Suggestions for Taking a Chemical Inventory **in the School Science Department**

- **Have spill/breakage aids available.**
- **Make sure the room is well lighted.**
- **Plan before you start.**
- **Alert school administrators about the inventory.**
- **Use safe ladders.**
- **Wear appropriate clothing.**
- **Avoid involving students.**
- **Work slowly.**

https://s.id/eBuku

We are sure that responsible science teachers and school administrators agree that it is necessary to know exactly what chemical substances are present on school premises and in what quantities. Such an inventory would serve many valuable purposes such as (but not limited to):

- To comply with regulatory requirements
- To make the school safer
- To efficiently use (and perhaps share) the existing inventory
- To rid the premises of excess/unused chemical substances
- To implement the storage of all remaining substances in compatible chemical families
- To isolate and safely store particularly hazardous substances
- To create and maintain a perpetual inventory of all chemical substances
- To identify substances (e.g., severe toxins, carcinogens) that should not be found on school premises and get rid of these materials
- To identify substances as a function of their specific hazardous character (e.g., flammables, acids, oxidizers) and provide their dedicated and approved storage

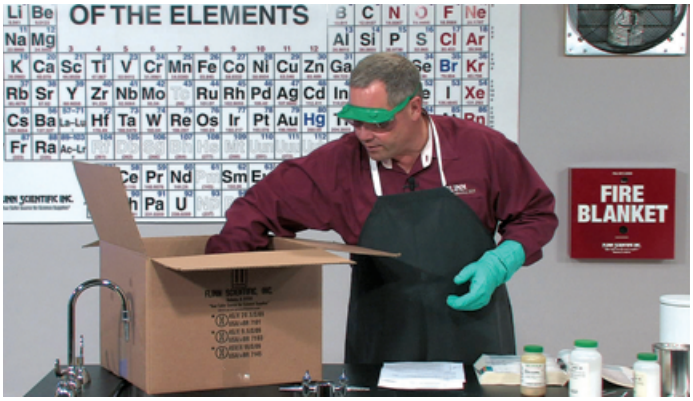
In our opinion, just plain old-fashioned "good sense" suggests that it is time for action! Action demands that you know what you have and how much of it you have. Once this inventory is accomplished, a great many benefits will follow.

It is very important to point out that laboratory chemicals should ***no longer be purchased like other routine school supplies!*** The normal routine of most schools is to acquire a year's supply of needed chemicals at one time along with other routine science supply needs. The result of this process is that dozens of chemical items, many in very large quantities, arrive at the school and are then stored in science storerooms never designed to handle such quantities and rarely equipped to meet even minimum standards of safe storage. We are sure your conventional wisdom says that the smaller the quantities of these materials found in schools at any given time, the smaller the problem.

We cannot emphasize strongly enough the need for science teachers, science department heads and, most particularly, school administrators and business managers to recognize the problems created by lumping hazardous chemicals into the buying routine. To continue to apply the same buying routine to hazards simply aggravates and perpetuates the problem. Those in the school with science backgrounds must educate the non-science-trained administrators about the severe problems created by continuing to buy hazardous chemicals in the same manner as they buy routine school supplies.

It can also accurately be stated that when a large school with many science teachers has no one in charge of managing the chemical storeroom, the problem is made more severe. When every science teacher or multiple science teachers are in charge of this matter—then, in fact, no one is in charge.

School districts with multiple school buildings also should give very serious consideration to establishing a central "chemical ordering committee." This committee could routinely see every chemical requisition. Their review would be aimed at completely eliminating or reducing the quantity of some substances purchased. No, we are not suggesting that science teachers be denied access to needed reagents. We are, however, suggesting that the matter be well managed. Who better to manage the problem than the knowledgeable users (i.e., the science teachers meeting as a committee).



It is common to find, among multiple school buildings, an excess of a chemical in Building A while the science teacher in Building B just placed an order for the very same chemical. Why can't inventories be shared with the goal of better systemwide chemical management? If the impediment to better, safer and more efficient substance management is the "established system" or the "established bureaucracy" then the "system" or the "bureaucracy" must be educated and its methods changed. An efficient method of chemical management in a science department or in a multiple-building school is to provide inventory-level information to all users and allow all users access to excess inventories. One building or department should not be allowed to rob another's inventory. However, excesses should be identified and shared. The science teacher who is a good substance or inventory manager should not be penalized to serve the poor manager in another department or building. Conventional wisdom suggests that excess substances can be better managed by sharing knowledge of their existence. For more efficient management of chemical supplies, a good inventory and communication is critical.

Once you have decided it is time to take an inventory, plan for the event using the Inventory Planning Checklist that follows on the next page. A very effective means of taking and temporarily recording your inventory is by using your phone or tablet as a recording device.

It is an absolute that you ***never undertake an inventory alone***. You must always have a teammate. The teammate is there to help you, to hold a ladder, to go for help or just to be there—but, in any case, you should never work alone. We urge against recruiting students. It is also an absolute that the right kind and type of fire extinguishers be in the room with you and immediately available for use.

Another absolute is that you are appropriately dressed and spill materials are present. In general, we assume you have done all the preplanning and all the plans have been implemented.

Record on paper or computer, the chemical name, bottle size, bottle type and approximate amount of chemical present. For example, a typical description might read, "one 5-lb bottle, glass, of acacia, about one-half full." You may opt to use Flinn Online Chemventory™, which is a cloud-based laboratory chemical inventory system that allows multiple users access to a single chemical inventory database

Chemical Inventory, continued

from multiple locations and devices. The program comes fully loaded with GHS pictograms, hazard codes and signal word information for more than 2,400 Flinn chemicals. You can build your inventory by selecting from a list of Flinn chemicals or add your own chemical information manually. You can build an inventory database for your school and invite other teachers, lab assistants and administrators to join for free. The program also includes a label printing feature to print GHS-compliant labels for any of the 2,400+ Flinn chemicals listed in the program. You also can take advantage of the chemical solution label printing options to easily keep track of all the solutions you prepare in your lab.

To the extent you can, you should avoid actually touching or moving bottles to take this inventory. If your shelves are loaded, you may have to remove some bottles in order to see the bottles at the rear of the shelf or cabinet. Try to avoid as much moving or transfer as possible.

It is unlikely that you will want to reorganize your shelves at this time since your primary goal is to determine what you have and how much of it you have. Once the inventory is complete and has been converted to hard copy then you can begin to think about the reorganization process. At this point focus on just discovering and recording what and how much you have. You really should not consider major reorganization until you know the "what and how much" since these facts may cause you to elect not to set shelf space aside for substances you wish to eliminate from your inventory. It is our experience that in an average school (if there is such a thing as an average school), four out of ten bottles on the shelves have not been used in the last five years and will not be used in the next five years. There is no need to dedicate shelf space to such excess substances.

If your shelves and cabinets are just loaded and a lot of movement of substances is required to inventory all the materials, then the task will require several hours. If however, most substances can be viewed and recorded with little bottle shifting or relocation then even a very large high school chemical stores facility will not require much more than about 2–2½ hours to record all of these substances and their pertinent information.

We recommend aquiring the Flinn Online Chemventory™. This system can be used to track and describe chemical information and on-hand amounts while also providing easy, electronic access to chemical information form on- and off-site locations.

CHEMICAL INVENTORY continued on next page.

QUESTIONS? CALL US AT
1-800-452-1261

Inventory **Planning Checklist**

- Who will be the team members to perform the inventory?
- How much time will you allow to perform this task?
- As materials are taken from the shelf (if you elect to do this at this time), where and how will they then be housed?
- Do you have the requisite safety items to protect yourselves during the process?
- Will this be simply an inventory of what substances you have, or will it be a major reorganization of the chemical stores facility?
- Are flashlights, ladders and other such devices available?
- Will the room be properly ventilated during the process?
- Will a means of communicating with the outside be available in case of a serious problem like spill, breakage or fire.
- How will you record the chemicals on a substance-by-substance basis?
- How will you handle unknowns or "mystery" substances as these are encountered?
- Will spill materials (e.g., sand, neutralizers) be available? If yes, which have you chosen?
- Will alternate containers (e.g., empty bottles, cans, bags) be available when a broken container is encountered?
- Is there a plastic broom, plastic dust pan and plastic receptacle available for cleanup?
- Have you made arrangements for the removal of unwanted substances or, if you want to isolate these materials, have you planned for temporary and safe storage methods while you examine your disposal options?
- Will a fume hood be available to very temporarily store a substance that, upon discovery, needs your immediate attention?
- Have you undertaken and completed as much storeroom housekeeping as possible prior to the inventory so you are not faced with obstacles that would lead to an accident?
- Have school authorities and maintenance people been alerted to this inventory undertaking?
- If you elect to do some disposal during the inventory process (we urge against this), are the reacting chemicals available?
- Have you arranged for the process to be free of interruptions that might distract you at a critical moment?
- Will the team members performing the inventory be wearing appropriate clothing?
- Will all sources of ignition be eliminated?
- Is it your plan to add some form of label or other kind of identification to each chemical container, and, if so, have you decided how this is to be done and do you have the means to do it available?
- Will you have a supply of replacement caps available for containers with bad closures? If you expect to transfer some substances to alternate containers, are some available?
- What will be done with the many bottles of solutions that have been prepared and stored for lab use over the past years? Will you include these in your inventory? How?
- If you expect to rearrange your chemical shelves during the process, are shelf labels available?
- Do you expect to identify substances by their hazardous character during the process? If yes, will you then house them (e.g., flammables, acids) in dedicated and approved cabinets? Are the cabinets now available? Is there sufficient space in the existing cabinets?
- Will the method you select to record this inventory allow you, if you elect to do so, to perpetually maintain the inventory?
- Will you have tape or an adhesive of some kind available to affix loose labels? Will you have blank labels available to place on currently unlabeled materials that you can identify with accuracy?

Chemical Inventory, continued

Next assign compatible chemical family designations and hazard data to each listing. Our online chemical inventory system has established 15 alpha designations to identify hazards. You may wish to use this same system to code your list. The designations follow.

Flinn Hazard Caution Codes

A — Flammable
B — Volatile
C — Toxic
D — Strong oxidizer or reducer
E — Carcinogenic
F — Produces peroxides
G — Skin and/or eye irritant
H — Contains harmful impurities
I — Unpredictable explosive
J — Harmful dust or vapors
K — Avoid contact with water
L — Avoid contact with air
M — Corrosive
N — Allergen
O — Avoid contact with organic material

If you do not know either the hazardous character or compatible chemical family of a substance, you need look no further than the individual listings of any chemical in the *Flinn Scientific Catalog/Reference Manual*.

Your next step would be to decide what stays and what goes in this total inventory. We urge you to be ruthless in ridding your premises of these unused and unneeded chemicals. In fact, when you have made the decision about ridding yourself of many substances, then consider getting those items off your shelf first. Do not simply acquire some cartons and pile bottle upon bottle into cartons and create a new problem. Rather, use your conventional wisdom and ask yourself if the item is hazardous and then investigate its hazardous character.

Be able to call for help in the event help is needed.

Should a chemical be physically isolated? Let's assume you find a 500-gram bottle of aluminum chloride, anhydrous, and you wish to rid yourself of this substance. You do not know how to achieve this, but you want it off the shelf and yet protected and safe for later disposition. Place the bottle in three thicknesses of baggies. You can get baggies at your local grocery store. Flinn has heavy-duty plastic bags called *Chem-Saf*™ Bags for this purpose. You will find *Chem-Saf*™ Bags listed on page 653 in this catalog/reference manual. Next, acquire some clean, never-used, one-quart and one-gallon paint cans. Flinn has such containers called *Saf-Stor*™ Cans. These are also listed on page 653 in this catalog/reference manual. You can acquire similar cans (less heavy duty) at a local paint or hardware store.

Now line the bottom of the can with just enough vermiculite or cat litter (cat litter is bentonite) to cushion the plastic bag–enclosed bottle. Place the plastic bag–enclosed bottle in the center of the can. Fill the remaining empty void of the can with vermiculite or cat litter. Place the friction lid on the can and label the outside of the can with the chemical formula of the substance contained therein. By using the chemical formula rather than the full name, you can thwart the potential vandal intent upon securing or using a hazardous chemical. The vandal simply will not be able to read the formula.

You have now provided a secure container for this unwanted substance. You may now assign an area in the storeroom where such hazards will be safe until you investigate and ultimately exercise your disposal or removal options. You will find that plastic bags and cans can be among your best friends for isolating and containing hazards during your investigation.

The cans will serve to protect against breakage and even act as a miniature fire cabinet to prevent these hazards from being directly involved in a conflagration.

Substances that remain on your shelves can now be reorganized into their compatible chemical families. We urge that you review all the details of appropriate and safe storage in the section of this catalog/reference manual dedicated to that subject.

Avoid distractions.

For the first time, you know exactly the substances and their quantities in your chemical stores area. It is from this base of knowledge that you can begin to manage this matter of chemicals on school premises. You needed to take this first, important step. You may need further help and advice. If you do, call Flinn.

CHEMICAL INVENTORY continued on next page.

Chemical Inventory, continued

FLINN COMPATIBLE **CHEMICAL FAMILY CODES**

When you assign compatible chemical family data, you may wish to use the system created by Flinn. The family designations are listed here and explained in more detail on the following pages. Family designations for individual chemicals are found in the individual chemical listings of this catalog/reference manual.

Flinn Organic Compatible Family Codes

01 – Acids, Amino Acids, Anhydrides, Peracids

02 – Alcohols, Glycols, Sugars, Amines, Amides, Imines, Imides

03 – Hydrocarbons, Esters, Aldehydes, Oils

04 – Ethers, Ketones, Halogenated Hydrocarbons

05 – Epoxy Compounds, Isocyanates

06 – Peroxides, Hydroperoxides

07 – Sulfides, Polysulfides, Sulfoxides, Nitriles

08 – Phenols, Cresols

09 – Dyes, Stains, Indicators

0M – Miscellaneous

Flinn Inorganic Compatible Family Codes

I1 – Metals, Hydrides

I2 – Acetates, Halides, Iodides, Sulfates, Sulfites, Thiosulfates, Phosphates, Halogens, Oxalates, Phthalates, Oleates

I3 – Amides, Nitrates (except Ammonium Nitrate), Nitrites, Azides

I4 – Hydroxides, Oxides, Silicates, Carbonates, Carbon

I5 – Sulfides, Selenides, Phosphides, Carbides, Nitrides

I6 – Chlorates, Bromates, Iodates, Chlorites, Hypochlorites, Perchlorates, Perchloric Acid, Peroxides, Hydrogen Peroxide

I7 – Arsenates, Cyanides, Cyanates

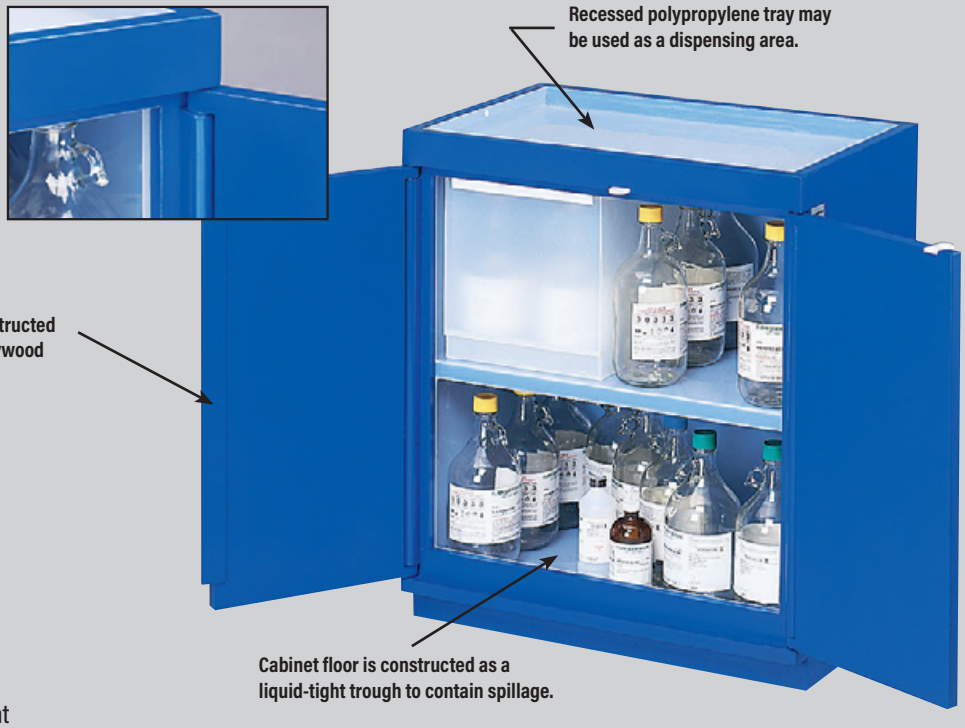
I8 – Borates, Chromates, Manganates, Permanganates, Molybdates, Vanadates

I9 – Acids (except Nitric)
(Nitric Acid is isolated and stored by itself.)

I10 – Sulfur, Phosphorus, Arsenic, Phosphorous Pentoxide

IM – Miscellaneous

Here's the Last Acid Cabinet **You'll Ever Need!**



DIMENSIONS:

Exterior:
36½" H x 31" W x 20" D

Interior:
28½" H x 29" W x 17¼" D

Bottle Capacity:
30 x 5 Pints or 90 x 1 Pint

Catalog No.	Description	Price/Each
SE8041	Flinn Acid Cabinet. Interior partially lined with polypropylene.	$ 968.35
SE8051	Flinn Acid Cabinet. Interior fully lined with polypropylene.	1241.20
SE8071	Nitric Acid Compartment. Polypropylene.	139.10

Flinn Acid Cabinets will not rust or corrode. Many companies promise corrosion resistance; we'll guarantee it. How? Simple—we don't use metal hardware or hinges. We use only wood and plastic in our construction; therefore, there is no rust or corrosion. Our unique design and unsurpassed quality will give you an outstanding cabinet both now and for many years to come.

▶ See free video at flinnsci.com.

Suggested Sequence of Steps to More Safely **Organize Your School's Chemical Stores Area**

1 Take an inventory of all the chemicals in your school. You will never know the extent of your problem until you know exactly what you have. Record the inventory. You may want to consider the purchase of the Flinn Online Chemventory™ system to facilitate this task.

2 Decide what products you will need for the next year (at best, two years). Ruthlessly rid yourselves of the remaining the accumulated materials.

3 Reorganize the remaining products into their compatible chemical families (see our Suggested Chemical Storage Pattern on pages 726–730). The actual sequence of compatible families on your shelves is not critical. What is important is to keep the compatible families separate and to keep the organic and inorganic families as far apart as possible. The Suggested Shelf Storage Pattern shown on pages 726–730 is only one suggested sequence you can use. If shelf space is a problem, you are permitted to place more than one compatible family on a shelf. Make sure you either have a physical divider or leave a 3" space between each family.

Hundreds of teachers who have reorganized their shelves, using these patterns, tell us products are easier to find versus the alphabetical system previously used. When you reorganize, you may need some estimate of the percentage of shelf space each family might occupy. If yours is a "typical" high school, the following profile may be a helpful guide.

Inorganic Families

Families	Percentage of Shelf Space Occupied	Families	Percentage of Shelf Space Occupied
Acids (Inorganic 9)	Store away from all other items. Store in a dedicated acid cabinet. Store nitric acid away from all other materials.	Sulfides, etc. (Inorganic 5)	Less than 1%
Metals, etc. (Inorganic 1)	Less than 5%	Chlorates, Perchlorates, etc. (Inorganic 6)	5+%
Halides, Sulfates, Phosphates, Acetates, etc. (Inorganic 2)	Could be 35–40% of available space. This is usually the largest family.	Arsenates, etc. (Inorganic 7)	Less than 1%
Nitrates, etc. (Inorganic 3)	Approximately 8–10%	Borates, Chromates, etc. (Inorganic 8)	Less than 1%
Hydroxides, Oxides, etc. (Inorganic 4)	Approximately 10%	Sulfur, Phosphorus, etc. (Inorganic 10)	Approximately 3%

4 ## Organic Families

Organic acids (Organic 1) will probably occupy about 5+% of your organic shelf space except for acetic acid, which should be stored with the inorganic acids (e.g., hydrochloric) in a dedicated acid cabinet. Keep acetic acid *away* from nitric acid. If your school is "typical," the remainder of your organic materials may occupy about 15–20% of your total shelf space. You should store all flammable organics in a dedicated flammables cabinet.

5 ## Other Materials

There may be some very large space consumers in 2-kilogram (5-lb.) containers (e.g., calcium chloride, calcium hydroxide). Certainly you may wish to extend family storage in a separate location for such large volumes of large packages.

6 ## Congratulations! You have now reorganized your chemical stores facility to:

- Store compatible products together.
- Separate acids into dedicated storage.
- Separate flammables into dedicated storage.
- Lock up all poisons.
- Record all inventory.
- Rid yourselves of excess materials.

YOU NOW HAVE A SAFER FACILITY!

Suggested Chemical **Storage Pattern**

Storage of laboratory chemicals presents an ongoing safety hazard for school science departments. There are many chemicals that are incompatible with each other. The common method of storing these products in alphabetical order sometimes results in incompatible neighbors. For example, storing strong oxidizing materials next to organic chemicals can present a hazard.

A possible solution is to separate chemicals into their organic and inorganic families and then to further divide the materials into related and compatible families. Following is a list of compatible families. On the next page, you will find this family arrangement pictured as shelf areas in your chemical stores area. The pictured shelf arrangement will easily enable you to rearrange your inventory into a safer and more compatible environment.

Inorganic

1. Metals, Hydrides
2. Acetates, Halides, Iodides, Sulfates, Sulfites, Thiosulfates, Phosphates, Halogens, Oxalates, Phthalates, Oleates
3. Amides, Nitrates (except Ammonium Nitrate), Nitrites, Azides
4. Hydroxides, Oxides, Silicates, Carbonates, Carbon
5. Sulfides, Selenides, Phosphides, Carbides, Nitrides
6. Chlorates, Bromates, Iodates, Chlorites, Hypochlorites, Perchlorates, Perchloric Acid, Peroxides, Hydrogen Peroxide
7. Arsenates, Cyanides, Cyanates
8. Borates, Chromates, Manganates, Permanganates, Molybdates, Vanadates
9. Acids (except Nitric) (Nitric Acid is isolated and stored by itself.)
10. Sulfur, Phosphorus, Arsenic, Phosphorus Pentoxide
11. Inorganic miscellaneous

Organic

1. Acids, Amino Acids, Anhydrides, Peracids
2. Alcohols, Glycols, Sugars, Amines, Amides, Imines, Imides
3. Hydrocarbons, Esters, Aldehydes, Oils
4. Ethers, Ketones, Halogenated Hydrocarbons
5. Epoxy Compounds, Isocyanates
6. Peroxides, Hydroperoxides
7. Sulfides, Polysulfides, Sulfoxides, Nitriles
8. Phenols, Cresols
9. Dyes, Stains, Indicators
10. Organic miscellaneous

NOTE: If you store volatile materials (e.g., ether, hydrocarbons) in a refrigerator, the refrigerator must be explosion-proof. The thermostat switch or light switch in a standard refrigerator may spark and set off the volatile fumes inside and thus cause an explosion.

This list is not complete and is intended only to cover the materials possibly found in an average school situation. This is not the only method of arranging these materials and is only offered as a suggestion.

See the next few pages for detailed inventory and storage steps you might follow to vastly improve the safety profile of your chemical storage.

SUGGESTED SHELF STORAGE PATTERN—**INORGANIC**

INORGANIC #10
Sulfur, Phosphorus, Arsenic, Phosphorus Pentoxide

INORGANIC #2
Halides, Sulfates, Sulfites, Thiosulfates, Phosphates, Halogens, Acetates, Oxalates, Phthalates, Oleates, Iodides

INORGANIC #3
Amides, Nitrates (not Ammonium Nitrate), Nitrites, Azides
(Store Ammonium Nitrate away from all other substances—*ISOLATE IT!*)

INORGANIC #1
Metals & Hydrides
(Store away from any water.)
(Store flammable solids in flammables cabinet.)

INORGANIC #4
Hydroxides, Oxides, Silicates, Carbonates, Carbon

If possible avoid using the floor.

INORGANIC #7
Arsenates, Cyanides, Cyanates
(Store away from any water.)

INORGANIC #5
Sulfides, Selenides, Phosphides, Carbides, Nitrides

INORGANIC #8
Borates, Chromates, Manganates, Permanganates, Molybdates, Vanadates

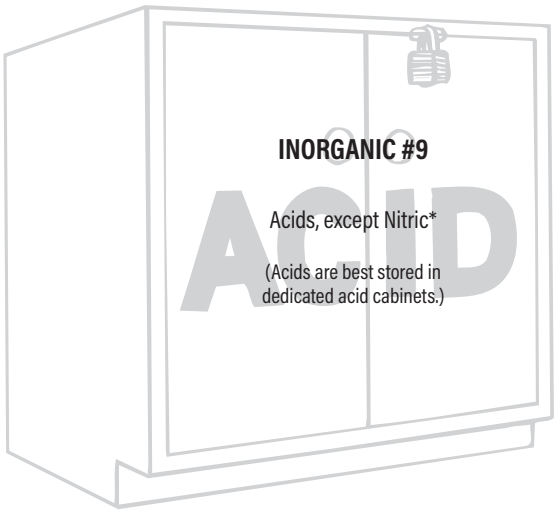
INORGANIC #6
Chlorates, Bromates, Iodates, Chlorites, Hypochlorites, Perchlorates, Perchloric Acid, Peroxides, Hydrogen Peroxide

MISCELLANEOUS

Storage Suggestions

1. Avoid storing chemicals on the floor (even temporarily).
2. Do not use the top shelf for chemical storage.
3. Do not store chemicals above eye level.
4. Firmly secure shelf assemblies to walls. Avoid island shelf assemblies.
5. Provide anti-roll-off lips on all shelves (Catalog No. SE1069).
6. Ideally, shelving assemblies should be of wood construction.
7. Avoid adjustable metal shelf supports and clips. It is better to use fixed, wooden supports.
8. Store acids in a dedicated acid cabinet. Store nitric acid in the same cabinet **only** if isolated from other acids. Store both inorganic and some organic acids in the acid cabinet.
9. Store flammables in a dedicated flammables cabinet.
10. Store severe poisons in a dedicated poisons cabinet.

OTHER STORAGE SUGGESTIONS ARE CONTAINED THROUGHOUT THIS CATALOG/REFERENCE MANUAL.



*Store nitric acid away from other acids unless your acid cabinet provides a separate compartment for nitric acid.

SUGGESTED SHELF STORAGE PATTERN—**ORGANIC**

ORGANIC #2
Alcohols, Glycols, Sugars, Amines, Amides, Imines, Imides
(Store flammables in a dedicated cabinet.)

ORGANIC #3
Hydrocarbons, Oils, Esters, Aldehydes
(Store flammables in a dedicated cabinet.)

ORGANIC #4
Ethers, Ketones, Halogenated Hydrocarbons, Ethylene Oxide
(Store flammables in a dedicated cabinet.)

ORGANIC #5
Epoxy Compounds, Isocyanates

ORGANIC #7
Sulfides, Polysulfides

If possible avoid using the floor.

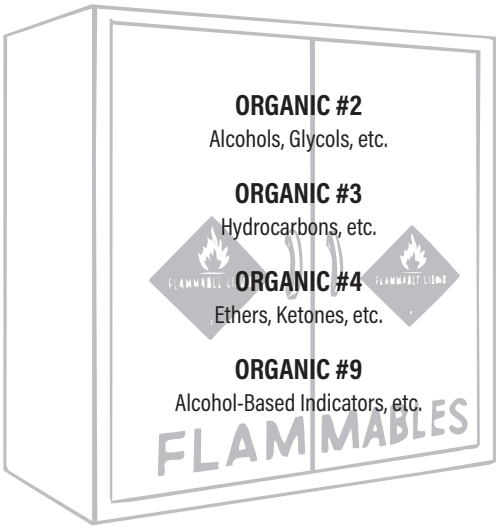
ORGANIC #8
Phenols, Cresols

ORGANIC #6
Peroxides, Hydroperoxides

ORGANIC #1
Acids, Amino Acids, Anhydrides, Peracids
(Store **certain** organic acids in acid cabinet.)

ORGANIC #9
Dyes, Stains, Indicators
(Store alcohol-based solutions in flammables cabinet.)

MISCELLANEOUS



HOW TO

Maximize Storage Space

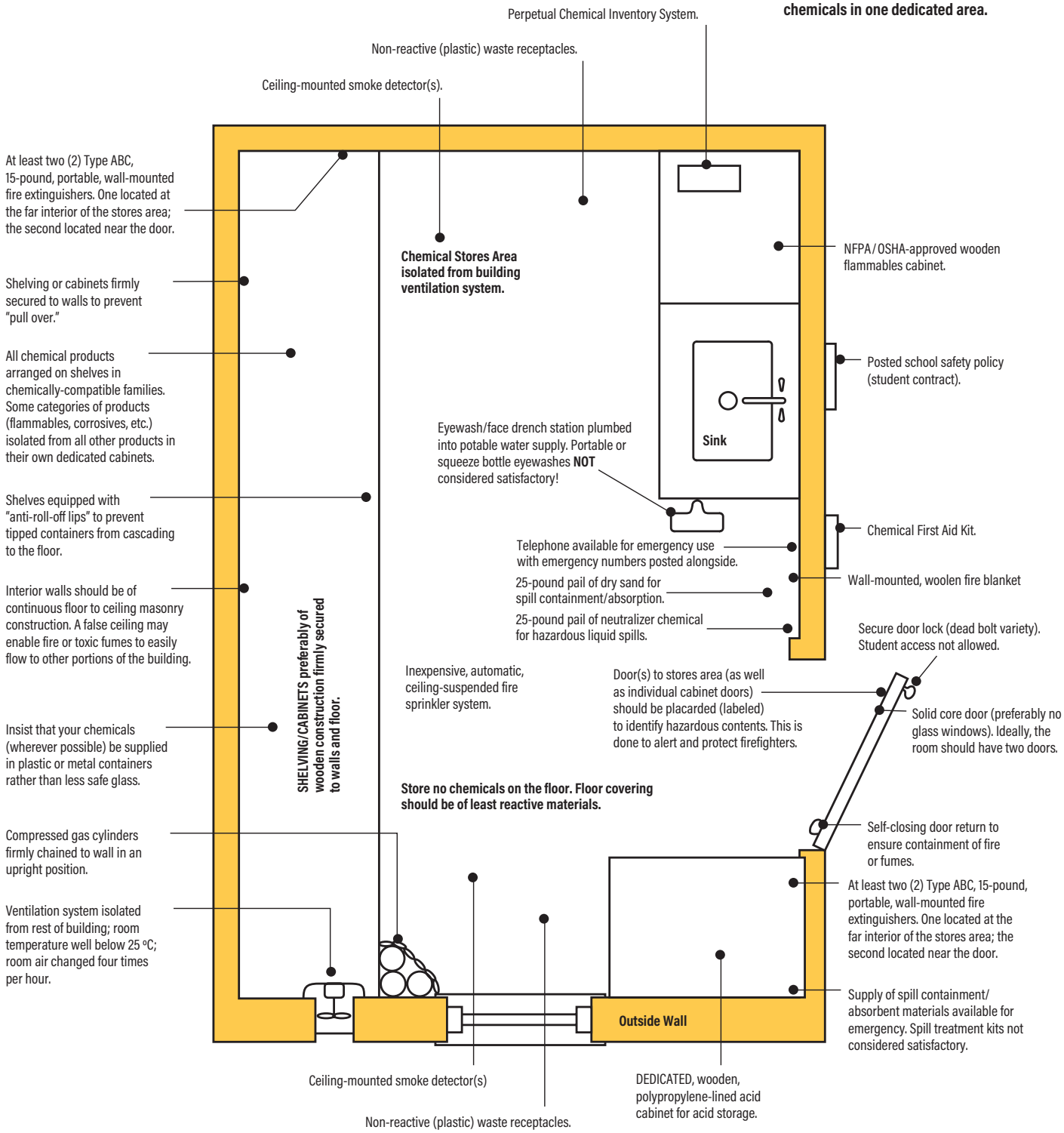
If shelf space is a problem, you are permitted to place more than one compatible chemical family on a shelf. Make sure you either have a physical divider or leave a 3" space between each family. This will maximize your tight shelf space while keeping each compatible chemical family separate from one another.

See page 730 for complete instructions on organizing your chemical stores area.

MODEL CHEMICAL STORES AREA

Please compare your facility to this model.

- **Never store chemicals in a fume hood.**
- **No chemicals routinely stored in classrooms.**
- **VARIOUS SCIENCE DEPARTMENTS (chemistry, biology) should store their chemicals in one dedicated area.**



MANY REASONS WHY WE ENCOURAGE YOU
NOT TO STORE CHEMICALS IN ALPHABETICAL ORDER

IF PRODUCTS ARE STORED TOGETHER	POSSIBLE REACTIONS
Acetic acid + acetaldehyde	**Small amounts of acetic acid will cause the acetaldehyde to polymerize, releasing great amounts of heat.**
Acetic anhydride + acetaldehyde	**Reaction can be violently explosive.**
Aluminum metal + ammonium nitrate	**Potentially explosive results.**
Aluminum metal powder + antimony trichloride	**Aluminum metal burns in the presence of antimony trichloride.**
Aluminum metal + any bromate, chlorate or iodate	**Finely divided aluminum metal in contact with a bromate, chlorate or iodate can be easily detonated by heat, shock or friction.**
Aluminum + bromine vapor	**Aluminum foil reacts with bromine vapor at room temperature and incandesces.**
Aluminum chloride, anhydrous	**$AlCl_3$, anhydrous, is constantly generating hydrochloric acid. After long storage, tightly closed containers have been known to explode when opened.**
Ammonia vapor + bromine vapor	**Unstable nitrogen tribromide is formed and explosion may result.**
Ammonium nitrate + acetic acid	**A mixture may result in ignition, especially if the acetic acid is concentrated.**
Antimony + bromine	**Antimony is spontaneously flammable in the presence of any halogen vapor.**
Arsenic + any bromate, chlorate or iodate	**A potentially explosive combination results if detonated by heat, shock or friction.**
Barium + carbon tetrachloride	**A violent reaction may occur.**
Calcium hypochlorite + charcoal	**A mixture can result in an explosion if heated.**
Carbon + any bromate, chlorate or iodate	**A potentially explosive combination results if detonated by heat, shock or friction.**
Carbon disulfide + aluminum	**Finely divided aluminum will spontaneously burst into flame in the presence of carbon disulfide.**
Chromium trioxide and glycerol	**Violent reaction may cause mixture to ignite.**
Copper + bromate, chlorate or iodate	**A potentially explosive combination results if detonated by heat, shock or friction.**
Hydrogen peroxide (6% or more) + iron(II) sulfide	**A vigorous, highly exothermic reaction results.**
Hydrogen peroxide (6% or more) + lead(II) or (IV) oxide	**Violent, possibly explosive reaction results.**
Lead sulfide + hydrogen peroxide (6% or more)	**Vigorous, potentially explosive reaction results.**
Magnesium hydroxide + maleic anhydride	**Potentially explosive reaction results.**
Mercury(II) nitrate + methyl alcohol	**May form mercury fulminate—an explosive.**
Mercury(II) oxide + magnesium metal	**An explosion may result if heated.**
Mercury(II) oxide + phosphorus	**Percussion may ignite this mixture.**
Nitric acid + magnesium metal powder	**Will react with explosive force.**
Nitric acid + phosphorus	**Phosphorus will burn spontaneously in the presence of nitric acid.**
Potassium cyanide + potassium nitrite	**A potentially explosive mixture results if heated.**
Silver metal + tartaric acid	**An explosive mixture results.**
Silver oxide + sulfur	**A potentially explosive mixture results.**
Sodium + sulfur	**Under the right conditions the reaction can proceed with explosive violence.**
Sodium nitrate + sodium thiosulfate	**A mixture of dry materials can result in explosion.**
Tin(IV) chloride + turpentine	**A flame-producing, exothermic reaction results.**

FLINN SCIENTIFIC

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