Inclusive Safety Solutions

What every teacher should know about special education and laboratory safety legislation

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THE PRINCIPAL'S DRAFT OF THE HIGH school class schedule did not look right to the new science supervisor. After reviewing the room assignments, he realized that all science classes for special education students were scheduled in rooms in the school basement next to the cafeteria. The supervisor asked why these classes were not scheduled in the science laboratories, as were all others. He was aware that the *National Science Education Standards* "emphatically reject any situation in science education where some people . . . are discouraged from pursuing science and excluded from opportunities to learn science" (National Research Council, 1996, 20). To the surprise of the science supervisor, the principal responded that it is just too unsafe for "those types of students" to work in a science laboratory.

Unfortunately, this scenario actually took place. It reflects the confusion among teachers and administrators about interpreting special education legislation, particularly procedural issues and legal limitations to controlling and disciplining mainstreamed special education students. The principal's response illustrates the misconception that all special education students are alike and have or create one particular set of problems.

In many school districts, special education and regular education departments operate on parallel (and theoretically) equal tracks. Recent federal laws and regulations are causing these tracks to merge in order to offer equal access and full inclusion for all students to the maximum extent possible in the general education curriculum. At the same time, federal and state safety standards relevant to the science laboratory are also evolving and may seem at odds with science laboratory curriculum expectations in an environment of full inclusion consistent with national science standards. If school administrators and teachers are to address this transition effectively, it is important to focus on providing equitable access to the best science education for all students in a safe, humane, and positive learning environment.

SPECIAL EDUCATION LEGISLATION

The springboard for much of the recent evolution of special education legislation can be traced to the 1969 Supreme Court decision, *Tinker v. Des Moines Independent School Board,* which held for the first time that students had constitutional rights in public school. The 1973 Rehabilitation Act, specifically Section 504, prohibited discrimination against individuals with disabilities in any program receiving federal funding. Public Law 94–142, Education for all Handicapped Children Act, also known as Individuals with Disabilities Education Act, 20 USC, Section 1400 *et seq.*, enacted in 1975, defined 13 specific categories of disabilities covered under civil rights laws.

These categories formed the basis for the criteria for individuals receiving special education services in public schools (Mooney, 1994). Figure 1 shows the approximate percentages of special needs students in the United States as of 1997 and shows that approxi-

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mately half are learning disabled and nearly 9 percent have emotional disturbances.

Although some students cannot be fully mainstreamed and require alternative placement, accommodations in terms of instructional strategies and/or assistive technology can and should be made. Special education programs are often developed as parallel programs to regular education and are taught separately by certified special education teachers who teach students in most or all subject areas with limited mainstreaming.

The Individuals with Disabilities Education Act (IDEA), or PL 105–17 Reauthorization Act of 1997, with its roots in PL 94–142, is the principal source of legal responsibility of boards of education with respect to special education. IDEA emphasized the need for special education students to interact with non-disabled peers in the least restrictive environment possible. This act also granted parents greater power and further clarified the conditions for their participation in their child's education (Mooney, 1994).

IDEA required school systems to develop Individual Education Programs (IEPs), written descriptions of the educational services deemed necessary to provide disabled students with an appropriate education. The IEP is created through a Planning and Placement Team (PPT) process that ensures the involvement of appropriate professionals, active participation by the parents, and access to necessary evaluation information in a team setting that addresses both academic and behavioral issues.

Science teachers with mainstreamed students in their classes are normally provided with written IEPs that detail the classroom accommodations necessary for these students to achieve success. Science teachers are expected to keep track of these accommodations and implement them as best they can, often with little guidance. Without proper training, science teachers may err on the side of caution and not provide disabled students with the scope of challenges in the laboratory or classroom that they are capable of handling with proper modifications.

A science teacher in a laboratory situation may feel that they cannot control or discipline a student having an IEP as they would another student. Provisions of IDEA and Section 504 generally hold that if students' behavior places themselves or others at risk and is not due to their disability, they may be disciplined in the same manner as all students. If the problem is a manifestation of their disability, then a PPT should be convened to determine if the placement or the IEP needs to be changed (Mooney, 1994).

Substantial confusion exists among teachers and administrators about these limitations on discipline as applied to students under IDEA. This confusion contrib-

FIGURE 1.

Distribution of special needs students in the U.S. public school system,1996–1997.

Type of disability	Total	Percent
Specific Learning Disability	2 676 299	51.11
Speech/Language Impairment	1 050 975	20.07
Mental Retardation	594 025	11.35
Emotional Disturbance	447 426	8.55
Other Health Impairments	160 824	3.07
Multiple Disabilities	99 638	1.90
Hearing Impairments	68 766	1.31
Orthopedic Impairments	66 400	1.27
Autism	34 101	0.65
Visual Impairments	25 834	0.49
Traumatic Brain Injury	10 378	0.20
Deaf-Blindness	1286	0.03
Total	5 235 952	100.00

Source: U.S. Department of Education

uted to a two-year delay in the final rules for the 1997 IDEA legislation that was intended to address these concerns and ease the way for unified educational programs for all students (Sack, 1999). As a result of these legislative and other regulatory initiatives, we have moved in a short 20 years from federal legislation allowing for segregated settings for disabled and non-disabled students to the late 1990s when similar legislation has expanded and clarified the mandate for an integrated educational system.

The challenge for science teachers is to meet the needs of individual students while maintaining high standards for all. One regular education science teacher reports that teaming with a special education teacher improves the education of all students, helps teachers maintain high standards, reduces discipline problems, and helps teachers grow professionally. Although in a team-teaching situation each teacher needs to be responsible for all students in the classroom, the science teacher ensures that curriculum goals are met while the special education teacher uses IEPs to modify and adapt the instructional approaches to students' needs (Chillot, 1999).

STANDARDS FOR A SAFE WORKING ENVIRONMENT

While *Tinker* was the springboard for special education legislation, the toxic gas release from a subsidiary of Union Carbide in Bhopal, India, which killed more than 6000 people in December 1984, was arguably the catalyst for legislation ensuring the public's "right-to-know" about potential hazards in the workplace. In 1987, OSHA's Hazard Communication Standard (29 CFR 1910.1200) became effective in many workplaces, including most schools. Its purpose was to ensure that chemical hazards and the means of protection from these hazards were communicated to employees.

Science laboratory instructors were exempt from the standard at that time. In 1990, OSHA's Laboratory Standard (29 CFR 1910.1450) was applied in the workplace and included middle and high school science laboratories. Currently, almost 40 states have adopted the laboratory standard, which requires schools to develop individualized chemical hygiene plans guided by "Prudent Practices for Handling Hazardous Chemicals in the Laboratory" (1981, NRC). This guideline minimally addresses employee standard operating procedures in dealing with laboratory hazardous chemicals and requires employers to maintain a safe working environment for employees.

OSHA covers only employees, not students. However, in order to secure a safe working environment for teachers and science paraprofessionals in the laboratory, students should be held by the school to the same standards (American Chemical Society, 1998). Procedural as well as appropriate behavioral expectations can be addressed by developing a school chemical hygiene plan (Young, 1990). All students in mainstreamed special education and self-contained classrooms are held to this safety plan. In addition, science teachers must support other OSHA safety standards and National Fire Protection Association standards.

STRATEGIES FOR LABORATORY SAFETY

Science teachers are responsible for providing science laboratory experiences for mainstreamed special education students, as are special education teachers in self-contained special education science classes. As trained and licensed professionals, science and special education teachers need to be aware of potential liabilities in working with students in laboratory situations. Although there may be some unique challenges to working with mainstreamed or self-contained students with special needs in a laboratory situation, teachers need to consider alternatives or modifications for providing safe and effective experiences that address both special education laws and safety regulation standards.

For science teachers, there are several useful websites: West Virginia University's website for teaching science to students with disabilities (*www.as.wvu.edu/~scidis*) includes lists of teaching strategies by disability; Do-It at the University of Washington, Seattle, Wash. (*weber.u.washington.edu/*~doit) offers workshops, links, and strategies for science students and teachers; and the Parents and Educators

Resource Center (*www.perc-schwabfdn.org*) offers the *Assistive Technology Guide*. OSHA's website provides teachers with information about the Laboratory Standard and Chemical Hygiene Plan (*www.osha.gov*). The World Safety website has a special section on safety resources for educators (*www.worldsafety.com*).

In addressing the special needs of students, science teachers should modify laboratory activities and secure specialized laboratory safety and instructional equipment. Also, teachers should improve their own knowledge about special needs students, eliminate inappropriate laboratory activities, and provide alternative activities for special education students.

Specific examples of facility modifications that should be made are:

✔ Barrier-free egress from the laboratory in case of the need for evacuation;
✔ Polycarbonate polymer or safety glass on all doors and windows in the laboratory;
✔ Laboratory doorways wide enough to accommodate wheelchairs or students on crutches;
✔ Minimum net area standards for occupancy loads must be met to strategically arrange furniture for appropriately sized aisles;
✔ Appropriate safety and instructional equipment, such as low-profile eyewashes and showers, lab stations, and reduced height chalk/marker boards;
✔ Utility controls that allow everyone access to water, gas, electricity, and so forth; and
✔ Appropriately installed computer wires and other cables to prevent trip/fall hazards.

Specific examples of instructional modifications that should be made are:

✔ Pairing special needs students with non-handicapped students willing to serve in partner situations or, if necessary, as special education aides;
✔ Consistency in assessment and behavioral expectations of all students (except for modification via an IEP or PPT); and
✔ Varied instructional methods (visual, auditory, and so forth) to compensate for visual and auditory difficulties.

Specific examples of considerations that administrators should make are:

✔ Limiting class sizes to improve on-task assistance for students with special needs;
✔ Scheduling laboratory periods in tandem with resource periods, if appropriate;
✔ Scheduling common planning periods for special education and science teacher team members; and
✔ Participating in the planning and placement team process to assist in the development of goals, objectives, and modifications for students with special needs.

Science teachers working with special education teachers can provide safe laboratory science programs for all students by incorporating a variety of instructional, organizational, and assistive technologies in their teaching strategies. Communicating, planning, varying instructional strategies, considering assistive technologies, observing, and assessing are critical components of an educationally challenging and safe laboratory experience. ✧

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Editor's Note: *The Science Teacher* and the National Science Teachers Association do not endorse Internet sites. Any sites mentioned in this article are recommendations of the author and should be checked carefully by teachers before being suggested to students.

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