



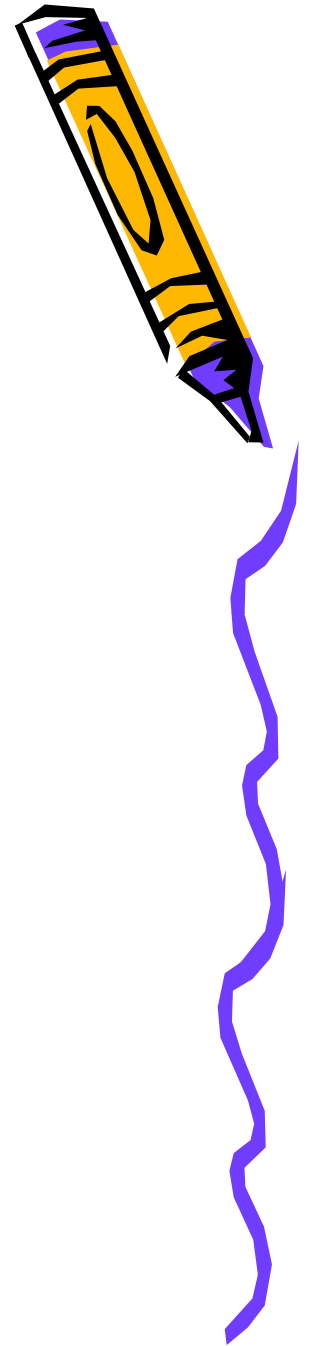
# School Chemical Cleanout

Matthew Langenfeld  
USEPA Region 8  
303-312-6284



# Region 8 School Cleanout Success

- 214 Schools Cleaned out to date
- Schools made safer for 77,000 students
- 95,000 pounds of hazardous chemicals properly disposed



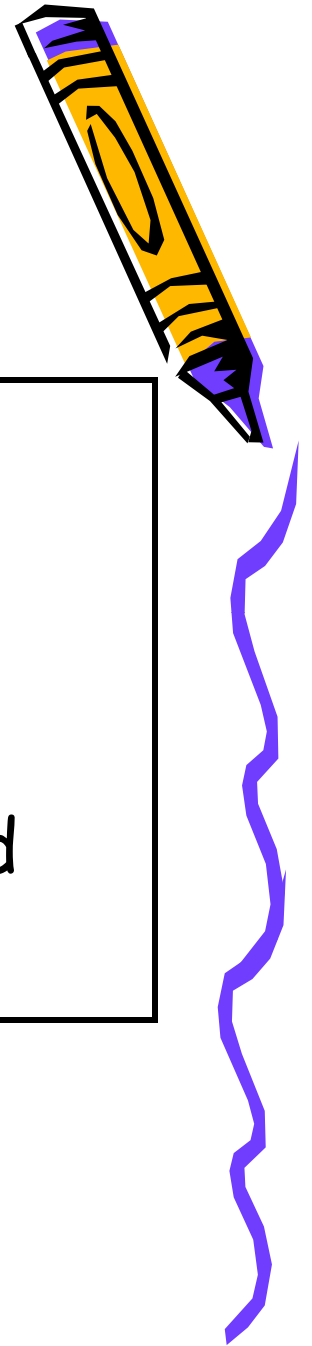
# State Totals

## Wyoming

- 51 Schools
- 16,177 Students
- 29,186 pounds of chemicals removed

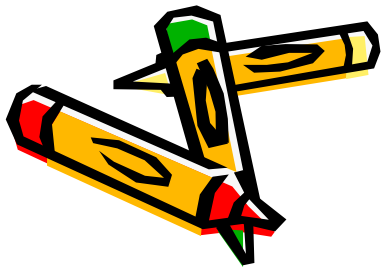
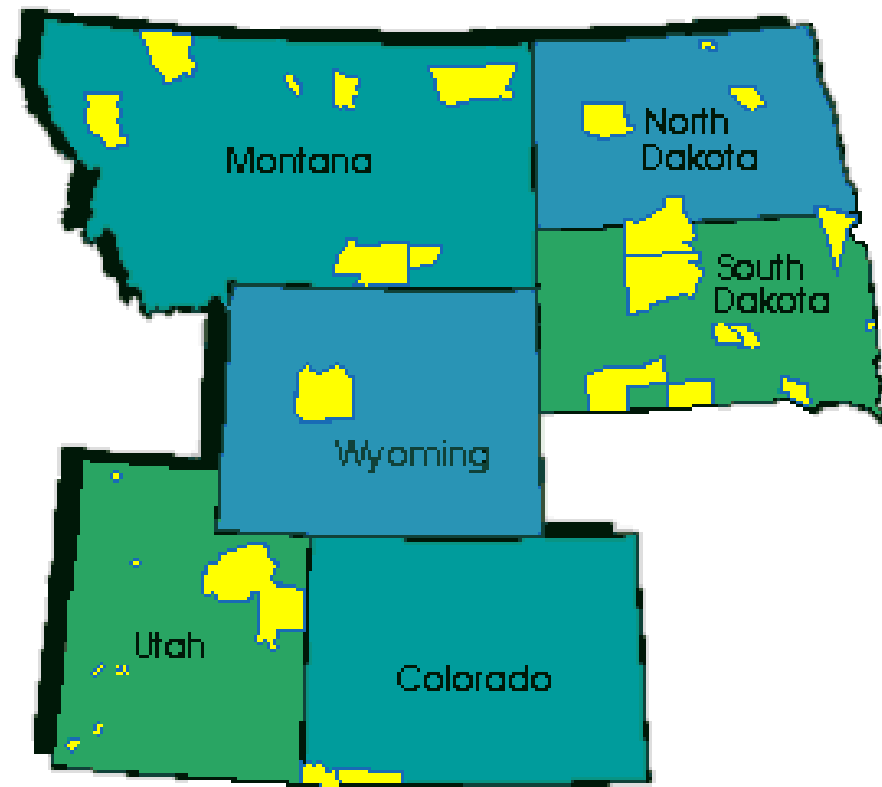
## Utah

- 6 Schools
- 7,027 Students
- 5,612 pounds of chemicals removed



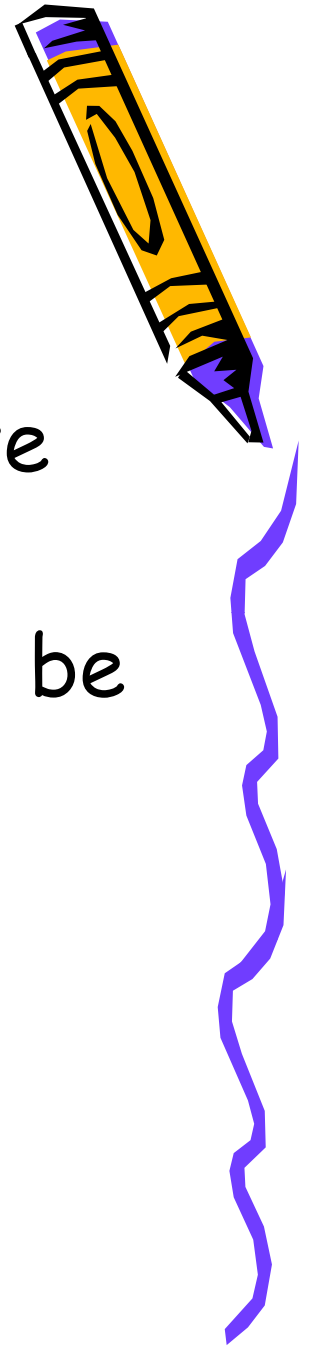
# Indian Country Schools

- 78 Schools
- 21,528 Students
- 46,373 pounds of chemicals removed

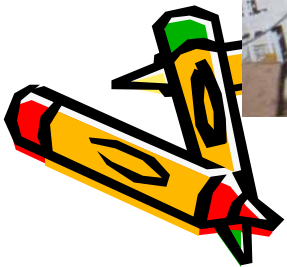


# Greatest Challenges

- Obtaining an accurate and complete inventory of all chemicals
- Determining chemicals that should be properly disposed
- Buy in from administration
- Finding funding for cleanout



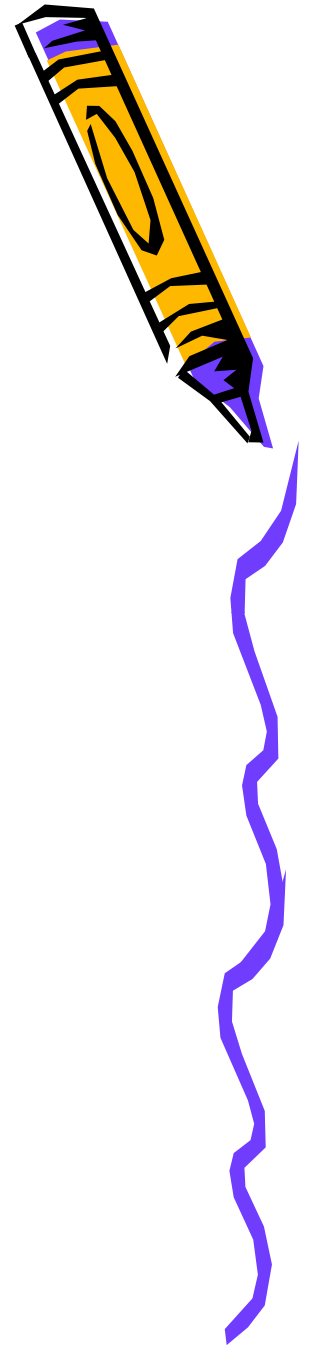
# Does my school require chemical cleanout ?





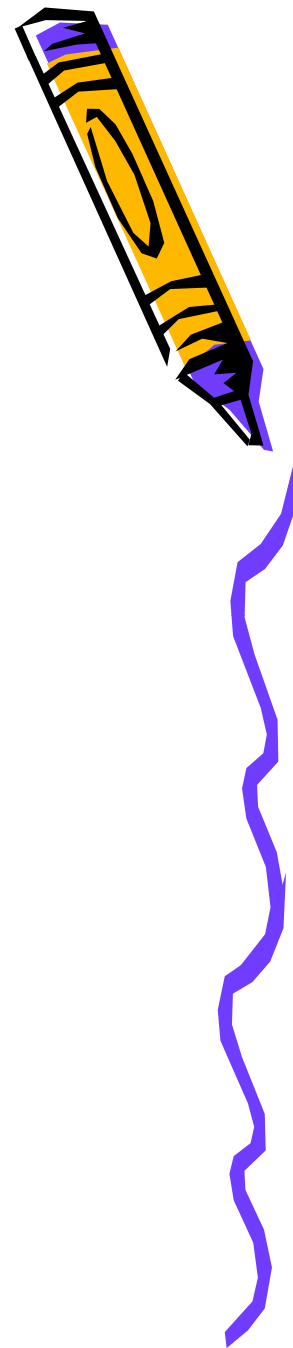
# Planning

- Obtain administrative buy in
- Set up a team
- Conduct an inventory of chemicals
- Determine your strategy



# Chemical Management

- Need a written plan
- Designed for your school or classroom
- Minimize inventory
- Remove toxic and dangerous chemicals
- Go green and/or microscale



# Question: What is Responsible Chemical Management?



Answer: Responsible chemical management involves taking steps to ensure chemicals in schools do not endanger students and school personnel.

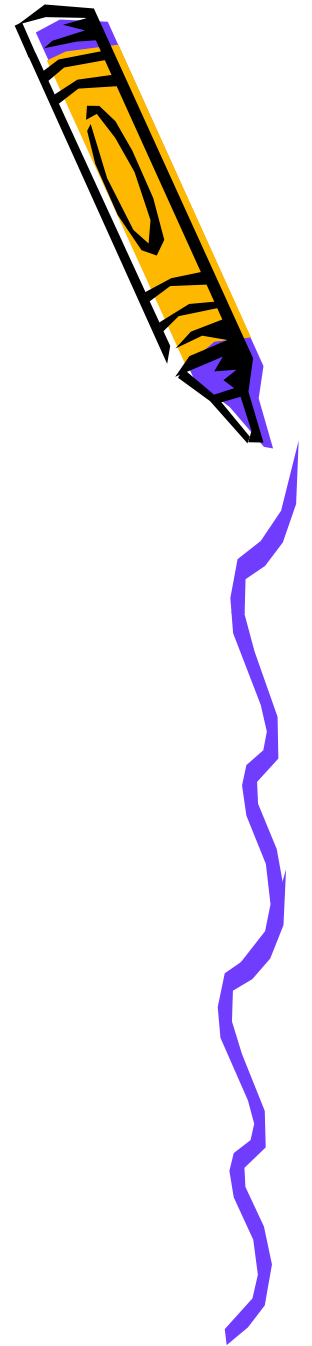
This may include:

- Evaluating chemicals for need, quantity, and appropriateness;
- Properly labeling, storing, and securing chemicals; and
- Safely disposing of waste and/or excess chemicals.

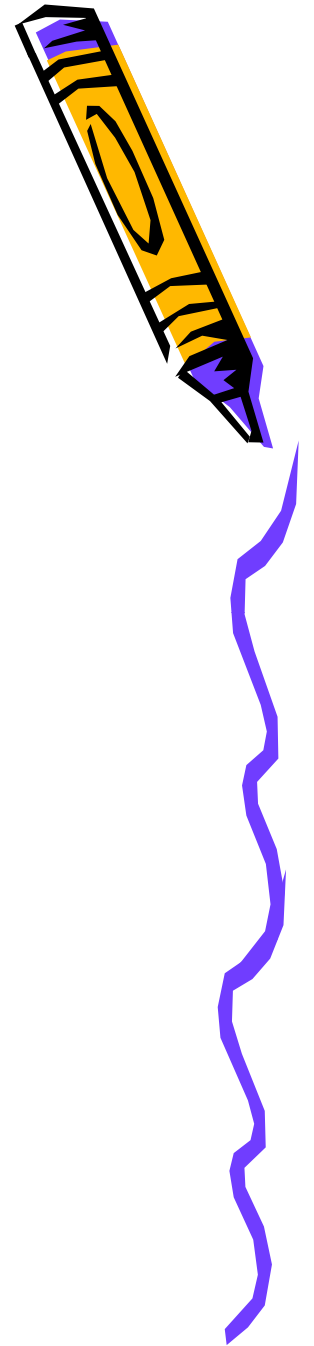


# Conduct a School Wide Assessment

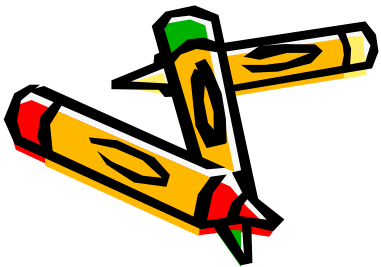
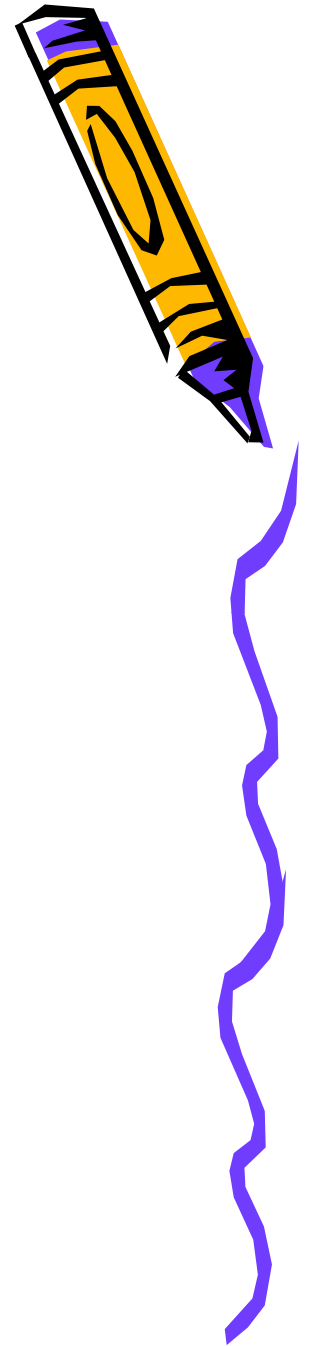
- Look at all areas
- Closets
- Shops
- Art/drama
- Locked areas
- Laboratories
- Warehouses
- Maintenance areas/sheds
- Buildings and Grounds

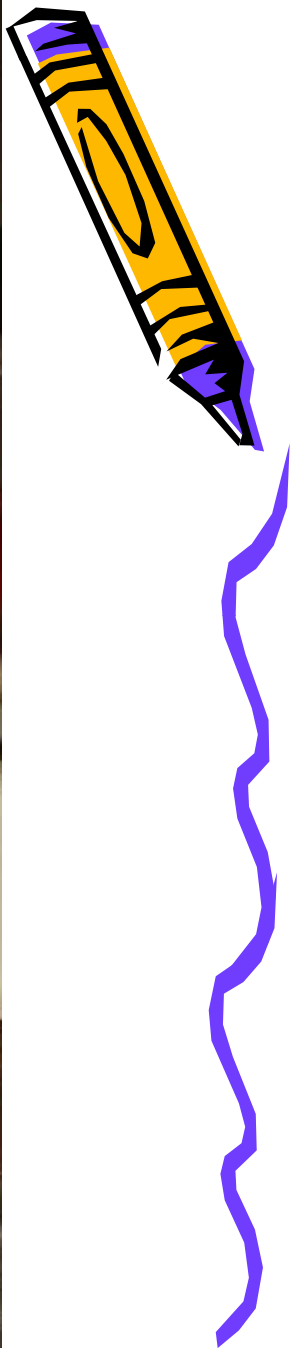
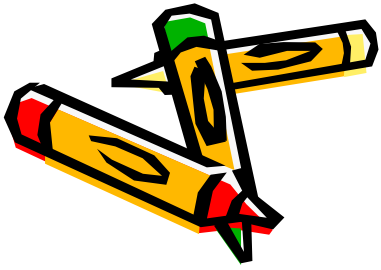


Lets go on an assessment



# Toxic Materials

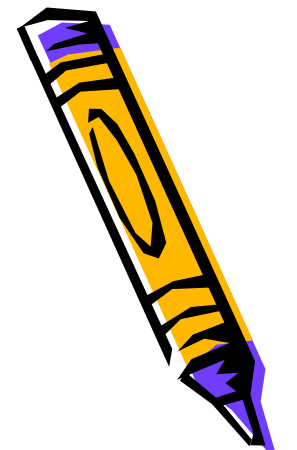




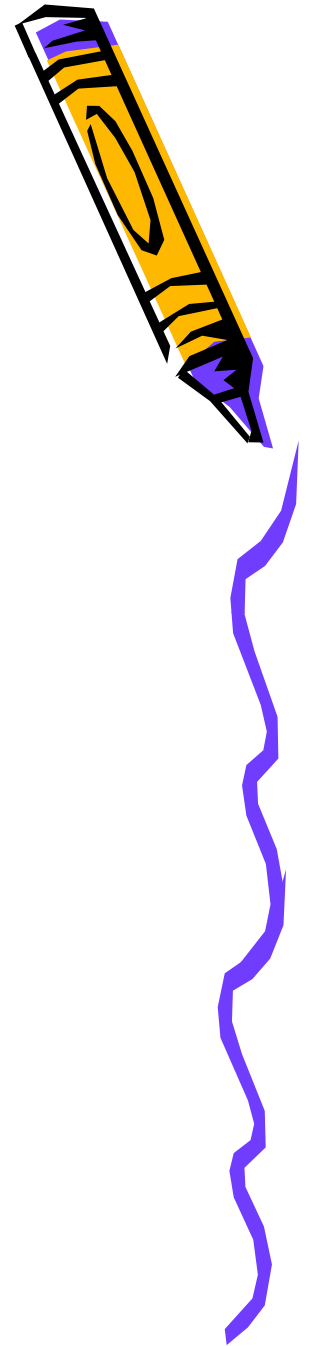


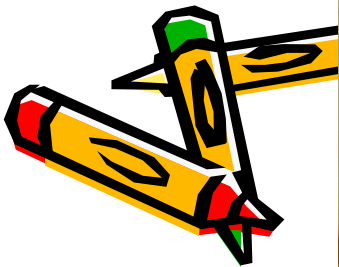
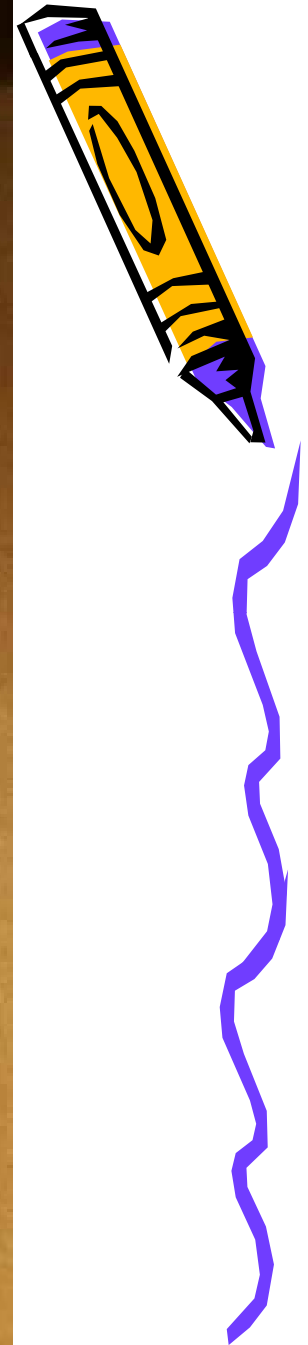


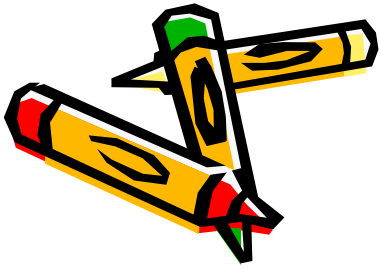
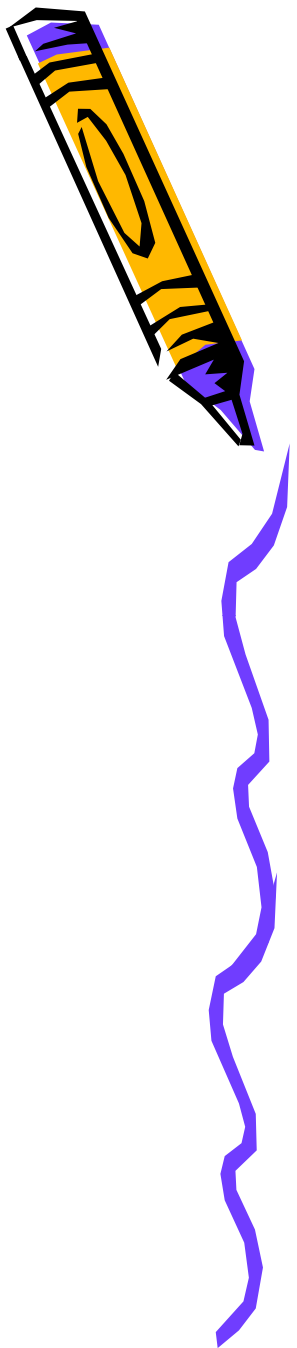
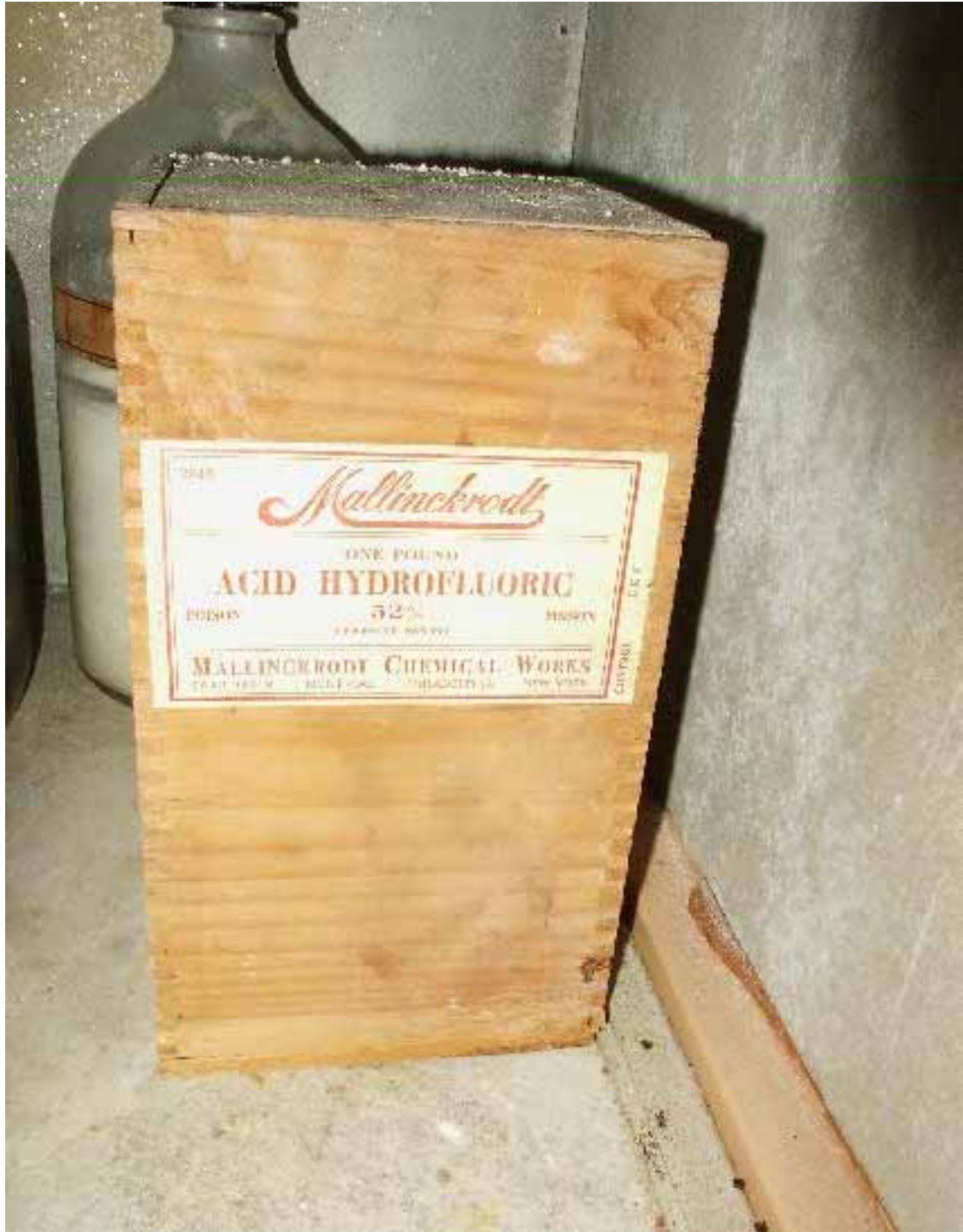




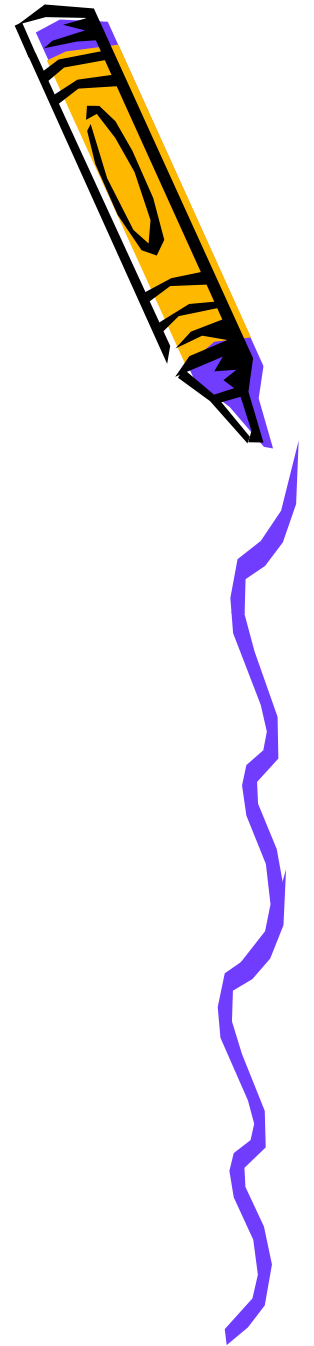
# Hazardous Materials







# Incompatible Storage





FLAMMABLE LIQUID  
3

FLUOR SCIENTIFIC INC.  
IRON

1 POUND  
IRON FILINGS  
Z03250  
78104-91  
LAFIRE SCIENTIFIC

Calcium Hydroxide

LUMCO

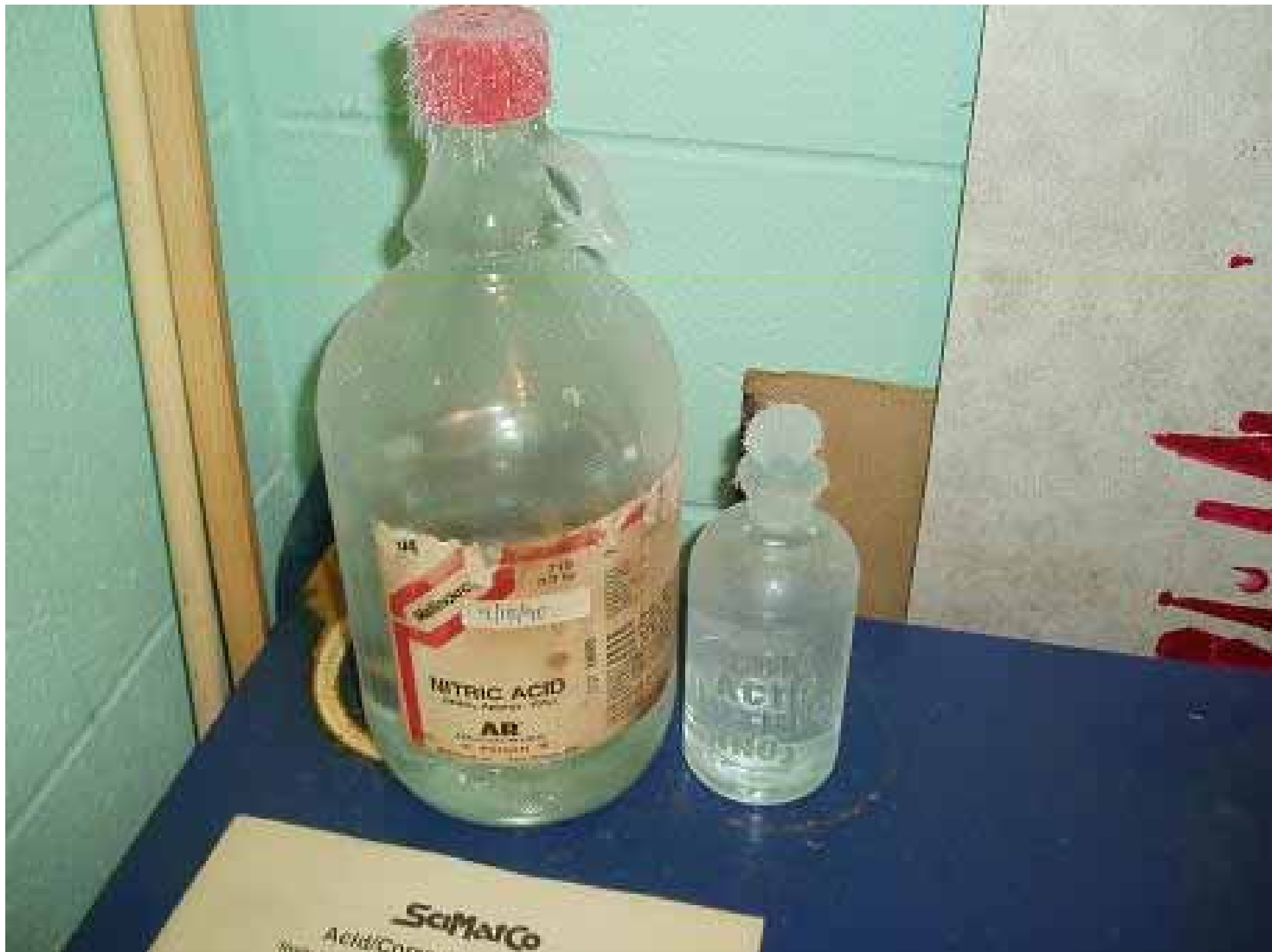
FERRIC CHLORIDE

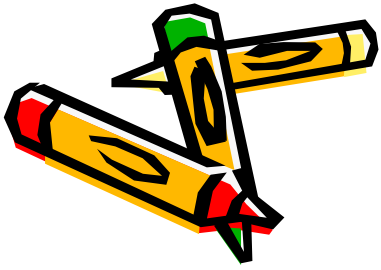
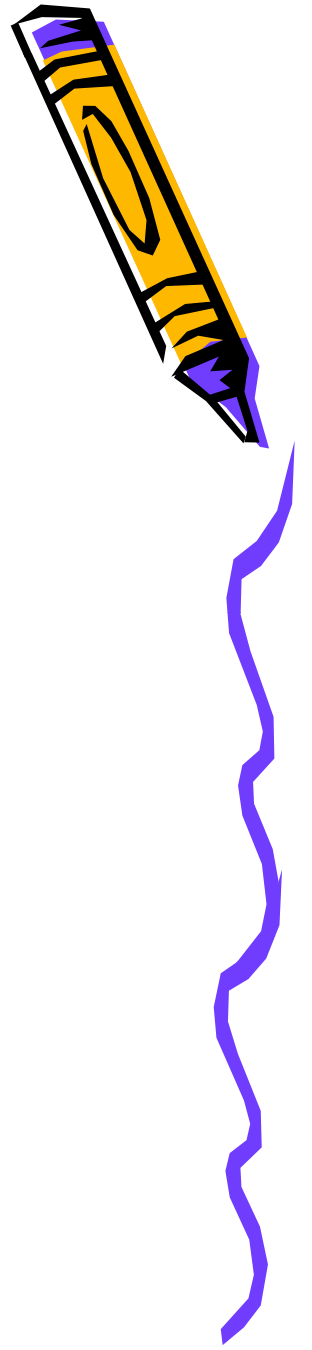
CHICAGO • MILWAUKEE • ILL.  
ULINE

CENT  
15-8081

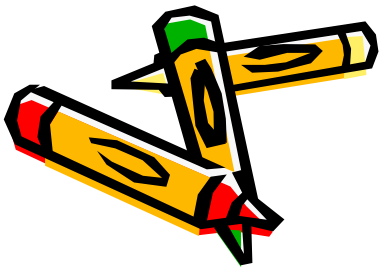
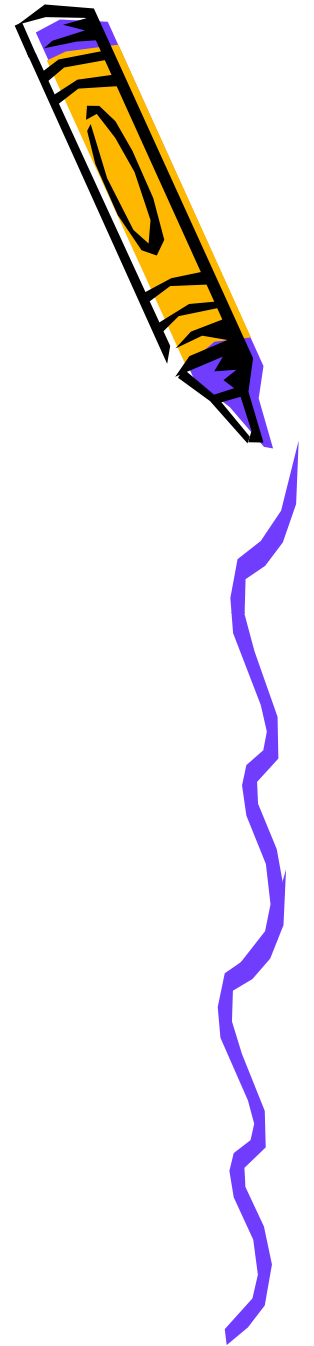


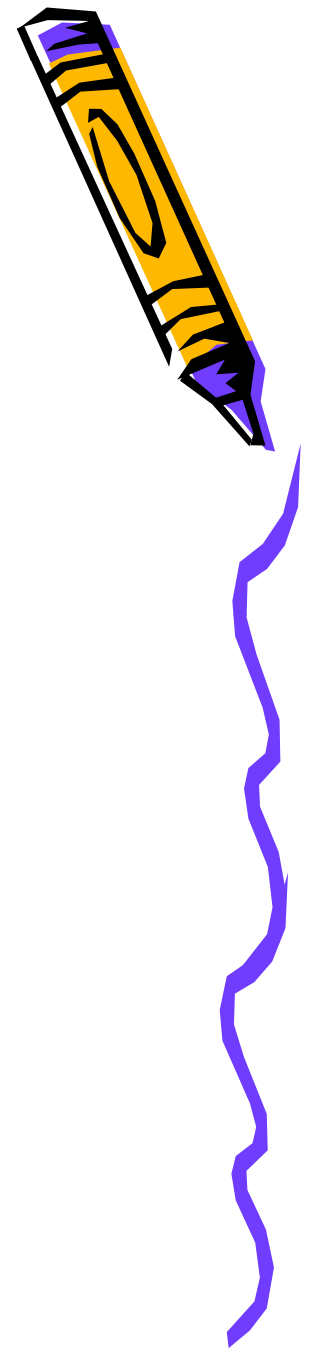
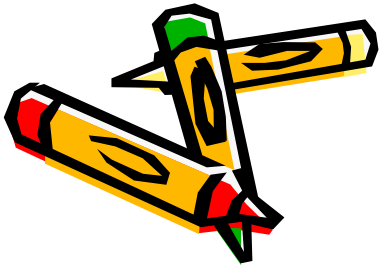




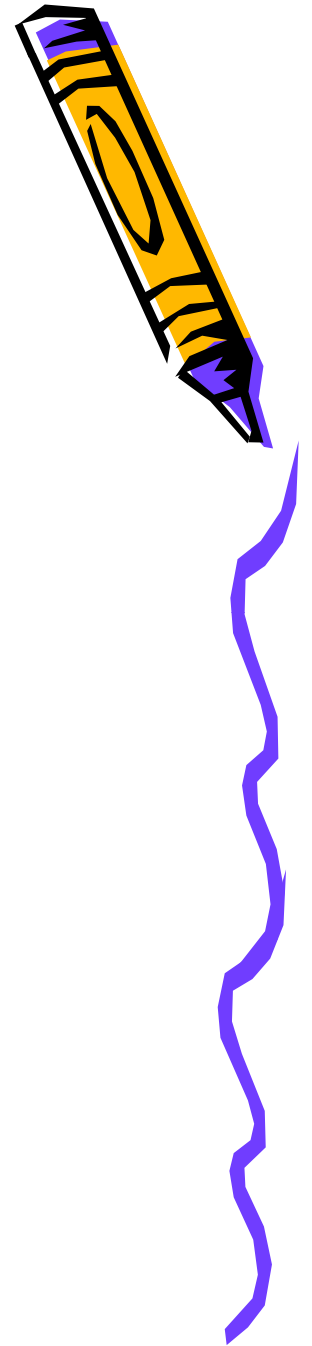


# Art Classrooms





# Maintenance Chemicals





**COLONIAL**

PREMIUM  
DUPLICATING  
FLUID

PROOF RESISTANT  
WATER RESISTANT  
NON TOXIC  
NON FLAMMABLE  
NON VOLATILE  
NON OXIDIZING  
NON CORROSIVE  
NON SOLUBLE IN WATER



ONE U.S. GALLON (3.785 LITERS)

**COLONIAL**

PREMIUM  
DUPLICATING  
FLUID

PROOF RESISTANT  
WATER RESISTANT  
NON TOXIC  
NON FLAMMABLE  
NON VOLATILE  
NON OXIDIZING  
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NON TOXIC  
NON FLAMMABLE  
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NON OXIDIZING  
NON CORROSIVE  
NON SOLUBLE IN WATER

ONE U.S. GALLON (3.785 LITERS)



**ACE**

**Xylol  
Xylene**

SATISFACTORY  
**ACE**  
PROMISE  
GUARANTEED

Medium strength solvent  
Ideal thinner for specialty  
paints & coatings

**Xylene**  
Disolvente de Fuerza Media

**DANGER!** FLAMMABLE LIQUID AND VAPOR, IRRITANT, HARMFUL, DANGEROUS  
FUMES IF ENCLOSED, CAUSES EYE IRRITATION.  
See other warnings on back panel.  
128 FL. OZ. (ONE GALLON) 3.8 LITERS

sunnyside

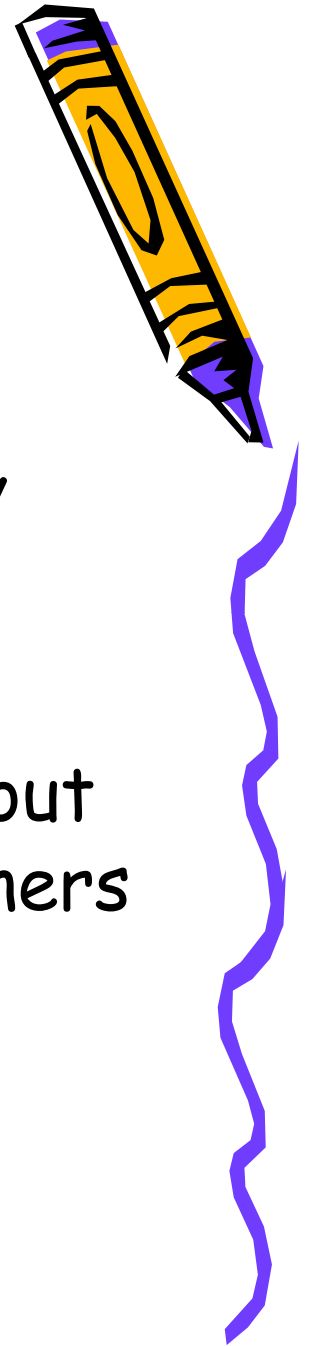
**xylol**  
SOLVENT

Excellent solvent  
powerful solvent for  
paints & clear finishes  
Industrial paints

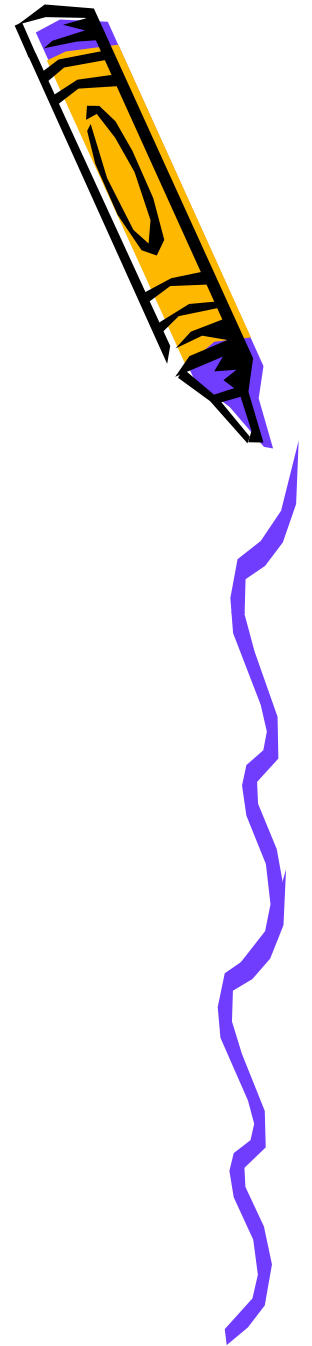
**DANGER!**  
FLAMMABLE LIQUID AND VAPOR, IRRITANT, HARMFUL, DANGEROUS  
FUMES IF ENCLOSED, CAUSES EYE IRRITATION.  
See other warnings on back panel.  
32 FL. OZ. (1 QT) 1.585 LITER

# Note Chemicals and Condition of each area

- Cleaning chemicals closet - clean, 20 containers, not leaking, Need Inventory
- Chemistry Lab, Several shelves of chemicals, no inventory, question compatibility, unknowns, odors, teacher only uses a few chemicals - Need Cleanout
- Biology Lab, Critters in formalin containers leaking formaldehyde odors, unknown stains - Need Cleanout



What do I do once I've  
decided to cleanout  
chemicals from my school





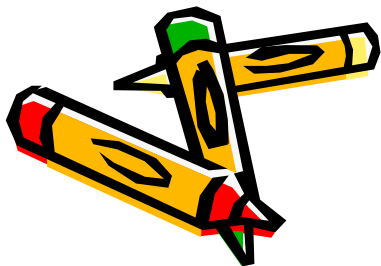
# School Chemical Cleanout

Brad Fimrite, President  
Mountain States Environmental Services, Inc.  
Billings, Montana  
406-248-4777



# Complete a Chemical Inventory

- Inventory all chemicals
- Determine those to be properly disposed and come up with a list
- List the name of the chemical, trade name, ingredients, percentages, phone numbers, container size, type, condition, leaking, seal broke, notes on bottles, weight, volume, chemical name, unknown,





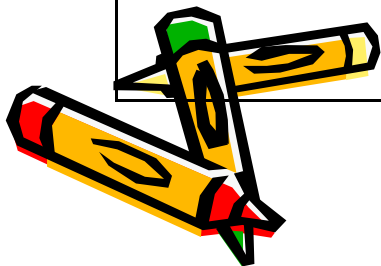
## MSES Chemical Inventory Sheet

School Name \_\_\_\_\_

Contact Name/Phone \_\_\_\_\_



Chemical Name		Number of Containers	Container Size	Container Type	Physical State



### Key

G=Glass M=Metal P=Polyethylene F=Fiber  
L=Liquid S=Solid A=Aerosol R=Residue (Sludge)



**EXAMPLE** MSES Chemical Inventory Sheet

School Name XYZ Middle School Somewhere, USA

Contact Name/Phone John Doe / 123-4567

Chemical Name		Number of Containers	Container Size	Container Type	Physical State
Sulfuric Acid 60%		2	1 L	G	L
Boric Acid		1	1 Lb.	F	S
Sodium metal in oil		1	16 Oz.	G	L
Broken mercury thermometers, in baggie		1	1 Gal	G	S/L

Key

G=Glass M=Metal P=Polyethylene F=Fiber  
L=Liquid S=Solid A=Aerosol R=Residue (Sludge)











6616

1/4 LB.

*Mallinckrodt®*

**PHOSPHORUS**

N.F. VII STICKS

(YELLOW)

NOT INCLUDED IN CURRENT I.P.C.

AT WL 3078

CAUTION: For manufacturing,  
preserving, or repacking.

CAUTION: Federal law prohibits  
shipping without prescription.

MALLINCKRODT CHEMICAL WORKS

**POISON**

**PHOSPHORUS**

N.F. VII STICKS

(YELLOW)

NOT INCLUDED IN CURRENT I.P.C.

AT WL 3078

2008 1 31



2008 1 31



0804

**Mallinckrodt.**

**ETHER**

FOR

**ANESTHESIA**

AND TESTED SPECIFICALLY FOR ANESTHETIC PURPOSES. This purified ether conforms to all U.S.P. requirements and contains the ideal amount of alcohol. To preserve its original purity and to provide maximum storage stability, Mallinckrodt Ether for Anesthesia is sold only in chemically treated containers.

MALLINCKRODT, INC.



SARGENT-WELCH

SC11410- 1PT

TRICHLOROETHANE

WATER FREE

NOT FOR FOOD OR DRUG USE

SARGENT-WELCH SCIENTIFIC COMPANY

1000 AVENUE SHORE, ILLINOIS 60402

379

500



apparatus.

ally: OIL, WATER

ERE

ing against plunger setting.

leaves and valve into

inflated; repeat Operation 4.

The release valve attached

with hand usually protected.

all holes in front, back,  
only deep to cover the  
residual oxygen will  
in the residual water,  
in suitable manner. DO

N. O. (133-A 2)

Potassium Hydroxide

**'Baker Analyzed' REAGENT**

NET WT. ANALYSIS OF LOT NO. 35564

Net Wt. 200g  
Potassium Content 4.00%  
Sulfate 0.01%  
Water 0.01%  
Residue 0.01%  
Total 100.00%

Net Wt. 200g  
Potassium Content 4.00%  
Sulfate 0.01%  
Water 0.01%  
Residue 0.01%  
Total 100.00%

ST. BAKER CHEMICAL CO., PHILADELPHIA



2008 4 2



PHOSPHORUS

NICKEL

PHOSPHORUS NITRATE  
F.C. COMPANY  
U.S.A.

Amorphous Phosphorus  
F.C. COMPANY  
U.S.A.

POTASSIUM SULPHATE  
CRYSTALS  
F.C. COMPANY  
U.S.A.

PHOSPHORUS  
PENTOXIDE  
F.C. COMPANY  
U.S.A.

Nickel  
Purified  
F.C. COMPANY  
U.S.A.





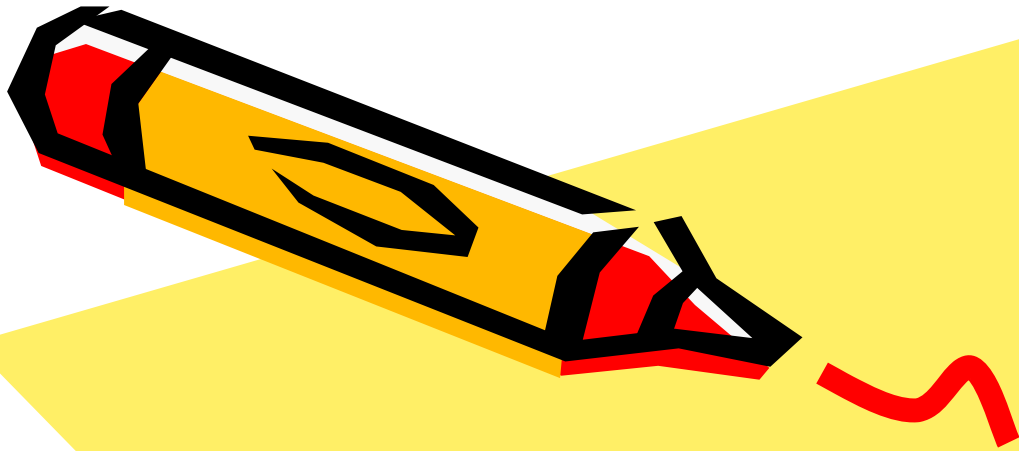
packed under water and  
 if water is removed.  
 on skin or in eyes.  
 of contact, immediately  
 or eyes with plenty of  
 skin area wet until  
 attention is obtained.  
 out of sun and  
 heat.  
 Use only according to  
 work book, under super-



LABORATORY  
 ABATUS







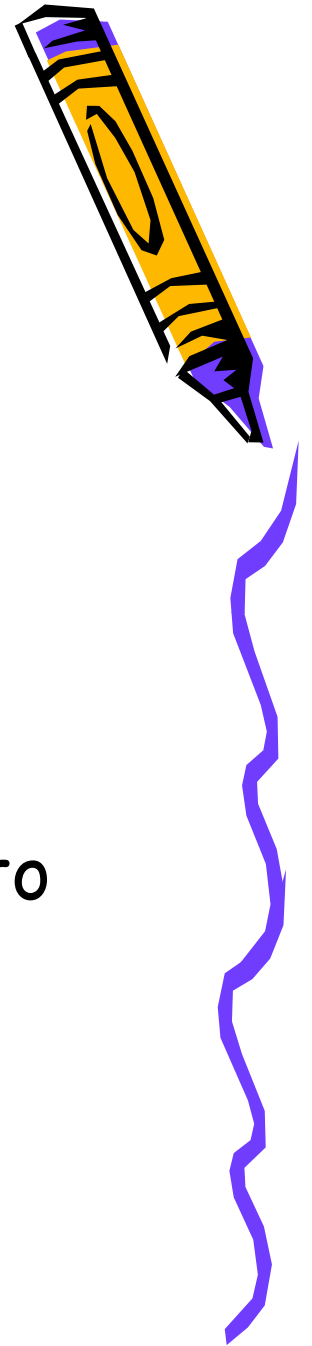
# School Chemical Cleanout

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USEPA Region 8  
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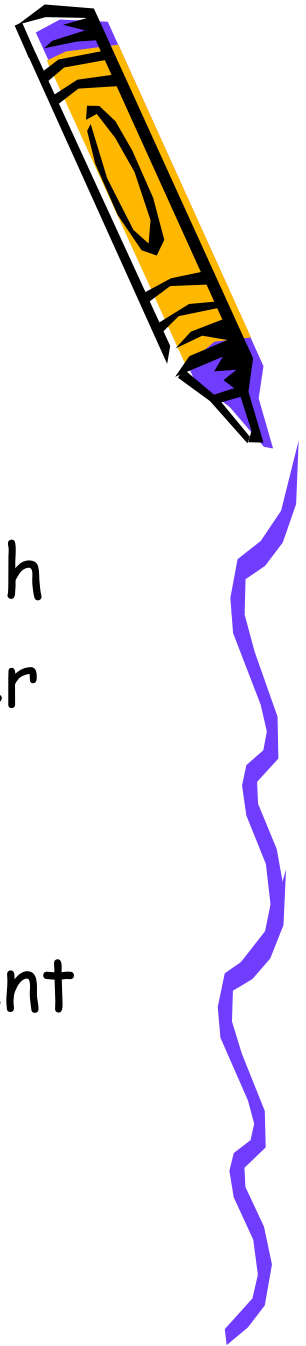
# Obtain Cost Estimates for Proper disposal

- Send inventory of chemicals to be disposed to a Waste Broker
  - o Recommend get 3 bids
  - o Ensure they are capable
  - o Give them a time frame to get back to you



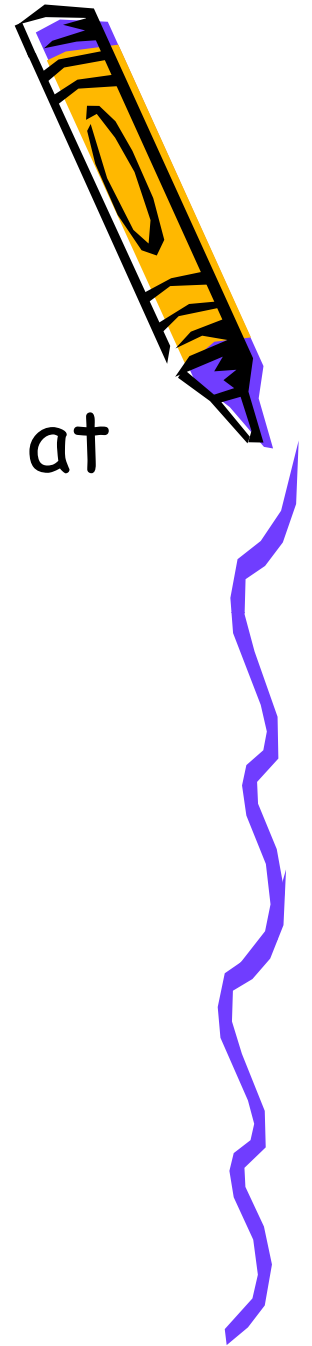
# Hazardous Waste ID Number Required from EPA ?

- Generation of hazardous waste (acids, bases, toxic) over 220 pounds per month
- Acutely hazardous waste (P-Listed) over 2.2 pounds
- Waste Broker may be able to help
- Contact State Environmental Department or EPA for help



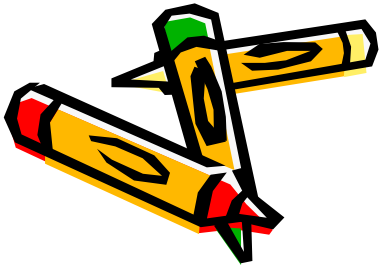
# Locate Funding

- School District most viable source at this time
- Insurance
- Inventory needed to demonstrate need
- Private industry



# Arrange for Cleanout

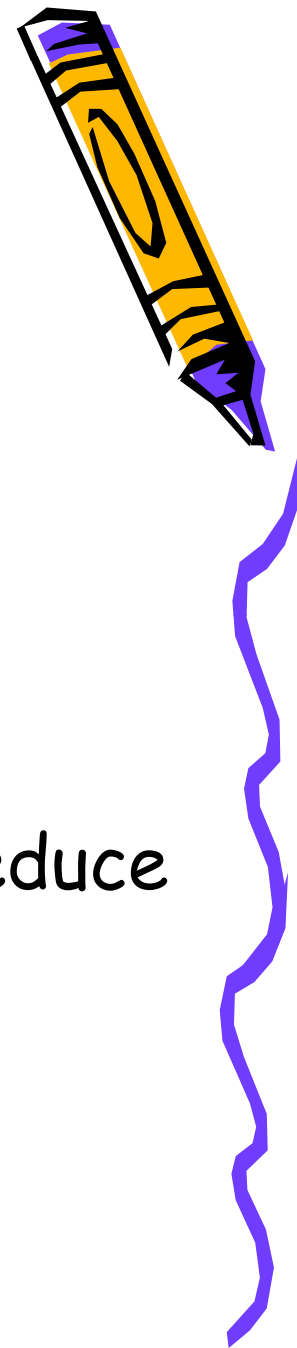
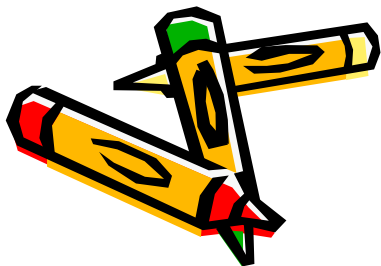
- Arrange a schedule
- Make sure cost estimate and inventory is up to date
- Make sure chemicals will be properly disposed
- Like to see chemicals lab packed and manifested - Required if hazardous





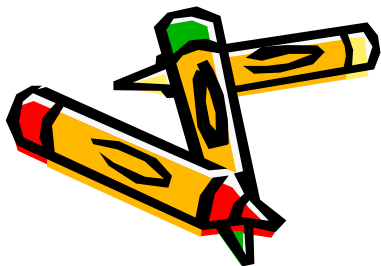
# Goals for Schools

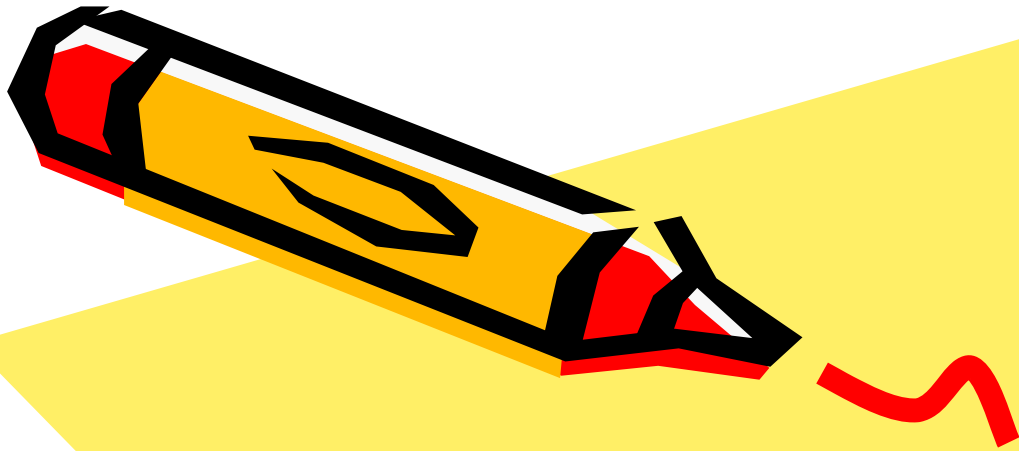
- Create a safer environment by:
  - o Removing hazardous chemicals
  - o Managing chemical inventories
  - o Promoting pollution prevention techniques and best practices to reduce laboratory hazards



# Behavior Changes Needed

- Teachers stockpile and inherit chemicals
- School superintendents, principals, and teachers are not aware of dangers
- Consistent message from school leaders on safety
- Communication to non-chemist teachers
- Inventories up to date
- Chemicals not retained unless needed





## Contact

Matthew Langenfeld

303-312-6284

[Langenfeld.matthew@epa.gov](mailto:Langenfeld.matthew@epa.gov)

