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Development and Validation of an Assessment Tool for a National Young Worker Curriculum

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Abstract

Background—An online, multiple-choice assessment was developed and validated for Youth@Work-Talking Safety, a NIOSH curriculum that equips middle and high school students with foundational workplace safety and health knowledge and skills.

Methods—Classical Test Theory was used for the test development and validation; the Jaeger method was used for cut score determination. A total of 118 multiple-choice items were developed to measure the acquisition of knowledge and skills taught through the NIOSH curriculum. Pilot testing was conducted with 192 8–12th grade students and a cut score was determined.

Results—The mean score for all test-takers on the Talking Safety assessment was 80.9%; total test reliability measured using an Alpha/KR20 statistic was 0.93. A minimum passing (cut) score of 74% was established.

Conclusions—The assessment provides an objective measure of students' acquisition of the foundational workplace safety and health competencies taught through the Talking Safety curriculum.

Keywords

National Institute for Occupational Safety and Health (U.S.); Centers for Disease Control and Prevention (U.S.); assessment; measurement; work; safety; adolescent; occupational injuries; young workers; curriculum

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

DISCLOSURE BY AJIM EDITOR OF RECORD

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DISCLAIMER

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the National Institute for Occupational Safety and Health.

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INTRODUCTION

For numerous developmental and environmental reasons, younger workers (aged 15–24 years) suffer disproportionately from workplace injuries [Salminen, 2004; Breslin et al., 2007 Centers for Disease Control and Prevention, 2010]. During the 10-year period of 1998–2007, an estimated 7.9 million nonfatal injuries to younger workers were treated in U.S. hospital emergency departments (EDs) [Centers for Disease Control and Prevention, 2010]. The nonfatal injury rate was 5.0 ED-treated injuries per 100 full-time equivalent workers, approximately two times higher than among workers age 25 or over [Centers for Disease Control and Prevention, 2010].

The integration of workplace safety and health into school curricula may be one way to ensure that all individuals, before they enter the labor force, have a foundation of occupational safety and health (OSH) knowledge and skills [Zierold and Anderson, 2006; Pisaniello et al., 2013]. In the United States, this integration is being promoted by the National Institute for Occupational Safety and Health (NIOSH), while the European Agency for Safety and Health at Work (EU-OSHA) leads efforts in the European Union to mainstream OSH into schools [European Agency for Safety and Health at Work, 2004; Degrand-Guillard, 2006]. The purpose of mainstreaming OSH into education is to ensure that all young people, before they begin working, receive instruction on workplace safety and health as part of their general schooling. These efforts are intended to increase awareness among future workers about workplace risks and how to prevent them, to help reduce job-related injuries and illnesses, and to involve students in developing positive safety cultures, at school, at work, at home, and in the community.

To facilitate mainstreaming OSH into education in the United States, the National Institute for Occupational Safety and Health (NIOSH) and its partners worked over many years to develop a curriculum titled *Youth@Work-Talking Safety*, for use in middle and high schools [NIOSH, 2015]. This curriculum teaches foundational workplace safety and health knowledge and skills—the NIOSH 8 Core Competencies (Table I)—that are general, transferable, and applicable across all jobs and industries. Although developed with young workers in mind, the 8 Core Competencies are relevant to all individuals who work. NIOSH and its stakeholders developed the competencies and aligned them with the Health Belief Model [Hochbaum, 1958; Rosenstock, 1960, 1974], one of the most widely used conceptual frameworks in health behavior research and practice [Champion and Skinner, 2008]. The 8 Core Competencies apply to all occupations and industries and complement the job-specific skills gained through apprenticeship and career technical or vocational training programs, as well as through on-the-job training [NIOSH, 2013; Schulte et al., 2014].

Feedback from teachers using the curriculum, as well as research that indicates the benefits of formal knowledge assessment in facilitating learning, skill retention, and skill transfer [Chan et al., 2006; Pellegrino and Hilton, 2012; Earl, 2013], prompted NIOSH to begin work on developing an assessment tool for *Talking Safety*. NIOSH entered into a collaboration with the non-profit organization, NOCTI, formerly known as the National Occupational Competency Testing Institute, to create a multiple choice test for the young worker curriculum.

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The assessment development process was based on Classical Test Theory (CTT), which is widely used as a framework for analyzing the precision of various types of tests [Hambleton and Jones, 1993; DeVellis, 2006; Sawaki, 2014]. Despite limitations of CTT [DeVellis, 2006], and the emergence of more robust methods, such as Item Response Theory, CCT remains a widely used measurement theory for examining test reliability and measurement error [Sawaki, 2014]. Furthermore, the Jaeger method [Jaeger, 1982] is one of the most common classification procedures for setting cut scores [Kaftandjieva, 2010] to determine the minimum passing score on an exam.

The primary objective of this paper is to describe the steps involved in creating the *Talking Safety* assessment, including its validation using CTT and the determination of a cut score with the Jaeger method (Fig. 1). The paper also suggests future directions and limitations of the *Talking Safety* assessment tool.

METHODS

Create a List of Competencies and Learning Objectives to Be Tested; Develop the Assessment Blueprint

The test development process began with NIOSH creating a comprehensive list of learning objectives included within each of the six main lessons of the *Talking Safety* curriculum (Table II), to be used as the initial "blueprint" for building the test. The learning objectives are specific statements that describe what a student should know or be able to do upon completion of the *Talking Safety* program.

Recruit Subject Matter Experts

A key component of assessment development is the participation of qualified Subject Matter Experts (SMEs) to assure content quality of an assessment [Linn et al., 1991]. NOCTI criteria for SMEs requires that they be business and industry representatives and teachers (secondary and post-secondary) who have at least three years of technical experience. NIOSH recruited six SMEs in young worker safety and health (from the Massachusetts Department of Public Health, the University of California, Berkeley, Labor Occupational Health Program, Oregon State University, and University of Washington) who met the criteria. (The NIOSH authors also participated as SMEs). In addition, three SMEs who were not involved in the development of the *Talking Safety* test served as reviewers. A small honorarium ($1,000) was provided to each expert. The SMEs received an email from NOCTI explaining their roles, tasks, and time commitment (approximately 30–40 hr over 30 weeks).

Weight and Rate the Competencies and Learning Objectives

The first task for SMEs was to rate the learning objectives based on the importance of: (i) students being competent in that task upon learning the curriculum; and (ii) the task being suitable for inclusion on the multiple-choice assessment. SMEs were given written instructions on how to use a Likert Scale (1–5) for rating the objectives, with five being the most important and one being the least important. The 33 student learning objectives delineated within the six, main *Talking Safety* lessons were synthesized into 24 "Core

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Components," or essential learning objectives to be covered on the test. NOCTI compiled the ratings and determined a weighting for the content coverage on the assessment. SME consensus was established on the content for the assessment and a final blueprint was created aligning the NIOSH 8 Core Competencies and the 24 Core Components (Table III).

Develop and Review Multiple-Choice Questions

Multiple-choice tests are used in diverse settings and often for high-stakes purposes. Achieving proper construction of such tests may be challenging [Little et al., 2012]. In the first of three consecutive, 3-hour webinars, the NOCTI facilitators trained SMEs on constructing effective multiple choice questions. During the webinars, the SMEs also viewed existing questions from the NOCTI question bank and selected items that had potential to be revised for use on the *Talking Safety* assessment.

Once the SMEs selected questions from NOCTI's existing item bank, the number of new questions that needed to be drafted was determined and the task was divided among the group members.

Review and Approve Draft Assessment

Multiple rounds of question writing and editing among NOCTI, NIOSH, and the SMEs occurred, resulting in the development of a total of 160 potential test questions, which were then entered into the NOCTI online system. Three independent reviewers who were not involved in the test development, reviewed the questions online in the actual test format/ environment and select items were revised based on their feedback.

The SME team conducted a second round of online review through a series of three consecutive, 2–3 hr webinars. The review entailed sorting the 160 questions into the 24 Core Components (Table III), deleting poorly worded or redundant items and drafting additional questions closing any gaps in the blueprint. The final assessment for pilot testing included 118 items. These questions underwent a formal "plain language" review [Plain Writing Act of 2010] to place the assessment at an 8th grade reading level (as measured on the Fleisher–Kincaid scale). The revised questions were then entered into the NOCTI online system. Two optional demographic questions (requesting the test-taker's age and grade) were also included.

Conduct Pilot Testing of the Assessment

The next phase of the assessment development involved administration of the 118 items with a pilot test group. NOCTI determined that the pilot sample for the NIOSH *Talking Safety* assessment should include a minimum of 150 participants and that the population should be representative of those who would take the assessment in a regular testing environment.

Through its partner network, NIOSH identified a school district in rural Oklahoma to participate in the pilot. The district is approximately 2 hr southeast of Oklahoma City and has a student population that is approximately 60% Caucasian and 30% American Indian, mainly from the Chickasaw, Cherokee, and Choctaw Nations. Race, ethnicity, and sex were not factors in the school's selection for the pilot test. The junior high school, comprised of

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grades 7 through 9, had approximately 160–170 students and the high school, with grades 10 through 12, had a similar number of students.

Prior to conducting the pilot test, NIOSH obtained an Institutional Review Board research exempt determination from the NIOSH Human Subjects Review Board (HSRB). The project occurred within a regularly established educational setting, during normal school hours and as part of established and ongoing classroom activities. NIOSH researchers were not in contact with students involved in the pilot testing, the project presented no risk of harm to participants, and therefore involved no procedures for which written consent is normally required outside of the research context. The pilot test was carried out with 8th through 12th grade students in the school system who were trained the *Talking Safety* curriculum (over one school day) and then completed the online test.

NIOSH provided an experienced instructor to lead the train-the-trainer workshop (in August at the start of the school year) for 14 teachers and assistants from the pilot school in Oklahoma. NIOSH project coordinators were also in attendance to assist with the training. The workshop provided an overview of the *Talking Safety* curriculum as well as hands-on experience with the activities.

The teachers and assistants who participated in the train- the trainer workshop taught the six, 45-min main lessons of the Oklahoma *Talking Safety* curriculum the following day, during regularly scheduled school hours. Students were put into groups of 25–30 by grade, and assigned to separate classrooms. Approximately 200 students participated in the training. Students were informed by their teachers of the purpose of the pilot testing, and they received written and verbal instructions for completing the proctored, online assessment.

Each student was assigned a test code number and the school coordinator maintained a log of the codes. Due to the large number of items to be tested (118 questions), the assessment was divided into two 59-question tests which could be completed in one 120-min session or two 60-min sessions. Students utilized the same test code for each session so that the results could be paired. No identifying information, such as student name, was collected. All test-takers completed the pilot assessment within a designated, 2-week period subsequent to receiving instruction on *Talking Safety*.

DATA ANALYSIS

Pilot data for the *Talking Safety* assessment were analyzed using ItemAn (version 3.5) and SPSS (version 21). Classical Test Theory was used to determine the reliability and validity of the test. The pilot test data were reviewed for test-level and item-level information. Brief descriptions of the selected statistics analyzed for the NIOSH *Talking Safety* assessment are listed in Table IV.

RESULTS

In total, 192 students in grades 8 through 12 in Oklahoma completed the *Talking Safety* pilot testing. Seventy-five percent of the test takers were in 8th grade (27.6%), 9th grade (26.6%), or 10th grade (20.8%), with the remaining 25% distributed between 11th (9.4%) and 12th

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grade (14.1%). Students' ages ranged between 12 and 18 years old, with the highest percentages of students being either 14 (27.6%) or 15 (22.4 %) years old. The mean score for all test takers over the 118 questions was 80.9%, with a standard deviation of 11.53%. The range of scores on the *Talking Safety* assessment was 33.1–100% with raw scores ranging from 39 to 114. As could be expected, the data demonstrate a significant correlation between overall test performance and student age (0.167, significant at the 0.05 level; 2-tailed test) and with grade level (0.272, significant at the 0.01 level; 2-tailed test). There were 55 students who fell into the low group of scorers (bottom 27%) with a maximum raw score of 91, and 56 students who fell into the high group of scorers (top 27%) with a minimum raw score of 105. The test data were negatively skewed (-1.49) with more of the test takers scoring at the higher end of the distribution. The distribution of students' test scores is presented in Figure 2.

Students performed best on the questions under Competency 6 (Recognize employer and worker rights and responsibilities that play a role in safe and healthy work), achieving a mean score of 88.7% on the items in this section. Conversely, students performed least well on the questions under Competency 4 (Recognize how to prevent injury and illness and describe the best ways to address workplace hazards) with a mean score of 63.9%.

Perform Item Analysis

The examination of the *Talking Safety* assessment for test reliability revealed a high level of internal consistency (Alpha/KR20 statistic of 0.93, with a standard error 3.05%). The average proportion of test takers choosing the correct answers on the *Talking Safety* assessment was 0.81. Item-level statistics revealed the proportion of correct scores for a single item ranged from a low of 5% to a high of 98% correct. The average discrimination index (DI) for the 118 items on the test was 0.25. The range of discrimination indices for the 118 questions was -0.11 to 0.73. A negative DI occurs when more of the lower scoring students answer the item correctly than did the higher scoring students.

Detailed, item-level statistics were also analyzed for each of the 118 items to identify questions that did not perform well during pilot testing. Through the data analyses, potentially problematic topics—items or clusters of items on which students had lower scores—were identified. Thirteen items had proportions correct scores of less than 60%. These items were examined to determine whether they were poorly constructed or whether they were simply more difficult. As noted previously, students underperformed on items related to Competency 4 (Recognize how to prevent injury and illness. Describe the best ways to address workplace hazards).

Create Two, Parallel Test Forms

Based on the pilot data, and after several rounds of discussion between NOCTI and NIOSH as to the scoring and importance of various items, two parallel forms of 50 multiple choice questions each were drafted, measuring similar material and that were of comparable difficulty. Of the items piloted, 34 of the 118 were not included on either form. Low-performing and redundant questions (as determined by the statistical analyses) were eliminated from the test. Approximately a quarter of items appear on both forms. The

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remaining 68 items appear on only one form. The mean score for Form 1 was 83.5% with a standard deviation of 12.89%, an Alpha/ KR20 reliability statistic of 0.87, and a standard error of 4.65%. Form 2 had a mean score of 84.3% with a standard deviation of 12.41%, an Alpha/KR20 reliability statistic of 0.87, and a standard error of 4.47%. Once the two parallel forms were constructed, the next step was to establish a suitable cut score for the test.

Establish a Cut Score

A criterion-referenced cut score is established to set the point at which a student is considered minimally competent on a multiple-choice assessment [Cizek, 1996; National Occupational Competency Testing Institute, 2015] and numerous methods exist for determining cut scores [Kaftandjieva, 2010]. The Jaeger method [Jaeger, 1982], one of the most widely used procedures for setting cut scores [Kaftandjieva, 2010], was utilized because of the method's involvement of stakeholders [Cizek, 1996]. This method requires the SME panel to establish a criterion question. This question is used to judge individual items on an assessment to determine whether an examinee must be able to answer an item correctly in order to be considered minimally competent in the subject matter. To implement this procedure, participants answer the following question for each item on the assessment: "Should every examinee.. .be able to answer the test item correctly?" [Jaeger, 1989, p. 494]. Jaeger's procedure involves many iterations of data collection. The SMEs are provided an opportunity to reconsider their initial opinions based on the judgments of other subject matter experts and on information related to actual test-taker performance (e.g., anticipated pass fail rates).

For the *Talking Safety* assessment, a group of 6 SMEs, including two new members (from the Oklahoma Department of Labor and the New York Committee for Occupational Safety and Health) not included in the original test development, were recruited and trained by NOCTI. The cut score workshop, facilitated by a NOCTI psychometrician (and an author on this manuscript), was conducted for the two forms of the assessment over two, 1.5 hr webinars a week apart. The panel of SMEs was required to make judgments on each individual item on the two assessments, determining which questions were critical for an examinee to answer correctly to be minimally competent in the subject matter. The panel also received the pilot testing data which provided information on the difficulty of each item or group of items. The pilot data were also used to calculate the percentage of students who would have passed on each test at the established cut score point. After determining the critical items for each test, a cut score of 74.0% was established for each form. The estimated percent of pilot test takers to achieve the cut score on Form 1 was 84.4%, and on Form 2 was 82.8%.

DISCUSSION

The rigorous process outlined in this paper resulted in the creation of a content valid assessment for the NIOSH young worker curriculum, *Youth@Work-Talking Safety*, which performed well with a pilot group of middle and high school students. Despite positive results, some limitations exist. Although the test developers followed an objective process, a fair amount of subjectivity was involved in designing and selecting the test items. Another

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limitation of this study is that the students who participated in the pilot may not necessarily represent a typical population. This is because many students in the Oklahoma school district are exposed to workplace safety and health topics through school clubs and through teachers with an interest in OSH. The students were tested at the beginning of the school year and their performance may differ from that of students tested at the end of the year.

A one-year follow-up, using the revised assessment items, was conducted with the same pool of students at the Oklahoma junior and senior high school, and with a new group of 8th grade students. The same test procedures were used as described in this paper. The results from the one-year follow up test will be analyzed and reported in the near future.

As mentioned previously, students participating in the Oklahoma pilot testing underperformed on Competency 4 (Recognize how to prevent injury and illness and describe the best ways to address workplace hazards). Further analyses of the pilot data revealed that students may have been confused by inconsistent language between the curriculum and the test questions in this area. NIOSH is currently revising the *Talking Safety* curriculum to address issues that surfaced from the pilot-testing in Oklahoma and from a demonstration project with more than 2,500 students in Florida public schools.

Despite the limitations addressed, the process outlined in this paper resulted in the creation of a content-valid assessment that performs well and provides schools with an objective measure of students' learning of critical workplace safety and health knowledge. An online, delivery platform through which school districts, and/or individual schools, or teachers can access the *Talking Safety* test has been developed. In addition, a digital badge [Alliance for Excellent Education, 2013] is being created by NOCTI and NIOSH that test-takers can earn if they achieve the minimum cut score on the exam. The development of this assessment tool came about as a result of requests from teachers and administrators in school districts using the *Talking Safety* curriculum. The assessment provides an important tool needed to further promote the mainstreaming of occupational safety and health into education in the United States.

CONCLUSION

To promote the integration of the NIOSH young worker curriculum, *Youth@Work-Talking Safety* into U.S. schools, an online, multiple-choice test was developed to assess students' acquisition of the foundational workplace safety and health competencies taught through the curriculum. A rigorous process was used to create the *Talking Safety* assessment, including its validation with Classical Test Theory and the determination of a cut score with the Jaeger method. Two parallel forms of 50 items each were drafted measuring similar material and that were of similar difficulty. A cut score of 74.0% was established for each form and the estimated percent of pilot test takers achieving this score on Form 1 was 84.4%, and on Form 2 was 82.8%. Anecdotal evidence suggests that the assessment may serve as an incentive to schools to use the *Talking Safety* curriculum. Assessment data may also demonstrate how students in different learning environments perform on the test, which in turn reflects their acquisition of critical knowledge and skills needed to benefit from and contribute to safe and healthy workplaces, now and throughout their lives.

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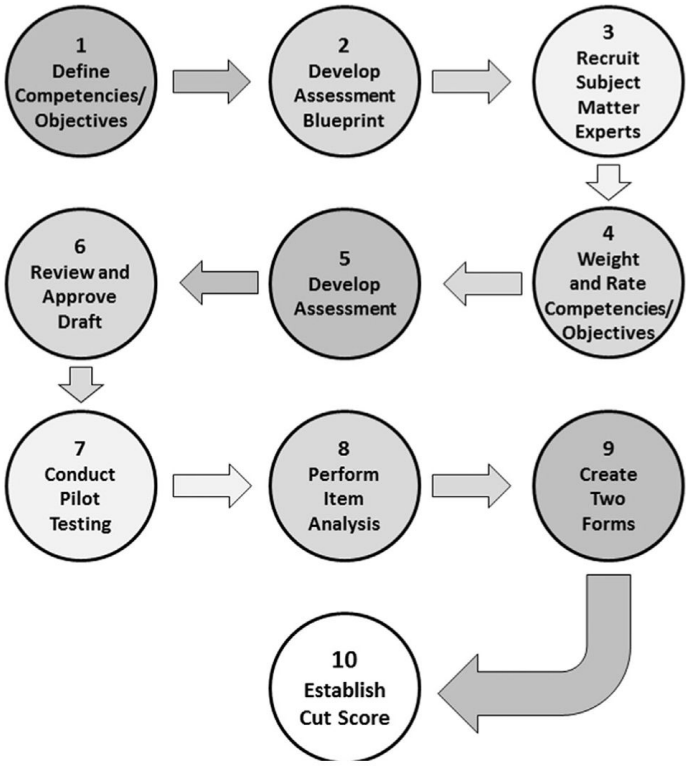

FIGURE 1.
Steps involved in the *Talking Safety* assessment development process.

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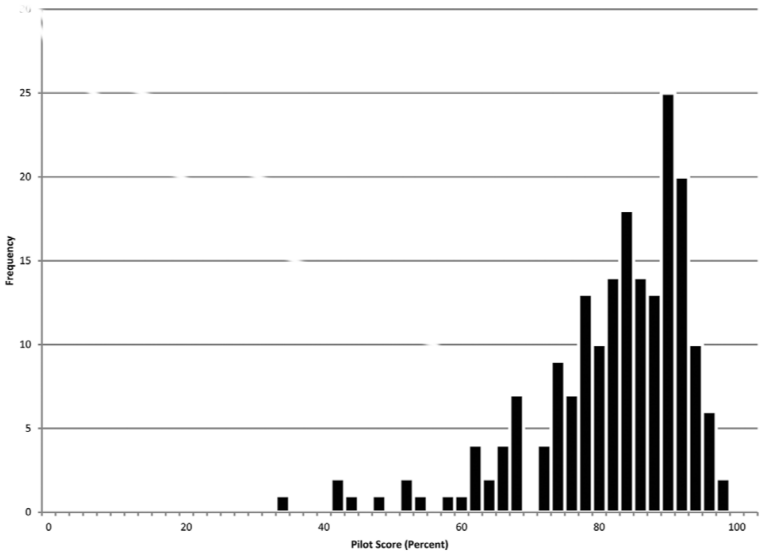

FIGURE 2.
Distribution of student scores on the *Talking Safety* assessment.

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TABLE I

NIOSH 8 Core Competencies Covered in the *Youth@Work—Talking Safety* Curriculum

Competency 1	Recognize that, while work has benefits, all workers can be injured, become sick, or even be killed on the job. Workers need to know how workplace risks can affect their lives and their families.
Competency 2	Recognize that work-related injuries and illnesses are predictable and can be prevented.
Competency 3	Identify hazards at work, evaluate the risks, and predict how workers can be injured or made sick.
Competency 4	Recognize how to prevent injury and illness. Describe the best ways to address workplace hazards and apply these concepts to specific workplace problems.
Competency 5	Identify emergencies at work and decide on the best ways to address them.
Competency 6	Recognize that employers are responsible for, and workers have the right to, safe and healthy work. Workers also have the responsibility for keeping themselves and coworkers safe.
Competency 7	Find resources that help keep workers safe and healthy on the job.
Competency 8	Demonstrate how workers can communicate with others—including people in authority roles—to ask questions or report problems or concerns when they feel unsafe or threatened.

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TABLE II

NIOSH *Youth@Work-Talking Safety* Curriculum Lessons and Learning Objectives

- Lesson 1: Introduction to young worker injuries
- Objectives
  - Describe how workplace injuries can affect a young person's life.
  - Explain why it is important to pay attention to workplace safety and health.
  - Recognize that workplace injuries and fatalities do happen to teens and could happen to them.
  - Recognize that work-related injuries and illnesses are predictable and can be prevented.
  - Question popular assumptions about why workplace injuries occur.
  - Analyze workplaces and identify health and safety hazards.
  - Give strategies for preventing injuries and illnesses at work.
- Lesson 2: Finding hazards
- Objectives
  - See hazards that exist in workplaces and predict the harm they may cause.
  - Understand the differences between various categories (types) of workplace hazards.
  - Identify ways to get information about chemicals used at work.
  - Explain that some workplace hazards are obvious, but others are not.
  - Construct a detailed hazard map of a hypothetical workplace or visually identify the health and safety hazards in an example hazard map.
  - Organize hazards by category.
  - Analyze and rank hazards with regard to (i) potential risk of injury from hazard, and (ii) potential severity of injury from hazard.
- Lesson 3: Making the job safer
- Objectives
  - Describe the three main ways to reduce or remove hazards at work.
  - Identify and describe specific workplace hazards, their health effects, and methods for controlling them.
  - Reflect on why some methods of controlling hazards are preferred to others.
  - Make a plan for controlling hazards in a specific workplace.
  - Make a list of workplace health and safety resources.
- Lesson 4: Emergencies at Work
- Objectives
  - Identify a wide range of possible workplace emergencies.
  - List ways to be prepared for various types of emergencies.
  - Recognize planning steps that can help young workers deal appropriately with emergencies.
  - Generate strategies for responding to various emergencies at work.
  - Demonstrate knowledge (verbally) through the Disaster Blaster! game.
- Lesson 5: Know your rights and responsibilities
- Objectives
  - List and describe teens' special legal rights and protections in the workplace.
  - Relate that along with legal rights comes personal responsibility to work safely.
  - Reflect on the importance of child-labor and wage laws and how these laws are implemented.
  - Provide this information about state labor laws:
    - Minimum wage for student workers under age18.
    - Hazardous work restrictions for young people under age18.

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Day and hour restrictions for working youth under age18.

Lesson 6: Taking action

Objectives

Recognize that openly discussing workplace problems with others leads to solutions.

Reflect on the concept that, while employers must provide a safe and healthy workplace, student workers have a responsibility to talk with employers, co-workers, union representatives, or other responsible adults about problems.

Recognize that, if a job feels unsafe,or if there are questions about how to do something, students should stop and seek advice.

Demonstrate ability to solve a problem at work and to advocate for personal and co-worker safety.

Create appropriate communication strategies and solutions to common problems that advocate for personal and co-worker safety.

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TABLE III

Alignment of *Talking Safety* Core Components (CC) With NIOSH 8 Core Competencies

Competency 1: Recognize that, while work has benefits, all workers can be injured, become sick, or even killed on the job. Workers need to know how workplace risks can affect their lives and their families.
CC1: Know that all people are at risk for injury at work.
CC 2: Understand if you get hurt at work, it could change your life forever.
CC 3: Know that teens get hurt more often at work than adults.
Competency 2: Recognize that work-related injuries and illnesses are predictable and can be prevented.
CC 4: Know that work-related injuries and illnesses are predictable, can be prevented, and don't happen by chance.
Competency 3:Identify hazards at work, evaluate the risks, and predict how workers can be injured or made sick.
CC 5: Know the definition of hazard (anything that could hurt you physically or mentally) and be able to distinguish between a hazard and an injury.
CC 6: Understand that all jobs have hazards, and some hazards are more obvious than others.
CC 7: Know the four categories of hazards (biological, chemical, safety, other).
CC 8: Know that some hazards can hurt you right away and some can make you sick in the future.
CC 9: Understand that it is best to fix the work environment, not the worker.
Competency 4: Recognize how to prevent injury and illness. Describe the best ways to address workplace hazards and apply these concepts to specific workplace problems.
CC10: Know the three ways to reduce or remove a hazard (remove it, policies, PPE).
CC 11: Understand why some methods for controlling hazards are better than others.
Competency 5: Identify emergencies at work and decide on the best ways to address them.
CC12: Identify types of emergencies at work.
CC13: Know the best way to deal with an emergency.
Competency 6: Recognize that employers are responsible for, and workers have the right to, safe and healthy work. Workers also have the responsibility for keeping themselves and coworkers safe.
CC14: Know that employers are responsible for providing a safe and healthy workplace and what government agency enforces child-labor and other work safety and health laws.
CC15: Know that employers are responsible for providing health and safety training.
CC16:Understand that workers also have responsibilities for keeping themselves and co-workers safe.
CC 17: Know that there are child-labor laws to protect teen workers from working too late, too long, and in dangerous jobs and know what agency enforces child-labor laws.
CC18: Know it is illegal for your employer to punish you for reporting a safety problem at work.
CC19: Know the steps you should take if you're injured at work (tell your boss, get medical help, file a claim form).
Competency 7:Find resources that help keep workers safe and healthy on the job.
CC 20: Know how to find information about hazards in the workplace.
CC 21:Know that government agencies can provide information and resources.
Competency 8:Demonstrate how workers can communicate with others—including people in authority roles—to ask questions or report problems or concerns when they feel unsafe or threatened.
CC 22: Understand that workers should speak up and ask questions if they feel unsafe at work.
CC 23: Understand that if they don't feel comfortable talking to their boss, teens should speak with another responsible adult.
CC 24: Know the steps for problem solving.

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TABLE IV

Test-Level and Select Item-Level Statistics Used for NIOSH Talking Safety Assessment

Measure	Brief description
Alpha/KR20 reliability statistic	A measure of internal consistency, or homogeneity of the scale/test. In general, an Alpha greater than 0.90 is excellent, a measure of 0.90–0.80 is good, and a measure of 0.80–0.70 is acceptable.
Standard error measurement	An estimate of the standard deviation of the errors of measurement in the scores. If a student were to take the same test multiple times (without any additional learning between testing sessions), the standard error of measurement would be the standard deviation of the multiple test scores. The smaller the SEm, the more likely the student would attain the same or very similar test scores.
Proportion correct	The proportion or percentage of test takers who answered an item correctly. Extreme values (close to 0.00 or close to1.00) may indicate that the item was too difficult or too easy for the test takers, or that there might be a problem with the item.
Discrimination index	A measure of how well test item discriminates between low and high scorers (i.e., is this item easier for high scorers). Generally, a higher number on this is better than a lower number. To arrive at this statistic, the item analysis program takes the top 27% of scorers, based on total test score, and the bottom 27%, and compares them to each other—subtracts the proportion correct for the low scorers from the proportion correct for the high scorers.