

Seven-Step Plan to Clean Up Your Chemical Storage Area



For years you have wanted to clean up and organize your chemical storage area. But it's such a huge job, where do you begin? Our seven-step plan will give the direction and guidance you need to get this job done safely, quickly, and efficiently.

Before we begin, some ground rules need to be established:

- Teachers cleaning up the chemical storage area should do so in teams. This work should never be done alone. Students should never be involved.
- Teachers doing this work should be from the school where the work is being done. The best time to do this type of work is immediately after school gets out in the spring.
- Teachers should be hired on an extended contract during the summer months to undertake this project. For an average-sized school of 1000 students, it will take a team of three to four teachers two weeks to clean up the chemical storage area.
- Teachers on an extended contract should also be covered by the school's insurance policy in the unlikely event of an injury.

It's very important that the teachers be paid for the work they are about to undertake. This problem of old chemicals may have existed long before the teachers started working at the school. Compensation from the school district is only fair.

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STEP 1: Take an Inventory

The most important step in cleaning up a chemical storage area is taking an accurate and complete inventory of every chemical in every chemical storage area, laboratory and classroom. Without a complete inventory you will not be able to proceed to step #2. Don't forget to check closets and drawers. Details on how to take an inventory can be found on pages 1164–1167 of this *Flinn Scientific Catalog/Reference Manual*. Please read these instructions carefully!

Critical information will be needed from your inventory. Most particularly, you will want to know: (1) the name of the chemical, (2) its shelf location, and (3) the approximate amount of chemical estimated to be in each container.

The shelf location of each chemical is important because it is likely that the same chemical will be found in several locations. Shelf location information will help you track down and consolidate these chemicals.

STEP 2: What Chemicals Do You Really Use?

It is fair to say that 40% of the chemicals you have in your chemical storage area have not been used in the last five years and probably won't be used in the next five years. Now is the time to decide which chemicals are really used. Once the inventory is completed, review your laboratory manuals, textbooks, demonstrations, and science fair projects to decide which chemicals are used and which chemicals are not.

As you review your inventory, you may discover an excessive amount of some chemicals. Calculate what quantities of these chemicals you use every year and then decide to keep no more than a two- to five-year supply. Determining how much chemical to keep will be influenced by two factors: the chemical shelf life and the hazardous nature of the chemical. The poorer the shelf life or the more hazardous the chemical, the less you will want to keep on hand. Shelf life and hazard information may be found in the *Flinn Scientific Catalog/Reference Manual* under each chemical listing.

If the chemical is not hazardous and has an indefinite shelf life, keep a four- to five-year supply. However, if the chemical is hazardous and the shelf life is poor, keep only a one-year supply on hand. Look carefully at each bottle, try to determine which bottle looks the freshest or has the best shelf life and only keep the amount you really think you need. Let the shelf life and chemical hazard information found in our *Flinn Scientific Catalog/Reference Manual* guide the way.

STEP 3: Organizing Your Chemical Storage Area

You now know which chemicals you use, which chemicals you want to keep, and which chemicals you would like to get rid of. Let's now physically move all of the chemicals in the chemical storage area (and anywhere else you found chemicals) out into the laboratory

area and onto the lab benches. (The laboratory next to the chemical storage area works best.) The right side of the laboratory will become an area for those chemicals which you either no longer use, or have excessive amounts of and would like to dispose of.

The left side of the laboratory will be those chemicals you want to keep. It's important that only authorized people working on this project be allowed to enter this room. Administrators, maintenance people and others must not be allowed into this laboratory area unless they are accompanied by one of the teachers involved in the cleanup project. This laboratory should be locked when not in use. If you discover chemicals which you feel uncomfortable moving or handling, please call Flinn Scientific for further advice.

STEP 4: Bag and Can Dangerous Chemicals or Practice "Devil Control"

There are certain chemicals found on school premises which Flinn Scientific considers to be "devils." A "devil" is any chemical which has a severe hazard alert. Severely poisonous, severely toxic, severely flammable, severely corrosive, strong oxidizer, carcinogen or strong stench are all characteristics which may qualify a chemical as a "devil." Refer to page 251 for our list of "devils."

To practice "devil control," purchase some clear, heavyweight plastic bags with twist ties, cat litter, and a selection of clean (empty) quart and gallon paint cans.

The first step in practicing "devil control" is to place each chemical container considered to be a "devil" into a clear plastic bag. Secure the bag with a twist tie. Should the bottle break, the spill will be contained in the plastic bag.

Once the chemical bottle is in the plastic bag, spread a thin layer of cat litter in the bottom of a paint can, place the sealed bag with the chemical container into the paint

SEVEN-STEP PLAN continued on next page.

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Seven-Step Plan to Clean Up Your Chemical Storage Area, continued

can, and fill the remaining portion of the can with cat litter. Place the lid on the paint can and label the can clearly with the chemical name, chemical formula, and hazard risk. Your "devil" chemical is now well protected! The metal paint can may be dropped, kicked, or even involved in a fire and the chemical container inside will not break. Should a leak occur, the cat litter will absorb the chemical and the spill will be contained inside the can.

Most "devils" may only be used once or twice during the school year, yet you need to properly protect and store these chemicals when they are not being used. Bags and cans are a very effective, yet inexpensive way to protect these "devil" chemicals.



STEP 5: Improve the Chemical Storage Area Facility

Now that the chemicals have been moved out of the chemical storage area and into the laboratory, you have an opportunity to make some improvements to the chemical storage area. First of all, give the room a good cleaning. Make sure the shelves are firmly attached to the wall and are in good condition. If the shelves are not in good condition, some type of repair or replacement should be made. Check the shelf clips carefully to make sure they are in good condition and not corroded. Better yet, replace the "adjustable" shelves with permanent shelves that will never collapse. Put "lips" on the shelves to

prevent bottle roll-off. Inspect the rest of the chemical storage area. Do any other improvements need to be made?

STEP 6: Organize Chemicals by Compatible Families

Now that the "devil" chemicals have been bagged and canned, and the storage area has been improved, it's time to return the chemicals you want to keep back into the chemical storage area. Before these chemicals are moved back into the chemical storage area, you must decide how they are to be stored and organized. In the past, they may have been stored alphabetically. This is wrong! Chemicals should be stored and organized by compatible chemical families. Pages 1168–1173 of this *Flinn Scientific Catalog/Reference Manual* describe how to properly store laboratory chemicals. Thousands of schools across the United States have adopted the Flinn Suggested Chemical Storage Patterns for the storage of their laboratory chemicals. Many states and insurance companies recommend the Flinn Suggested Chemical Storage Patterns as the preferred method of chemical storage.

First, separate your chemicals into compatible families by dividing the chemicals into inorganic and organic families, then subdividing them further into their unique compatible chemical families. For instance, oxidizers are broken into five different families. Nitrates are stored in Inorganic #3, except ammonium nitrate, which is isolated. Chromates and permanganates are stored in Inorganic #8. Chlorates and perchlorates are stored in Inorganic #6, and nitric acid is stored separately in a dedicated acid cabinet.

Before the chemicals are moved back into the chemical storage area it is very helpful to label each chemical bottle with the appropriate compatible chemical family storage number. It is also helpful to label each shelf

with the compatible family number. Labeling both the chemical shelving and the chemical bottles with the appropriate Flinn compatible chemical family number will allow you to easily locate and return any chemical to its appropriate storage location. Without this labeling, you'll soon find your chemical storage area in disarray. You may make your own bottle and shelf labels or purchase pre-printed labels from Flinn Scientific, Inc. (All Flinn chemicals are already labeled with this information.)

STEP 7: Chemical Disposal—Your Options

Now that your chemicals have been properly bagged, canned, labeled and placed back into the chemical storage area using Flinn's Suggested Compatible Family Shelf Storage Patterns, your task is now complete ...almost.

As you walk out of the chemical storage area feeling good about what you have accomplished, you soon realize you still have all of those chemicals that need to be disposed of. What are your options for chemical disposal? Flinn has devoted 30 pages in this *Catalog/Reference Manual* to disposal procedures. First read about your options on pages 1174–1178 and if you want to dispose of small quantities of chemicals, refer to the disposal procedures found on pages 1179–1203.

We hope our seven-step plan to clean up your chemical storage area has given you the direction and courage needed to improve the safety profile of your school. It's no small task to clean up a chemical storage area, but with a well defined plan and the support of your school administration, this job can be done.

Good luck! If you have any questions, please feel free to call us. We're here to help!



Seven-Step Plan to Clean Up the Chemical Storage Area Video

Flinn Scientific has created a free online video series describing a seven-step plan to help you clean up your chemical storage area. Each video chapter covers one step of the process from taking a chemical inventory to storing chemicals safely and understanding chemical treatment or disposal options. By following the steps in each video, you will gain the confidence of knowing your chemical storeroom is safe and organized. We also provide suggestions on how to convince your administration to allocate the time and money necessary for you to take a chemical inventory and clean up the chemical storeroom.

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