

**LAB SAFETY 101: PART 1**  
A RESOURCE FOR EDUCATORS



2020

# Lab Safety 101 with Flinn Scientific



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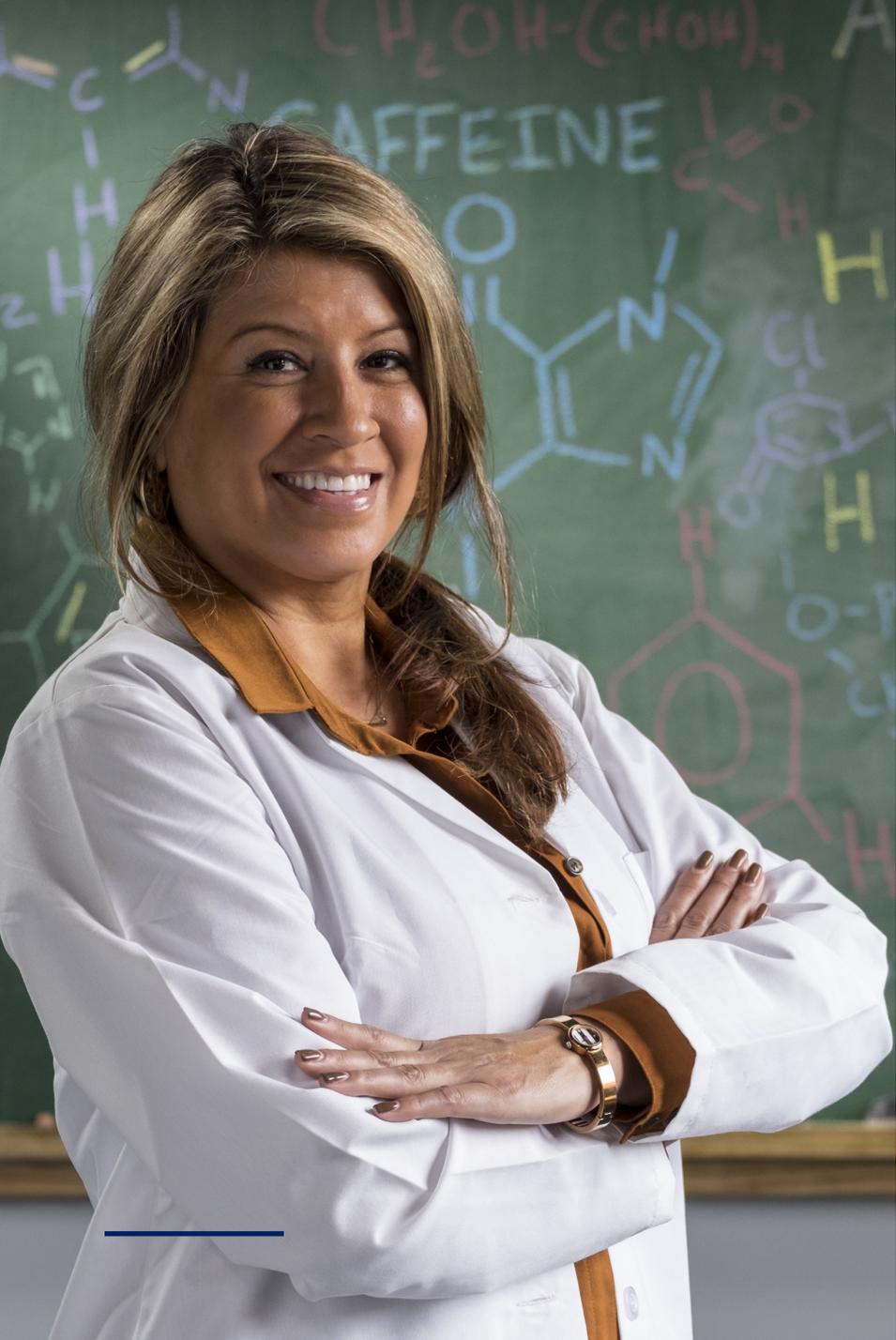
Flinn Scientific, Inc.  
P.O. Box 219, Batavia, IL 60510-0219

Flinn has been the Safer Source for Science for over 40 years, dedicated to making school laboratories a safe environment for both students and instructors.

Come with FLINN on a guided tour of the science department as we investigate common safety protocols and best-practices including safety contracts, chemical storage, how to deal with emergency situations such as fires, floods, chemical spills, orphan chemicals and more.

## OVERVIEW OF THIS SESSION

1. Prevention
2. Duty of Care
3. Student Lab Safety Contract
4. Best Practices Hazard Identification
5. Fire
6. Flood
7. Chemical Spills
8. Orphan Chemicals
9. Chemical Storage
10. Chemical Inventory
11. Chemical Labelling



## Prevention is Better Than Reaction

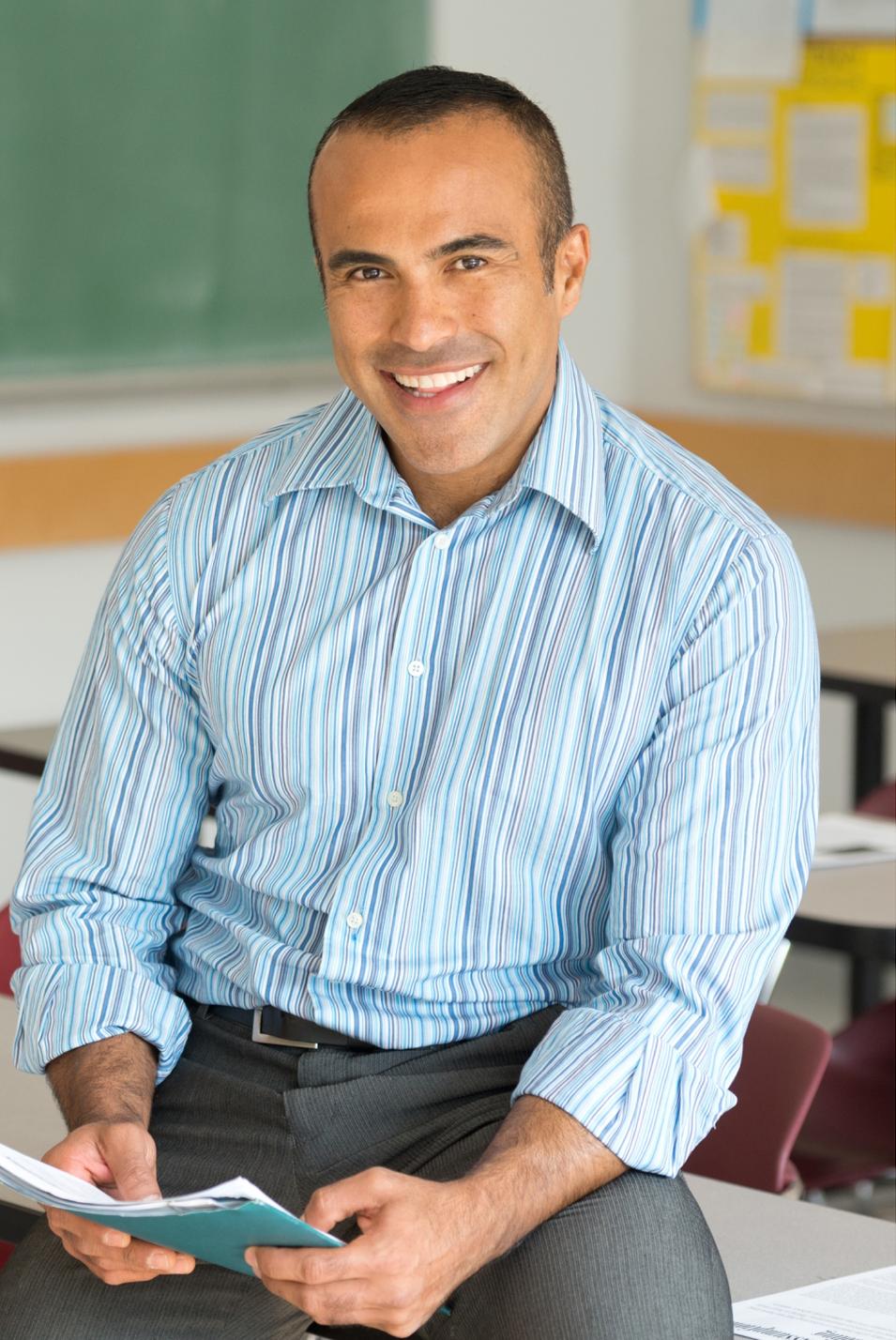
The first and most pressing issue with regard to safety is anticipating potential issues and reducing / removing the possible items that create these unsafe situations.

By being aware of safety procedures and best practices, you can reduce the possible unsafe situations that arise by significant degrees and provide a safer and more compliant prep room and science laboratory.

# Common Issues with Messy Labs and Prep Areas

We find issues in labs and prep rooms in many schools. Having issues with keeping spaces organized and safe is common, but dangerous.



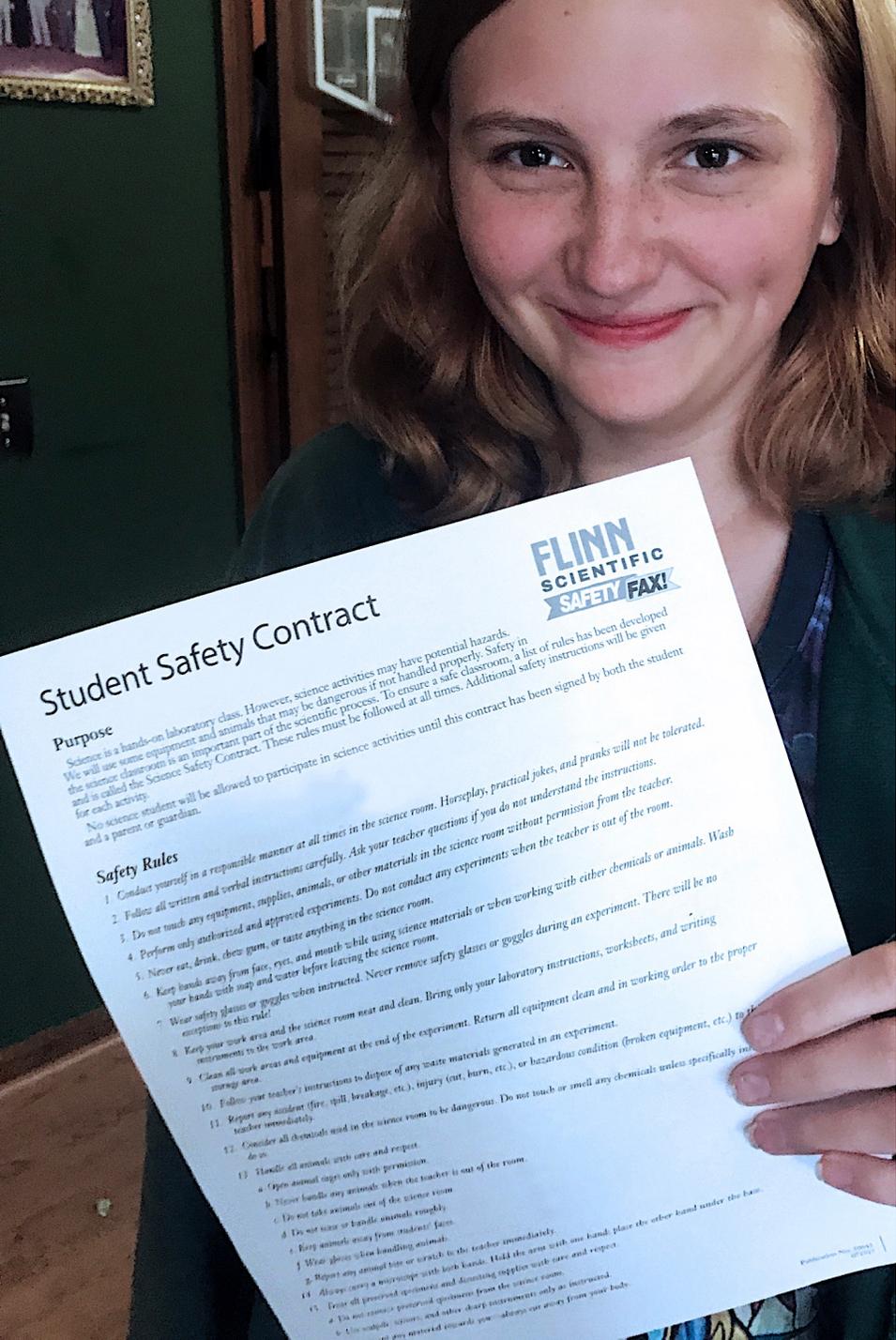


## Professional Duty of Care as a Science Educator

Your duty of care as a professional educator is based on the following: ( Due Diligence )

- Provide the safest possible environment for your students and your colleagues
- Ensure that all safety equipment is 100% operational and safety protocols are followed exactly
- Make decisions which are based on safe curricular investigations to meet expectations ( *does the safety risk exceed the educational value of doing it?* )

*YouTube videos are wonderful but not always safe or reliable.*



# Student Lab Safety Contract

Do you provide / review a student lab safety contract with your students?

Do you have them sign it and have their parents sign it as well?

You need to review the entire contract on the first day of school and periodically during the school year.

Before each lab activity you need to review the lab procedures that are expected in the lab.

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## 1. Flinn Safety Contract



## Student Lab Safety Contract

Please take a few moments and review the Laboratory Rules that Flinn Scientific has created to assist you as a professional science educator

Each of these points are useful independently but as a collection of rules and lab procedures they are of the utmost importance in the lab.

Your duty of care or ‘due diligence’ as a science teacher is based on providing a safe learning environment for your classes.

**We can email you a pdf of the Safety Contract afterwards if you would like to use it with your class. Just ask – that’s why we are here today!**



## From the Student Lab Safety Contract

Science is a hands-on laboratory class. You will be doing many laboratory activities which require the use of hazardous chemicals. **Safety in the science classroom is the #1 priority for students, teachers, and parents.** To ensure a safe science classroom, a list of rules has been developed and provided to you in this student safety contract. These rules must be followed at all times. Two copies of the contract are provided. One copy must be signed by both you and a parent or guardian before you can participate in the laboratory. The second copy is to be kept in your science notebook as a constant reminder of the safety rules.

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1. <https://www.flinnsci.com/safety>



## From the Student Lab Safety Contract

<b>Conduct</b>	Conduct yourself in a responsible manner at all times in the laboratory.
<b>Follow</b>	Follow all written and verbal instructions carefully. If you do not understand a direction or part of a procedure, ask the instructor before proceeding.
<b>Work</b>	Never work alone. No student may work in the laboratory without an instructor present.
<b>Do Not Touch</b>	When first entering a science room, do not touch any equipment, chemicals, or other materials in the laboratory area until you are instructed to do so.
<b>Do Not Eat</b>	Do not eat food, drink beverages, or chew gum in the laboratory. Do not use laboratory glassware as containers for food or beverages.

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1. <https://www.flinnsci.com/safety>

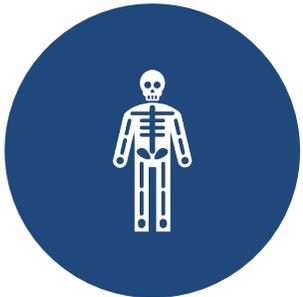
# From the Student Lab Safety Contract



Perform only those experiments authorized by the instructor. Never do anything in the laboratory that is not called for in the laboratory procedures or by your instructor. Carefully follow all instructions, both written and oral. Unauthorized experiments are prohibited.



Be prepared for your work in the laboratory. Read all procedures thoroughly before entering the laboratory.



Never fool around in the laboratory. Horseplay, practical jokes, and pranks are dangerous and prohibited.



Observe good housekeeping practices. Work areas should be kept clean and tidy at all times. Bring only your laboratory instructions, worksheets, and/or reports to the work area. Other materials (books, purses, backpacks, etc.) should be stored in the classroom area.



## Do Your Best- Be Aware!

Even with the best possible routines and protocols established in the science laboratory, occasionally accidents will happen.

By being aware of potential hazards and taking the steps to mitigate these risks you have done a great service to the students.

Don't become complacent in your role as the lead science safety advocate in your classroom.

Where do you think most science lab accidents occur in K-12 teaching?



## Introduction to Hazards in the Lab

Most schools are very safe places to work and learn. However, there are occasionally periods of turbulence in the school where accidents may occur even though the most comprehensive precautions were taken. **Does this room look familiar?**

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# The Importance of Lab Safety

Notice anything wrong with these images?



No gloves or goggles



Improper goggle use

# Common Issues with Messy Labs and Prep Areas

We find issues in labs and prep rooms in many schools. Having issues with keeping spaces organized and safe is common, but dangerous.





## Fire in the Lab

- Remain Calm.
- Ensure Students leave the lab in an orderly fashion.
- Designate one student to pull Fire Alarm.
- Evaluate the fire and decide on measures to take.
- Fire Extinguisher usage?
- Keep yourself between fire and a clear exit. If fire grows, close door and exit school.
- Report to Principal and Emergency Services immediately.

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# After the Rainbow—CSB Video



Calais Webber Injury in 2006  
(Ohio)

Alonzo Yanes Injury 2014  
(NYC)

Malachi McFadden 2019  
(DeKalb County GA)

Flinn Catalog Methanol Call-out



## Floods in the Lab

Have you ever had a water pipe flow out into the lab? How about a water turret that you can't shut off? These things happen.

- Floods need to be contained quickly.
- Evaluate and determine whether to remove students.
- Contact maintenance personnel at once.
- Shut off water supply to room if you know where the valve is located.
- Isolate electrical and Gas lines at once with master shut-off switch.





## Chemical Spills in the Lab

They are not all the same and there is not a 'one-size fits all' chemical spill kit with only one material to be used.

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# How to Handle Chemical Spills

There are different techniques for handling different types of spills – also called ‘Accidental Release’.

**Acidic Spills**

**Caustic Spills**

**Solvents ( Flammables )**

**If you know what chemicals are being used, you can always refer to the MSDS / SDS for immediate chemical information. ( *GHS* )**

**Do you familiarize yourself with the chemical you will be using prior to using it first?**

**Is there a chemical spill kit available?**

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1. [Chemical Spill Control](#)

2.

# Flinn Chemical Labels

Take a look at the chemical label for information (GHS format)



**DANGER!** Highly flammable liquid and vapor. Keep away from heat, spark, and open flames. Keep away from combustible materials. Causes serious eye irritation. May cause drowsiness or dizziness.

**FIRST AID:** IF SWALLOWED: Rinse mouth. Contact POISON CENTER or physician if you feel unwell. IF ON SKIN: Flush affected area with water. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present, and continue rinsing.

770 N. Raddant Road, Batavia, IL 60510 U.S.A.  
630-879-6900  
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**FLINN**  
SCIENTIFIC

"Your Safer Source  
for Science"

A0009

500 mL

## ACETONE

reagent,  $\text{CH}_3\text{COCH}_3$ , F.W. 58.08

★ **HAZARD ALERT:** Highly flammable liquid and vapor. Causes mild skin irritation. Causes serious eye irritation. May cause drowsiness or dizziness. Avoid breathing fumes. Use in a well-ventilated area. Wear protective gloves and eye protection. Wash thoroughly after handling.  $\text{ori-rat LD}_{50}$ : 5800 mg/kg. PEL: 1000 ppm.

**IN CASE OF FIRE:** Use triclass dry chemical fire extinguisher.



LOT: 999999

**STORAGE:** Organic #4 inside a dedicated flammables cabinet. If a flammables cabinet is not available, store in a Flinn Saf-Stor™ Can.

ORGANIC #4

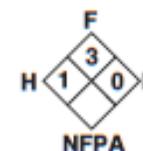


**DISPOSAL:** #18a

**SHELF LIFE:** Good, if stored safely.

**SOLUBLE:** Miscible with water, alcohol, ether and chloroform.

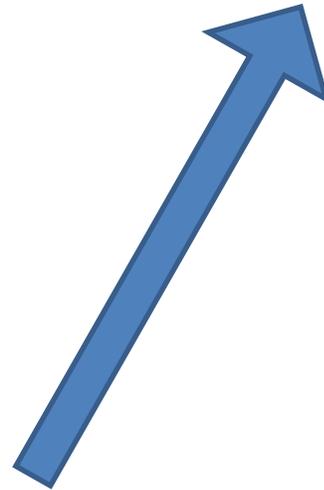
**CAS NO:** 67-64-1



NFPA



# Flinn Chemical Safety Data Sheets



SDS #: 7  
Revision Date: August 31, 2016

Save SDS to Your Library

## Safety Data Sheet (SDS)

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

#### Acetone

Signal Word  
DANGER

Flinn Scientific, Inc. P.O. Box 219, Batavia, IL 60510 (800) 452-1261  
Chemtrec Emergency Phone Number: (800) 424-9344

Pictograms

### SECTION 2 — HAZARDS IDENTIFICATION

Hazard class: Flammable liquids (Category 2). Highly flammable liquid and vapor (H225). Keep away from heat, sparks, open flames, and hot surfaces. No smoking (P210).



Hazard class: Eye irritation (Category 2A). Causes serious eye irritation (H319).



Hazard class: Specific target organ toxicity, single exposure; Narcotic effects (Category 3). May cause drowsiness or dizziness (H336). Avoid breathing mist, vapors or spray (P261).

### SECTION 3 — COMPOSITION, INFORMATION ON INGREDIENTS

Component Name	CAS Number	Formula	Formula Weight	Concentration
Acetone	67-64-1	CH <sub>3</sub> COCH <sub>3</sub>	58.08	
Synonyms: Dimethyl ketone, 2-Propanone				

### SECTION 4 — FIRST AID MEASURES

Call a POISON CENTER or physician if you feel unwell (P312).

**If inhaled:** Remove victim to fresh air and keep at rest in a position comfortable for breathing (P304+P340).

**If in eyes:** Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do so. Continue rinsing (P305+P351+P338). **If eye irritation persists eyes:** Get medical advice or attention (P337+P313).

**If on skin:** Wash with plenty of water.

**If swallowed:** Rinse mouth. Call a POISON CENTER or physician if you feel unwell.

### SECTION 5 — FIRE FIGHTING MEASURES

Class IB flammable liquid.

A dangerous fire hazard from heat, flame or strong oxidizers.

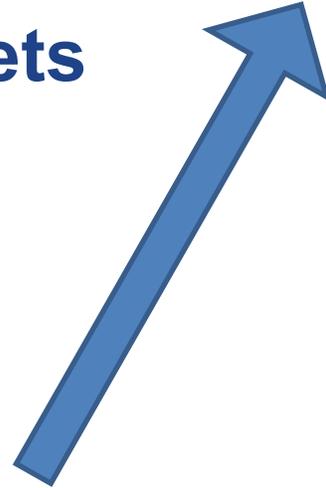
Flash point: -17 °C (CC) Flammable limits: Upper 12.8% Lower 2.6% Autoignition temperature:

NFPA Code

H-1

F-3

# Flinn Chemical Safety Data Sheets



465 °C

R-0

When heated to decomposition, may emit toxic fumes.

In case of fire: Use a tri-class dry chemical fire extinguisher (P370+P378).

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## SECTION 6 — ACCIDENTAL RELEASE MEASURES

Remove all ignition sources and ventilate area. Contain the spill with sand or other inert absorbent material and deposit in a sealed bag or container. See Sections 8 and 13 for further information.

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## SECTION 7 — HANDLING AND STORAGE

Flinn Suggested Chemical Storage Pattern: Organic #4. Store with ethers, ketones, and halogenated hydrocarbons.

Store in a dedicated flammables cabinet. If a flammables cabinet is not available, store in Flinn Saf-Stor™ can.

Keep container tightly closed (P233). Keep cool (P235). Use only in a hood or well-ventilated area (P271). Take precautionary measures against static discharge (P243).

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## SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION

Wear protective gloves, protective clothing, and eye protection (P280). Use latex, not nitrile gloves. Wash hands thoroughly after handling (P264). Use only in a hood or well-ventilated area (P271).

Exposure guidelines: PEL 1000 ppm (OSHA); TLV 500 ppm, STEL 750 ppm (ACGIH); IDLH 2500 ppm

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## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Colorless liquid. Sweet pungent odor like nail polish remover. Boiling point: 56.5 °C

Soluble: Miscible with water, alcohol and many other organic solvents. Density: 0.79

Melting point: -94.6 °C

Vapor density: 2.00

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## SECTION 10 — STABILITY AND REACTIVITY

Stable. Potentially explosive reaction with strong oxidizing agents and halogenated compounds.

Shelf life: Good, if stored properly.

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## SECTION 11 — TOXICOLOGICAL INFORMATION

Acute effects: Eye and respiratory tract irritant, dizziness, CNS ORL-RAT LD<sub>50</sub>: 5800 mg/kg depression.

IHL-RAT LC<sub>50</sub>: 50,100 mg/m<sup>3</sup>/8H

Chronic effects: Dermatitis.

SKN-RBT LDL<sub>0</sub>: 20 mL/kg

Target organs: Liver, kidneys, CNS, respiratory system.

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## SECTION 12 — ECOLOGICAL INFORMATION

Data not yet available.

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## SECTION 13 — DISPOSAL CONSIDERATIONS

Please review all federal, state and local regulations that may apply before proceeding.

Flinn Suggested Disposal Method #18a is one option.

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## SECTION 14 — TRANSPORT INFORMATION

Shipping name: Acetone. Hazard class: 3, Flammable Liquid. UN number: UN1090.

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## SECTION 15 — REGULATORY INFORMATION

TSCA-listed, EINECS-listed (200-662-2), RCRA code U002

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## SECTION 16 — OTHER INFORMATION

This Safety Data Sheet (SDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific, Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. The data should not be confused with local, state, federal or insurance mandates, regulations, or requirements and CONSTITUTE NO WARRANTY. Any use of this data and information must be determined by the science instructor to be in accordance with applicable local, state or federal laws and regulations. The conditions or methods of handling, storage, use and disposal of the product(s) described are beyond the control of Flinn Scientific, Inc. and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME

# Flinn Chemical Safety Data Sheets

RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THIS PRODUCT(S).

N.A = Not available, not all health aspects of this substance have been fully investigated.

N/A = Not applicable

**Consult your copy of the Flinn Science Catalog/Reference Manual for additional information about laboratory chemicals.**

**Revision Date:** August 31, 2016

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## Acid Spills

Ensure that the spill has not mixed with another substance.  
**DO NOT ADD WATER TO DILUTE!**

Put on protective gloves, goggles, and apron and use the provided materials from the Spill Kit.

Use the Acidic Spill Powder from the Spill Kit to absorb / neutralize the spill.

Gather the neutralized substance and put it into the vinyl bags supplied in the kit. Label and date the bag.



## Caustic (Basic) Spills

Ensure that the spill has not mixed with another substance.  
**DO NOT ADD WATER TO DILUTE!**

Put on protective gloves, goggles, and apron and use the provided materials from the Spill Kit.

Use the Caustic Spill Powder from the Spill Kit to absorb / neutralize the spill.

Gather the neutralized substance and put it into the vinyl bags supplied in the kit. Label and date the bag.



## Flammable Spills

**Remove and turn off ALL sources of heat or possible ignition.(electrical, hotplates, burners)**

Do not add water to dilute the solution.

Ensure that the spill is not mixed with another chemical. Gather and wear appropriate protective equipment from Spill Kit.

Use the Solvent / Flammable mixture from the Spill Kit to absorb and contain the spill.



## Flinn Spill Control Kit

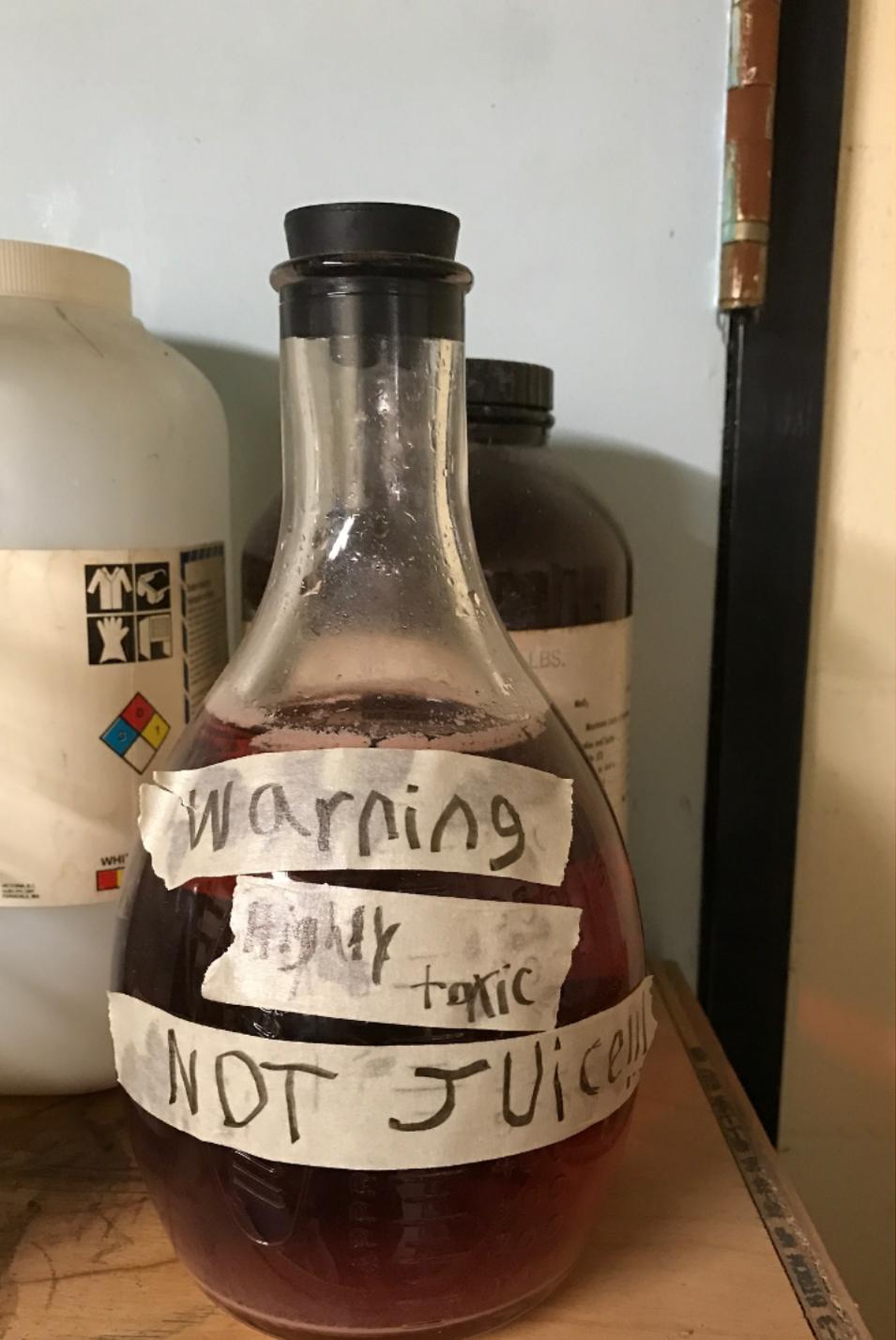
The Flinn Spill Control Center has everything you need to handle most laboratory spill emergencies in one convenient location.

- 
1. [Flinn Chemical Spill Control Center](#)

# Suspicious or Old Chemicals

We understand that you might have some old chemicals in your prep area or even in your lab.

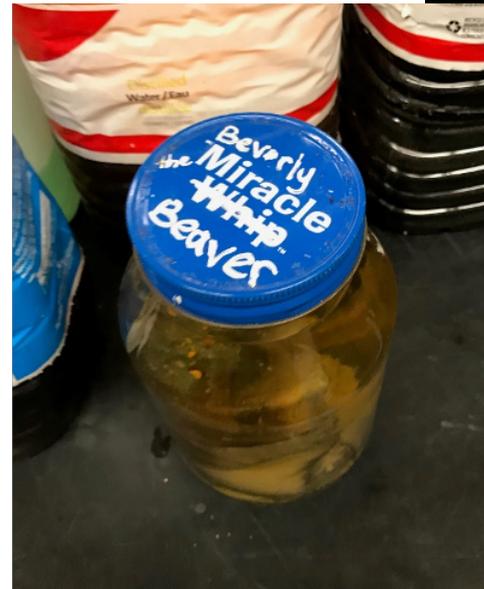
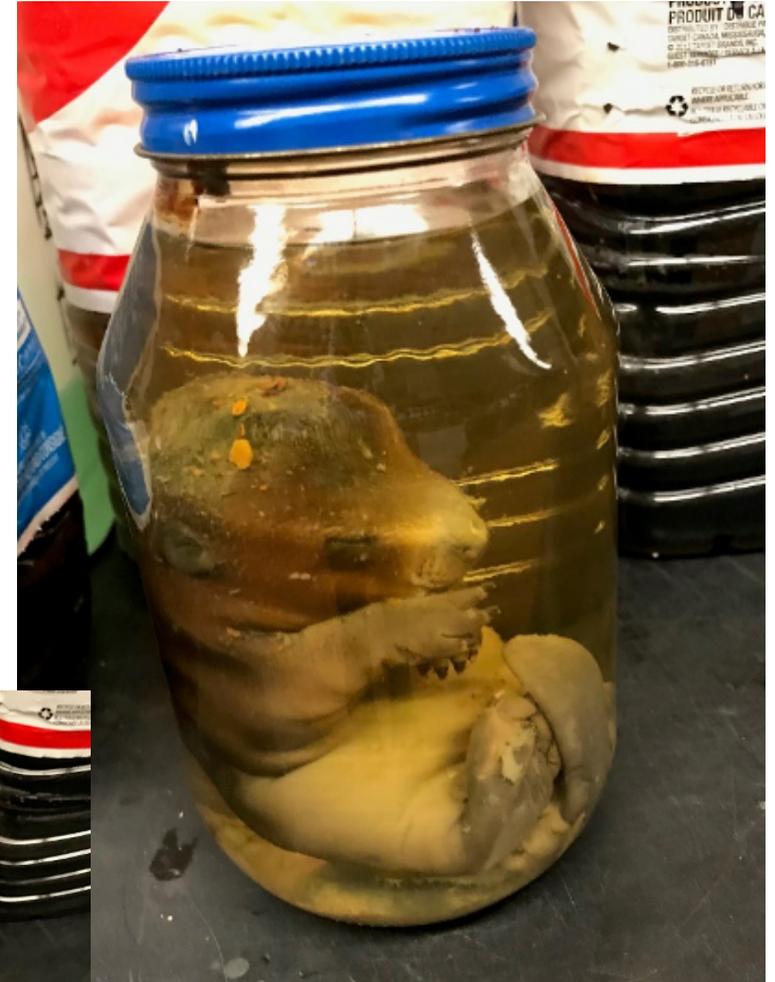
Hopefully you can have these old chemicals removed from your science department with the next hazardous material clean-up scheduled by your school district.



# Homemade Specimen Jars

Time to dispose of those 'homemade' specimens in pickle jars..... These can be toxic and are not safe!

- These specimens that students or teachers bring into the science department need to be disposed of.
- Typically these are not preserved or fixed properly and if older, they were likely immersed in formaldehyde solution.....
- Say good-bye to Beverly!



# Orphan Chemicals

What in the world is that dark liquid in the flask?

- Unknown #1
- Reagent “B”
- DO NOT USE!
- “Pour your Old Used Chemicals in Here”
- October 1, 2009





## Flinn Can Help Identify These ‘Unknown’ Substances In The Lab

Flinn has dedicated pages and pages of relevant information and procedures as to how you can identify these mystery substances.

It's in the Yellow Pages of our Reference Manual or you can call us toll-free and ask for Technical Support. We are here to help you!

**1-800-452-1261 toll-free support**

# Chemical Storage





## Are You Storing Your Chemicals Properly?

This is a result of incompatible chemical storage



## Chemical Storage Matters

You cannot store your chemicals **ALPHABETICALLY!** Too many potential interactions with severe consequences exist.

- You cannot store all your acids in together! (*Nitric and Acetic Acid are incompatible* )
  - You cannot store chemicals randomly!
  - See the FLINN Chemical Storage Guide Poster & follow the suggestions to minimize interactions!!!
-



# FLINN SCIENTIFIC Chemical Storage Pattern

## Organic Storage Codes

- 01** – Acids, Amino Acids, Anhydrides, Peracids
- 02** – Alcohols, Glycols, Sugars, Amines, Amides, Imines, Imides
- 03** – Hydrocarbons, Esters, Aldehydes, Oils
- 04** – Ethers, Ketones, Ketenes, Halogenated Hydrocarbons, Ethylene Oxide
- 05** – Epoxy Compounds, Isocyanates
- 06** – Peroxides, Hydroperoxides, Azides
- 07** – Sulfides, Polysulfides, Sulfoxides, Nitriles
- 08** – Phenols, Cresols
- 09** – Dyes, Stains, Indicators
- OM** – Organic Miscellaneous

## Inorganic Storage Codes

- 11** – Metals, Hydrides
- 12** – Acetates, Halides, Iodides, Sulfates, Sulfites, Thiosulfates, Phosphates, Halogens
- 13** – Amides, Nitrates (except Ammonium Nitrate, store as I8), Nitrites, Azides
- 14** – Hydroxides, Oxides, Silicates, Carbonates, Carbon
- 15** – Sulfides, Selenides, Phosphides, Carbides, Nitrides
- 16** – Chlorates, Bromates, Iodates, Chlorites, Hypochlorites, Perchlorates, Perchloric Acid, Peroxides, Hydrogen Peroxide
- 17** – Arsenates, Cyanides, Cyanates
- 18** – Borates, Chromates, Manganates, Permanganates
- 19** – Acids (except Nitric) (Nitric Acid is isolated and stored by itself.)
- 110** – Sulfur, Phosphorus, Arsenic, Phosphorous Pentoxide
- IM** – Inorganic Miscellaneous

## Chemical Families and Corresponding Storage Codes

Acetates — <b>12</b>	Carbides — <b>15</b>	Halogens — <b>12</b>	Miscellaneous (inorganic) — <b>IM</b>	Phosphides — <b>15</b>
Acids, Inorganic (except Nitric) — <b>19</b> <small>(Nitric Acid is isolated and stored by itself.)</small>	Carbon — <b>14</b>	Hydrides — <b>11</b>	Miscellaneous (organic) — <b>OM</b>	Phosphorus — <b>110</b>
Acids, Organic — <b>01</b>	Carbonates — <b>14</b>	Hydrocarbons — <b>03</b>	Nitrates — <b>13</b> <small>(except Ammonium Nitrate, store as I8)</small>	Phosphorous Pentoxide — <b>110</b>
Alcohols — <b>02</b>	Chlorates — <b>16</b>	Hydrogen Peroxide — <b>16</b>	Nitrides — <b>15</b>	Polysulfides — <b>07</b>
Aldehydes — <b>03</b>	Chlorites — <b>16</b>	Hydroperoxides — <b>06</b>	Nitriles — <b>07</b>	Selenides — <b>15</b>
Amides (inorganic) — <b>13</b>	Chromates — <b>18</b>	Hydroxides — <b>14</b>	Nitrites — <b>13</b>	Silicates — <b>14</b>
Amides (organic) — <b>02</b>	Cresols — <b>08</b>	Hypochlorites — <b>16</b>	Oils — <b>03</b>	Stains — <b>09</b>
Amines — <b>02</b>	Cyanates — <b>17</b>	Imides — <b>02</b>	Oxides — <b>14</b>	Sugars — <b>02</b>
Amino Acids — <b>01</b>	Cyanides — <b>17</b>	Imines — <b>02</b>	Peracids — <b>01</b>	Sulfates — <b>12</b>
Anhydrides — <b>01</b>	Dyes — <b>09</b>	Indicators — <b>09</b>	Perchlorates — <b>16</b>	Sulfides (inorganic) — <b>15</b>
Arsenates — <b>17</b>	Epoxy Compounds — <b>05</b>	Iodates — <b>16</b>	Perchloric Acid — <b>16</b>	Sulfides (organic) — <b>07</b>
Arsenic — <b>110</b>	Esters — <b>03</b>	Iodides — <b>12</b>	Permanganates — <b>18</b>	Sulfites — <b>12</b>
Azides (inorganic) — <b>13</b>	Ethers — <b>04</b>	Isocyanates — <b>05</b>	Peroxides (inorganic) — <b>16</b>	Sulfoxides — <b>07</b>
Azides (organic) — <b>06</b>	Ethylene Oxide — <b>04</b>	Ketenes — <b>04</b>	Peroxides (organic) — <b>06</b>	Sulfur — <b>110</b>
Borates — <b>18</b>	Glycols — <b>02</b>	Ketones — <b>04</b>	Phenols — <b>08</b>	Thiosulfates — <b>12</b>
Bromates — <b>16</b>	Halides — <b>12</b>	Manganates — <b>18</b>	Phosphates — <b>12</b>	
	Halogenated Hydrocarbons — <b>04</b>	Metals — <b>11</b>		

“Your Safer Source for Chemicals”

# A Common Messy Situation In School Laboratories

This is an extremely hazardous chemical storage cabinet that appears to store ALL their chemicals in one spot. Multiple serious safety concerns here – but common sense should be used. 100% preventable with some effort and proper safety protocols followed.

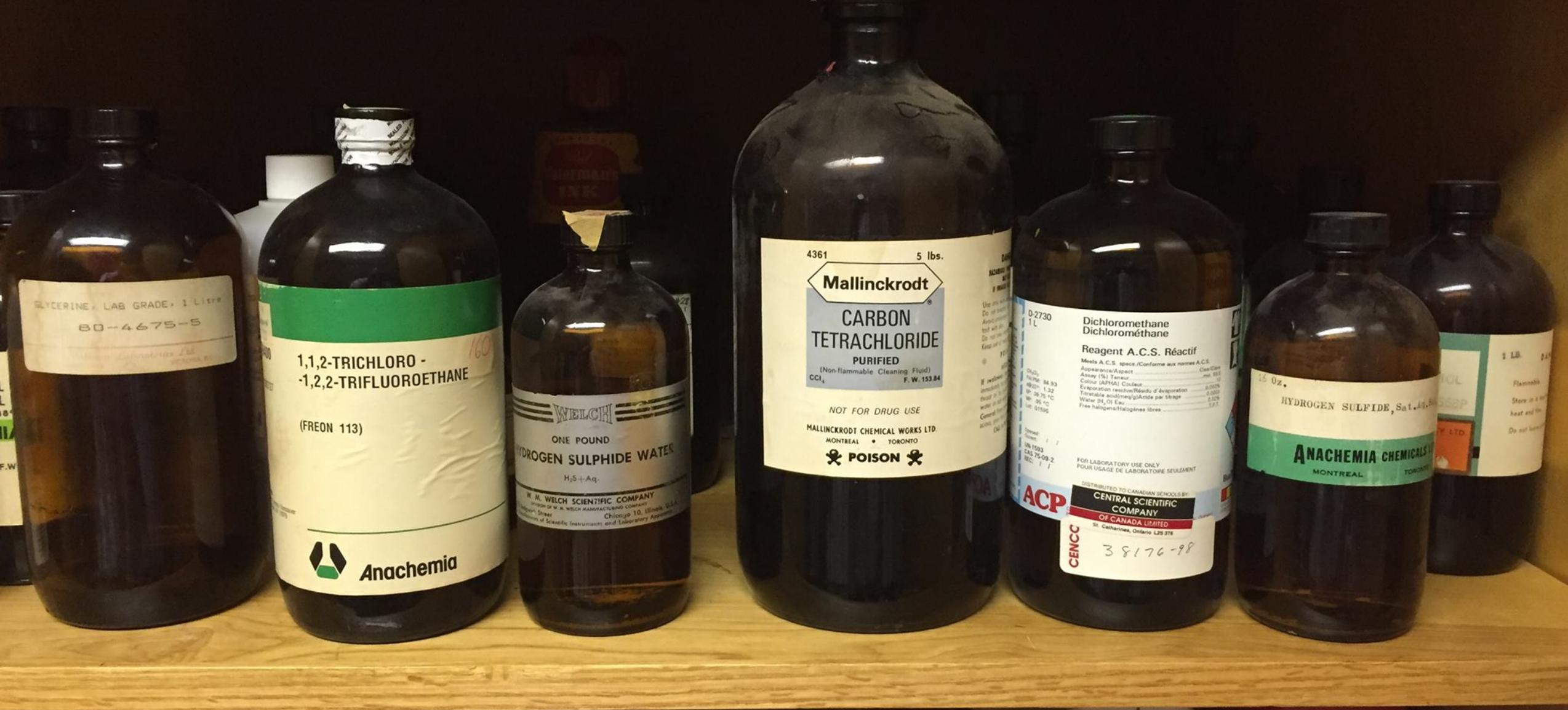




## Does this look like a safe practice for your chemical storage?

This is absolutely not a photoshop image. Both a scary and 100% preventable issue.

# Don't Allow Your Stockroom to End Up Like This!



GLYCERINE, LAB GRADE, 1 Liter  
80-4675-5

1,1,2-TRICHLORO -  
-1,2,2-TRIFLUOROETHANE  
(FREON 113)  
Anachemia

WELCH  
ONE POUND  
HYDROGEN SULPHIDE WATER  
 $H_2S + Ag$   
W. M. WELCH SCIENTIFIC COMPANY  
Division of W. A. WELCH MANUFACTURING COMPANY  
Chicago 10, Illinois, U.S.A.  
Manufacturers of Scientific Instruments and Laboratory Apparatus

4361 5 lbs.  
Mallinckrodt  
CARBON  
TETRACHLORIDE  
PURIFIED  
(Non-flammable Cleaning Fluid)  
 $CCl_4$  F. W. 153.84  
NOT FOR DRUG USE  
MALLINCKRODT CHEMICAL WORKS LTD.  
MONTREAL • TORONTO  
POISON

D-2730  
Dichloromethane  
Dichlorométhane  
Reagent A.C.S. Réactif  
Meets A.C.S. specs./Conforme aux normes A.C.S.  
Appearance/Aspect: Clear/Clair  
Assay (%): 99.99  
Color (APHA): Colorless/Incolore  
Evaporation residue/Résidu d'évaporation: 0.0005  
Titratable acidities/Acidité par titrage: 0.0005  
Water, H<sub>2</sub>O, Eau: 0.02%  
Free halogens/Halogènes libres: 0.01%  
FOR LABORATORY USE ONLY  
POUR USAGE DE LABORATOIRE SEULEMENT  
DISTRIBUTED TO CANADIAN SCHOOLS BY  
CENTRAL SCIENTIFIC COMPANY  
OF CANADA LIMITED  
St. Catharines, Ontario L2S 3T8  
38176-98

15 Oz.  
HYDROGEN SULFIDE, Sat.  
ANACHEMIA CHEMICALS  
MONTREAL TORONTO

1 LB.  
Flammable  
Store in a cool  
dry place  
Do not breathe  
vapors





## Chemical Inventory

Do you have a current chemical inventory of ALL chemicals in your prep area / lab areas?

Are your chemicals labeled according to GHS for maximum compliance?

Do you consider less hazardous alternatives for concentrated or dangerous chemicals you are purchasing?

**You can ask the experts at Flinn for assistance in making 'greener' choices. We are here to help you!**

# Labelling Requirements

- Existing bottles of chemicals require a GHS compliant label – 30mL dropper bottles or a 2.5L bottle. **No exemptions!**
- You can create an overlay label and adhere it over the existing supplier label. This is to standardize communication on the chemical labels.
- Solutions made in the lab require a label as well. *Ex Made a 0.1M HCl solution from a 3M stock bottle.* Both vessels require a current GHS label for compliance and adherence to the CHP & OSHA.



**DANGER!** Flammable liquid and vapor. Causes severe skin burns and eye damage.

**Acetic Acid, Glacial**

Catalog #: **A0005**

Chemical Grade: **Reagent**

Amount: **250 mL**

Purchased: **03/11/2014**

Family: **O 1**

Disposal: **24a**

# Labelling Requirements

- New bottles of chemicals ordered from trusted suppliers will already have compliant GHS labelling.
- There is a prescribed format for labelling chemicals from the United Nations (GHS) and for updating existing older bottles in your lab.
- Different options exist to retrofit the labels on the bottles

## Chemical Product Labels

*Always read the label on a chemical bottle to obtain and review basic safety information concerning the properties of a chemical. It is the responsibility of teachers to be fully aware of the hazards and risks of all chemicals they are using.*

**FLINN SCIENTIFIC INC.**  
"Your Safer Source for Science Supplies"

**S0075** 500 g  
**SODIUM HYDROXIDE**  
caustic soda, soda lye, pellets, reagent,  
NaOH, F.W. 40.00

**\* HAZARD ALERT:** Causes severe skin burns and eye damage. Considerable heat evolves when added to water.

**LOT:**  
**STORAGE:** Inorganic #4  
**INORGANIC #4 I**

**DISPOSAL:** #10  
**SHELF LIFE:** Good; keep tightly closed.  
**SOLUBLE:** Water and alcohol.  
**CAS NO:** 1310-73-2  
UN1823

**DANGER!** Causes severe skin burns and eye damage. Do not breathe dust. Wear protective gloves and eye protection. Wash thoroughly after handling. PEL: 2 mg/m<sup>3</sup>.  
**FIRST AID:** IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN: Flush affected area with water. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present, and continue rinsing.

**H301+H314**  
F+  
NFPA

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**CORROSIVE TO BODY TISSUE**

# Chemical Hygiene Plan / Right to Know Laws

The various state Right to Know laws are all very similar. The six major requirements or provisions discussed above are always included, along with minor modifications concerning who must be trained and how or to whom you will have to send lists of the actual SDS and hazardous materials on-site and how often those lists are populated and sent. The paperwork requirements (SDS and reporting lists) can be overwhelming, but are mandated by the state and federal laws.



## THE SCIENCE TEACHER'S FIVE MAJOR STEPS INCLUDE:

1. Take an inventory (develop a list of hazards)
2. Acquire, update, and maintain Safety Data Sheets (SDS)
3. Label and identify all chemicals properly
4. Training & Practice Drills
5. Develop a Chemical Hygiene Plan

Following these five steps will not only help you comply with your respective state's Right to Know laws, but will also improve the safety in your classroom.



## How To Deal With Labelling Older Chemicals In The School Prep Area / Storage Cabinets

You must have a current chemical inventory of the products in your lab. **Including OLD chemicals!!!**

You need to have a GHS label on EVERY Chemical in the lab including dropper bottles and student learning kits. **Period.**

There is no exemption for small bottles – even dropper bottles should have a proper label with the necessary information printed in color (Red diamond if needed)

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# How to Read A Safety Data Sheet (SDS)

Safety Data Sheets (SDS) are an important requirement of the OSHA Hazard Communication Standard. SDS are essential documents that are used to inform employees, students, and the general public about how materials can be safely handled, used, and stored. Since Flinn provides chemicals only to schools, we have written Flinn SDS specifically for teachers and their students. Using clear and straightforward language, each Flinn SDS provides all the relevant safety and hazard information in a consistent, useful, and easy-to-read two-page format. Flinn SDS follow the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). The 16 sections are divided into four major areas, each designed to answer a specific question.

**What is the material and what do I need to know immediately in an emergency?**

Sections 1–3.

**A** It is important that the chemical name on the label match the name on the SDS. Many chemicals have similar names, but very different properties.

**B** The most important section! Provides an overview of the physical and health hazard risks associated with using the material.

**C** Signal words, either Danger or Warning, heighten the awareness of the relative risk when using certain chemicals. Danger is the more severe warning!

**D** Eight pictograms exist in the GHS classification scheme to call attention to physical and health hazards. See page 1238 for more information about GHS pictograms.

**E** This section includes the formula, formula weight, concentration, and CAS#. The CAS# is the single identifying number for each specific substance. CAS# should match the CAS# on the bottle label.

**What should I do if a hazardous situation occurs?**

Sections 4–6.

**F** Seek medical attention. These first-aid measures are only meant for immediate first aid and should always be followed up with professional medical care. The CAS# is the single identifying number for each specific substance. CAS# should match the CAS# on the bottle label.

**G** This section is written for the firefighter. Flash point (the lowest temperature at which enough vapor is present to form an ignitable mixture with air); upper and lower flammable limits; and the auto ignition temperature (AIT) are common properties included in this section.

FLINN SCIENTIFIC, INC. Safety Data Sheet (SDS)					SDS #: 181.00
					Revision Date: September 25, 2014
<b>SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION</b>					
<b>n-Butyl Alcohol</b>					
Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261					
CHEMTREC Emergency Phone Number: (800) 424-9300					
			Signal Word	DANGER	
			Pictograms		
<b>SECTION 2 — HAZARDS IDENTIFICATION</b>					
Hazard class: Flammable liquids (Category 3). Flammable liquid and vapor (H226). Keep away from heat, sparks, open flames, and hot surfaces. No smoking (P210).					
Hazard class: Acute toxicity, oral (Category 4). Harmful if swallowed (H302). Do not eat, drink or smoke when using this product (P270).					
Hazard class: Skin corrosion or irritation (Category 2). Causes skin irritation (H315).					
Hazard class: Serious eye damage/eye irritation (Category 1). Causes serious eye damage (H318).					
Hazard class: Specific target organ toxicity, single exposure; respiratory tract irritation (Category 3). May cause respiratory irritation (H335).					
Hazard class: Specific target organ toxicity, single exposure; Narcotic effects (Category 3). May cause drowsiness or dizziness (H336). Avoid breathing mist, vapors or spray (P261).					
<b>SECTION 3 — COMPOSITION, INFORMATION ON INGREDIENTS</b>					
Component Name	CAS Number	Formula	Formula Weight	Concentration	
n-Butyl alcohol	71-36-3	CH <sub>3</sub> (CH <sub>2</sub> ) <sub>3</sub> OH	74.12		
Synonym: 1-Butanol; n-Butanol					
<b>SECTION 4 — FIRST AID MEASURES</b>					
Call a POISON CENTER or physician if you feel unwell (P312).					
<b>If inhaled:</b> Remove victim to fresh air and keep at rest in a position comfortable for breathing (P304+P340).					
<b>If in eyes:</b> Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing (P305+P351+P338).					
<b>If on skin (or hair):</b> Immediately remove all contaminated clothing. Rinse skin with water (P303+P361+P353).					
<b>If swallowed:</b> Rinse mouth. Call a POISON CENTER or physician if you feel unwell (P302+P301+P312).					
<b>SECTION 5 — FIRE FIGHTING MEASURES</b>					
Class 1C flammable liquid.					
Flash point: 37 °C Flammable limits: Lower: 1.4% Upper: 11.2% Autoignition Temperature: 343 °C					
When heated to decomposition, may emit toxic fumes.					
<b>In case of fire:</b> Use tetracarbonyl fire extinguisher (P370+P378).					
NFPA Code					
H-2					
F-3					
R-0					
<b>SECTION 6 — ACCIDENTAL RELEASE MEASURES</b>					
Remove all ignition sources and ventilate area. Contain the spill with sand or other inert absorbent material and deposit in a sealed bag or container. See Sections 8 and 13 for further information.					
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PAGE 1 OF 2					

**H** The NFPA code is a numerical code established by the National Fire Protection Association. It rates the substance *under fire conditions* in four categories. Health, Flammability, Reactivity, and unusual reactivity: 4 is a severe hazard, 0 is no hazard.

**I** How to clean up a spill. Always remove unprotected personnel from area and make sure all students are safe. Contain the spill with sand or absorbent materials.

HOW TO READ A SAFETY DATA SHEET (SDS) continued on next page.

# Safety Data Sheet

The safety data sheet (sds), formerly known as the material safety data sheet (msds), is provided by the manufacturer, distributor, or importer of a chemical to provide information about the substance and its use.

The sds, unlike the msds, is required to present the information in a uniform manner. The information includes the properties of each chemical; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, disposing of, and transporting the chemical. **There are 16 sections on every sds in the same sequence.**

The ghs provides standard language or “building blocks” for communicating the hazards of chemicals in the sds, just as on chemical labels. These “building blocks” include the use of specific signal words, pictograms, hazard statements, and precautionary statements.

## 1. How to Read a Safety Data Sheet

# FLINN SCIENTIFIC

Ask about our custom district solutions designed to support a safe return to school:

- Custom safety and professional development/learning proposals to ensure full school safety
- Full PPE for students, faculty, and support staff
- Blended science learning solutions that provide continuity of lab instruction for both onsite & remote learners