with hazardous materials and waste.

SOL – Standards of Learning

SOP – Standard Operating Procedure

UFC – Uniform Fire Code

Appendix H **Chemical Review List**

The following list distinguishes which chemicals must NOT be purchased, stored, or used in Dare County Schools under any circumstances; which chemicals can be used and stored in restricted quantities only; which chemicals can only be used in an AP (advanced placement) lab and/or for demonstration purposes-only; and outlines the "chemical status" for each chemical (i.e. whether the chemical is a suspected carcinogen, moderately or extremely toxic, flammable, reactive, explosive, etc.).

This list was prepared using data from the Council of State Science Supervisors, and the Flinn Chemical Reference Manual (2004). Evaluation of these chemicals involved reactivity, toxicity, carcinogenic potential, reproductive and/or mutagenic hazards, explosiveness, and flammability.

IMPORTANT NOTES:

If you have questions about any specific chemical, please contact the Science Department Chairs.

The Science Department Chairs, using continuously updated chemical inventories from elementary, middle and high school teachers, may revise/add to this list periodically. Anytime an official revision is made, an updated Appendix H will be distributed.

This list is a work-in-progress; certain designations listed below are subject to change. If you have questions about any of the designations for certain chemicals listed below, please consult the Science Department Chairs.

Key:

bold = Chemicals that must NOT be purchased, stored or used in Dare County Schools under any circumstances. Chemicals not in bold can be used, but only with restrictions, precautions and procedures detailed within this Plan.

NA = Not allowed for use in specified school type (middle or high school)

+ = Only limited quantities of these concentrated chemicals must be stored and used, or an amount that will be consumed in one school year [No more than 2.5 Liters (2500 mL) or 500 grams, unless a more stringent amount is noted below]. Chemicals should be stored in appropriate/locked cabinet. **In general, solution/molar forms of these chemicals is permitted.**

AP or demo only = Concentrated form of these chemicals is allowed to be used for high school AP and/or demonstration purposes only

✓ = Chemicals permitted in specified school type (middle or high school)

^ = Permitted stains and indicators. **In general, any stain/indicator in solution is permitted. Powder form not recommended.**

Note: Vials containing powder forms of metals (i.e. aluminum, arsenic, barium, calcium, chromium, cobalt, lithium, magnesium, manganese, mercury, phosphorous, potassium, ruthenium sodium, tellurium, uranium, zinc) are not allowed; these metals can cause metal fume fever

Chemical Status

P = reproductive or mutation data reported

C = positive or suspected carcinogen

T= moderately to extremely toxic

R= highly reactive and/or corrosive

F = flammable

E = explosive

Appendix H – continued

Chemical Review List

Revised 3-3-08

Chemical Name	Middle/Elem. School	High School	Status
Acetamide	NA	NA	C
Acetanilide	NA	NA	T
Acetic acid (glacial)	Molar Solution only	+	T, F, R
Acetic acid	Molar Solution only	+	R
Acetic anhydride	NA	NA	F, R, T
Acetone	NA	+	F, T
Acetophenone	NA	NA	T, F
Acetyl chloride	NA	+ (AP or demo only)	F
Acetylsalicylic acid	✓	✓	T, P
Acrylonitrile	NA	NA	C
Adipic acid	NA	NA	T
dl-Adrenaline (solution form)	✓	✓	T
Albert's Stain "A" and "B"	✓	✓	
Alizarin Red S	NA	NA	T, F
Alizarin Yellow R	NA	NA	T
^Aluminon	NA	+ (AP or demo only)	P, T
Aluminum chloride (anhydrous)	NA	NA	R, T
Aluminum hydroxide	NA	NA	T, F
Aluminum powder	NA	NA	F, T
Aluminum sulfide	NA	NA	T, F
Ammonium bichromate	NA	NA	T, E, F
Ammonium bifluoride	NA	NA	T
Ammonium chromate	NA	NA	T, C
Ammonium dichromate	NA	NA	C, T, E, F
Ammonium formate	NA	NA	T
Ammonium hydroxide (14 M)	✓	✓	T
Ammonium hydroxide (6 M)	✓	✓	T
Ammonium nitrate (crystal)	NA	NA	T, E
Ammonium nitrate (pearl)	✓	✓	
Ammonium oxalate	NA	NA	T, R
Ammonium vanadate (ammonium metavanadate)	NA	NA	T
Ammonium pyrrolidinedithiocarbamate	NA	NA	T, P
α-Amylase	NA	NA	T, P
Aniline	NA	NA	T, C
Aniline hydrochloride	NA	NA	T
Anthracene	NA	NA	C
Antimony (lumps)	NA	✓	T
Antimony (powder)	NA	NA	T, C
Antimony oxide	NA	NA	T
Antimony pentachloride	NA	NA	R
Antimony potassium tartrate	NA	NA	T, P
Antimony sulfide	NA	NA	T, F, E
Antimony telluride	NA	NA	T, F, E
Antimony trichloride	NA	NA	T
Arabic gum	NA	NA	T, P
L-(+) Arabinose	✓	✓	
Arsenic	NA	NA	T
Arsenic chloride	NA	NA	T

Chemical Name	Middle/Elem. School	High School	Status
Arsenic pentoxide	NA	NA	T
Arsenic sulfide	NA	NA	C, T
Arsenic trioxide	NA	NA	C, T
Asbestos	NA	NA	C
Ascarite	NA	NA	C
Barium carbonate	NA	NA	T
Barium chloride	Molar Solution only	+ (AP or demo only)	T
Barium oxalate	NA	NA	T
Barium hydroxide	Molar Solution only	+	T, R
Barium peroxide	NA	NA	T, F
Barium nitrate	Molar Solution only	Molar Solution only	T
Barium sulfate	NA	+ (AP or demo only)	C, T
Barium sulfide	NA	NA	T, F
Basic Fuchsin	NA	NA	C, T
Benzaldehyde	NA	NA	T, F, E
Benzene	NA	NA	C, T, F
Benzidine	NA	NA	T
Benzoic acid	✓	✓	T, F
Benzoin	NA	NA	C, T
Benzoyl chloride	NA	NA	T, R
Benzoyl peroxide	NA	NA	T, E, R
Benzyl alcohol	NA	NA	T, F
Beryllium carbonate	NA	NA	T
2,2'Biquinoline	NA	NA	P, T
Bismuth chloride	NA	NA	T
Bismuth fine granular	NA	NA	T, F
Biuret powder	NA	NA	T
Biuret solution	✓	✓	R
Boric acid	✓	✓	T
^Brilliant Cresol Blue	✓	✓	T, C, P
^Brilliant Green	✓	✓	T, P
Bromine	NA	+ (AP or demo only)	T, F
Bromine water	NA	+ (AP or demo only)	T
^Bromocresol Green	✓	✓	T
^Bromocresol Purple	✓	✓	P
^Bromophenol Blue	✓	✓	P
^Bromophenol Red	✓	✓	
^Bromothymol Blue	✓	✓	P
Cadmium	NA	NA	C, T
Cadmium bromide	NA	NA	T
Cadmium carbonate	NA	NA	T
Cadmium chloride	NA	+ (AP or demo only)	C
Cadmium mossy	NA	NA	C, T, P
Cadmium nitrate	NA	NA	C, T, F
Cadmium sticks	NA	NA	C, T, F
Cadmium sulfate	NA	NA	C, T
Cadmium sulfide	NA	NA	C, T
Caffeine (pure form)	NA	NA	T, P
Calcium carbide	NA	+ (AP or demo only)	F
Calcium cyanide	NA	NA	T
Calcium fluoride	NA	NA	T, P
Calcium hypochlorite	Molar Solution only	Molar Solution only	T
Calcium nitrate (crystals)	✓	✓	F
Calcium sulfide	NA	NA	T, F
Calcium oxide	✓	✓	R, F
Calcium turnings	✓	✓	F, E
Camphor	✓	✓	T, P

Chemical Name	Middle/Elem. School	High School	Status
n-Caprylic acid	NA	NA	T, P
^Carbol Fuchsin "Ziel Neelsen"	✓	✓	
Carbon (activated)	✓	✓	T, P
Carbon disulfide	NA	NA	F, E
Carbon tetrachloride	NA	NA	T
Carmin	NA	NA	P, T
Catechol (pyrocatechol)	NA	NA	T
Ceric sulfide	NA	NA	P
Cesium chloride	NA	NA	T, P
Chlorine (gas)	NA	NA	T
Chlorine water	✓	✓	
Chloral hydrate	NA	NA	T
Chloretone (chlorobutanol)	NA	NA	T
m-Chloroacetic acid	NA	NA	T, C, F
Chlorobutane	NA	NA	T, F
Chloroform	NA	NA	C, T
Chlorpromazine	NA	NA	T
Chrome alum	NA	NA	C, T
Chromium	NA	NA	C, T
Chromium (powder)	NA	NA	C, E
Chromium acetate	NA	NA	C
Chromium nitrate	Molar Solution only	Molar Solution only	T, P, C
Chromium oxide	NA	NA	C
Chromium potassium sulfate	NA	+	T, P, C
Chromium trioxide (chromic acid)	NA	NA	C, T
Clorox Liquid Bleach	✓	✓	T, R
Cobalt	NA	NA	T
Cobalt chloride	Molar Solution only	+	T, C
Cobalt (chips, pellets & shot)	NA	NA	C, T, E
Cobalt nitrate	Molar Solution only	Molar Solution only	T, C
Cobalt sulfate	NA	NA	T, C
Cochineal	NA	NA	T, C, P
Colchicine	NA	NA	C, T
Collodion flexible	NA	NA	T, F
^Congo Red	✓	✓	T, P
Copper fine powder	NA	NA	C, F
Copper (I, II) oxide	NA	+ (AP or demo only)	T, E
Cottonseed oil	NA	NA	C, F
^m-Cresol Purple	✓	✓	T, C
Cryolite	NA	NA	T, P
^Crystal Violet	✓	✓	T, P, C
Cupric acetate	NA	NA	T, P
Cuprous chloride	✓	✓	T, P, R
Cupric oxide	NA	+ (AP or demo only)	T, E
Cupric sulfate	Small crystal only	✓	T, C, P
Cyclohexane	NA	NA	F, T
Cyclohexene	NA	NA	F, T, E
Cyclohexanol	NA	NA	F, T
^Diazo "A"	✓	✓	
Dichlorobenzene	NA	+ (AP or demo only)	T
^2,6-Dichlorophenol Indophenol Sodium Salt	Solution only	Solution only	T
Dichromate acid cleaner	NA	NA	C, T, P
N,N-Diethylaniline	NA	NA	T, P, F
Dimethylaniline	NA	NA	T
^Dimethylgloxime	Solution only	Solution only	P, T
Dichloroethane (ethylene dichloride)	NA	NA	C
Diisopropyl ether	NA	NA	E

Chemical Name	Middle/Elem. School	High School	Status
2,4-Dinitrophenol	✓	✓	T, E
Diphenylamine	NA	NA	T, F
s-Diphenylcarbazone	NA	NA	P, T
Dioxane	NA	NA	C
Dithizone	NA	NA	T
^EDTA N/50	✓	✓	
^Eosin Blue	✓	✓	T
^Eosin Yellow	✓	✓	T
^Erichrome Black T	✓	✓	
Ethyl alcohol	✓	✓	F, T
Ethylene dichloride (Dichloroethane)	NA	NA	C, F, T
Ethylenedinitrilotetraacetic acid	NA	NA	T, M
Ethylene oxide	NA	NA	T, F
Ether (ethyl ether)	NA	NA	F, T
^Fast Green FCF	✓	✓	C, T
Ferric ammonium citrate	Molar Solution only	+	C
Ferric chloride	✓	✓	T, R, P
Ferrous sulfate	✓	✓	T
^Fluorescein	Solution only	Solution only	T
Formaldehyde (37% solution)	NA	NA	T, C
Formaldehyde (10% solution) / Formalin	✓	✓	T
Formic acid	NA	NA	R, T, P
Fuchsin acid	NA	NA	C, T, P
Gallic acid	NA	NA	T, P
Gasoline	NA	NA	F, E
Gibberellic acid	NA	NA	C, T
Gold Foil	✓	✓	T, C
Guanidine hydrochloride	NA	NA	T, P
Gum Guar	✓	✓	T, P
Gunpowder	NA	NA	E
Hematoxylin	NA	NA	C
Hemoglobin	NA	NA	T, C
Hexachlorophene	NA	NA	T
1,6-Hexanediamine	✓	✓	T
Hydrobromic acid	NA	NA	T
Hydrochloric acid	Molar Solution only	+	R
Hydrofluoric acid	NA	NA	T
Hydrogen gas	NA	NA	F
Hydrogen peroxide (30%)	NA	+(AP or demo only)	T, R
Hydrogen peroxide (3%)	✓	✓	T
Hydrogen sulfide	NA	NA	T
Hydroquinone	NA	NA	T
Hydroxylamine hydrochloride	NA	NA	T, P
Indigo	NA	NA	P, T
^Indigo carmine	Solution only	Solution only	T, C, P
Inulin	NA	NA	T
Indole	NA	NA	T, C
Indoleacetic acid	NA	NA	T, C, P
Indolebutyric acid	NA	NA	P, T
Indophenol sodium salt	NA	NA	T
Iodine crystal	NA	No more than 150 grams	T, R
^Iodine solution "Gram"	✓	✓	
Iodoform	NA	NA	T, P
Iron dust	NA	NA	C
Isopentyl alcohol	✓	✓	F, T
Isopropyl alcohol	✓	✓	F

Chemical Name	Middle/Elem. School	High School	Status
^Janus Green B	✓	✓	C, T
Kinetin	NA	NA	T, P
Lactic acid	✓	✓	R
Lanthanum nitrate	NA	NA	T, P
Lead acetate (flakes)	NA	NA	T, C
Lead arsenate	NA	NA	C, T
Lead carbonate	NA	NA	T, P, C
Lead chloride	NA	NA	T, P, C
Lead chromate	NA	NA	C, T, P, E
Lead dioxide	NA	+ (AP or demo only)	P, E, C
Lead nitrate	NA	+ (AP or demo only)	T, P, C
Lead oxide (red)	NA	NA	T, C
Lead oxide (yellow)	NA	NA	T, C
^Light Green	✓	✓	
Lithium	NA	NA	F, R
Lithium carbonate	NA	NA	C, T
Lithium chloride	Molar Solution only	+	T, C
Lithium hydroxide	NA	NA	T, R
Lithium nitrate	Molar Solution only	+	E, R
Lithium sulfate	NA	NA	T, P
^Litmus Blue	✓	✓	
^Litmus Red	✓	✓	
^Luminol	✓	✓	C, T, P
Lycopodium powder	NA	+ (AP or demo only)	T, C
DL-Mandelic acid	NA	NA	T
Magnesium (ribbon)	✓	✓	F
Magnesium (turnings)	✓	✓	
Magnesium chlorate	NA	NA	T
Magnesium perchlorate	NA	NA	R
Magnesium powder	NA	NA	F, R
^Malachite Green	✓	✓	T, P
^Malachite Green Hyrdochloride	✓	✓	T, P
Malonic acid	NA	+ (AP or demo only)	T
Manganese (powder)	NA	NA	C, F, E
Manganese chloride	Molar Solution only	+	T, P, C
D-(+) Mannose	NA	NA	T, C, P
^Martius Yellow	✓	✓	C, T, P
Mercury (elemental)	NA	NA	P, T, C
Mercury (I and II) nitrate	NA	NA	T, R
Mercuric bichloride	NA	NA	T, P, C
Mercuric chloride	NA	NA	T, P, C
Mercuric nitrate	NA	NA	T, R
Mercuric oxide red	NA	NA	T, P, F
Mercuric oxide red	NA	NA	T, F, E
Mercurochrome	NA	NA	T, P
Mercurous nitrate	NA	NA	T, E
Menthol	NA	NA	T
Metals powder vials (i.e. aluminum, arsenic, barium, calcium, chromium, cobalt, lithium, magnesium, manganese, mercury, phosphorous, potassium, ruthenium sodium, tellurium, uranium, zinc)	NA	NA	F, E, May cause metal fume fever
DL-Methionine	NA	NA	C, T
Methyl alcohol	✓	✓	F, T
Methyl ethyl ketone	NA	NA	F
^Methyl Green	✓	✓	C, T

Chemical Name	Middle/Elem. School	High School	Status
Methyl iodide	NA	NA	C
^Methyl Orange	✓	✓	T, P
^Methyl Red	✓	✓	C, T
^Methyl Violet	✓	✓	T, P
Methyl methacrylate	NA	NA	T, F
^Methylene Blue	✓	✓	T, P
Millon's reagent solution	NA	NA	T
Molybdenum powder	NA	NA	T, P, F, E
Molybdic acid	✓	✓	T, P
Molybdic anhydride	NA	NA	T, C, E
Murexide	NA	NA	T
Muriatic acid (35-37%)	Molar Solution only	+	T, R, P
Naphthalene	NA	+	T, P, C, F
1-Naphthaleneacetic acid	NA	NA	T, C
alpha-Naphthol	NA	NA	T, P
^Naphthol Blue Black	✓	✓	P
^Naphthol Yellow	✓	✓	C, P
^Neutral Red	✓	✓	T
Niacin	NA	NA	T, C
Nickel(ous) Ammonium sulfate crystals	NA	+	T
Nickel(ous) chloride	Molar Solution only	+	T, C
Nickel(ous) sulfate	Molar Solution only	+	T, C
Nickel (sheet)	✓	✓	
Nickel shot & powder ("sheet" preferred)	✓	✓	C, T, P
^Nigrosin Black	✓	✓	P
Niobium fine granular	NA	NA	F, E, T
Nitric acid	Molar Solution only	+	T, P, R
<i>m</i> -Nitrophenol, p	✓	✓	
Nonanoic acid	NA	NA	T, R
Nucleic acid	NA	NA	T
^Oil Scarlet 6G	✓	✓	T, C, P
Oleic acid	NA	NA	T, P, C
^Orange IV	✓	✓	T
Orcein	NA	NA	P, T
Osmium tetroxide	NA	NA	T
Oxalic acid	NA	+(AP or demo only)	T, R
^Palladium Black	✓	✓	
^Paris Green	NA	NA	T
Pentane	✓	✓	F
Perchloric acid	NA	NA	R, E
Perchloroethylene	NA	NA	C, T
Petroleum ether	NA	+	F
^1,10-Phenanthroline	NA	+(AP or demo only)	T, P
Phenol (crystal)	NA	NA	C, T
Phenol (liquefied)	NA	NA	T, C, P
^Phenolphthalein	✓	✓	C, T
^Phenol Red	✓	✓	T, P
Phenyl salicylate	NA	NA	T
1-Phenyl-2-Thiourea (only in PTC Paper)	NA	+ AP only	T
Phenylthiocarbamide powder	NA	NA	T
Phosphoric acid	Molar Solution only	+	T
Phosphorous, red or white	NA	NA	F
Phosphorous pentoxide	NA	NA	F, R
Phthalic anhydride	NA	NA	T, R
Picric acid	NA	NA	T, E
Potassium binoxalate	✓	✓	T
Potassium bromate	NA	+(AP or demo only)	C

Chemical Name	Middle/Elem. School	High School	Status
Potassium bromide	✓	✓	
Potassium metal	NA	NA	E, R
Potassium chlorate	NA	+ (AP or demo only)	T, E
Potassium chromate	NA	Molar Solution only	C, T
Potassium cyanide	NA	NA	T
Potassium dichromate	NA	Molar Solution only	R, T, C
^Potassium ferricyanide	Solution only	+	T
^Potassium ferrocyanide	Solution only	+	T
Potassium hydroxide (solid)	✓	✓	T, R, P
Potassium iodate	NA	+	T, E
Potassium nitrate	✓	✓	F, E
Potassium nitrite (crystals)	✓	✓	F, E
Potassium perchlorate	NA	NA	E
Potassium periodate	NA	+	R
^Potassium permanganate	Solution only	+	T, F
Potassium sulfide	NA	NA	F, T
Primuline	NA	NA	T, P
Propionic acid	NA	+	F
n-Propyl alcohol	NA	NA	F
Protamine sulfate	NA	NA	T
Pyridine	NA	NA	T, F
Pyrogallol (pyrogallic acid)	NA	NA	T
Pyronin B	NA	NA	T, P
Propylene glycol	NA	NA	T, P
Quinine sulfate	NA	NA	T, P
Rennin	✓	✓	T
Resorcinol	NA	NA	T, C, P
Resazurin	✓	✓	T, P
Riboflavin	NA	NA	T, P
Rose's metal sticks	NA	NA	T
Rosin gum powder / lumps	NA	NA	T
Saccharin sodium	NA	NA	C, T, P
^Saffranin	✓	✓	
Salicylic acid	✓	✓	T, P
Saponin	NA	NA	T, P
Sebacoyl chloride/hexane solution	NA	+	F
Selenium powder	NA	NA	T, C
Shellac gum	NA	NA	T, P, C
Silver acetate	✓	✓	T
Silver carbonate	NA	NA	C
Silver cyanide	NA	NA	T
Silver dust	NA	NA	C, F
Silver nitrate (solid)	NA	+	T, R
Silver nitrate (solution)	Molar Solution only	✓	T, R
Silver oxide	NA	NA	T, F, E
Soda lime	✓	✓	R
Sodium arsenate	NA	NA	T, C
Sodium arsenite	NA	NA	T, C
Sodium azide	NA	NA	T, E
Sodium borohydride	NA	NA	T, E
Sodium chlorate	Molar Solution only	Molar Solution only	F
Sodium chromate	NA	Molar Solution only	C, T, P
Sodium cyanide	NA	NA	T
Sodium dichromate	NA	Molar Solution only	T, C
Sodium fluoride	NA	Molar Solution only	T
Sodium hydroxide solutions	✓	✓	R

Chemical Name	Middle/Elem. School	High School	Status
Sodium hydroxide	✓	✓	R
Sodium hypochlorite	✓	✓	T, R
Sodium iodate	NA	NA	T
Sodium metal	NA	Small shavings only, No "Ingots" (No more than 1 gram)	F, R
Sodium nitrate	✓	✓	F
Sodium nitrite (granular)	✓	✓	T, F, E
Sodium nitrite	✓	✓	C, T, E
Sodium oxalate	Molar Solution only	Molar Solution only	T
Sodium peroxide	NA	NA	E
Sodium sulfide	NA	Crystal-type only. No more than 25 grams	T, F
Sodium sulfide hydrate	NA	NA	T, P, R, F
Sodium thiocyanate	✓	✓	T
Sodium tungstate	NA	NA	T, P
Sodium vanadate meta	NA	NA	T, P
Spermacetic	NA	NA	T, C
Stannic chloride	NA	Powder or crystal form only (no liquid or fuming)	R, T
Strontium (metal)	NA	NA	F
Strontium nitrate	✓	✓	F
Sudan III	NA	NA	T, C P
^Sudan IV	Solution only	Solution only	C
Sulfosalicylic acid (3%)	NA	NA	T
Sulfuric acid	Molar Solution only	+	T, R
Talcum powder (asbestos-free)	✓	✓	C
Tannic acid	NA	+	C, T, P
Tellurium dioxide	NA	NA	T, P
Tellurium powder	NA	NA	T, P
Tetrabromoethane	✓	✓	T
Thermit black	✓	✓	F
Thiamine hydrochloride	NA	NA	T
Thioacetamide	NA	NA	C, T
Thiourea (thiocarbamide)	NA	NA	C
Thorin	NA	NA	T
Thymol	NA	NA	T, P
Thymolphthalein	✓	✓	T, P, C
Tin powder	NA	NA	C
Tiron	NA	NA	T
Titanium powder/sponge	NA	NA	C, P
Toluene	NA	NA	T, F
^Toluidine	NA	+	C
Trichloroethylene	NA	NA	C, T
Tricine	NA	NA	T, P
2,3,5-Triphenylchloride	NA	NA	T
Triphenyltetrazolium chloride	NA	NA	T
Tungsten powder	NA	NA	T, P
Tungstic anhydride	NA	NA	T
Turmeric acid	NA	NA	T
Uracil	NA	NA	T, P, C
Uranine	NA	NA	T, P, C
Uranium powder	NA	NA	T, C, P, Radioactive
Uranyl acetate	NA	NA	C
Uranyl nitrate	NA	NA	C, F, E
Urethane	NA	NA	C
n-Valeric acid	NA	NA	T, R
Vanadium pentoxide	NA	NA	T, P

Chemical Name	Middle/Elem. School	High School	Status
Vinylite	✓	✓	C
^Winkler's solution #2-R	✓	✓	
Wood's metal (contains Cadmium)	NA	NA	T
^Wright's Stain	✓	✓	T, C, P
Xanthidrol	NA	NA	T, P
Xylene	+	+	F, T
D-Xylose	✓	✓	T
Zinc dithiol	NA	NA	T
Zinc dust	Very small amounts OK for mercury spill kits	Very small amounts OK for mercury spill kits	R, E
Zinc nitrate (flakes)	✓	✓	T, F
Zinc sulfide luminous	NA	NA	C, T
Zironyl chloride	NA	NA	T, C