

Dallas Center-Grimes Community School District
P.O. Box 680, 2405 W 1st Street
Grimes, Iowa 50111

Hazard Communication Program (Right to Know):

Purpose: To communicate DC-G Community School District's hazard communication program to all employees.

Objectives:

1. To safeguard our employees' health.
2. To provide information to our employees on the health and physical hazards of chemical materials used in our operations.
3. To comply with OSHA CFR 29 1910.1200 and Iowa's Right To Know law.

1. CHEMICAL INVENTORY LIST

DC-G School District will maintain a list of all chemicals regulated under the Right To Know law. A physical inventory of all chemicals will be updated annually. Employees of DC-G School District will have access to the Material Safety Data Sheets Online through Hazardous Materials at <http://www.hazcomonline.com/msds.php>

The primary system is very easy to use. From <http://www.hazcomonline.com/msds.html>, click on the LOGIN button on the left side. The user name and password is dcg. Then click on MSDS (General) or MSDS (Science) on the left side. The new screen will have a pull down menu at the top. Enter a few letters and hit return. Options with that information will be provided. Click on the second column (MSDS in red print). The MSDS will be available for review or printing.

2. MATERIAL SAFETY DATA SHEETS

A Material Safety Data Sheet (MSDS) can be found for each substance used at DC-G School District, which is regulated under the Right To Know law.

Employees of DC-G School District will have access to the Material Safety Data Sheets Online through Hazardous Materials at <http://www.hazcomonline.com/msds.php>

The primary system is very easy to use. From <http://www.hazcomonline.com/msds.html>, click on the LOGIN button on the left side. The user name and password is dcg. Then click on MSDS (General) or MSDS (Science) on the left side. The new screen will have a pull down menu at the top. Enter a few letters and hit return. Options with that information will be provided. Click on the second column (MSDS in red print). The MSDS will be available for review or printing.

3. LABELING

DC-G School District will use the Hazardous Materials Identification System (HMIS) for its labeling system. All containers of hazardous materials, regardless of size or purpose, must be labeled. The Head of Maintenance will conduct in-house labeling according to the following guidelines:

- * Original labels on containers in which the material is received are not to be removed or defaced.
- * If a material is transferred from the original container to a secondary container, the secondary container must be labeled properly.
- * If a different material is placed in a secondary container other than what the label designates, a new label will be applied.
- * Exception: containers filled by the person using the material and consumed by the same person during the work shift will not need a label.
- * Process tanks will be labeled to indicate the correct hazards.
- * Label information will include:
 - Name of substance.
 - Appropriate hazard warning.

- * Labels will be legible, in English, and displayed prominently on the container.

The Chemical Inventory List will also contain the appropriate hazard warnings for each hazardous material on the list. This will aid in correctly filling out and applying appropriate labels to containers. Containers of hazardous materials will not be introduced into the workplace without a label. If a new material is received or purchased without a label, the Head of Maintenance will be notified.

HMIS Labeling

HMIS communicates hazard information through the use of colors and numbers. The numerical ratings are assigned for the following areas: Health, Flammability, and Reactivity. Health is designated by the color blue, flammability by red, and reactivity by yellow. In general, the numbers 1 through 4 designate the following: 4 indicates a severe hazard, 3 is a serious hazard, 2 is a moderate hazard, 1 is a slight hazard, and 0 is a minimal hazard. The numbers assigned are determined through the following hazard rating information.

HEALTH HAZARD RATING

0	Minimal Hazard	No significant risk to health.
1	Slight Hazard	Irritation or minor reversible injury possible.
2	Moderate Hazard	Temporary or minor injury may occur.
3	Serious Hazard	Major injury likely unless prompt action is taken and medical treatment is given.
4	Severe Hazard	Life-threatening, major or permanent damage may result from single or repeated exposures.

FLAMMABILITY HAZARD RATING

0	Minimal Hazard	Materials that are normally stable and will not burn unless heated.
1	Slight Hazard	Materials that must be preheated before ignition will occur. Flammable liquids in this category will have flash points (the lowest temperature at which ignition will occur) at or above 200 degrees F. (NFPA Class IIIB).
2	Moderate Hazard	Material that must be moderately heated before ignition will occur, including flammable liquids with flash points at or above 100 degrees F and below 200 degrees F (NFPA Class II & Class IIIA).
3	Serious Hazard	Materials capable of ignition under almost all normal temperature conditions, including flammable liquids with flash points below 73 degrees F and boiling points above 100 degrees F, as well as liquids with flash points between 73 degrees F and 100 degrees F (NFPA Class 1B and 1C).
4	Severe Hazard	Very flammable gases or very volatile flammable liquids with flash points below 73 degrees F and boiling point below 100 degrees F (NFPA Class 1A),

REACTIVITY HAZARD RATING

0	Minimal Hazard	Materials that are normally stable, even under fire conditions, and will not react with water.
1	Slight Hazard	Materials that are normally stable but can become unstable at high temperatures and pressures. These materials may react with water, but they will not release energy violently.
2	Moderate Hazard	Materials that, in themselves, are normally unstable and will readily undergo violent chemical change but will not detonate. These materials may also react violently with water.
3	Serious Hazard	Materials that are capable of detonation or explosive reaction but require a strong initiating source, or must be heated under confinement before initiation; or materials that react explosively with water.
4	Severe Hazard	Materials that are readily capable of detonation or explosive decomposition at normal temperatures and pressures.

4. TRAINING

Initial Training

Initial employee training will be provided on-line through AEA 11 or in person with the entire district staff. Content will include the following information:

- I. Requirements of the Law
 - a. Requirements for manufacturers, employers, and employees are discussed verbally.
- II. Employees and work area chemicals
 - a. Review handouts of the chemical inventory list.
- III. Material Safety Data Sheets (MSDS)
 - a. MSDS are fully explained.
 - b. Handout - Blank sample of MSDS.
- IV. Labeling
 - a. The HMIS label is fully explained.
 - b. Handout - "HMIS."
- V. General Concepts
 - a. Definitions, recognition, traits and air sampling of chemicals are discussed.
 - b. Handout - Glossary of Terms.
- VI. Physical and Health Hazards
 - a. The Chemical Inventory List is reviewed. Hazard classes, including Solvents, Flammables, Acids and Bases, Compressed Gases, Irritants, and Toxic Metals. Each of these hazard classes is discussed verbally. Each discussion includes hazards common to the materials in that class and protective measures or equipment employees can use to protect themselves.
- VII. Protective Equipment
 - a. Personal protective equipment was discussed in the previous section for hazard classes.
 - b. Existing school policies for safety equipment is reviewed.

Re-fresher Training

The district will provide re-fresher training annually.

5. NONROUTINE JOBS

DC-G School District has a few jobs not performed on a routine basis. These might include maintenance of boiler units, air conditioners, machines, motor vehicles, grounds and others. The procedures and hazard of these jobs will be relayed to the employees by the Head of Maintenance. The information to be relayed will be determined with the help of the Buildings and Grounds through the MSDS for the materials to be used for the job.

6. OUTSIDE CONTRACTORS

Contractors who enter DC-G School district to perform work will be provided with sufficient information to train their own employees about the chemical hazards they might encounter. The information will be provided to the contractor through the Chemical Inventory List and the appropriate MSDS.

7. EMERGENCY RESPONSE

DC-G School District will furnish the Chemical Inventory List to the local fire department. The Chemical Inventory List will contain the NFPA numerical hazard rating for health, flammability, and reactivity, or any information that denotes a special hazard. This information will be submitted along with the name of a contact person and the mailing address of DC-G School District.

The local fire department will be encouraged to tour DC-G School once a year to familiarize itself with the layout of the school and material storage areas.

Signs

Storage areas for materials determined to be hazardous under the Right To Know regulations will be marked with an NFPA sign. A sign displaying the most hazardous numerical rating for any material in the storage area in the fields of health, flammability, and reactivity will be posted outside the storage area. The local fire department will review this system to establish department familiarization. A variance documenting an agreement between the local fire chief and DC-G School District to use the NFPA system as mentioned above will be filed with the Iowa Department of Labor.

8. RIGHT TO KNOW - BASIC VOCABULARY

Right to Know - Federal law requiring that employees be informed and trained regarding chemicals that may be in their workplace.

Chemical Inventory List - A list of all the hazardous chemicals in the district. The list gives you some general information about each chemical.

MSDS - Material Safety Data Sheet contacts specific information about the chemical. There are nine areas that need to be included on the MSDS. (Only eight if there are no special precautions.) MSDS sheets are the primary source of chemical information. This information, SIRI MSDS Index, can be accessed at <http://hazard.com/msds/index.php>.

HMIS - Hazardous Material Identification System is the labeling system used to identify levels of hazards.

Hazard Class - Six different categories of hazard classes.

Solvent	Dissolved other materials. Vary hard on skin and organs. Usually evaporates quickly.
Flammable	Has a flashpoint under 100% F (consider flashpoint, vapor concentration, and source of ignition).
Acid and bases	Precautions much the same as solvents.
Compressed Gas	Gas stored under pressure.
Toxic Metals	The many metals all around use. How they are used and at what level of exposure.
Irritants	Causes an inflammation of any part of the body.

Health Hazard - Effect chemical has on health when using product, short term and long term. (Rating shown in blue) Anything that has a negative effect on your health.

Flammability Hazard - Flash point and/or explosion possibilities. (Rating shown in red.)

Reactivity Hazard - How material reacts when mixed with other materials or reactions to a variety of conditions. (Rating shown in yellow.)

TLV - Threshold Limit Value - Indicates the exposure a person can have eight hours per day, every day, without health concern. Usually reported at parts per million. Low TLV is a health concern. The higher the TLV the better.

Vapor Density - Weight of the chemical. Air equals one. Greater than one is heavier than air, less than one is lighter than air.

Hazard Rating - Chemicals rated 1-4, each hazard with different rating meanings. Zero (0) means the lowest concern, with a 4 rating being the highest concern for each hazard area.

Level of Danger - Includes type of chemical, length of exposure, amount of chemical involved, and individual susceptibility.

Training Vocabulary

absorption: A soaking up of one substance through the entire mass of another.

ACGIH: Abbreviation for the American Conference of Governmental Industrial Hygienists, a private organization of

occupational safety and health professionals. The ACGIH recommends occupational exposure limits for numerous toxic substances, and it updates and revises its recommendations as more information becomes available. ACGIH limits are not legally enforceable.

acute: An adverse effect on the human body with symptoms of high severity coming quickly to a crisis.

CAA: Clean Air Act

carcinogen: A substance capable of causing cancer.

catalyst: A chemical, which changes the rate of a chemical reaction between two other chemicals without affecting the chemical itself.

ceiling limit: The maximum amount of a toxic substance allowed to be in workroom air at any time during the day.

CFR: Code of Federal Regulations

chemical: Any element, chemical compound or mixture of elements and/or compounds.

chronic: An adverse effect on the human body with symptoms which develop slowly over a long period of time or which frequently recur.

combustible: Able to catch on fire and burn.

gram: The unit of mass in the metric system. An ounce is about 28 grams, and a pound is approximately 450 grams. (A teaspoon of sugar weighs about 8 grams.)

health hazard: Anything, which can have a harmful effect on health under the conditions in which it is used or produced. There can be both acute and chronic health hazards.

HMIS: Hazardous Materials Identification System. This is a marking system developed by the National Paint and Coatings Association.

IARC: International Agency for Research on Cancer.

IDHL: Immediate dangerous to health and life.

ignition temperature: The lowest temperature at which a substance will catch on fire and continue to burn. The lower the ignition temperature, the more likely the substance is going to be a fire hazard.

ingestion: Swallowing.

kilogram: 1000 grains. One kilogram equals about 2.2 pounds.

LC 50: The concentration of a substance in the air that causes death in 50% of the animals exposed by inhalation. A measure of acute toxicity.

LD 50: The dose that causes death of 50% of the animals exposed by swallowing a substance. A measure of acute toxicity.

liter: The unit of volume in the metric system. A liter is about the same as a quart.

meter: The unit of length in the metric system. A meter is about 40 inches.

OSHA: Abbreviation for the Occupational Safety and Health Administration. U.S. Department of Labor. OSHA develops and enforces federal standards for occupational safety and health.

oxidizer: A material which may cause the ignition of combustible materials without the aid of an external source of ignition or which, when mixed with combustible materials, increases the rate of burning of these materials when the mixtures are ignited.

pel: Permissible exposure limits.

permeable: The ability to pass or penetrate a substance or membrane.

pH: A measure of how acid or how caustic (basic) a substance is on a scale of 1-14. pH of 1 indicates that a substance is very acid; pH of 7 indicates that a substance is neutral; and a pH of 14 indicates that a substance is very caustic (basic).

polymerization: A chemical reaction in which individual molecules combine to form a single large chemical molecule (polymer). Usually involves the release of a lot of energy.

ppm: Parts per million. Generally used to express small concentrations of one substance in a mixture.

reactivity: The ability of a substance to undergo change, usually by combining with another substance or by breaking down. Certain conditions, such as heat and light, may cause a substance to become more reactive. 1: highly reactive substances may explode.

RTECS: The Registry of Toxic Effects of Chemical Substances, a listing of chemicals compiled by NIOSH.

SIC: The Standard Industrial Classification, a governmental coding system for grouping industry into categories.

CHEMICAL INVENTORY, HAZARD ASSESSMENT, AND STORAGE SYSTEM

SCIENCE TEACHERS

Science teachers should use the "Chemical Inventory, Hazard Assessment, and Storage System" to comply with most components (hazard identification, labeling, and storage) of federal and state "Right To Know Laws" or chemicals kept in school labs and storerooms.

The STORAGE CATEGORY provides a listing of inorganic chemical groupings from 1 through 10, and organic chemical groupings from 1 through 8. Placing chemicals in these groups and storing them according to Tables 1A (Inorganics) and 1B (Organics), will help assure that chemical incompatibilities will be reduced if accidental spillage occurs on a single shelf, or if a chemical leaks through to shelves below.

The NFPA HAZARD depicts information provided by the National Fire Protection Association concerning Health Hazard (H), Fire Hazard (F), Reactivity with other substances (R), and an other (O) category. Although this system was designed to assist firefighters in dealing with chemical fires, the information can be especially valuable to teachers in recognizing chemical hazards. The information should also prove very valuable to students who use chemicals in lab experiments. A complete description of these NFPA Hazards is provided in Table 2 below. The chemicals that do not have NFPA hazard ratings listed should still be handled with care. The NFPA has not rated all items. For additional detailed information concerning chemicals, refer to the Merck Index 3.

The HAZARD CLASS provides information synthesized by the U.S. Department of Transportation concerning safe transport of hazardous materials in commerce. The groups include: Explosives, Combustible Liquids, Compressed Gases, Corrosives, Flammable Gases, Flammable Liquids, Flammable Solids, and Poisons. A complete description of these groups follows.

Explosives (Expl):

Class A - Liquids, or gaseous explosives which, in general, function by detonation and include such devices as blasting caps, detonating primers, ammunition for cannon, grenades, bombs, rockets, torpedoes, etc.

Class B - Those explosives that generally function by rapid combustion rather than detonation as in Class A. This class includes such items as special fireworks, flash powders, some pyrotechnic signal devices, and liquid or solid propellant explosives.

Class C - Certain types of manufactured articles that contain Class A or Class B, or both as components but in restricted quantities, and certain types of fireworks.

Combustible Liquid (Comb.liq):

Any liquid that has a flash point* at or above 100 F (37.8 C) and below 200 F (93.3 C).

Compressed Gas (Comp.Gas):

Any material or mixture having in the container an absolute pressure exceeding 40 pounds per square inch (p.s.i.) at 70 F or regardless of the pressure at 70 F having an absolute pressure exceeding 104 p.s.i. at 130 F; or any liquid flammable material having a vapor pressure exceeding 40 p.s.i. absolute at 100 F.

Corrosive (Corr):

A liquid or solid that causes visible destruction or reversible alterations in human skin tissue at the site of contact, or in the case of leakage from its packaging, a liquid that has a severe corrosion rate on steel.

Flammable Gas (Fl.gas):

Any material that meets the definition of compressed gas outlined above, or meeting any of the properties below. Either a mixture of 13 % or less (by volume) with air forms a flammable mixture or the flammable range with air is wider than 12% regardless of the lower limit.

Flammable Liquid (Fl.liq):

Any liquid having a flash point below 100 F (37.8 C).

Flash Point:

The minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid.

Flammable Solid (Fl.sol):

Any solid material other than one classed as an explosive, which, under conditions normally incident to transportation, is liable to cause fires through friction retained from heat from manufacturing or processing, or which can be ignited readily, and when ignited burns so vigorously and persistently as to create a serious transportation hazard. Included are spontaneously combustible and water-reactive materials.

ORM-A (Other Regulated Material):

A material that has an anesthetic, irritating, noxious, toxic or other similar property.

ORM-B:

A material leakage, including a solid when wet with water, of which could cause significant damage to the vehicle transporting it.

ORM-E:

A material that is not included in hazard class ORM-A or ORM-B as described in this document. A material that presents an environmental hazard if it enters natural water sources.

Poison A (Pois.A):

Poisonous gases or liquids of such a nature that a very small amount of the gas, or vapor of the liquid, mixed with air is dangerous to life.

Poison B (Pois.B):

Those substances, liquid or solid (including pastes and semisolids), other than Class A poisons or irritating materials, which are known to be so toxic to humans as to afford a hazard to health during transportation; or which, in the absence of adequate data on human toxicity, are presumed to be toxic to humans because they fall within any one of the following categories when tested on laboratory animals:

- Oral Toxicity - those which produce death within 48 hours of a group of 10 or more white laboratory rats weighing 200 to 300 grams at a single dose of 50 mg. or less per kg. of body weight when administered orally.
- Toxicity and Inhalation - those which produce death within 48 hours of more than half of a group of 10 or more white laboratory rats weighing 200 to 300 grams, when inhaled continuously for a period of one hour or less at a concentration of 2 mg. or less per liter of vapor, mist, or dust, provided such concentration is likely to be encountered by humans when the chemical product is used in any reasonable foreseeable manner.
- Toxicity by Skin Absorption - those which produce death within 48 hours in half or more of a group of 10 or more rabbits tested at a dosage of 200 mg. or less per kg. of body weight, when administered by continuous contact with the bare skin for 24 hours or less.

Items which do not have Hazard Class ratings should still be handled with care. The U.S. Department of Transportation has not rated all items.

The STORAGE LOCATION should be completed only after all unwanted items have been removed and properly disposed and the storage classifications have been determined. Shelves should be labeled in each storeroom according to Tables 1A and 1B, then containers should be labeled and moved to the respective shelf according to the proper Storage Category. The location of the chemical should then be noted in this Storage Location category using the shorthand method below:

Rm 132 - N 2

This abbreviation would be translated to read; room 132, North wall, shelf 2. Such information will prove invaluable in relocating items and in meeting "Right To Know" laws, which require the placarding of storerooms.

The category entitled EXP. DATE refers to the Manufacturer's Suggested Shelf Expiration Date. It is essential that all chemicals be removed from storage and usage before this date is exceeded. By adhering to such dates, teachers can assure that the substance meets the property specifications that the manufacturer has stated on the container. After this expiration date, many substances begin to degrade and may not have the properties for which it was purchased. By checking the Exp. Date category and the Quantity category at the beginning of each purchasing period, teachers can be assured that they are ordering materials which are becoming in short supply in their storerooms, as well as those which need replacement.

Paper copies of each inventory should be provided to local fire departments for them to use in the event of a fire involving the building.

Data entered in the inventory should be reviewed annually to assure that all unwanted, old, dangerous, and excessive chemicals have been removed and then properly disposed according to local, state, and federal regulations.

As a "rule of thumb," it is recommended that no more than a one-year supply of chemicals be stored. This will help assure that items are not beyond their manufacturer's suggested shelf life and that harmful synergistic reactions involving excess quantities of dangerous substances are avoided. In addition, accidents and unnecessary placardings can be minimized. Compliance with local insurance and fire guidelines can also be more easily met.

LABELING

Once all information has been completed for all categories for all items in the storeroom, labels should be printed and affixed to each container. Containers should then be placed on the properly labeled shelf according to the chemical storage category.

Table 1A

SUGGESTED SHELF STORAGE PATTERN - INORGANIC

Inorganic 10

Sulfur, Phosphorous, Arsenic
Phosphorous pentoxide

Inorganic 7

Arsenates, Cyanides,
Cyanates

Inorganic 2

Halides, Sulfates, Sulfites
Thiosulfates, Phosphates,
Halogens, Acetates

Inorganic 5

Sulfides, Selenides,
Phosphides, Carbides,
Nitrides

Inorganic 3

Amides, Nitrites, Azides
Nitrates (except Ammonium nitrate)

Inorganic 8

Borates, Chromates,
Manganates, Permanganates

Inorganic 1

Metals, Halides
(store away from water)
(store flammable solids in
flammable cabinet)

Inorganic 6

Chlorates, Perchlorates,
Chlorites, Per chloric acid
Peroxides, Hypochlorites,
Hydrogen peroxide

Inorganic 4

Hydroxides, Oxides, Silicates,
Carbonates, Carbon

Miscellaneous

Inorganic 9

Acids, except Nitric (store Nitric acid away from other acids unless a separate compartment is available for Nitric acid).

Table 1B

SUGGESTED SHELF STORAGE PATTERN - ORGANIC

Organic 2

Alcohols, Glycols, Amines
Amides, Imines, Inides

Organic 8

Phenol, Cresols

Organic 3

Hydrocarbons, Esters, Aldehydes

Organic 6

Peroxides, Azides,
Hydroperoxides

Organic 4

Esters, Ketones, Ketenes,
Halogenated hydrocarbons,
Ethylene oxide

Organic 1

Acids, Anhydrides,
Peracids

Organic 5

Epoxy compounds, Isocyanates

Miscellaneous

Organic 7

Sulfides, Polysulfides

Miscellaneous

REFERENCES

- School Science Laboratories: A Guide to Some Hazardous Substances, Council of State Science Supervisors and U.S. Consumer Products Safety Commission, Washington, D.C., 1984
- Fire Protection Guide on Hazardous Materials - 9th Edition, National Fire Protection Association, Battery March Park, Quincy, Mass., 00269, 1985
- The Merck Index, 10th Edition, 1983; Merck & Co., Inc., Professional Handbooks Dept., P.O. Box 2000, Rahway, N.J. 07065-0901, 1983
- Code of Federal Regulations, 49 Transportation, Parts 100 to 177, Office of the Federal Register, National Archives and Records Service, General Services Administration, Washington, D.C., Nov. 1, 1985
- Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, U.S. Department of Labor, Occupational Safety and Health Administration, Washington, D.C., 1980
- Chemical Catalog/Reference Manual, Flinn Scientific, Inc., P.O. Box 231, 917 W. Wilson St., Batavia, IL 60510
- Aldrich Catalog Handbook of Fine Chemicals, Aldrich Chemical Co., P.O. Box 355, Milwaukee, WI 53201