

NSELA Safety Position Statement Science Teaching Conditions

Introduction:

Based on increasing enrollment and budget constraints in many schools across the nation, it is common for the following undesirable conditions to exist for science teachers.

1. Science/STEM lab/classrooms have more students and staff, surpassing the legal occupancy load; (NFPA Life Safety Code 101)
2. Teachers are assigned three or four different lab courses to teach;
3. Some lab class sizes have reached thirty or more, surpassing the better professional safety practice (NSTA, NSELA, etc.) and/or legal safety standard (NFPA Life Safety Code 101)
4. Teachers are teaching in four or five different classrooms during a week;
5. Teachers' lab prep room is often a distance from their lab/classroom, creating unsafe transport of hazardous materials issues;
6. Master schedules are developed which do not allow for "team planning" among instructors who teach the same courses.

National and state studies, initiatives and programs (Project 2061, Scope, Sequence, & Coordination (SS&C), National and State science standards, Systemic State Initiatives, and Next Generation Science Standards [NGSS]) have strongly advocated an improvement in science teaching, Pre-Kindergarten through 16.

Statement:

In order to provide for safer learning/teaching science/STEM classrooms/laboratories, legal safety standards and better professional safety practices must be met. They include but are not limited to the following:

1. Legal Safety Standards:
 - a. Occupational Safety and Health Administration (OSHA)
 - b. National Fire Protection Association (NFPA)
 - c. Environmental Protection Agency (EPA)
 - d. International Code Council (ICC)

2. Better Professional Safety Standards
 - a. American National Standards Institute (ANSI)
 - b. American Chemical Society (ACS)
 - c. Council of State Science Supervisors (CSSS)
 - d. National Science Teaching Association (NSTA)

Progress in science/STEM is important to the future of students in society. Science teachers must meet many challenges as they work to improve science education and achieve these state and national science goals, and school districts must place science instructors in conditions that are conducive to improving science education.

Therefore, the National Science Education Leadership Association (NSELA) advocates the following:

1. The number of different lab science courses assigned to an instructor during any academic term should not exceed two.
2. The number of students assigned to a science/STEM lab class section should not exceed the professional/quasi-legal standard of 24 (and may be less depending upon legal occupancy load levels and the specific needs of "exceptional students"). Research clearly indicates that it is extremely difficult for one instructor to adequately supervise more than 24 students in a lab setting.
3. Teacher should be assigned a course schedule which allows them to teach the same science class in the same lab to avoid unnecessary transport of hazardous chemicals.
4. When considering the lab and lecture aspects of teachers' assignments, a schedule should be developed which ensures that an instructor does not have to use more than two different rooms.
5. Teachers should be assigned a lab/classroom that is properly equipped for the specific science activities. All teaching laboratories must have appropriate engineering controls, written administrative procedures and personal protective equipment. (OSHA Laboratory Standard 29 CFR 1910.1450)
6. A lab prep room should be in close proximity to the science lab/classroom. If this is not possible, the prep room should be on the same floor as the science lab/classroom. In latter cases, it is advisable that laboratory para-professionals or tech support employees should be provided for safer preparation and transfer of hazardous materials.
7. Teachers should be provided department written safety acknowledgment forms, these forms must be approved by the local Board of Education, for students, parents and guardians of students regarding appropriate legal safety regulations and professional best practices to be followed in science/STEM classroom, laboratories, and field sites. The safety acknowledgment forms should be kept on file for the length of time within individual state statute of limitations. In addition, a safety disclaimer form should also be used to help keep the teacher and school out of harm's way legally. See NSTA's "COVID-19 Pandemic Safer Science/STEM Online and

Face-to-Face Learning Environments Instruction Disclaimer Statement” at <https://www.nsta.org/covid-19-pandemic-safer-science>.

8. Teachers should be provided with release time or receive a stipend during the summer to help develop the science curriculum, hazardous chemical management and more. They should not be expected to work on a task of this importance after completing a day of teaching.

A science schedule should be developed which will allow science teachers to do the following:

- a. Participate in team planning with their colleagues who teach the same courses;
- b. Be involved in multidisciplinary team planning with teachers from other curricular areas such as mathematics, social studies, English and technology.
- c. Be involved in multidisciplinary team planning with teachers from other curricular areas such as STEM programs (Science, Technology, Engineering, and Mathematics) and STEAM programs (Science, Technology, Engineering, Art and Mathematics).
- d. Provide professional development opportunities for members of the science staff which will enable them to remain abreast of recent developments in science. Emphasis should be placed on a variety of learning styles and instructional strategies such as cooperative learning and assessment alternatives, as well as on laboratory safety, working with diverse classrooms, and the responsibilities of the science teacher.
- e. Each science/STEM lab/classroom should be equipped with educational technology, e.g., computers, appropriate software, and Internet access that support the objectives of the curriculum.
- f. Procedures should exist which will allow for prompt replacement or repair of equipment that is damaged or which becomes inoperative. Also, the science budget should provide for immediate purchase of consumables and early replacement and maintenance of science equipment.
- g. Para-professional support should be provided (to prepare solutions, assemble apparatus, perform the safety checks that are listed in the district's chemical hygiene plan or appropriate state alternative laboratory safety standards), and provision should be made for the proper purchase, use and disposal of hazardous chemicals.
- h. Safety and legal considerations prohibit the use of science/STEM laboratories for non-science instruction.

- i. Adequate and secure space must be provided to store science supplies and equipment.
 - j. Financial support and release time should be provided for teachers to participate in their professional association(s) and network with colleagues in other parts of the state/nation.
 - k. Annual complete safety compliance training involving legal safety standards and better professional practices.
9. In an effort to assist science teachers with all of the tasks required to maintain a safer STEM space, it is suggested that each school develop a Chemical Hygiene Officer duty period each day. During this period, the designated science teacher will assist with laboratory inventory, work orders, ordering supplies, testing the environmental controls (i.e., safety shower, eyewash, fume hoods) on a weekly basis, and assist in properly disposing, or arranging for the disposal of, all chemical waste. This duty will provide a safer school environment for staff and students than having the same professional sit in the hallway or file in the main office.

Conclusion:

In order to provide for a safer teaching/learning environment for both teachers and students, science/STEM teaching conditions must be addressed. Given the potential hazards and resulting risks to occupants in laboratories, it is absolutely critical the science leaders be advocates and change agents to make sure these conditions are in fact in concert with all legal safety standards and better professional safety practices.

References:

- Safety in the Science Classroom, Laboratory or Field Sites, National Science Teachers Association Sample Safety Acknowledgement Form:
<http://www.nsta.org/docs/SafetyInTheScienceClassroomLabAndField.pdf>
- Science Safety Portal, National Science Teachers Association Safety Advisory Board:
<http://www.nsta.org/safety/>

Credits:

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