ACS Chemistry for Life®

COMMITTEE ON CHEMICAL SAFETY
Recommendation

INTEGRATED SCIENCE SAFETY INSTRUCTION (EDUCATION/TRAINING)

INTRODUCTION

The Committee on Chemical Safety (CCS) recommends the use of consistent definitions in the chemistry curriculum and in developing safety materials for instruction and in communicating with fellow instructors and safety professionals. This recommendation has a supporting video at: https://youtu.be/ZIogNqqAuPI

DEFINITIONS

Training is a process in which individuals learn rules and regulations or acquire procedural knowledge needed for a particular task. Chemical safety training is outcomes-driven, teaching physical or cognitive skills including techniques and knowledge for specific tasks.

Education is a process in which individuals gain conceptual knowledge and understanding and explore the applications and extension of that knowledge using critical thinking skills. Chemical safety education is foundational, providing knowledge and reasoning skills for future situations.

Training and education are complementary. No hierarchy is implied. Continuously developing competencies in chemical safety requires both.

EXAMPLES OF INTEGRATED SCIENCE SAFETY

Two scenarios illustrate that education and training are integral and overlapping parts of safety instruction. *Italicized blue text* indicates educational concepts and underlined purple text indicates training procedures.

Scenario 1. Lab workers finish an experiment and have leftover reagents and reaction products. The workers must *determine if the materials are hazardous or non-hazardous*. Non-hazardous materials can be disposed of in the trash or down the drain. However, if the materials are hazardous, the workers must add them to a waste container. This step requires *determining incompatibilities with other materials in the waste container* and updating the label *with accurate information*. If the waste container is full, the workers must arrange for organizational waste pickup.

Scenario 2. Research students are setting up a distillation. *Recognizing that a distillation involves a volatile organic solvent*, they utilize a chemical fume hood. Before any lab work, they don lab coats and eye protection and *select the proper glove* after consulting the Safety Data Sheets for the chemicals. To clear out clutter from the fume hood, they relocate *flammable or reactive materials to appropriate storage*. They *select heating equipment approved for use with flammable chemicals*. An alarm sounds when they raise the sash to its maximum; knowing that this is due to a temporary decrease in ventilation, they turn off the alarm during setup. The researchers place their apparatus on lab-jacks, at least six inches from the front, and use the framework to anchor their equipment. To *prevent floods*, they secure the condenser's water lines. They lower the sash when set-up is complete and reset the alarm.

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