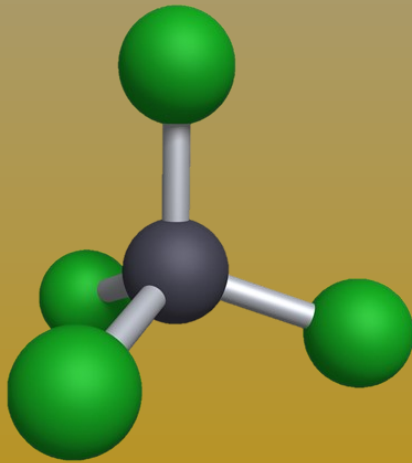


Safe Chemical Management in School Science Laboratories

SUPPLEMENT

Surveillance Findings



Division of Epidemiology, Environmental & Occupational Health
Consumer, Environmental & Occupational Health Service
Right to Know Unit



March 2020

Table of Contents

Surveillance Findings

Page

Introduction	1
Reported Chemicals with Hazardous Nature Greater than Educational Utility (Appendix A)	2
Reported Chemicals with Hazardous Nature, But May Have Potential Educational Utility (Appendix B).....	3
Reported Hazardous Chemicals (Appendix A and B) by School Type	4
Examples of Less Frequently Reported Hazardous Chemicals (from Appendix A and B).....	6
Hazardous Chemicals (from Appendix A and B) that Are Not Listed on the NJ RTK Hazardous Substance List	7

Introduction

This publication is a supplement to the New Jersey Department of Health’s guidance document “Safe Chemical Management in School Science Laboratories.” It describes the prevalence of hazardous chemicals (from Appendix A and B) in New Jersey public schools. These chemicals have been identified by the National Institute for Occupational Safety and Health (NIOSH) as having a hazardous nature that outweighs their educational utility.

The New Jersey Worker and Community Right to Know (RTK) Act requires that all NJ public employers, including public schools, to submit an annual inventory of all hazardous chemicals present at their facilities via the RTK Online Survey. For this purpose, each school uses the RTK Hazardous Substance List (RTKHSL) to identify and report chemicals located throughout the school facility.

The New Jersey Department of Health analyzed the 2017 RTK Online Survey data to determine how frequently chemicals targeted by NIOSH were reported by NJ public schools on their inventories. Results show that 83% of these chemicals were reported at least once by these schools on their NJ 2017 Right to Know Online Surveys. The analysis included: charter, elementary, middle, vocational-technical, and high schools.

The tables and figures on the following pages summarize the Department’s findings. Please note the following:

- 1) The RTK Act mandates that schools report only chemicals that are published in the NJ RTKHSL. As shown in Table 5, there may be chemicals on-site that are not reported because they do not meet this requirement;
- 2) In order to help identify chemicals used in a laboratory setting, only those chemicals reported on the RTK Survey at 100% concentration were included;
- 3) A chemical substance could have been reported more than once by the same school if stored in different locations, for example, a storage closet and a classroom;
- 4) Chemical inventories submitted in RTK Surveys are self-reported.

Reported Chemicals with Greater Hazardous Nature than Educational Utility (Appendix A)

Table 1 shows the 10 most frequently reported chemicals on the 2017 RTK Online Survey in this category.

TABLE 1 — Top 10 Most Frequently Reported Chemicals with Greater Hazardous Nature than Educational Utility (Appendix A) New Jersey, 2017

Reported Chemical	Hazard	No. of Reports
Silver nitrate	Oxidizer, corrosive, may be fatal if ingested	580
Magnesium, metal (powder)	May ignite spontaneously on contact with water or damp materials	521
Strontium nitrate	Oxidizer	320
Lithium nitrate	Oxidizer	275
Nickel, metal	Reasonably anticipated human carcinogen, mutagen	204
p-Dichlorobenzene	Combustible, reasonably anticipated human carcinogen	143
Potassium, metal	Flammable (NFPA = 3), water reactive, forms peroxides	124
Sodium chromate	Oxidizer, corrosive, known human carcinogen	111
Lithium, metal	Oxidizer	110
Sodium nitrite	Oxidizer, corrosive, may be fatal if ingested	98

Reported Chemicals with Hazardous Nature, But May Have Potential Educational Utility (Appendix B)

Table 2 shows the 10 most frequently reported chemicals on the 2017 RTK Online Survey in this category.

TABLE 2 — Top 10 Most Frequently Reported Chemicals with Hazardous Nature, But May Have Potential Educational Utility (from Appendix B), New Jersey, 2017

Reported Chemical	Hazard	No. of Reports
Potassium permanganate	Oxidizer, corrosive	585
Potassium chlorate	Oxidizer	312
Potassium chromate	Oxidizer, known human carcinogen	288
Ammonium bichromate	Oxidizer, corrosive, known human carcinogen	218
Sodium chlorate	Oxidizer	167
Aluminum chloride	Water reactive, corrosive	159
Sodium fluoride	May be fatal if inhaled or ingested	152
Ferrous sulfate	Irritant	145
Cyclohexane	Flammable (NFPA = 3)	136
Toluene	Flammable (NFPA = 3), irritant, may be fatal if ingested	120

Reported Hazardous Chemicals (from Appendix A and B) by School Type

Hazardous Chemicals (from Appendix A and B) were reported across all school types. Figures 1 and 2 show that reported chemicals from both categories were similarly distributed among the types of schools. Even though these hazardous chemicals were predominantly reported by high schools, they were also present in elementary and middle schools.

FIGURE 1

Distribution of Reported Chemicals with Greater Hazardous Nature than Educational Utility (Appendix A) by School Type New Jersey, 2017

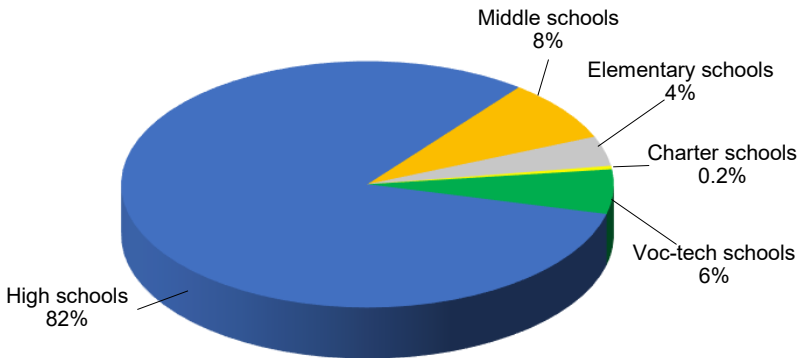
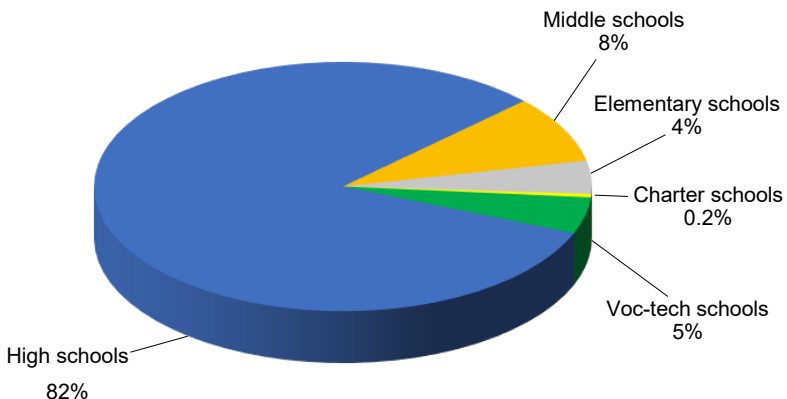


FIGURE 2

Distribution of Reported Chemicals with Hazardous Nature, But May Have Potential Educational Utility (Appendix B) by School Type, New Jersey, 2017



Percentages may not add up to 100% due to rounding

Table 3 shows the top 10 most frequently reported chemicals from the two categories (Tables 1 and 2) by type of school. These top 10 chemicals represented higher percentages of reported chemicals in elementary (64%), middle (69%), and charter (79%) schools than in voc-tech (49%) and high schools (50%). Even though the majority of the reports by elementary and middle schools were from these top 10 chemicals, it is important to note that other chemicals from the two categories were also reported as shown in the second to last row.

TABLE 3 — Top 10 Most Frequently Reported Hazardous Chemicals (Appendix A and B) by School Type, New Jersey, 2017

Reported Chemical	Type of School*				
	ES	MS	HS	VTS	CS
Potassium permanganate	42(15%)	87(16%)	428(8%)	24(7%)	4(29%)
Silver nitrate	34(12%)	66(12%)	436(8%)	41(11%)	3(21%)
Magnesium, metal (powder)	31(11%)	60(11%)	407(7%)	22(6%)	1(7%)
Strontium nitrate	11(4%)	27(5%)	259(5%)	23(7%)	0(0%)
Potassium chlorate	12(4%)	25(4%)	264(5%)	10(3%)	1(7%)
Potassium chromate	11(4%)	31(6%)	226(4%)	20(6%)	0(0%)
Lithium nitrate	3(1%)	17(3%)	244(5%)	11(3%)	0(0%)
Ammonium bichromate	20(7%)	26(5%)	166(3%)	4(1%)	2(14%)
Nickel, metal	6(2%)	22(4%)	166(3%)	10(3%)	0(0%)
Sodium chlorate	5(2%)	24(4%)	130(2%)	8(2%)	0(0%)
Total Top 10	175(64%)	385(69%)	2,726(50%)	173(49%)	11(79%)
All Other Reported Chemicals from Appendix A and B	98(36%)	176(31%)	2,714(50%)	177(51%)	3(21%)
TOTAL NO. OF REPORTS	273	561	5,440	350	14

*ES=elementary schools; MS=middle schools; HS=high schools; VTS=vocational-technical schools; CS=charter schools; %=Percentage of all reports of that school type; Percentages may not add up to 100% due to rounding

Examples of Less Frequently Reported Hazardous Chemicals (from Appendix A and B)

Table 4 gives examples of hazardous chemicals (from Appendix A and B) that were less frequently reported by schools but still pose serious health and safety hazards to students and staff. Many of these laboratory chemicals were reported by elementary and middle schools.

**TABLE 4 — Examples of Less Frequently Reported Hazardous Chemicals (from Appendix A and B)
New Jersey, 2017**

Reported Chemical	Hazard	No. of Reports
Arsenic and its compounds	Known human carcinogen	24
Benzene	Flammable (NFPA = 3), known human carcinogen, mutagen	6
Cadmium and cadmium compounds	Known human carcinogen	76
Carbon disulfide	Flammable (NFPA = 4), acute central nervous system toxicity and peripheral neurotoxicity	29
Chloroform	Reasonably anticipated human carcinogen	38
Mercury	Neurotoxin, corrosive, may be fatal if inhaled or ingested	78
Methyl methacrylate	Flammable (NFPA = 3), explosive (vapor)	6
Phosphorous, red, white	May ignite spontaneously in air	16
Sodium azide	Explosive, may be fatal if ingested or absorbed through the skin	9
Trichloroethylene (TCE)	Known human carcinogen	11
Uranyl acetate	Radioactive material	3

Hazardous Chemicals (from Appendix A and B) that Are Not Listed on the NJ RTK Hazardous Substance List

Table 5 shows a total of 28 hazardous chemicals (from Appendix A and B) that are not on the NJ RTK Hazardous Substance List, i.e., do not have an assigned RTK Substance number, and are therefore not required to be reported. If used or stored at a school, these chemicals may still present a hazard to staff and students.

**TABLE 5 — List of Hazardous Chemicals (from Appendix A and B) That Are Not on the NJ RTK Hazardous Substance List
New Jersey, 2017
Total=28**

Hazardous Chemicals with Greater Hazardous Nature than Educational Utility (Appendix A)	Hazardous Chemicals with Hazardous Nature, But May Have Potential Educational Utility (Appendix B)
Ascarite II	Barium chloride
Chloropromazine	Benzene (phenylbutazone)
Gunpowder	Carmine
Lead carbonate	Cobalt nitrate
Methyl orange	Dichloroindophenol sodium salt
Methyl red	Fuchsin (acid/basic)
Potassium oxalate	Hematoxylin
Silver oxide	Magnesium chlorate
Sodium thiocyanide	Methyl oleate
Stearic acid	Potassium periodate
Sudan IV	Salol (phenyl salicylate)
Tannic acid	Sodium nitrate
Wood's metal	Sodium oxalate
	Sudan III
	Sulfamethazine

the 1990s, the number of people in the UK who are employed in the public sector has increased from 10.5 million to 12.5 million (12.5% of the population).

There are a number of reasons for this increase. One is that the public sector has become a more important part of the economy. Another is that the public sector has become more efficient. A third is that the public sector has become more attractive to workers. A fourth is that the public sector has become more competitive.

The public sector has become a more important part of the economy because it provides a range of services that are essential for the well-being of the population. These services include health care, education, and social care. The public sector has also become more efficient because it has been able to reduce costs and improve quality of service.

The public sector has become more attractive to workers because it offers a range of benefits that are not available in the private sector. These benefits include job security, pension schemes, and flexible working arrangements. The public sector has also become more competitive because it has been able to attract investment and improve its services.

The public sector has become more competitive because it has been able to attract investment and improve its services. This has been achieved through a number of measures, including the introduction of competition, the restructuring of public services, and the introduction of new technologies. The public sector has also been able to attract investment from the private sector.

The public sector has also been able to attract investment from the private sector because it offers a range of opportunities for investment. These opportunities include the development of new services, the expansion of existing services, and the introduction of new technologies. The public sector has also been able to attract investment from the private sector because it offers a range of benefits that are not available in the private sector.

The public sector has also been able to attract investment from the private sector because it offers a range of opportunities for investment. These opportunities include the development of new services, the expansion of existing services, and the introduction of new technologies. The public sector has also been able to attract investment from the private sector because it offers a range of benefits that are not available in the private sector.

The public sector has also been able to attract investment from the private sector because it offers a range of opportunities for investment. These opportunities include the development of new services, the expansion of existing services, and the introduction of new technologies. The public sector has also been able to attract investment from the private sector because it offers a range of benefits that are not available in the private sector.

The public sector has also been able to attract investment from the private sector because it offers a range of opportunities for investment. These opportunities include the development of new services, the expansion of existing services, and the introduction of new technologies. The public sector has also been able to attract investment from the private sector because it offers a range of benefits that are not available in the private sector.

The public sector has also been able to attract investment from the private sector because it offers a range of opportunities for investment. These opportunities include the development of new services, the expansion of existing services, and the introduction of new technologies. The public sector has also been able to attract investment from the private sector because it offers a range of benefits that are not available in the private sector.

The public sector has also been able to attract investment from the private sector because it offers a range of opportunities for investment. These opportunities include the development of new services, the expansion of existing services, and the introduction of new technologies. The public sector has also been able to attract investment from the private sector because it offers a range of benefits that are not available in the private sector.

The public sector has also been able to attract investment from the private sector because it offers a range of opportunities for investment. These opportunities include the development of new services, the expansion of existing services, and the introduction of new technologies. The public sector has also been able to attract investment from the private sector because it offers a range of benefits that are not available in the private sector.

The public sector has also been able to attract investment from the private sector because it offers a range of opportunities for investment. These opportunities include the development of new services, the expansion of existing services, and the introduction of new technologies. The public sector has also been able to attract investment from the private sector because it offers a range of benefits that are not available in the private sector.