

Final Performance Report

Evaluation of a School-Based Agricultural Health and Safety Curriculum: *Work Safe Work Smart*

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LIST OF ABBREVIATIONS

EQ	Evaluation Questionnaire
HBM	Health Belief Model
IRB	Institutional Review Board
MDH	Minnesota Department of Health
NIOSH	National Institute for Occupational Safety and Health
WSWS	<i>Work Safe Work Smart</i> Curriculum

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ABSTRACT

Background: Agriculture is one of the most hazardous industries in Minnesota and the United States. In rural Minnesota, adolescents are frequently employed in both agricultural and non-agricultural jobs and are injured at a higher rate than older workers. To address this issue, the Minnesota Department of Health previously developed and pilot tested an occupational health and safety curriculum targeted to rural Minnesota adolescents. The *Work Safe Work Smart* curriculum contains nine lessons developed to enhance adolescent knowledge, attitudes, and beliefs related to rural occupational health and safety. The specific goals of this study were to (1) evaluate the effectiveness of the *Work Safe Work Smart* curriculum in rural Minnesota high schools by measuring changes in attitudes and beliefs related to preventative behaviors based on behavior-change theory; (2) identify critical factors for incorporating the curriculum into existing school curricula; and (3) promote dissemination and utilization of the curriculum in rural schools.

Methods: A group-randomized study design was used to evaluate the curriculum. Eligible schools were rural public high schools with ≥ 20 students in each grade. Using a stratified cluster design, schools were randomly selected from within four agricultural regions and three categories of school size. Participating schools within each region and size class were randomly assigned to the intervention or control conditions. The primary evaluation tool was a self-completed student questionnaire that included demographic information; possible covariates (such as farm residency, work history); and components of behavior-change models such as knowledge, intention, perceived benefits, perceived barriers, perceived susceptibility, perceived severity and self-efficacy. A pre-test and two post-tests were used to evaluate outcomes. Following recruitment and teacher training, 18 intervention schools (N=2183) and 20 control schools (N=2568) agreed to participate in the evaluation. Baseline (pre-test) data was collected in the Fall of 2001, preceding curriculum implementation. Post-tests were administered in the Spring and Fall of 2002. Survey items were grouped *a priori* and summed into scores for seven outcome categories for analysis (knowledge, intent, benefits, barriers, susceptibility, severity, and self-efficacy). Statistical analysis was based on mixed linear models with adjustment for baseline (pre-test) values. Secondary analyses examined the curriculum impact by covariates of

gender, race, ethnicity, academic level, farming experience, farm residence, work history, injury history, parental education, and thrill-seeking behaviors. Data from a previous non-randomized study were also analyzed.

Results: All schools remained in the study through the first post-test, but one intervention and two control schools withdrew before the second post-test. Two of the intervention schools were not able to complete the curriculum by the first post-test. Students were exposed to the curriculum primarily through health classes (42%) and careers classes (40%). By Post-Test 1, adolescents exposed to the curriculum demonstrated a statistically significant change in three outcomes. Compared to control students, intervention students showed a greater awareness of their risk of workplace injuries (perceived susceptibility, $p = 0.038$), reported a greater insight of potential life altering workplace injuries (perceived severity, $p \leq 0.001$), and an increased understanding of hazard recognition, labor laws, and workplace injury prevention strategies (increased knowledge, $p = 0.004$). By the second post-test, only one of the seven outcomes (perceived severity, $p=0.025$) remained statistically significant. Secondary analyses indicated that the effectiveness of the intervention was not consistent across various categories of measured covariates. For some outcomes, there was evidence of a greater intervention effect among girls, freshmen (9th graders), those with a parental education beyond high school, non-Hispanics, and those with a reduced frequency of risky behaviors. There was little evidence that intervention effectiveness was associated with farm residence, previous work history, previous farm work, or previous work injury. Data from a previous non-randomized study of the curriculum supported the overall findings. Following completion of the post-tests, over 4,000 copies of the curriculum were distributed on CD-ROM and the curriculum (whole or in parts) was downloaded over 8,000 times from the Minnesota Department of Health web site.

Conclusion: The *Work Safe Work Smart* curriculum was successfully implemented into a variety of existing school curricula in a sample of rural Minnesota high schools. Adolescents exposed to the curriculum demonstrated measurable changes in several outcomes that may be associated with beneficial behaviors in occupational safety and health.

SIGNIFICANT FINDINGS

The primary objective of this project was to conduct a rigorous field evaluation of the implementation and effectiveness of the *Work Safe Work Smart* curriculum in a sample of rural Minnesota high schools. Using a stratified cluster design, schools were randomly selected from within four agricultural regions and three categories of school size. Participating schools within each region and size class were randomly assigned to the intervention or control conditions. The primary evaluation tool was a self-completed student questionnaire that included demographic information; possible covariates (such as farm residency, work history); and multiple items to assess student knowledge, intention, perceived benefits, perceived barriers, perceived susceptibility, perceived severity and self-efficacy. A pre-test and two post-tests were used to evaluate outcomes. Following recruitment and teacher training, 18 intervention schools (N=2183) and 20 control schools (N=2568) agreed to participate in the evaluation.

All schools remained in the study through the first post-test, but one intervention and two control schools withdrew before the second post-test. Two of the intervention schools were not able to complete the curriculum by the first post-test. Students were exposed to the curriculum primarily through health classes (42%) and careers classes (40%).

Aim 1: Evaluate changes in students' knowledge, attitudes and beliefs regarding agricultural/work-related safety behaviors due to the inclusion of the *Work Smart Work Safe* curriculum into existing school curricula.

At the first post-test following completion of the curriculum, adolescents exposed to the curriculum demonstrated a statistically significant change in three outcomes. Compared to control students, intervention students showed a greater awareness of their risk of workplace injuries (perceived susceptibility score, *mean difference* = -0.78, *p* = 0.038), reported a greater insight of potential life altering workplace injuries (perceived severity score, *mean difference* = -0.60; *p* ≤ 0.001), and an increased understanding of hazard recognition, labor laws, and workplace injury prevention strategies (increased knowledge score, *mean difference* = 0.63; *p* =

0.004). By the second post-test, only one of the seven outcomes – perceived severity score (*mean difference = -0.40; p=0.025*) – remained statistically significant.

These overall findings were supported through analysis of data from a previous non-randomized study of this curriculum involving five intervention and six control schools. At the first post-test following completion of curriculum, a statistically significant intervention effect was found for five of the seven outcomes: intent, knowledge, susceptibility, severity, and self-efficacy. Three of these outcomes (knowledge, susceptibility, and severity) were also significant in the present study. Two outcomes – benefits and barriers – were not significantly associated with the intervention in either study. No significant effects remained at the second post-test the following school year.

Secondary analyses indicated that the effectiveness of the intervention in the current study was not consistent across various categories of measured covariates. For some outcomes, there was evidence of a greater intervention effect among girls, freshmen (9th grade), those with a parental education beyond high school, non-Hispanics, and those with a reduced frequency of risky or thrill-seeking behaviors. There was little evidence that farm residence, previous work history, previous farm work, or previous work injury were associated with greater intervention effectiveness.

In a mixed model analysis in which all of the above examined covariates were included in the model, a significant intervention effect in the desired direction was found for two additional outcomes at Post-Test 1: intent (*mean difference = -0.545, p= 0.044*) and barriers (*mean difference = -0.472, p = 0.035*). At Post-Test 2, only severity was significant.

Aim 2: Identify critical factors to incorporating agricultural/work health and safety training (i.e., *Work Smart Work Safe*) into school curricula.

One of the most critical factors to incorporating an occupational health and safety curriculum is evidence of the need for, and effectiveness of, this training. While abundant statistics exist demonstrating work-related risks to young workers and to those working in agriculture, there

was no evidence at the outset of this study that this curriculum could produce any measurable impacts. The findings from this study, however, demonstrate that this curriculum can significantly impact personal knowledge, attitudes, and beliefs that may be associated with preventative behaviors.

Specific findings from this study may be important both for identifying future modifications of the curriculum and for identifying the best opportunities for implementation. For example, it appears that the curriculum may have the most impact on younger students who have had less work experience. This suggests introducing these concepts as early as possible, potentially even at the junior high level, although this would need to be evaluated.

The absence of significant measurable intervention effects the following school year also has implications for implementation. There may be some benefit, for example, to presenting various components of the curriculum over several school years rather than as a single “dose.”

The *Work Safe Work Smart* curriculum was successfully implemented in 18 rural Minnesota high schools. Several factors were identified that were critical to successful recruitment and implementation. One important component to implementation was sufficient flexibility in how the curriculum might be incorporated into other existing curricula. At the risk of having an inconsistent environment (and study protocol) in which the curriculum was implemented, it was necessary to allow schools to determine when and where to fit in all or parts of the curriculum. As demonstrated in this study, the curriculum (or various parts) was not limited to agriculture-related programs, but was incorporated into a spectrum of existing curricula including health, social studies, English, US history, and careers/life work. Some schools offered different components in different classes taught by different teachers.

Another issue likely to be critical to incorporation of this curriculum is how that curriculum addresses state or federal education/graduation standards. A considerable effort was made to ascertain and demonstrate to schools how this curriculum could fulfill various education standards (as of 2000). A table included in the curriculum lists national standards and how they relate to each lesson (p. xvi, Appendix A). This was quite important to teachers and schools since

new Minnesota standards were being phased in at that time and many schools were already burdened with determining how their existing curricula could fulfill various standards.

Aim 3: Establish ongoing statewide support for incorporating agricultural/work health and safety curricula within rural schools

Teacher training is probably an important component to acceptance and ongoing implementation, but this study did not fully address that issue since training was a required part of the protocol and not a variable to be evaluated. Free training workshops were offered to all participating schools at the conclusion of the study, but there was little response to this solicitation. This suggests that other modes of teacher training might be considered such as training videos or multimedia presentations on CD-ROM or even through a web site.

As part of a curriculum dissemination strategy, the curriculum was made available in three modes: the original three-ring binder hard copy, CD-ROM, and via the Minnesota Department of Health web site. Following completion of the post-tests, over 4,000 copies of the curriculum were distributed on CD-ROM and the curriculum (whole or in parts) was downloaded over 8,000 times from the Minnesota Department of Health web site.

USEFULNESS OF FINDINGS

The ultimate goal of an occupational health and safety curriculum is to reduce work-related injuries and illnesses. This study was not designed to measure those outcomes. However, there is a substantial literature that suggests that healthier behaviors are associated with certain knowledge, attitudes, and beliefs. Behavior-change theories such as the health belief model have identified a number of factors (such as perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and self-efficacy) as important to adopting healthier behaviors. The curriculum was designed to address these concepts in an occupational context, and the evaluation methods in this study were designed to measure changes in these factors. The findings demonstrated that the *Work Safe Work Smart* curriculum, under real-world conditions, did produce significant, if limited, impacts on several of these constructs.

The absence of an impact on two components of the health belief model in either of the two analyzed data sets (perceived benefits and perceived barriers) suggests that either these constructs were not adequately measured or that the curriculum did not address these concepts sufficiently. This may be an area for future revisions of the curriculum.

While significant changes were found at the first post-test which was administered following completion of the curriculum, there was little measurable change at the second post-test given near the start of the following school year. Taken at face value, this finding suggests the need for ongoing exposure to concepts of occupational safety and health. One possible way to address this issue may be to present components of the curriculum over several years, perhaps in several classes, rather than as a single block. In two schools in this study, this approach was in fact taken. Although teachers were limited to a single grade level, some schools implemented portions of the curriculum in different classes taught by different teachers (e.g. hazard recognition lessons in health class, while labor laws in civics or history class).

Although *Work Safe Work Smart* was initially being developed to address only agricultural work hazards, it was ultimately necessary to broaden its applicability to the rural community, and

encompass both agricultural and non-agricultural workplaces. This repositioning of the curriculum, supported by focus groups and teachers, was an important recognition that rural Minnesota youths – and presumably adolescents in other farming states – regardless of whether they live on a farm, are often involved in both farming and non-farming jobs. This curriculum reaches youth at a time when they are starting to work at multiple jobs both on and off the farm and are at increasing risk of agricultural and non-agricultural work-related injury. Furthermore, MDH data have shown that students do not decrease their hours of farm work as they move into the workplace, rather, they take on non-agricultural work in addition to maintaining their more traditional farm activities. We believe that this curriculum may be particularly applicable to rural adolescents.

This study provides some indication of the possible interest in an occupational health and safety curriculum for adolescents. Full-scale dissemination began in September 2003 when electronic versions (pdf format) of the curriculum became available on CD-ROM and via the MDH web site. Both modes contained the full curriculum as well as separate lessons. All modes of distribution were (and remain) free and without restriction for educational use. Over the following year, over 4,000 CDs were distributed (mostly through the Department of Education) and there were over 8,000 downloads from the web site. Unfortunately, we have no statistics or follow-up data on use or implementation of the curriculum. In 2005, we expect to obtain some feedback via our web page and through a planned communication to all the schools that participated in this effort.

INTRODUCTION and BACKGROUND

Farming has been consistently identified as one of Minnesota's most hazardous occupations (Zaidman 2004). Minnesota Fatality Assessment and Control Evaluation (MN FACE) program has documented serious ongoing injury hazards associated with tractor use (Brown et al. 1997), augers (Boyle et al. 1995), grain bins (Boyle et al. 1996), and manure pits (Madery and Parker 1993) in Minnesota. Farm work has also been consistently related to child injury-related deaths (Parker and Wahl 1999). From 1999 through 2000, MN FACE documented seven agricultural work related deaths in youth 10-18 years old with 88% between the ages of 13 and 18 years.

Census data indicate that approximately 100,000 adolescents between 14 and 18 years of age reside in rural Minnesota counties. In these rural counties, many adolescents live on and/or work on farms or agribusinesses and are potentially exposed to agricultural hazards. In a survey of six rural Minnesota high schools, Parker and colleagues found that up to 45% of male high school students and 21% female students had had some farm work (Parker et al. 2002). In addition, many rural students also had non-farm jobs (Munshi et al. 2002). Thus, rural Minnesota adolescents who live on a farm may have jobs on and off the farm and adolescents who do not live on a farm may be employed in farming as well as non-farming jobs. Other surveys have shown that approximately 80% of high school students work at some point during their high school years (Runyan and Zakocs 2000).

Development of the *Work Safe Work Smart* Curriculum

The *Work Safe Work Smart* curriculum evaluated in the present study was developed and pilot tested by the Minnesota Department of Health in a previous NIOSH-funded effort (NIOSH Grant R01CCR514360, 1997-2001, "Enhancing Agricultural Safety and Health Through Education", David Parker, MD, PI; Teresa Hillmer, PhD, Project Director). Since that study has not been previously published, a brief summary of the curriculum development is presented here.

Despite a number of federal and state laws such as the Fair Labor Standards Act that limit the types of work that youth under age 18 can perform, many adolescents are at risk of occupational injuries. Many contributing factors have been identified or suggested such as the types of jobs youth frequently hold, the lack of training, and lack of supervision (National Research Council 1998; Runyan and Zakocs 2000). Although educational interventions have frequently been recommended as one approach to address this problem (NIOSH 1999; NIOSH 2003), surprisingly few educational interventions for teen workers have been evaluated and reported (Runyan and Zakocs 2000).

The development of an educational intervention for rural Minnesota youth that would encompass agricultural (and other occupational) health and safety concepts was initiated in 1997 with support from a previous grant from NIOSH. That grant funded the Minnesota Department of Health to develop and pilot test a school-based agricultural health and safety curriculum and evaluate its performance and implementation.

With NIOSH support the *Work Safe Work Smart (WSWS)* curriculum was created with the assistance of a Curriculum Development Team, comprised of an epidemiologist, an occupational medicine physician, a health educator, a curriculum writer, high school agricultural education teachers, a public health nurse, and a high school administrator. Most of the team was from rural Minnesota counties. Students from three rural high schools also participated in focus groups to provide valuable information used in curriculum development. Representatives from the Minnesota Department of Labor and Industry, the Minnesota Department of Children, Family and Learning (now known as the Department of Education), and Agricultural Extension at the University of Minnesota supplied additional input for specific parts of the curriculum. The few curricula that were available at that time (California, Massachusetts) were reviewed for concepts and examples that could be adapted for *WSWS*.

The curriculum was designed for adolescents and included educational components familiar to teaching professionals in each lesson (e.g., key concepts, learner outcomes). The nine-lesson curriculum consists of topics such as agricultural hazard recognition, injury prevention strategies,

child labor laws, and the communication skills needed to discuss agricultural and other work-related safety concerns (Appendix A; also available at the MDH web page at: <http://www.health.state.mn.us/divs/hpcd/cdee/occhealth/index.html>).

WSWS was designed to provide students with the ability to resolve diverse health and safety issues in a variety of agricultural and work settings with the intent that skills taught in this curriculum would remain with them throughout their adult working lives.

The primary aim of the curriculum is to promote safe work-related behaviors by impacting attitudes and knowledge that are associated with safe behavior. Improvement in the students' confidence in their ability to contribute to the creation of a safe work environment is also an important goal of the curriculum. Additionally, the curriculum could potentially fill a need for rural Minnesota schools that do not have educational materials to promote agricultural and work health and safety.

For the pilot study of the *Work Safe Work Smart* curriculum, eleven schools in three rural Minnesota counties (Meeker, McLeod, Sibley) administered an outcome evaluation survey as a pretest to all ninth and tenth grade students. This survey was developed to evaluate knowledge, intent, and other predictors of future behavior based on components of the health belief model such as perceived risks, benefits, susceptibility, etc.(Strecher and Rosenstock 1997; Gielen and Sleet 2003). This instrument was developed with the help of a behavioral epidemiologist. MDH staff (health educator and an epidemiologist) taught the curriculum to teachers in the five intervention sites that implemented *WSWS* at their schools. All ninth and tenth graders at the five intervention sites (N=856) were taught *WSWS* from January through March 2000. Trained observers monitored *WSWS* implementation for each lesson, completing checklists to document various aspects of the implementation. The remaining six participating schools did not implement the curriculum and served as controls (N=1357). After the curriculum was taught, the outcome evaluation tool was again administered in all eleven schools to evaluate the change in the students' scores in the intervention schools compared to the control schools. A second post-test in all 11 schools was administered at the start of the following school year (September 2000) to measure longer-term changes due to the curriculum. Data from the pre-tests and post-tests

were not fully analyzed or reported before the conclusion of that project due to the absence of the Principal Investigator and the Project Director during the final months of the grant. (These data were subsequently analyzed and compared to findings from the current project.)

The pilot implementation of the *Work Safe Work Smart* curriculum in the 1999-2000 school year was successfully completed in five rural schools. Teachers who taught the curriculum supported future inclusion of *Work Safe Work Smart* into their school's standard curricula. In addition, a useful evaluation survey had been developed to measure outcomes predictive of future behavior. Both the curriculum and the evaluation survey (with minor changes) were utilized in the present project.

Even with a completed data analysis, several factors would limit the interpretation of the outcome evaluation in that pilot study. First, schools were not randomly assigned into an intervention or control group. Five schools involved with the study from the beginning of the grant period participated as intervention schools. Six additional schools were subsequently recruited to serve as control sites. This methodology could lead to uncertainty regarding comparability between control and intervention groups. Second, the sample size for this study is very small (n=11 schools), thus limiting its power. Third, this study was undertaken in three adjacent counties. These counties were not representative of Minnesota's diverse agricultural, socio-economic, or minority populations. Therefore results seen in schools in these counties may not be generalizable to schools in other areas of Minnesota, and by inference, broader geographic regions of the United States. Finally, the curriculum was not widely disseminated or conveniently available (it only existed in hardcopy) to rural schools in Minnesota or elsewhere.

Background of the Present Curriculum Evaluation

As noted above, there were a number of limitations of the previous development grant. Furthermore, previous research aimed at identifying effective intervention strategies in the occupational setting have been limited due to failure to apply the principles of rigorous scientific study design, lack of a theoretical framework, and relatively small sample sizes (Goldenhar and Schulte 1994). Consequently, it was important to further evaluate the *WSWS* curriculum and its

potential to change predictors of work-related safety behavior. That opportunity presented itself with the award of the present NIOSH grant in 2000 (NIOSH R01OH004220, 2000-2004). A more rigorous study design was proposed, including a larger sample of schools of various sizes selected from different regions of the state and randomization into intervention and control groups.

At the outset of this project, there had been few evaluations of school-based agricultural or work health and safety education programs (National Research Council 1998; Runyan and Zakocs 2000). Work safety curricula had been developed by groups in California and Massachusetts. However, the Massachusetts curriculum was not developed for rural agricultural communities (NIOSH 1999) and had not had the benefit of outcome evaluation. An evaluation of an agricultural-related curriculum in 2003 in California involved a very small sample size (Ron Strohlic, pers. communication). In another small published controlled trial of an occupational health curriculum among 11th grade students, the 96 intervention students performed better on post-tests than the 100 control students (Lerman et al. 1998). Recently, Reed and colleagues have reported positive changes in teen behaviors on farms following exposure to the AgDARE high school curriculum (Reed et al. 2001; Reed et al. 2003).

Tailored (site and problem specific) interventions have been adopted to effectively change individual health behaviors such as smoking, diet, and breast cancer screening (Rimer et al. 1992; Curry et al. 1993; Skinner et al. 1994). Similarly, the use of tailored interventions has been undertaken to develop worker safety-training programs (Marcus et al. 1986); however these interventions have not focused on adolescent workers nor have they attempted to integrate work health and safety into existing educational programs within schools in diverse rural communities.

There is ample evidence that school-based interventions may be successful in the areas of drug and tobacco use (Bruvold 1993; Perry et al. 2003), diet and exercise (Perry et al. 1990), and other high-risk behaviors (Weissberg and Elias 1993). The integration of school-based health education into programs that target multiple outcomes has been shown to positively impact youth behavior and increase critical thinking skills, enabling them to resolve a variety of health-related problems in partnership with their peers and adults (Elias and Kress 1994). The efficacy of

strategies to teach adolescents about farm and/or work safety, however, has not been rigorously evaluated.

While adolescent training and supervision to promote work safety is important in order to help develop safe work habits (Aherin et al. 1990), the United States Department of Health and Human Services concluded from a review of over two hundred childhood injury prevention programs, that a variety of teaching mechanisms should be used in health and safety educational programs. However, none of these programs addressed agricultural health and safety.

Specific Aims

NIOSH Strategic Goals call for the development, implementation and evaluation of injury prevention strategies. The National Occupational Research Agenda (NORA) calls for research to determine the efficacy and effectiveness of intervention techniques and strategies. Among the strategies recommended under NORA is “information dissemination and health communication practices” as well as “safety and health training.” An increase in high quality school-based programs is called for in Healthy People 2000. The purpose of these programs is to help children acquire developmentally appropriate knowledge, attitudes, and skills, which enable them to avoid high-risk behaviors (Weissberg and Elias 1993). In addition, the United States Department of Labor notes, “School-to-Work practitioners are constantly searching for new ways to address the growing and changing needs of their school-to-work systems” (NIOSH 1999).

The purpose of this research is to evaluate the *Work Safe Work Smart* health and safety curriculum, which was designed to provide rural students with the ability to understand diverse agricultural and occupational health and safety issues in a variety of settings. The primary hypothesis of this study is that a beneficial change in the predictors of safe behaviors (e.g., perceived susceptibility to injury, barriers and benefits to safe behavior) regarding agricultural work-related injury will be greater among rural youth exposed to the curriculum compared to their non-exposed peers. The underlying assumption is that these changes will lead to a reduction in preventable injury.

The specific aims of this study were to:

1. Evaluate changes in students' knowledge, attitudes and beliefs regarding agricultural/work-related safety behaviors due to the inclusion of the *Work Smart Work Safe* curriculum into existing school curricula;
2. Identify critical factors to incorporating agricultural/work health and safety training (i.e., *Work Smart Work Safe*) into school curricula; and
3. Establish ongoing statewide support for incorporating agricultural/work health and safety curricula within rural schools.

METHODS

The *Work Safe Work Smart* curriculum (Appendix A) was developed and pilot tested in three rural Minnesota counties during a previous NIOSH-funded project (1997-2001). The nine-lesson curriculum was designed to provide students with the ability to resolve diverse health and safety issues in a variety of agricultural and non-agricultural work settings. The primary objective of the current project was to evaluate the impact of the curriculum on knowledge, attitudes, and beliefs associated with preventative health behaviors. A group-randomized design was used to evaluate the impact of the *Work Smart Work Safe* curriculum among adolescents in four agricultural regions of Minnesota. Using a stratified cluster design, schools were randomly selected within regions and by school size. Participating schools within each region and size class were randomly assigned to the intervention or control conditions. A pre-test and two post-tests were used to evaluate outcomes. Given adequate sample size, inferences based on the results of such studies can be as strong as those from randomized clinical trials (Murray 1998). Therefore, this design is the optimal choice for occupational health intervention effectiveness (Zwerling et al. 1997).

“Youth at Work” Partnership

The current WSWS curriculum evaluation grant was awarded to the Minnesota Department of Health at the same time (Fall 2000) that another NIOSH-funded grant was awarded, “Childhood Agricultural Trauma and Asthma Evaluation System (CATES),” (R01OH004265). The primary goal of the second grant was to use survey-based in-school surveillance methods to collect information on work activities, asthma, injury occurrence, and risk factors related to injury or asthma in a cohort of rural Minnesota adolescents attending public high schools. The Principal Investigators, project directors, and other key staff were in the same unit of the MDH (Center for Occupational Health and Safety), and several staff had roles on both projects.

Due to the shared target population, the anticipated difficulty in attempting to recruit rural high schools from around a very large state for two projects, careful consideration was given at the outset of these projects as to whether, or how, they could share and/or collaborate on various

components of the projects such as sample selection, recruitment, and other administrative activities (e.g. school and printing contracts). After careful review of each project's objectives, proposed methodologies, sample size requirements, etc., MDH project staff and researchers from the University of Minnesota School of Public Health determined that utilizing a common protocol for sample selection and recruitment and certain other administrative tasks were technically feasible and would reduce time and costs. It was also decided to represent both projects under a single unifying theme. This theme became: "*Youth at Work: A Partnership for Adolescent Work Safety.*" A *Youth at Work* logo was developed and was used on all communications to schools and other collaborators. Schools were invited to participate in the *Youth at Work* project, described as having two components: (1) a curriculum evaluation and (2) an injury, asthma, and work experience survey. Both projects would involve surveys administered over two academic years. A *Youth at Work* recruitment fact sheet is shown in Appendix C.

Advisory Board

An Advisory Board was formed consisting of professionals from agricultural education, health education, school administration, epidemiology and occupational health and safety (Acknowledgments). Specific functions of the Advisory Board included: promoting the *WSWS* curriculum (Appendix A) and study to state, regional and community entities; identifying possible key personnel in each school; determining how and when to contact these individuals; and assisting the study investigators in preparing recruitment materials. The board met a total of five times from December 2000 through November 2002.

Evaluation Questionnaires (pre-test and post-tests)

As with the curriculum, the EQs (student evaluation questionnaires) used in this study had been developed and pilot tested in the previous *WSWS* pilot test grant (CDC/NIOSH R01CCR514360). Only minor changes to the questionnaire (Appendix B) were made for this investigation. The identical instrument was used in the pre-test and both post-tests. The self-completed instrument was designed to collect the following categories of information: basic

demographic information (age, grade, race, gender, ethnicity); other possible cofactors related to outcomes (farm residence, ever worked, ever injured, parental education, risk-taking behavior); knowledge of several occupational health and safety concepts; intent to follow safe work practices; and attitudes and beliefs that may be predictors of future behavior according to the health belief model (HBM) including perceived benefits, barriers, personal susceptibility, severity, and self-efficacy. Tables 1 and 2 show questionnaire items related to components of the HBM and to knowledge and intent. True/False and Likert scales were used to score survey questions. Scores were summed within each construct to create outcome variables. Reliability of the constructs was evaluated using Cronbach's alpha based on pre-test data.

Sample Selection

Eligibility criteria of schools included the following characteristics: (1) a public high school; (2) at least 20 students in each of grades 9 through 12; (3) located in a rural county as defined in the United States Department of Agriculture (USDA) Urban-Rural Continuum Codes for Metropolitan and Non-metropolitan Counties (Butler and Beal 1994); and (4) not located in Meeker, McLeod or Sibley counties (sites from the pilot test of *WSWS*). Because farm hazards vary based on the type of farming, students working within different types of agricultural environments may have different work experiences and responded differently to the *WSWS* curriculum. Therefore, it was decided to identify major agricultural regions within the state and to stratify on these regions in school selection. Information from the Minnesota Department of Agriculture was used to identify the top ten counties producing each of Minnesota's major agricultural products (e.g., dairy, swine, sugar beets). These counties were subsequently mapped by agricultural product into four geographic regions as follows: Region 1) swine, corn, and soybeans; Region 2) dairy and poultry; Region 3) forestry and wild rice; and Region 4) sugar beets and small grains such as wheat (Figure 1).

A list of all Minnesota public high schools was obtained from the Minnesota Department of Education (formerly known as the Department of Children, Families, and Learning). Based on the eligibility criteria, it was determined that 190 rural high schools met the initial eligibility

criteria. General characteristics and student populations of these schools by region and grade are shown in Table 3.

In addition to region, school size (enrollment) was postulated to be a potential factor related to various outcomes. For example, school size might impact how the curriculum was implemented. In addition, it was believed that including a more representative range of school sizes might enhance the study inferences. Thus, a size stratum based on student population was established as follows:

Stratum 1 (small): 90-169 students;

Stratum 2 (medium): 170-560 students; and

Stratum 3 (large): 561-1600 students.

Within each of these four agricultural regions, power calculations suggested that ten schools would need to be selected and randomized into five intervention and five control conditions for a total of 40 schools. School selection then proceeded as follows. All eligible schools were first assigned a random number. Schools were then sorted in ascending order by region, then size, and random number. Next, schools within a region and stratum were randomized to an intervention or control status. . The first schools encountered in each region and stratum (starting with the smallest random number) were approached for recruitment into *Youth at Work*. If a school refused, the next (randomly sequenced) school in that region and stratum was approached until the complement of schools for each region and stratum was filled. Schools did not know whether they would be an intervention or control school before they agreed to participate. For each region, the goal was to recruit four small schools (stratum 1), four medium schools (stratum 2) and two large schools (stratum 3). (One additional school would be recruited from Region 4 for the CATES study only.) School selection and participation status is shown in Table 4. A summary of refusals was maintained and is shown in Table 5.

School Recruitment

Since each school district and each school was unique, a multi-pronged flexible recruitment strategy was developed in order to optimize participation. The MDH worked extensively with

the Advisory board and the Minnesota School-to-Work program to develop strategies that reduced potential barriers to study participation. For example, both intervention and control schools received financial support to offset the costs of implementation (e.g., curriculum, pre/post tests). This support varied depending on whether the school was an intervention or control school and whether they were participating in both *Youth at Work* studies. Generally, during the first school year (when the curriculum was taught), control schools received \$500 and intervention schools \$3,000. During the second year (in which only surveys were administered), most schools received either \$1,500 or \$2,500, depending on the number of surveys (post-test 2 and up to three CATES surveys).

Two benefits promoted during recruitment to encourage participation in this study included: (1) WSWS as a tool to provide formative work toward meeting National Education and Minnesota graduation standards, and (2) teachers were given training in the use of an agricultural education curriculum. These strategies were implemented to decrease possible participation barriers such as limited class time for existing curricula, new material preparation time, and completion of graduation standards.

As previously noted, a single school recruitment protocol was developed for two concurrent grants under the “Youth at Work” project. Recruitment began with a letter (Appendix C) from the Commissioner of Health to schools outlining Youth at Work goals and an invitation to participate, followed by phone calls from Advisory Group members and project staff to assess potential participation and arrange follow up school site interviews (Figure 2).

Two MDH staff (the original co-PI of this grant and the original PI of the CATES grant) directed recruitment efforts from January through June 2001, logging approximately 6,500 miles in travel to meet with school administrators and potential teachers.

Significant differences in the way schools design and implement their curricula encouraged a protocol by which each intervention school devised an implementation plan that worked best for its staff and students. The advantages of this approach were twofold. First, it allowed schools to select the most appropriate grade level, classes, and teachers for implementation and secondly, it

reflected the way implementation of the curriculum would occur naturally in the schools. School administrators and teachers decided which staff had the most interest in teaching the curriculum and would therefore be the most appropriate for implementation. Classes suggested for implementation were required courses such as health, social studies, English (speech), career development, and history. Schools could not select 12th grade students for implementation since those students would not be available for the second post-test the following school year.

Intervention schools agreed to expose all students in the selected grade level of intervention to the curriculum. It was important to include all intervention grade students in the study, not just subgroups (e.g., agricultural education, advanced placement). Characteristics of subgroups of students in a school could differ between schools and from the general student body in ways that could have influenced changes in outcome measures and introduced bias into the evaluation.

IRB and FWA Agreements

The study protocol was approved by the Minnesota Department of Health Institutional Review Board (IRB) at the outset of the study. Annual review and renewal by the IRB was obtained and submitted to NIOSH with the annual progress reports.

A designated administrative representative from each participating school completed a Federal Wide Assurance agreement as well as a signed participation agreement regarding their willingness to abide by these criteria and assuring teacher participation (Appendix E).

Teacher Training

Prior to the beginning of school in September 2001, 30 educators who were designated by their schools to teach *WSWS* during the upcoming school year attended a one-day training session offered in their geographic region. Study investigators (i.e., injury epidemiologist and project director), a Department of Labor and Industry specialist in child labor laws and when available, a community member injured on the farm, facilitated training sessions. The trainings consisted of the following: (1) a discussion given by a community member who was injured on the farm, (2)

background on the public health approach to injury prevention and agricultural safety, (3) demonstrations of hands-on use for all nine lessons of the curriculum and its activities (e.g., hazard mapping, role playing), (4) review of child labor laws, (5) descriptions of the extent of farm/work-related injury, and (6) the relevancy of this curriculum to student education.

Training took place at central locations in three of the four regions. Two make-up sessions were offered in Minneapolis for those unable to attend regional training. All training sessions provided participants with an opportunity to discuss with designers of the curriculum and their colleagues, WSWs teaching strategies and concerns. A three-ring binder of the curriculum, and a certificate of completion were provided to each participant. Snacks, beverages and lunch were provided at each session. Dates for regional training sessions were determined by consensus of participating teachers in a region. The Advisory Board took the necessary steps to provide Continuing Education Units to participating teachers in order to enhance attendance.

Study Implementation

To eliminate manual data entry, its associated errors, and facilitate accuracy during implementation and analysis, the evaluation instrument (Appendix B) was printed on machine-readable forms in three distinct colors. To track participation over time, evaluation questionnaires (EQ) were printed with unique document sequence numbers and a perforated detachable cover sheet. While only one evaluation instrument was used, a different color-coded EQ was used for each study timeframe. To eliminate issues of storage of three sets of EQs on site for participating schools, EQs were labeled and stored at MDH. Mailings to schools took place in Fall 2001, Spring 2002 and Fall 2002.

In August 2001, all schools submitted to study investigators student rosters for the Fall 2001 term. These rosters were used to create labels for the EQs. To insure privacy while maintaining individual participation tracking, the name of the school, student and current grade were labeled on the cover sheet. Written instructions to remove cover sheets and maintain a cover sheet file on site were sent to each school with the first shipment of EQs. Contract designated school liaisons mailed completed EQs back to MDH.

At intervention sites, *WSWS* pre-tests were administered prior to curriculum implementation. After the pre-test was given, teachers implemented the nine-lesson curriculum, at their discretion, between October and May of the 2001-2002 academic school year. *WSWS* lessons were approximately fifty minutes in length and included topics such as agricultural hazard recognition, injury prevention strategies, child labor laws, and communication skills needed to positively discuss agricultural/work-related safety concerns. Examples from the community and from students' experiences were used throughout to demonstrate relevancy of topics. Key concepts and associated learner outcomes were included in each lesson. Control sites did not implement the curriculum but did administer the pre-test according to site convenience. Both intervention and control schools administered the same questionnaire again (Post-test 1) near the end of the same (2001-2002) school year and again (Post-test 2) during the Fall semester of the following school year (2002-2003).

Data Entry and Management

As noted above, machine-readable forms were utilized for the student EQs. An independent contractor scanned completed EQs and created electronic data sets for MDH editing, coding, and analysis. Project staff worked closely with the scanning contractor to develop appropriate scanning logic and protocols. To ensure data quality and validity, a data quality test was conducted prior to full-scale scanning comparing data from 200 surveys that were scanned to data from the same surveys that had been manually entered (double keyed). This quality assurance evaluation resulted in several minor modifications to the scanning and pre-processing programs and demonstrates a very high level of accuracy for data entry via scanning.

A working data dictionary was created to determine scanning criteria and the creation of three, time dependent, electronic raw data sets. Data editing programs were developed by MDH staff to check for consistency of responses (e.g., grade, gender), skip patterns, missing data, multiple responses, and numeric consistency of dates (e.g., age, test date).

Following data editing and coding for the pre-test, a widely used measure of reliability (Cronbach's alpha) was used to verify the internal consistency of EQ questions within the outcome categories.

This study is a group-randomized trial using a nested cohort design with schools as the unit of randomization. Statistical analysis was performed using mixed linear model methods of the Statistical Analysis System (SAS Institute Inc, 1999-2001). Primary analysis of each Post-Test (1 and 2) was implemented with regression adjustment for baseline (pre-test) values (Murray 1998). The mixed model analysis was adjusted for region and school size, with school included as a random effect. Secondary analysis examined the outcomes by potential mediating variables including gender, race, ethnicity, academic level, farming experience, farm residence, work history, injury history, thrill seeking and excitement behavior, as well as parental education.

Because the original pilot test of the curriculum used an almost identical survey instrument and administered both pre-tests and two post-tests to intervention and control schools, a limited analysis of those data were undertaken as an additional comparison to the findings of the present study.

RESULTS

School Recruitment and Retention

The outcome of school selection and recruitment is presented in Table 4. This table lists the order of recruitment, region, stratum, and final status of participating schools at baseline. After recruitment, 66% (41) of the 62 schools actively recruited agreed to participate with 3 (7%) schools agreeing to participate in the CATES study only and 1 (2%) school agreeing to participate in *WSWS* only. By July 2001, 39 schools had agreed to participate in the *WSWS* evaluation. One school initially agreeing to participate in both studies was subsequently randomized into an intervention category for *WSWS* but withdrew from both studies prior to *WSWS* teacher training in August 2001 due to personnel cuts. After randomization and teacher training, 38 schools comprised the *WSWS* study sample of 4751 eligible students at 18 intervention and 20 control sites. Regions “1”, “2”, and “4” had full complements of five intervention sites matched by region and stratum to five control sites. Region “3” had three matched intervention/control sites and two unmatched control sites.

The reasons for schools refusing to participate in the *Youth at Work* project are given in Table 5. In summary, 33% refused participation due to financial cuts and layoffs, 33% for “no specific” reason, 14% said “too busy”, 10% said “too many surveys”, and 10% had incompatible schedules. Because randomization identified schools from parallel school districts, financial cuts and personnel layoffs were seen as comparable for participating and refusal schools.

No schools withdrew their participation during the first year of implementation (2001-2002) in which the pretest and first post-test were administered and the curriculum taught (in intervention schools). However, during the second year (2002-2003), three schools withdrew from the study prior to administering post-test 2. One intervention and the matching control site from Region “2” plus one unmatched control site from Region “3” withdrew due to loss of personnel and changes in their scheduling.

Teacher Training and *WSWS* Implementation

Thirty teachers representing 18 intervention schools attended a one-day training session and completed a training evaluation survey. Immediately following training, participants answered 5 statements on a scale of 1 to 5 with “1” indicating they “Strongly Disagree” and “5” indicating they “Strongly Agree”. Overall, teacher responses to the training were strongly positive. To the statement, “My comprehension of workplace health & safety has improved as a result of this training”, 67% strongly agreed, 30% agreed, and 3% disagreed. To the statement, “The child labor law presentation contributed to my knowledge of the material”, 67% strongly agreed, 27% agreed, 3% were neutral, and 3% strongly disagreed. To the statement, “As a result of this training I feel confident teaching this curriculum”, 50% strongly agreed, 47% agreed, and 3% were neutral. To the statement, “I understand how the Work Safe Work Smart curriculum fits into what I teach”, 60% strongly agreed, 33% agreed, 7% were neutral and finally, 67% strongly agreed, 30% agreed, and 3% were neutral to the statement, “This topic is relevant to the students I teach”.

In the designated grade levels for each intervention school, a total of 1854 students were registered as of Fall 2001. The average number of students participating per school was 103 with a range of 34-348 students per school. The curriculum was taught over time frames of 1-20 weeks, with an average implementation of 8 weeks (Table 6). Since it was not feasible to use in-school observers to evaluate implementation and student participation (as used in the *WSWS* pilot test), self-reported Teacher checklists (Appendix G) were given to teachers to complete following completion of each lesson; these checklists were to be submitted to MDH following completion of the curriculum. Checklists verified total lessons taught as well as module completion within each lesson. Checklists were submitted by 97% (29/30) of the teachers implementing *WSWS*. All nine *WSWS* lessons were completed as outlined in teacher training without significant modification at 89% (16/18) of the intervention sites (Table 6). Noted in this monitoring was one large stratum intervention site (school “A”) teaching 33% of the curriculum (Lessons 1-3) and another large intervention site (school “B”) teaching 44% of the curriculum (Lessons 1-4). When these implementation teachers were asked about thoroughness and completion of modules taught, school “A” stated “they were unaware of the checklists and had

not completed them”. School “B” submitted checklists for the first 4 lessons stating no other lessons were taught. Both schools stated remaining modules were not completed due to insufficient time to fully incorporate WSWs into their existing curricula.

Teachers were also requested to complete checklists to rate their level of comfort in teaching the material for each lesson on a scale of 1-7 with “1” indicating they were “Not at all comfortable” and “7” indicating they were “Extremely comfortable”. Per these checklists, the overall average teacher comfort level was “6” with Lesson “1” (*An Introduction to Worker Safety*), Lesson “2” (*Recognizing Workplace Hazards*), Lesson “3” (*Preventing Workplace Injuries and Illnesses*), Lesson “4” (*Applying Prevention Strategies in the Workplace – Part I*), Lesson “5” (*Applying Prevention Strategies in the Workplace – Part II*), Lesson “6” (*The Importance of Worker Safety Laws*), Lesson “7” (*Worker Safety Laws and You*) and Lesson “9” (*Putting Work Safety into Practice*) all averaging a rating of “6”. Lesson “8” (*Addressing Unsafe Workplace Conditions*) had the lowest teacher comfort rating of “5”.

Another aspect of the teacher checklist allowed teachers to rate student participation for each lesson on a scale of 1-7 with “1” indicating “No Participation” by the students and “7” indicating “Very High Participation” by the students. The average teacher-reported student participation was “5”. Lesson “3” (*Preventing Workplace Injuries and Illnesses*) received the lowest student participation rating of “4” while Lesson “7” (*Worker Safety Laws and You*) received the highest rating of “6”.

Incorporation of WSWs into Existing Curricula

Classes chosen by schools for implementation included Civics, English, Health, American History, and Careers (Table 6). Eighty-two per cent of students participating in the WSWs curriculum training did so in either Health or Careers classes. Health classes were the most common type of class to integrate WSWs into existing curricula representing 42% (772) of participating students. Careers classes were the next most popular setting with 40% (738). While most schools implemented WSWs with one teacher in one type of class, two schools chose multiple teachers to divide the curriculum content over multiple class types. Specifically one

school chose to implement *WSWS* with four teachers in English, Health or History class while another school utilized two teachers in either a Health or History class.

Student Participation

Student rosters from the schools just prior to the start of the school year showed 2183 students in the intervention schools in the grades chosen for intervention, and 2568 students in the control schools in the corresponding grades. The smallest school had 29 potential participants while the largest school had 466 potential participants.

As per the original study design, data on student movement (e.g., absenteeism, transfers, drop outs) during the study was requested from each school to follow-up with individual students as well as compare similarities and differences between schools. The completeness of this information from all schools and at each test period was not consistent and is not utilizable for follow-up or comparison. However, data are shown in Table 7 for the pre-test to illustrate the inconsistent reporting by schools. These tables show participation rates and reasons for non-participation as provided by the schools for the pretest. While some schools could provide explanations for 100% of the non-participants, other schools were not able to provide explanations for any of their non-participants. Of the reasons for non-participation that were provided, the two most common were absences (25% of total missing) and “no longer enrolled” as of the survey date (18% of missing).

Fortunately, participation in the pre-test was high for almost all schools, ranging from 64% to 100%. Of the 38 schools, 23 had participation rates over 90%. Pre-test participation was 85% overall for the 18 intervention schools, and 84% overall for the 20 control schools. The overall participation was 84.7% for all schools. (These percentages would be very slightly higher if the original number of enrollees were reduced by the number of students not enrolled at the time of the survey.)

As a closed cohort, only students who were eligible for the pre-test would be eligible for Post-tests 1 and 2. Participation rates could be measured two ways for post-tests: as a proportion of the original enrollees (such as when calculating pre-test participation) or as a proportion of those who completed the pre-test (i.e., an approximate retention rate). Table 8 shows participation rates

for all three test cycles (pre-test, post-test 1, post-test 2) using the original enrollees as the denominator while Table 9 shows post-test “retention” rates as a proportion of the pre-test. Post-Test participation as a percent of original enrollees (Table 8) was remained fairly high at the first Post-Test with 77.3% of intervention and 76.2% of control students participating, with a range of 63% to 100% for individual schools. Calculated as a retention rate (proportion of pre-test surveys), the participation was 90.9% for intervention schools and 90.3% for control schools. A few retention rates for individual schools were over 100%, indicating that some students who missed the Pre-Test were present for the Post-Test. As previously noted, no entire schools dropped out of the study prior to the first post-test, generally administered during the spring semester of 2001-2002 school year. Consequently, despite the fact that it was spring, a high participation rate was realized.

A decline in participation did occur for the second post-test, given in the fall semester of the following school year (2002-2003). This decline was due almost entirely to the loss of three entire schools. As previously noted, three schools (one intervention and two control) indicated they could no longer participate in the *Youth at Work* project the following school year (2002-2003) due to loss of staff and scheduling changes. Unfortunately, these schools had a combined pre-study enrollment of 1141 students in the targeted grades. Consequently, for post-test 2, participation was 62.2% for intervention and 55.4% for control schools as a proportion of original enrollees. Calculated as a retention rate, participation was 73% in the intervention group and 66% in the control group. Participation among schools remaining in the study was virtually identical for both post-tests.

Outcome Evaluation

Table 10 provides a summary of the frequencies of all survey items by intervention status and test period. Numbered items in the table refer to the item number on the questionnaire (Appendix B). Recoded items have an “R” preceding the number.

The descriptive data in Table 10 demonstrate a great degree of comparability between the intervention group and the control group at the pre-test, supporting the effectiveness of the

randomization. Overall at pre-test, 49% of the participants were male, 89% were white, 3.5% were Hispanic, 21% lived on a farm, 71% had ever worked at a steady job (paid or unpaid), 41% reported having had two or more jobs, 12.8% reported having been injured at work, and 7% reported having had two more work injuries. Injuries in this study were defined as any injury that required medical attention or restricted normal activities for at least one day. Overall at pre-test, there was a fairly even split for grade level with 39% in grade 9, 32% in grade 10, and 31% in grade 11.

As previously described, a variety of outcomes were defined *a priori* based on a summed set of questionnaire items. These constructs were defined in Tables 1 and 2, representing knowledge, intent, perceived benefits, perceived barriers, perceived susceptibility, perceived severity, and self-efficacy. The reliability (consistency) of each of these constructs was evaluated using Cronbach's alpha. Results of this analysis are shown in Table 11. The lowest alpha (0.39) was found for "perceived severity," a construct comprised of the fewest number of items (4). The alphas for the other constructs ranged from 0.59 to 0.84, suggesting a reasonable degree of consistency in these measures. No changes were made to the constructs and these constructs were used in further analyses.

Overall results from the mixed model analysis are shown in Table 12. The intervention effect represents the difference in adjusted mean scores between intervention and control, accounting for baseline (pre-test) values. Negative values for the intervention effect show a difference in the desired direction for that factor, except for knowledge, where a positive value is in the desired direction. As seen Table 12, intervention effect measures are in the desired direction for all outcomes for Post-Test 1. Several of the differences were statistically significant. Compared to control students, intervention students showed a greater awareness of their risk of workplace injuries (perceived susceptibility score *mean difference* = -0.78; 95% CI = (-1.52, -0.05); $p = 0.038$). Intervention students also reported a greater insight of potential life altering workplace injuries (perceived severity score *mean difference* = -0.60; 95% CI = (-0.93, -0.27); $p \leq 0.001$), and an increased understanding of hazard recognition, labor laws, and workplace injury prevention strategies (knowledge score *mean difference* = 0.63; 95% CI = (0.22, 1.04); $p = 0.004$).

By Post-Test 2, however, these differences were no longer evident. At Post-Test 2, only one factor – perceived severity score – showed a statistically significant difference in the desired direction (*mean difference* = -0.396 , $p = 0.025$). No differences were seen for any of the other factors.

Models were also run to examine intervention effects by covariates of gender, grade, farm residence, any work history, farm work, previous work injury, father's education, mother's education, ethnicity, race, and frequency of thrill-seeking behavior or excitement. These results are shown in Table 13. A total of 420 effect values are shown for both post-tests in this table; these values were not adjusted for multiple comparisons and should be interpreted cautiously.

With respect to gender, there is evidence that girls responded more to the intervention than boys. The intervention effect was greater for girls than boys for all seven outcomes at Post-Test 1. At Post-Test 1, only girls showed a significant association with the intervention for knowledge. While the intervention was significantly associated with perceived severity for both genders at Post-Test 1, this outcome was significant only for girls at Post-Test 2.

For grade level at Post-Test 1, there was a greater intervention effect for freshmen (grade 9) than either sophomores (grade 10) or juniors (grade 11) for six of the seven outcomes. Statistically significant effects were found for freshmen (severity, knowledge), but not for either sophomores or juniors. The significant impact on severity for freshmen remained for Post-Test 2.

No consistent pattern was seen for farm residence. At Post-Test 1, a significant intervention effect was found regardless of farm residence for susceptibility, severity, and knowledge. For barriers, however, there was a significant intervention effect only those not residing on a farm.

There was little evidence that the effectiveness of the intervention was associated with previous work experience. At Post-Test 1, a significant intervention effect for susceptibility, severity, and knowledge was found for those with and without previous work experience. For barriers, a significant impact was found only for those with no previous work experience.

There was also little evidence that the effectiveness of the intervention was related to a history of farm work. At Post-Test 1, the intervention was associated with severity and knowledge for those with and without farm experience. An effect was found for susceptibility for those with farm experience but not for those without farm experience at Post-Test 1. At Post-Test 2, an intervention effect was found only for those with farm experience for severity.

With respect to a previous work-related injury, the intervention had a significant impact on severity and knowledge at Post-Test 1 whether they had been injured or not. However, the intervention had a significant impact on perceived susceptibility only among those with a previous work injury, but this did not carryover over into Post-Test 2.

Parental education is shown in Table 13 for two categories: high school education or less, or beyond high school. With respect to parental education, father's education had little impact on the effectiveness of the intervention. A significant intervention effect for knowledge was found for father's education beyond high school at Post-Test 1. Mother's education, however, had a more consistent influence. At Post-Test 1, a significant intervention effect was found for barriers, severity, and knowledge for those with a mother's education greater than high school. In contrast, intent was significantly associated with mother's knowledge less than or equal to a high school education. No differences at Post-Test 2 were related to mother's or father's education.

As shown in Table 10, consistent with the demographics of rural Minnesota, this study included few Hispanics (3.5%) and non-Whites (8%) at pre-test, greatly limiting any conclusions that can be drawn. With that said, a significant intervention effect was seen for non-Hispanic ethnicity for perceived severity at both post-tests. Although the intervention effect for knowledge reached statistical significance only for non-Hispanics, the intervention effect value was the same for non-Hispanics (0.58) and Hispanics (0.59). Interestingly, a large intervention effect for barriers was seen only for Hispanics at Post-Test 2; this outcome did not reach statistical significance at Post-Test 1.

Almost no differences were found by race. Although the intervention effect for severity and knowledge was statistically significant for whites at Post-Test 1, the actual value of the intervention effects was essentially the same for whites and non-whites for both outcomes.

Two similarly phrased questions on the student survey (see Q.64a and b, Appendix B) attempted to categorize students according to how often they engaged in risky or dangerous behaviors. The seven potential responses to these questions were grouped into four categories that contained more comparable numbers for Table 13. The frequency of doing something dangerous for the thrill of it (“thrill seeking behavior”) was associated with the intervention for several outcomes at both post-tests. A significant intervention effect was found only the “never” category for intent, benefits, and barriers at Post-Test 1. At Post-Test 2, either or both of the lower frequency categories (never, 1-6 times) were significantly associated in the desired direction with the intervention for benefit, susceptibility, severity, and self-efficacy. Curiously, the intervention group actually scored worse than the controls among those in the highest frequency category (21+times) of thrill seeking for benefits at Post-Test 2.

The related survey question on the frequency of doing something risky because it was exciting (“excitement behavior”) showed a similar pattern. At Post-Test 1, either or both of the two lowest frequency responses were significantly associated with the intervention for barriers and self-efficacy. At Post-Test 2, only the “never” category was significantly associated with the intervention for benefits, susceptibility, and severity, with the effect in the expected direction.

In a mixed model analysis in which all of the above examined covariates were included in the model, a significant intervention effect in the desired direction was found for five outcomes at Post-Test 1. In addition to the three previous significant outcomes shown in Table 12 (knowledge, susceptibility, severity), a significant intervention effect was found for two additional outcomes: intent (*mean difference* = -0.545, *p* = 0.044) and barriers (*mean difference* = -0.472, *p* = 0.035). However, at Post-Test 2, severity was still the only significant outcome associated with the curriculum.

In summary, the overall model indicated a statistically significant impact of the intervention on at least three outcomes (knowledge, susceptibility, and severity) at the first post-test and one outcome (severity) at the second post-test. Secondary analyses indicated that the effectiveness of the intervention was not consistent across various categories of measured covariates. For some outcomes, there was evidence for greater intervention effectiveness among girls, freshmen, those with a parental education beyond high school, non-Hispanics, and those with a reduced frequency of dangerous or risky behaviors. There was less consistent evidence or no evidence that farm residence, previous work history, previous farm work, or previous work injury were factors associated with greater intervention effectiveness.

Comparison of Overall Findings to Pilot Test Results

To provide additional perspectives on the overall findings, data from the previous pilot study (described in the Background) were examined using the same outcome constructs and analytic models. As previously described, the pilot study used a slightly earlier version of the curriculum and virtually the same survey student questionnaire. That study involved five intervention schools (N=856) and six control schools (N=1357) that were not randomized and were located in three adjacent rural counties. In that study, however, implementation was much more closely monitored with actual observers in the classroom. Previously unanalyzed results for the overall mixed linear model analyses are shown Table 14. At Post-Test 1, a statistically significant intervention effect was found for five of the seven outcomes: intent, knowledge, susceptibility, severity, and self-efficacy. Three of these outcomes (knowledge, susceptibility, and severity) were also significant in the present study. Two outcomes – benefits and barriers – were not significantly associated with the intervention in either study. None of the outcomes in the pilot study for Post-Test 2 were significantly associated with the intervention, although the intervention effects were all in the desired direction.

Thus two separate studies of the *WSWS* curriculum implemented in rural Minnesota high schools, involving different schools, selection criteria, and sample size, demonstrated measurable impacts of the intervention during the same school year, but little if any impact the following school year.

Curriculum Dissemination and Implementation to Other Schools

During the study, the *WSWS* curriculum was only disseminated to intervention schools to avoid contaminating responses for Youth at Work participants. Following the second post-test in Fall 2002, two additional study activities were initiated: (1) identifying and implementing strategies for ongoing statewide dissemination of the curriculum, and (2) development and promotion of free training workshops for using the curriculum, first targeted to all control schools in this study and the previous pilot study. These activities were initiated after consultation with the Youth at Work advisory group.

The training workshops were expected to be modeled on the highly-rated training sessions developed and utilized in the training of teaching staff in the intervention schools as part of this study and the previous pilot study. Training staff would include the study project director, health educator, and a labor law expert from the Department of Labor and Industry. An added component would be the inclusion of teachers who had had real-world experience with the curriculum as part of the intervention group. The training would be offered to control schools first, since they were already familiar with the project and presumably recognized the need and potential benefits of the curriculum. Consequently, letters and emails were sent to all participating staff at the control schools in this study and the previous pilot study in early 2003 offering free curriculum training (the grant would pay travel costs and also reimburse schools for substitute teachers). The solicitation allowed the school to indicate dates that would work best for their schedules (during the spring semester 2003 or following summer) and several regional workshops were anticipated, as was arranged at the outset of the study for the intervention schools.

Unfortunately, only two of the invited participants indicated a potential interest in a training session. No systematic record was kept of the reasons – when known – that schools were unable or unwilling to participate. However, at that time, Minnesota schools were undergoing serious budget issues and a dramatically changing landscape with respect to graduation standards. As previously described, a “selling” point for schools to participate in this project and implement the

WSWS curriculum was how the curriculum fulfilled specific education/graduation standards (at that time). As a result of this very limited response to training, it was not economically feasible to offer training sessions.

In contrast to the disappointing outcome for providing training, the identification and implementation of strategies for statewide dissemination of the *WSWS* curriculum vastly exceeded original project goals. In addition to distributing the printed (3-ring binder) version of the curriculum to participating schools and to any other school upon request, two additional means of dissemination were developed: via CD-ROM and via a downloadable version available on the MDH Center of Occupational Health and Safety web page. These additional formats allowed the greatest potential for dissemination at very nominal cost. The graphic designer who worked on the original *WSWS* layout was contracted to convert the original PageMaker version of the *WSWS* curriculum into an Adobe Acrobat® (pdf) format. During this process, some simple navigation tools were added to the Acrobat version, a few errors were corrected, and web links were updated. The designer also created the graphics for the CD label and for the CD label and enclosure (Appendix J, K), using the same theme that appeared on the covers of the three-ring binder for the printed version (Appendix I). Approximately 5,000 copies of the CD-ROM were produced and the Acrobat versions were posted on the MDH web page in September 2003. (<http://www.health.state.mn.us/divs/hpcd/cdee/occhealth/index.html>)

Regardless of the format, copies of the *WSWS* curriculum were (and remain) available without charge and without restriction for educational use.

As could be anticipated, dissemination has been most successful using the electronic formats. While approximately 100 copies of the printed 3-ring binder version have been distributed upon request, approximately 4,800 copies of the *Work Safe Work Smart* curriculum on CD have been distributed upon request to the Minnesota Department of Education and directly to a variety of teachers, educational administrators, school-to-work programs, districts with federal Perkins money, “Learn and Serve” grantees, Minnesota statewide transition interagency work group, Minnesota career information system, charter schools, and service learning coordinators. CD’s have also been requested from Texas, Utah and Canada.

The web-based dissemination has also been very effective. As shown in Table 15, in the approximately one year period after the curriculum was posted on the MDH web site (from Sept. 1, 2003 until Aug. 25, 2004), the whole curriculum or various parts of the curriculum were downloaded 8,177 times. It was not possible to determine how many unique “addresses” were involved, since most individuals from the same school district will show the same domain name.

Due to the nature of the main modes of dissemination of the curriculum, it is not known how many Minnesota high schools or teaching staff at those schools have examined the *WSWS* curriculum or have utilized all or parts of it. Budget limitations and loss of staff prevented a systematic follow-up survey of all rural Minnesota high schools.

Discussion and Conclusions

The specific aims of this study were to:

1. Evaluate changes in students' knowledge, attitudes and beliefs regarding agricultural/work-related safety behaviors due to the inclusion of the *Work Smart Work Safe* curriculum into existing school curricula;
2. Identify critical factors to incorporating agricultural/work health and safety training (i.e., *Work Smart Work Safe*) into school curricula; and
3. Establish ongoing statewide support for incorporating agricultural/work health and safety curricula within rural schools.

The first and primary aim was accomplished by utilization of a very powerful study design, the group-randomized trial, to evaluate the impact of the *Work Safe Work Smart* curriculum on rural Minnesota adolescents. Rather than attempting to measure reductions in actual work-related injury rates – which would have required a substantially longer study – this study focused on changes in knowledge, intentions, attitudes, and beliefs that are associated with adoption of preventative behaviors, based on several behavior-change theories such as the health belief model (Strecher and Rosenstock 1997; Gielen and Sleet 2003).

In the context of this study, health belief model theory suggests that adolescents will take recommended actions to avoid workplace injury if: (1) they believe there is a chance they will be injured at work (perceived susceptibility); (2) the consequences of being injured are potentially serious (perceived severity); (3) their actions will reduce their susceptibility to injury or the severity of injury (self-efficacy); and (4) the benefits of taking the recommended actions outweigh the cost (perceived benefits and barriers). The large body of literature that has assessed the health belief model indicates that beliefs regarding perceived susceptibility, barriers, and self-efficacy are particularly predictive of adoption of preventive behaviors (Strecher and Rosenstock 1997).

A statistically significant intervention effect was found at Post-Test 1 for knowledge and for two outcomes measuring perceptions and attitudes of workplace hazards, specifically perceived

susceptibility and perceived severity. However by Post-Test 2, eight to ten months later, only one measured outcome – perceived severity – was significantly associated with the intervention.

These overall findings were confirmed and strengthened through analysis of data from a second (previous) non-randomized study of this curriculum, in which a significant intervention effect was found for five of the main outcomes at the first post-test. No significant effects remained the following school year.

While student familiarity with, and fatigue from, taking the same survey three times in the course of a year could play some role in these findings, it must be concluded that the impact of the curriculum diminishes over time in this population, as measured by these methods. Given that conclusion, there well may be some benefit to incorporating various components of the curriculum over several school years rather than as a single “dose.”

Additional analyses indicated that the effectiveness of the curriculum was not consistent across various categories of measured covariates. For some outcomes, study evidence is strongest for greater intervention effectiveness among girls, freshmen (9th graders), those with a parental education beyond high school, non-Hispanics, and those with a reduced frequency of dangerous or risky behaviors. There is less consistent evidence or no evidence that farm residence, previous work history, previous farm work, or previous work injury were factors associated with greater intervention effectiveness.

These findings may be important both for identifying future modifications of the curriculum and for identifying the best opportunities for implementation (Aim 2). For example, it appears that the curriculum may have the most impact on younger students who have had less work experience. This suggests introducing these concepts at the earliest grade possible. This also suggests that the curriculum might be considered for use at the junior high level, although this would need to be evaluated.

(Schutske 1994) concludes although education is one clear method for reducing agricultural morbidity, sustaining programs over multiple years remains problematic. At issue, then, is how

to maintain or further expand the use of this curriculum in schools pressured by budget limitations, already-full curricula, and changing graduation standards. To accomplish the curriculum evaluation (Aim 1), it was also critical to accomplish Aim 2: identify critical factors for incorporating agricultural/work safety and health training into school curricula.

While this study required a significant effort and cost to recruit schools to participate – an effort that would not likely be sustainable on an ongoing non-research basis – a number of recruitment strategies identified in this study and the previous pilot test would be generally relevant. Identifying factors to promote incorporation of the curriculum started with the design and development of the curriculum itself. For example, focus groups and teacher feedback during the pilot study suggested that the curriculum needed to accommodate a wider range of work experiences. Although *WSWS* was initially being developed only to address agricultural work hazards, it was ultimately necessary to broaden its applicability to the rural community, encompassing both agricultural and non-agricultural workplaces. This was an important recognition that rural Minnesota youths – and presumably adolescents in other farming states – regardless of whether they live on a farm, are often involved in both farming and non-farming jobs. This curriculum reaches youth at a time when they are starting to work at multiple jobs both on and off the farm and are at increasing risk of agricultural and non-agricultural work-related injury (Belville et al. 1993). Further, MDH data have shown that students do not decrease their hours of farm work as they move into the workplace, rather, they take on non-agricultural work in addition to maintaining their more traditional farm activities.

Another important component to implementation was sufficient flexibility in how, where, and when the curriculum might be incorporated into other existing curricula. At the risk of having an inconsistent environment (and study protocol) in which the curriculum was implemented, it was necessary to allow schools to determine when and where to fit in all or parts of the curriculum. As demonstrated in this study, the curriculum (or various parts) was not limited to agriculture-related programs, but was incorporated into a wide spectrum of existing curricula including health, social studies, English, US history, and careers/life work. Some schools offered different components in different classes taught by different teachers.

Teacher training is probably an important component to acceptance and implementation, but this study did not fully address that issue since training was part of the protocol and not a variable to be evaluated. However, with the wide dissemination of the curriculum and the absence of training workshops, it is likely that some teachers will be utilizing at least parts of the curriculum without formal training. We anticipate creating a web-based mechanism for schools to provide feedback to MDH on their experiences with the curriculum. As previously described, our disappointing response to the offer of free training workshops suggests that other modes of teacher training might be considered such as training videos or multimedia presentations on CD-ROM or even through a web site.

An issue likely to be critical to incorporation of this or any other curriculum is how that curriculum addresses state or federal education/graduation standards. As previously described, a considerable effort was made to ascertain and demonstrate to schools how this curriculum could fulfill various education standards (as of 2000). A table included in the curriculum lists national standards and how they relate to each lesson (p. xvi, Appendix A). This was quite important to teachers and schools since new Minnesota standards were being phased in at that time and many schools were already burdened with determining how their existing curricula could fulfill various standards.

A difficulty in promoting the curriculum to schools at the outset of this study was the lack of any evidence of the effectiveness of the curriculum (since that was the purpose of this study). That factor should no longer be a barrier since this study has demonstrated an impact under very real-world conditions.

Establishing ongoing support (Aim 3) has been addressed through several means. A key component of this aim (as well as Aim 2) has been the identification and implementation of multiple modes of dissemination of the curriculum. Ensuring that teachers and administrators have ready access to the curriculum for evaluation is a critical part of ongoing support. In addition to the original 3-ring binder hard copy (complete with poster), the curriculum has been made available on CD-ROM and on the MDH web site (both versions in Acrobat format with additional navigation tools). Over 4,000 CD's were requested and distributed by the Minnesota

Dept. of Education, and all or parts of the curriculum have been downloaded over 8,000 times. All versions are free and can be used for educational purposes without restriction. As listed elsewhere, presentations of the curriculum have been made to a variety of educational as well as occupational health groups.

In addition to the dissemination efforts, MDH will continue to promote the curriculum through its web page and through communications directly to the schools and through governmental and non-governmental groups with a vested interest in adolescent health and safety.

In conclusion, this study has demonstrated that implementation of the *Work Safe Work Smart* curriculum in rural Minnesota high schools could be successfully accomplished and that this curriculum had a significant and measurable impact on knowledge, attitudes, and beliefs that are associated with preventative health behaviors.

PRESENTATIONS AND ANTICIPATED PUBLICATIONS

Publications

No publications have been submitted as of the termination of this project; a manuscript on the overall findings is in preparation for submission in early 2005.

Presentations

Project staff have made presentations to a wide variety of groups:

- Minnesota Association of Career and Technical Administrators, 2003 State Conference
- Minnesota Safety Council, 2003 Fall Conference
- Minnesota Business Educators, Inc., 2003 Fall Conference
- Invitation to present *Work Safe Work Smart* abstract at the 7th World Conference on Injury Prevention and Safety Promotion, June 2004, Vienna (could not attend due to lack of sufficient travel funds)
- A *Work Safe Work Smart* poster session was presented at the 21st National Conference on Health Education and Health Promotion, May 21-23, 2003, in San Diego. Conference title was "Emerging Opportunities for Health Promotion and Health Education: Sailing into New Waters". Sponsored by the Association of State and Territorial Directors of Health Promotion and Public Health Education and the CDC. The audience was 500 educators, communicators and decision makers in health promotion and health education.
- Invited presentation to 15 teachers at the 7th annual "Making Connections; a Best Practices Conference" on April 1, 2004. It was organized by the SC Service, Work and Learning Center. The teachers were primarily school to work teachers, or incorporated some sort of internship in their classroom. Presenter comments: "The response was great; they were all very excited about the curriculum and each person had a story about how they could use it in their classroom. In the presentation I provided the background on curriculum development, national statistics about youth at work, walked them through the highlights of each lesson, and shared the evaluation results. I also had them get in small groups and do the hazard mapping exercise in lesson 4."
- Invited presentation at NIOSH Childhood Agricultural Safety and Health PI Research Conference, Morgantown, September 17, 2002.
- Invited presentation at NIOSH Childhood Agricultural Safety and Health PI Research Conference, Morgantown, September 25, 2003.
- Invited presentation at NIOSH Childhood Agricultural Safety and Health PI Research Conference, Pittsburgh, September 17, 2004

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Our thanks go to the many Minnesota teachers, students, and specialists who provided invaluable assistance in developing this resource. A complete listing of the people and institutions involved in the development of the curriculum can be found in the Credits (Appendix A).

We are gratefully acknowledge the staff and students at the 41 Minnesota high schools involved in the evaluation of the curriculum during the 2001-2002 and 2002-2003 school years:

Albert Lea	Milaca Secondary
Bemidji Senior	Montevideo Senior
Brainerd Senior	Morris Area Secondary
Buffalo Lake-Hector	Murray County Central Secondary
C-G-B Secondary	Nevis Secondary
Cook County Secondary	New London Spicer
Dawson-Boyd Secondary	Nicollet Secondary
Fergus Falls Senior	Norman County West
Fulda Secondary	Northland Secondary
Glenville-Emmons Senior	Owatonna Senior
Greenway Senior	Parkers Prairie Secondary
Hayfield Secondary	Pelican Rapids Secondary
Henning Secondary	Pine Island Secondary
Hinckley-Finlayson Secondary	Red Rock Central Secondary
Jefferson Senior	Sebeka Secondary
Kingsland Senior	St. Peter Senior
Lafayette High	Tracy Secondary
Lesueur-Henderson Secondary	Tri-County Secondary
Lincoln Secondary	Underwood Secondary
Luverne Senior	United South Central Senior

Marshall County Central Secondary

Special thanks to the following teachers who agreed to implement the *Work Safe Work Smart* curriculum in their classrooms during the 2001-2002 school year:

Buffalo Lake-Hector

Frank Hutton
Lyndee Warren

C-G-B Secondary

Jill Dorschadis

Fulda Secondary

Brad Holinka
Stephanie Streng

Glenville-Emmons

Craig Rayman

Hayfield Secondary

Lori Link
Greg Peterson
Mary Peterson
Vince Reynolds

Jefferson

Roger Johnson

Kingsland Senior

Pam Quiram

Lincoln Secondary

Janet Burns

Marshall County Central Secondary

Scott Parker

Milaca Secondary

James Taylor
Jennifer Taylor
Trina Olson

Morris Area Secondary

Ann Streed

Nevis Secondary

Liz Eischens
Janet Golden-Landquist

Owatonna Senior

Georgia Brenden
Char Ost
Val Rose
Maia Sheie

Parkers Prairie Secondary

Jayne Arvidson
Dean Yocum

Pelican Rapids Secondary

Vicki Huck
Bill Januszewski

Tracy Secondary

Brian Michelson

Underwood Secondary

Virgil Evavold

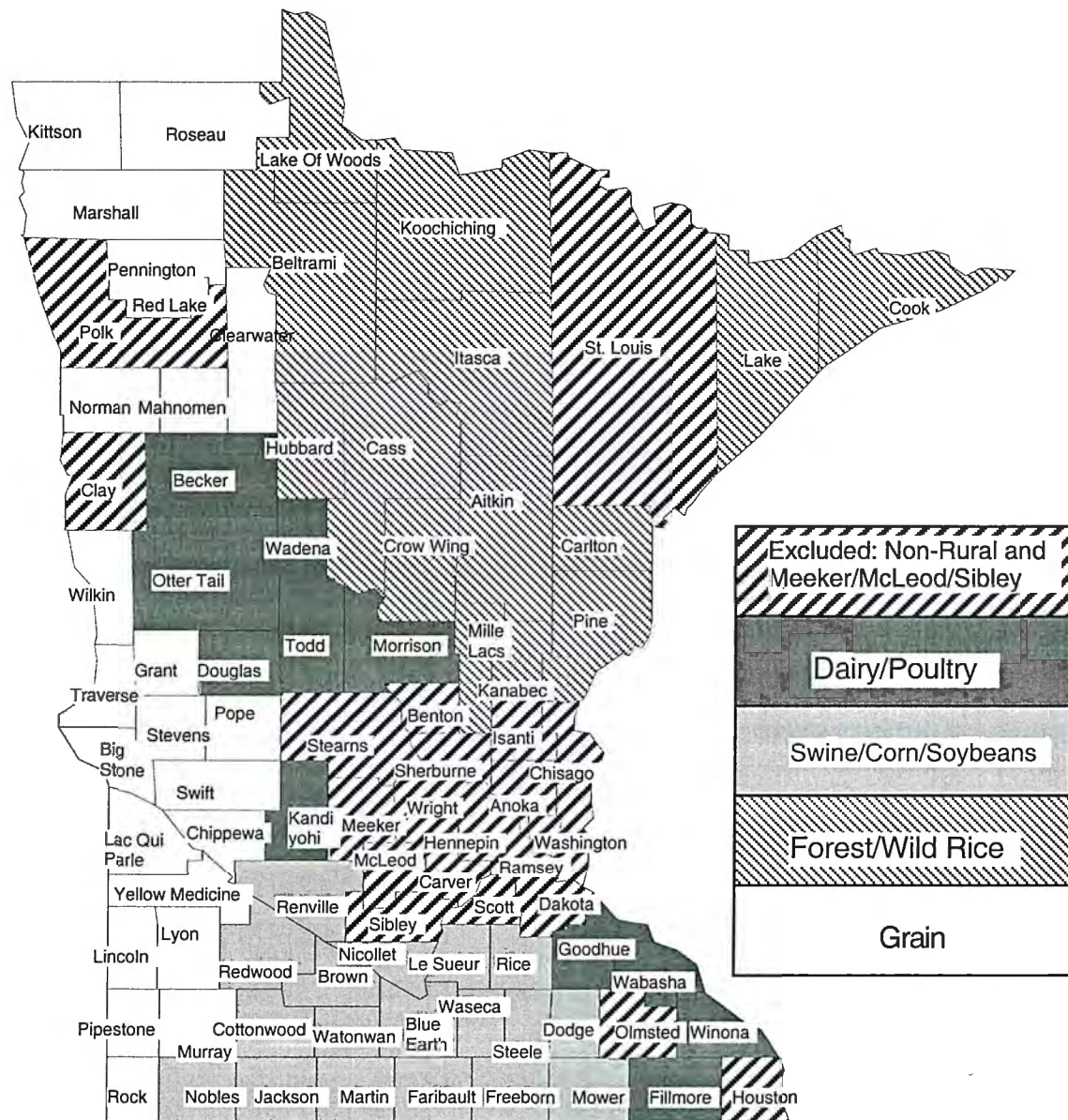
United South Central Senior

Greg Ellsworth

We greatly acknowledge the current and past members of the *Youth At Work* Advisory Board who critical contributions and insights made this project possible:

B.J. Anderson	Children, Families and Learning
Ann Bajari	Meeker-Mcleod-Sibley Public Health
Nancy Cowell	Sibley East Junior High
John Engelking	Sibley East Junior High
Jim Ertl	MN CFL Lifework Development
Peter Hannan	University of Minnesota
Deborah Hennrikus	University of Minnesota
Jan Kellner	MN CFL Lifework Development
Ed Larsen	Retired Principal, Pequot Lakes High School
Joe Miller	Lester Prairie High School
Ilene Nelsen	Meeker County Public Health
Craig Rayman	Glenville-Emmons High School
Tim Rice	Eden Valley-Watkins High School
Michele Schermann	University of Minnesota Extension Services
John Shutske	University of Minnesota Extension Services
John Smith	Glencoe – Silver Lake High School
Ann Streed	Morris Area Secondary School

Figure 1. Minnesota Agricultural Regions* and Counties Used in Selection of Schools



*See text for definitions. Excluded counties include Metro area and other non-rural counties plus three rural counties that participated in the previous pilot test

Figure 2. School Recruitment Process

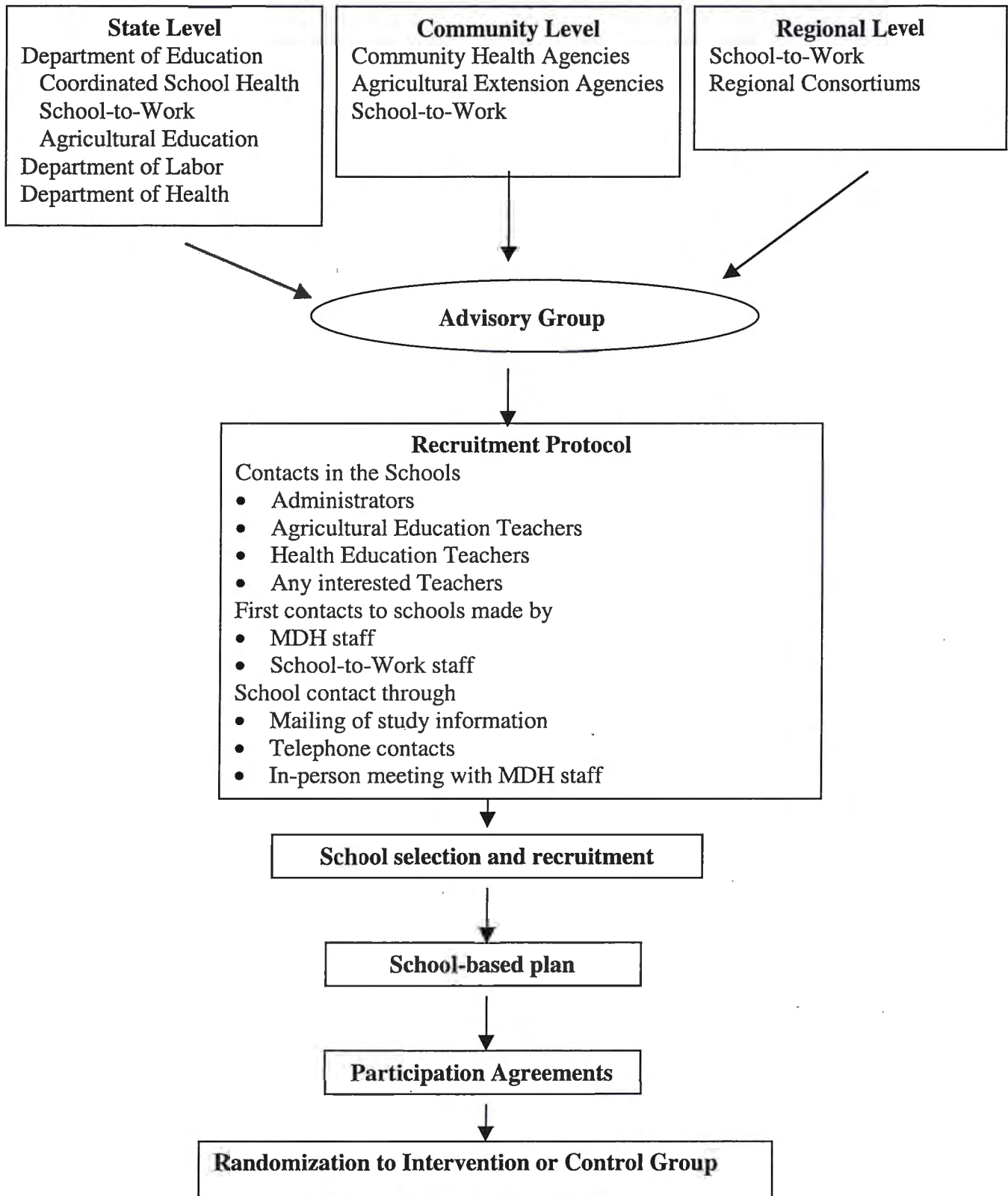


Table 1. Questionnaire Items Used to Define Health Belief Model Constructs

Health Belief Model Constructs	Survey Questions Used to Define Constructs
Perceived Benefits	<p>12) If I have to choose between completing my job quickly or safely, I would always choose to be safe.</p> <p>15) I have a responsibility to fellow workers to try to do something about unsafe work situations.</p> <p>19) I will be less likely to be injured at work if I try to identify and change unsafe conditions.</p> <p>21) There s no real need for laws that protect workers.</p> <p>25) An individual worker’s efforts to make a workplace safer can make a difference.</p> <p>26) When I try to do something about unsafe work situations I am making the workplace safer for fellow workers.</p> <p>28) Workers have a responsibility to look for unsafe situations in the workplace.</p> <p>31) If it helps me finish my job faster, I might remove protective equipment, such as shields and guards on machinery.</p> <p>35) There is not much an individual worker can really do to prevent workplace injuries or illness.</p> <p>39) Alerting an employer to unsafe conditions at the workplace often wouldn’t do any good.</p> <p>40) Working quickly is more important than working safely.</p>
Perceived Barriers	<p>13) If protective clothing such as goggles were uncomfortable, I would not wear it on the job if I could get away with it.</p> <p>14) There should be no child labor laws, such as those that do not allow hiring of teens for some types of jobs, since they decrease opportunities for teens to work.</p> <p>24) Worrying about workplace safety would make me look like a geek to the people I work with.</p> <p>27) It is worth the extra time to take safety precautions at work.</p> <p>42) If it would make my job faster, I might choose not to wear protective clothing, such as gloves, dust masks or goggles.</p>
Perceived Susceptibility	<p>17) A workplace injury or illness could happen to me sometime in m working life.</p> <p>20) Serious workplace injuries happen to other people – they won’t happen to me.</p> <p>22) I am not concerned about the possibility of being injured in work situations.</p> <p>29) Most work situations are so safe that there is no need to be concerned about workplace injuries.</p> <p>36) Serious workplace injuries are so rare that they are really not worth worrying about.</p> <p>41) I will be les likely to be injured at work if I follow worksite safety rules.</p>
Perceived Severity	<p>18) A serious workplace injury or illness could happen to me in m working life.</p> <p>32) There is no need to be concerned about workplace injuries and illnesses since most are not serious.</p> <p>34) Many workplace injuries result in death, permanent changes in appearance, or long-term disability.</p> <p>37) If I ad a serious workplace injury, it could change what I do with my life.</p>
Self-Efficacy	<p>16) I would find it difficult to ask co-workers to change the way they are doing a job in order to make the workplace safer.</p> <p>23) I wouldn’t know what steps to take if I notice an unsafe condition at work.</p> <p>30) I would be good at convincing an employer to make a hazardous work situation safer.</p> <p>33) I’m confident that I could come up with good suggestions to make a dangerous work situation safer.</p> <p>38) I would be very reluctant to talk to an employer about unsafe conditions I’d noticed at the workplace.</p> <p>43) How confident are you that you could do the following in our current workplace or in places where you might be employed in the future? Mark a number 1-5 that indicates your level of confidence</p> <ul style="list-style-type: none"> - a) identify most unsafe conditions or hazards that exist in the workplace - b) point out to your employer a work situation that you think is unsafe - c) convince your employer to take steps to make a hazardous work situation safer - d) ask co-workers to change the way they’re doing a job to make the workplace safer - e) come up with good suggestions to make a dangerous work situation safer

Table 2: Questionnaire Items Used to Define Knowledge and Intent Constructs

Factor	Survey Questions Used to Define Factor
Knowledge	<p>Please indicate whether you think these statements are true or false by marking 1 for “true”, 2 for “false” and 3 for “I don’t know”:</p> <p>44a) By law, employers are required to provide a safe and healthy workplace.</p> <p>44b) Employers are not required to pay for your medical care if you get sick or hurt from the job.</p> <p>44c) It is illegal for your employer to fire or punish you for reporting a workplace safety problem.</p> <p>44d) There are no restrictions on the time of day that people under 18 can work.</p> <p>44e) Teens younger than 16 are not allowed to work with power-driven equipment, such as lawn mowers and snow blowers.</p> <p>44f) By law, a person under 14 cannot be employed at all</p> <p>44g) The most effective way of preventing workplace injuries is to educate workers about workplace hazards and available safety measures.</p> <p>44h) I could safely hold my breath and go into a room with toxic gas in order to rescue someone.</p>
Intent	<p>The next few items are about what you think you will do regarding workplace safety in your future working life. On a scale of 1 to 5 when “1” means “Always” and “5” means “Never”, for each item mark the number that indicates how often you think you will take action.</p> <p>48) If I see an unsafe situation at work, I will do what I can to make it safer.</p> <p>49) I will use required protective equipment and follow worksite safety rules</p> <p>50) I will check places where I work for unsafe conditions.</p> <p>51) I will talk to my employer about working conditions that I think are unsafe.</p> <p>52) When lifting something that seems to heavy, I will ask for help.</p> <p>53) I will talk to my employer about working conditions that I believe are illegal.</p>

Table 3. Characteristics of Eligible Schools by Region and Size

	Region 1 Swine, Corn, & Soybeans	Region 2 Dairy and Poultry	Region 3 Forestry & Wild Rice	Region 4 Grains and Sugar Beets
Total Number of Students				
9 th Grade	6370	5369	4918	3382
10 th Grade	6234	5275	4873	3403
11 th Grade	5986	5095	4523	3289
12 th Grade	5878	5022	4291	3413
Total Number of Schools	54	47	43	46
Average Grade Size/School				
9 th Grade	118	114	114	74
10 th Grade	114	112	113	74
11 th Grade	111	108	105	72
12 th Grade	109	107	100	74
Number of Counties	19	11	14	23

*There are 87 counties in Minnesota, but this table only considers the 67 counties eligible for this grant. Of the 20 ineligible counties, 17 are considered metropolitan areas by the U.S. Department of Agriculture Rural Continuum Code and three were considered ineligible because they were previous participants in the pilot test and in an injury surveillance survey.

Table 4. School Selection and Participation Status by Region and Stratum.

School	Random No.	First41 ¹	Replc	Region	Stratum ²	Refusal	Status ³
REGION 1 (complete)							
<i>Refusal</i>	0.01549	<i>Y</i>		<i>1</i>	<i>1</i>	<i>X</i>	
C-01	0.08879	Y		1	1		CNT
I-04	0.10739	Y		1	1		INT
C-04	0.13859	Y		1	1		CNT
<i>Refusal</i>	0.16417	<i>N</i>	<i>R1</i>	<i>1</i>	<i>1</i>	<i>X</i>	
<i>Refusal</i>	0.16846	<i>N</i>	<i>R2</i>	<i>1</i>	<i>1</i>	<i>X</i>	
I-01	0.19579	N	R3	1	1		INT
(+ 19 more eligible)							
<i>Refusal.</i>	0.05160	<i>Y</i>		<i>1</i>	<i>2</i>	<i>Late X</i>	
I-18	0.14372	Y		1	2		INT
C-18	0.21444	Y		1	2		CNT
I-05	0.28546	Y		1	2		INT
<i>Refusal</i>	0.29579	<i>N</i>	<i>R1</i>	<i>1</i>	<i>2</i>	<i>X</i>	
C-05	0.31354	N	R2	1	2		CNT
(+ 14 more eligible)							
<i>Refusal</i>	0.01769	<i>Y</i>		<i>1</i>	<i>3</i>	<i>X</i>	
<i>Refusal.</i>	0.02343	<i>Y</i>		<i>1</i>	<i>3</i>	<i>X</i>	
<i>Refusal</i>	0.05035	<i>N</i>	<i>R1</i>	<i>1</i>	<i>3</i>	<i>X</i>	
I-13	0.05486	N	R2	1	3		INT
C-13	0.24748	N	R3	1	3		CNT
<i>Refusal</i>	0.48351	<i>N</i>	<i>R4</i>	<i>1</i>	<i>3</i>	<i>X</i>	
(+2 more eligible)							
REGION 2 (complete)							
C-17	0.03036	Y		2	1		CNT
C-14	0.04996	Y		2	1		CNT
I-17	0.09757	Y		2	1		INT
I-14	0.21741	Y		2	1		INT
(+ 19 more eligible)							
I-15	0.05052	Y		2	2		INT
C-15	0.19235	Y		2	2		CNT
I-07	0.20458	Y		2	2		INT
<i>Refusal</i>	0.23817	<i>Y</i>		<i>2</i>	<i>2</i>	<i>X</i>	
C-07	0.26193	N	R1	2	2		CNT
(+ 12 more eligible)							
C-06 (WSWS Only)	0.06570	Y		2	3		CNT
<i>Refusal</i>	0.10511	<i>Y</i>		<i>2</i>	<i>3</i>	<i>X</i>	
<i>Refusal.</i>	0.10918	<i>N</i>	<i>R1</i>	<i>2</i>	<i>3</i>	<i>X</i>	
I-06	0.61968	N	R2	2	3		INT
<i>Refusal</i>	0.73608	<i>N</i>	<i>R3</i>	<i>2</i>	<i>3</i>	<i>X</i>	
(+ 2 more eligible)							
REGION 3 (Incomplete)							

School	Random No.	First41 ¹	Replc	Region	Stratum ²	Refusal	Status ³
<i>Refusal</i>	0.03563	Y		3	1	X	
C-12	0.05922	Y		3	1		CNT
C-20	0.10335	Y		3	1		CNT
<i>Refusal</i>	0.12372	Y		3	1	X	
I-12	0.14739	N	R4	3	1		INT
(+ 18 more eligible)							
C-10	0.01271	Y		3	2		CNT
I-08	0.19556	Y		3	2		INT
C-08	0.19915	Y		3	2		CNT
<i>Refusal</i>	0.22693	Y		3	2	X	
I-10	0.25037	N	R1	3	2		INT
(+ 11 more eligible)							
X-01 (CATES Only)	0.18141	Y		3	3		CATES
C-19	0.25088	Y		3	3		CNT
<i>Refusal</i>	0.35530	N		3	3	X	
(+ 1 more eligible)							
REGION 4 (complete)							
I-09	0.02425	Y		4	1		INT
I-02	0.03519	Y		4	1		INT
<i>Refusal</i>	0.04083	Y		4	1	X	
C-09	0.05549	Y		4	1		CNT
<i>Refusal.</i>	0.12123	N	<i>R1</i>	4	1	X	
C-02	0.28034	N	R2	4	1		CNT
X-02 (CATES Only)	0.33850	N	R3	4	1		CATES
(+ 10 more eligible)							
<i>Refusal</i>	0.01627	Y		4	2	X	
C-16	0.03332	Y		4	2		CNT
C-03	0.15600	Y		4	2		CNT
<i>Refusal</i>	0.26854	Y		4	2	X	
I-16	0.37944	Y		4	2		INT
<i>Refusal</i>	0.38297	N	<i>R1</i>	4	2	X	
X-03 (CATES Only)	0.42949	N	R2	4	2		CATES
I-03	0.43460	N	R3	4	2		INT
(+ 13 more eligible)							
C-11	0.12496	Y		4	3		CNT
I-11	0.20035	Y		4	3		INT
(+ 6 more eligible)							

¹First41 refers to the initial random sample of 41 schools selected for recruitment. Y=yes.

²Stratum refers to three categories of school size; 1=small, 2=medium, 3=large.

³Status: INT=Intervention, CNT=Control; CATES=participating only in the surveillance grant, not the curriculum evaluation grant.

Table 5. Summary of Reasons Given by Schools for Declining to Participate

School*	Region	Size	Visited	Reasons for Refusal
0.12123	4	1	no	Too many things to do, too busy. Losing both their principal and superintendent (same person).
0.16417	1	1	yes	Too many demands on teachers and at this time of year (May); many teachers see new things as extra work rather than as opportunities.
0.05035	1	3	no	Too busy
0.23817	2	2	no	Some previous bad experiences were mentioned.
0.10918	2	3	no	Terrible financial bind; doing cuts and layoffs.
0.01549	1	1	yes	It just won't work out at this time – no specific reason
0.02343	1	3	yes	Had problems fitting the curriculum into their block schedule – just didn't work.
0.03563	3	1	no	No specific reason.
0.12372	3	1	yes	Although originally agreed to participate, declined before training due to budget cuts and layoffs.
0.05160	1	2	yes	Said that the teacher couldn't fit the curriculum in.
0.01769	1	3	no	Too many surveys already being done.
0.48351	1	3	yes	No specific reason
0.26854	4	2	yes	Said that teachers were already unhappy, class size decreasing, too many demands and no money.
0.22693	3	2	yes	Had to cut 1 million dollars out of their budget.
0.35530	3	3	yes	No specific reason
0.73608	2	3	yes	No specific reason.
0.29579	1	2	no	No specific reason
0.16846	1	1	no	No specific reason
0.38297	4	2	no	Too many surveys. Can't do another.
0.04083	4	1	yes	Superintendent was first year and principal didn't want to even ask anyone because he was leaving.
0.01627	4	2	yes	Too many demands on the teachers. Couldn't handle any non-mandatory programs.
0.10511	2	3	no	Deep financial cuts and layoffs.

*Random number originally assigned to school.

Table 6. Curriculum and Test Implementation by School*

School	Pre-Test Date	Curric. Start	Curric. End	Lessons Done	Grade	Class	Post 1 Date	Post 2 Date
I-1	10/08/01	01/15/02	01/30/02	All	9	Civics	4/04/02	10/02
C-1	12/12/01						5/22/02	12/02
I-2	10/26/01	02/25/02	05/20/02	All	9	Careers	5/22/02	09/02
C-2	12/13/01						5/15/02	09/02
I-3	12/06/01	12/13/01	01/10/02	All	9-10	Civics	4/30/02	10/02
C-3	10/30/01						4/15/02	10/02
I-4	12/12/01	05/06/02	05/21/02	All	10	Health	5/09/02	10/02
C-4	11/02/01						4/25/02	09/02
I-5	11/14/01	01/29/02	05/07/02	All	10	English Health US Hist	5/10/02	09/02
C-5	11/14/01						4/24/02	09/02
I-6	10/08/01	10/22/01	11/05/01	1-3	11	Health	5/24/02	X
C-6	11/07/01						4/19/02	X
I-7	11/06/01	11/13/01	04/12/02	All	10	Health	4/23/02	12/02
C-7	10/11/01						5/24/02	10/02
I-8	09/19/01	10/31/01	03/25/02		9	Careers	4/16/02	09/02
C-8	09/26/01						4/17/02	10/02
I-9	12/21/01	01/30/02	01/17/02	All	10	Health	5/10/02	11/02
C-9	10/01/01						5/06/02	10/02
I-10	12/12/01	12/19/01	01/30/02	All	9	Careers	4/17/02	10/02
C-10	10/13/01						4/18/02	11/02
I-11	11/01/01	05/06/02	05/15/02	All	9	Civics	5/16/02	10/02
C-11	09/26/01						5/29/02	10/02
I-12	12/08/01	02/04/02	04/01/02	All	9	Health	4/01/02	09/02
C-12	10/02/01						3/15/02	09/02
I-13	12/17/01	09/18/01	11/15/01	1-4	11	Life Work	5/20/02	12/02
C-13	10/17/02						5/02/02	09/02
I-14	9/28/01	10/08/01	3/05/02	All	10	Health, US Hist	5/09/02	10/02
C-14	11/30/01						3/07/02	10/02
I-15	10/03/01	01/08/02	1/28/02	All	9	Social, Careers	5/06/02	10/02
C-15	10/16/01						5/31/02	12/02
I-16	11/05/01	11/18/01	03/23/02	All	10	Health	4/03/02	11/02
C-16	10/24/01						3/12/02	10/02
I-17	09/24/01	11/26/01	2/06/02	All	10	Careers	3/18/02	09/02
C-17	10/03/01						3/19/02	09/02
I-18	9/20/01	2/22/02	3/06/02	All	9	?	5/02/02	09/02
C-18	11/15/01						5/23/02	10/02

*Data shown only for 18 intervention schools and the 18 matched (by region and size) control schools.

Table 7. Participation Rates at Pre-Test and Reasons for Missing, Fall 2001.

Intervention Schools	Students Enrolled	Missing Explained					Missing Unexplained	Completed Surveys
		Absent	Exempt*	No longer Student	Refusal	Explained Total		
I-01	52	2	0	0	0	2	0	50
I-02	42	2	0	0	0	2	0	40
I-03	62	0	0	0	0	0	3	59
I-04	38	0	0	0	0	0	3	35
I-05	73	0	3	1	0	4	0	69
I-06	395	29	2	9	5	45	2	348
I-07	73	1	0	1	1	3	8	62
I-08	95	0	1	0	1	2	2	91
I-09	32	0	0	0	0	0	3	29
I-10	210	17	15	1	0	33	5	172
I-11	109	1	1	4	0	6	0	103
I-12	50	0	1	1	0	2	0	48
I-13	459	46	13	19	0	78	89	292
I-14	67	0	0	0	0	0	3	64
I-15	121	0	0	0	0	0	12	109
I-16	74	0	0	0	0	0	10	64
I-17	37	0	3	0	0	3	0	34
I-18	194	2	0	0	0	2	5	187
Total	2183	100	39	36	7	182	145	1856

*Includes students in special education, hospital, treatment, part-time, home schooled, incarcerated, ESL, ALC, PSEO.

Table 7 (continued). Participation Rates at Pre-Test and Reasons for Missed Participation, Fall 2001.

Control Schools	Students Enrolled	Missing Explained					Missing Unexplained	Completed Surveys
School		Absent	Exempt*	No longer Student	Refusal	Explained Total		
C-01	42	3	0	0	0	3	1	38
C-02	32	4	0	0	0	4	0	28
C-03	61	0	0	0	0	0	5	56
C-04	59	4	0	0	0	4	0	55
C-05	168	7	0	10	0	17	1	150
C-06	280	9	3	1	0	13	52	215
C-07	149	0	0	0	0	0	16	133
C-08	88	0	0	0	0	0	8	80
C-09	29	0	0	0	0	0	0	29
C-10	111	0	0	0	0	0	3	108
C-11	125	1	1	0	0	2	0	123
C-12	74	0	0	0	0	0	6	68
C-13	358	17	0	0	0	17	71	270
C-14	35	0	0	0	0	0	6	29
C-15	97	4	0	0	3	7	0	90
C-16	81	0	0	0	0	0	3	78
C-17	43	0	0	0	0	0	6	37
C-18	231	0	0	0	0	0	36	195
C-19	466	33	0	78	0	111	0	355
C-20	39	0	0	6	2	8	0	31
Total	2568	82	4	95	5	186	214	2168

*Includes students in special education, hospital, treatment, part-time, home schooled, incarcerated, ESL, ALC, PSEO.

Table 8. Participation Rates by School for all Tests (as a Percent of Enrollees)

Intervention Schools	Students Enrolled	Completed Surveys Pre-Test N (%)¹	Completed Surveys Post-Test 1 N (%)¹	Completed Surveys Post-Test 2 N (%)¹
I-01	52	50 (92.6)	47 (90.4)	45 (86.5)
I-02	42	40 (95.2)	42 (100.0)	41 (97.6)
I-03	62	59 (95.2)	38 (61.3)	50 (80.6)
I-04	38	35 (92.1)	35 (92.1)	37 (97.4)
I-05	73	69 (94.5)	63 (86.3)	52 (71.2)
I-06	395	348 (88.1)	266 (67.3)	0 (0.0)
I-07	73	62 (84.9)	63 (86.3)	57 (78.1)
I-08	95	91 (95.8)	86 (90.5)	82 (86.3)
I-09	32	29 (90.6)	28 (87.5)	27 (84.4)
I-10	210	172 (81.9)	166 (79.0)	166 (79.0)
I-11	109	103 (94.5)	87 (79.8)	79 (72.5)
I-12	50	48 (96.0)	35 (70.0)	34 (68.0)
I-13	459	292 (63.6)	298 (64.9)	271 (59.0)
I-14	67	64 (95.5)	64 (95.5)	60 (89.6)
I-15	121	109 (90.1)	100 (82.6)	88 (72.7)
I-16	74	64 (86.5)	62 (83.8)	60 (81.1)
I-17	37	34 (91.9)	32 (86.5)	27 (73.0)
I-18	194	187 (96.4)	176 (90.7)	181 (93.3)
Total	2183	1856 (85.0)	1688 (77.3)	1357 (62.2)

¹Percent is number of completed surveys divided by the number of students enrolled prior to start of fall semester

Table 8 (continued). Participation Rates by School for all Tests (as Percent of Enrollees)

Control Schools	Students Enrolled	Completed Surveys Pre-Test N (%)¹	Completed Surveys Post-Test 1 N (%)¹	Completed Surveys Post-Test 2 N (%)¹
C-01	42	38 (90.5)	38 (90.5)	33 (78.6)
C-02	32	28 (87.5)	32 (100.0)	30 (93.8)
C-03	61	56 (91.8)	60 (98.4)	58 (95.1)
C-04	59	55 (93.2)	54 (91.5)	56 (94.9)
C-05	168	150 (89.3)	139 (82.7)	131 (78.0)
C-06	280	215 (76.8)	177 (63.2)	0 (0.0)
C-07	149	133 (89.3)	127 (85.2)	129 (86.6)
C-08	88	80 (90.9)	78 (88.6)	60 (68.2)
C-09	29	29 (100.0)	27 (93.1)	29 (100.0)
C-10	111	108 (97.3)	85 (76.6)	83 (74.8)
C-11	125	123 (98.4)	112 (89.6)	113 (90.4)
C-12	74	68 (91.9)	57 (77.0)	58 (78.4)
C-13	358	270 (75.4)	232 (64.8)	223 (62.3)
C-14	35	29 (82.9)	36 (102.9)	26 (74.3)
C-15	97	90 (92.8)	89 (91.8)	84 (86.6)
C-16	81	78 (96.3)	73 (90.1)	73 (90.1)
C-17	43	37 (86.0)	35 (81.4)	33 (76.7)
C-18	231	195 (84.4)	154 (66.7)	184 (79.7)
C-19	466	355 (76.2)	327 (70.2)	0 (0.0)
C-20	39	31 (79.5)	26 (66.7)	19 (48.7)
Total	2568	2168 (84.4)	1958 (76.2)	1422 (55.4)

¹Percent is number of completed surveys divided by the number of students enrolled prior to start of fall semester.

Table 9. Participation Rates by School for all Tests (as Percent of Pre-Tests)

Intervention Schools	Students Enrolled	Completed Surveys Pre-Test N (%)¹	Completed Surveys Post-Test 1 N (%)²	Completed Surveys Post-Test 2 N (%)²
I-01	52	50 (92.6)	47 (94.0)	45 (90.0)
I-02	42	40 (95.2)	42 (105.0)	41 (102.5)
I-03	62	59 (95.2)	38 (64.4)	50 (84.7)
I-04	38	35 (92.1)	35 (100.0)	37 (105.7)
I-05	73	69 (94.5)	63 (91.3)	52 (75.4)
I-06	395	348 (88.1)	266 (76.4)	0 (0.0)
I-07	73	62 (84.9)	63 (101.6)	57 (91.9)
I-08	95	91 (95.8)	86 (94.5)	82 (90.1)
I-09	32	29 (90.6)	28 (96.6)	27 (93.1)
I-10	210	172 (81.9)	166 (96.5)	166 (96.5)
I-11	109	103 (94.5)	87 (84.5)	79 (76.7)
I-12	50	48 (96.0)	35 (72.9)	34 (70.8)
I-13	459	292 (63.6)	298 (102.1)	271 (92.8)
I-14	67	64 (95.5)	64 (100.0)	60 (93.8)
I-15	121	109 (90.1)	100 (91.7)	88 (80.7)
I-16	74	64 (86.5)	62 (96.9)	60 (93.8)
I-17	37	34 (91.9)	32 (94.1)	27 (79.4)
I-18	194	187 (96.4)	176 (94.1)	181 (96.8)
Total	2183	1856 (85.0)	1688 (90.9)	1357 (73.1)

¹Pre-test percent is number of completed pre-tests divided by the number of students enrolled prior to start of fall semester.

²For Post-Test 1 and Post-Test 2, the percent is the number of completed surveys divided by the number of completed Pre-Tests.

Table 9 (continued). Participation Rates by School for all Tests (as Percent of Pre-Tests)

Control Schools	Students Enrolled	Completed Surveys Pre-Test N (%)¹	Completed Surveys Post-Test 1 N (%)²	Completed Surveys Post-Test 2 N (%)²
C-01	42	38 (90.5)	38 (100.0)	33 (86.8)
C-02	32	28 (87.5)	32 (114.3)	30 (107.1)
C-03	61	56 (91.8)	60 (107.1)	58 (103.6)
C-04	59	55 (93.2)	54 (98.2)	56 (101.8)
C-05	168	150 (89.3)	139 (92.7)	131 (87.3)
C-06	280	215 (76.8)	177 (82.3)	0 (0.0)
C-07	149	133 (89.3)	127 (95.5)	129 (97.0)
C-08	88	80 (90.9)	78 (97.5)	60 (75.0)
C-09	29	29 (100.0)	27 (93.1)	29 (100.0)
C-10	111	108 (97.3)	85 (78.7)	83 (76.9)
C-11	125	123 (98.4)	112 (91.1)	113 (91.9)
C-12	74	68 (91.9)	57 (83.8)	58 (85.3)
C-13	358	270 (75.4)	232 (85.9)	223 (82.6)
C-14	35	29 (82.9)	36 (124.1)	26 (89.7)
C-15	97	90 (92.8)	89 (98.9)	84 (93.3)
C-16	81	78 (96.3)	73 (93.6)	73 (93.6)
C-17	43	37 (86.0)	35 (94.6)	33 (89.2)
C-18	231	195 (84.4)	154 (79.0)	184 (94.4)
C-19	466	355 (76.2)	327 (92.1)	0 (0.0)
C-20	39	31 (79.5)	26 (83.9)	19 (61.3)
Total	2568	2168 (84.4)	1958 (90.3)	1422 (65.6)

¹Pre-test percent is number of completed pre-tests divided by the number of students enrolled prior to start of fall semester.

²For Post-Test 1 and Post-Test 2, the percent is the number of completed surveys divided by the number of completed Pre-Tests.

Table 10. Survey Response Frequencies by Test and Intervention Status

Question ¹	Pre-Test N=4024		Post-Test 1 N=3645		Post-Test 2 N=2778	
	Intervention N=1856 No. (%) ²	Control N=2168 No. (%)	Intervention N=1687 No. (%)	Control N=1958 No. (%)	Intervention N=1356 No. (%)	Control N=1422 No. (%)
1. Job History						
Never	451 (24)	643 (30)	484 (29)	704 (36)	422 (31)	441 (31)
Farm	192 (10)	168 (8)	160 (9)	129 (7)	113 (8)	83 (6)
Non-Farm	921 (50)	1052 (49)	765 (45)	869 (44)	604 (45)	694 (49)
Both	252 (14)	257 (12)	238 (14)	205 (10)	173 (13)	164 (12)
Incongruent	5 (0)	9 (0)	8 (0)	4 (0)	6 (0)	7 (0)
Non-Steady WE	0 (0)	2 (0)	3 (0)	3 (0)	1 (0)	1 (0)
Missing	35 (2)	37 (2)	29 (2)	44 (2)	37 (3)	32 (2)
R1. Recoded job history						
Never Worked	451 (24)	643 (30)	484 (29)	704 (36)	422 (31)	441 (31)
Worked	1370 (74)	1488 (69)	1174 (70)	1210 (62)	897 (66)	949 (67)
Missing	35 (2)	37 (2)	29 (2)	44 (2)	37 (3)	32 (2)
R2. Recoded # of jobs						
No Job	451 (24)	643 (30)	484 (29)	704 (36)	422 (31)	441 (31)
One Job	567 (31)	626 (29)	446 (26)	521 (27)	379 (28)	386 (27)
Two or More Jobs	800 (43)	847 (39)	724 (43)	685 (35)	525 (39)	563 (40)
Missing	38 (2)	52 (2)	33 (2)	48 (2)	30 (2)	32 (2)
3. Had job w/risk of injury						
No	518 (28)	591 (27)	417 (25)	521 (27)	378 (28)	410 (29)
Yes	869 (47)	903 (42)	762 (45)	697 (36)	533 (39)	539 (38)
Blank	451 (24)	643 (30)	484 (29)	704 (36)	422 (31)	441 (31)
Missing	18 (1)	31 (1)	24 (1)	36 (2)	23 (2)	32 (2)
R3. Recoded job w/risk						
No	969 (52)	1234 (57)	901 (53)	1225 (63)	800 (59)	851 (60)
Yes	869 (47)	903 (42)	762 (45)	697 (36)	533 (39)	539 (38)
Missing	18 (1)	31 (1)	24 (1)	36 (2)	23 (2)	32 (2)
4a. Injured at work						
No	1133 (61)	1225 (57)	965 (57)	1032 (53)	795 (59)	845 (59)
Yes	251 (14)	265 (12)	207 (12)	182 (9)	98 (7)	98 (7)
Blank	451 (24)	643 (30)	491 (29)	712 (36)	422 (31)	441 (31)
Missing	21 (1)	35 (2)	24 (1)	32 (2)	41 (3)	38 (3)
R4b. Recoded # of Injuries						
No Injuries	1585 (85)	1869 (86)	1454 (86)	1740 (89)	1221 (90)	1287 (91)
One Injury	102 (5)	103 (5)	74 (4)	78 (4)	37 (3)	39 (3)
Two or More Injuries	136 (7)	151 (7)	128 (8)	100 (5)	52 (4)	53 (4)
Missing	33 (2)	45 (2)	31 (2)	40 (2)	46 (3)	43 (3)
6. Relative's risk of injury						
No	580 (31)	708 (33)	612 (36)	850 (43)	654 (48)	749 (53)
Yes	1247 (67)	1403 (65)	1051 (62)	1063 (54)	674 (50)	650 (46)
Missing	29 (2)	57 (3)	24 (1)	45 (2)	28 (2)	23 (2)

Question ¹	Pre-Test N=4024		Post-Test 1 N=3645		Post-Test 2 N=2778	
	Intervention N=1856 No. (%) ²	Control N=2168 No. (%)	Intervention N=1687 No. (%)	Control N=1958 No. (%)	Intervention N=1356 No. (%)	Control N=1422 No. (%)
7. Importance of work safety to relatives						
00 Not Important	11 (1)	16 (1)	17 (1)	15 (1)	8 (1)	14 (1)
01	10 (1)	21 (1)	6 (0)	7 (0)	5 (0)	3 (0)
02	26 (1)	23 (1)	9 (1)	19 (1)	4 (0)	7 (0)
03	29 (2)	35 (2)	30 (2)	30 (2)	14 (1)	21 (1)
04	43 (2)	65 (3)	28 (2)	40 (2)	24 (2)	13 (1)
05	133 (7)	180 (8)	128 (8)	117 (6)	82 (6)	93 (7)
06	106 (6)	91 (4)	94 (6)	95 (5)	59 (4)	46 (3)
07	179 (10)	191 (9)	149 (9)	132 (7)	98 (7)	90 (6)
08	223 (12)	221 (10)	197 (12)	192 (10)	126 (9)	127 (9)
09	123 (7)	162 (7)	128 (8)	124 (6)	69 (5)	65 (5)
10 Extremely Important	404 (22)	470 (22)	328 (19)	356 (18)	226 (17)	202 (14)
Blank	544 (29)	663 (31)	552 (33)	793 (41)	620 (46)	720 (51)
Missing	25 (1)	30 (1)	21 (1)	38 (2)	21 (2)	21 (1)
8. Friend's risk of injury						
No	1042 (56)	1268 (58)	988 (59)	1299 (66)	855 (63)	952 (67)
Yes	794 (43)	863 (40)	676 (40)	627 (32)	483 (36)	446 (31)
Missing	20 (1)	37 (2)	23 (1)	32 (2)	18 (1)	24 (2)
9. Importance of safety to friends						
00 Not Important	24 (1)	37 (2)	19 (1)	21 (1)	11 (1)	9 (1)
01	11 (1)	14 (1)	6 (0)	9 (0)	6 (0)	9 (1)
02	24 (1)	24 (1)	15 (1)	6 (0)	14 (1)	8 (1)
03	30 (2)	47 (2)	27 (2)	29 (1)	16 (1)	18 (1)
04	64 (3)	48 (2)	39 (2)	38 (2)	20 (1)	24 (2)
05	143 (8)	141 (7)	136 (8)	128 (7)	85 (6)	81 (6)
06	99 (5)	111 (5)	100 (6)	72 (4)	66 (5)	54 (4)
07	114 (6)	139 (6)	133 (8)	101 (5)	95 (7)	75 (5)
08	114 (6)	141 (7)	105 (6)	121 (6)	71 (5)	70 (5)
09	53 (3)	77 (4)	40 (2)	54 (3)	39 (3)	44 (3)
10 Extremely Important	157 (8)	169 (8)	118 (7)	125 (6)	108 (8)	95 (7)
Blank	996 (54)	1185 (55)	928 (55)	1226 (63)	808 (60)	909 (64)
Missing	27 (1)	35 (2)	21 (1)	28 (1)	17 (1)	26 (2)
10. Witnessed work injury						
No						
Yes	535 (29)	585 (27)	439 (26)	459 (23)	284 (21)	268 (19)
Missing	30 (2)	43 (2)	25 (1)	41 (2)	22 (2)	29 (2)
11. Know someone injured at work						
No	522 (28)	689 (32)	541 (32)	745 (38)	561 (41)	665 (47)
Yes	1306 (70)	1452 (67)	1119 (66)	1167 (60)	768 (57)	722 (51)
Missing	28 (2)	27 (1)	27 (2)	46 (2)	27 (2)	35 (2)

Question ¹	Pre-Test N=4024		Post-Test 1 N=3645		Post-Test 2 N=2778	
	Intervention N=1856 No. (%) ²	Control N=2168 No. (%)	Intervention N=1687 No. (%)	Control N=1958 No. (%)	Intervention N=1356 No. (%)	Control N=1422 No. (%)
12. Will choose safe v. quick						
1 Strongly Agree	561 (30)	613 (28)	456 (27)	524 (27)	345 (25)	383 (27)
2	499 (27)	556 (26)	450 (27)	498 (25)	338 (25)	331 (23)
3	614 (33)	751 (35)	601 (36)	697 (36)	526 (39)	539 (38)
4	100 (5)	169 (8)	107 (6)	128 (7)	80 (6)	88 (6)
5 Strongly Disagree	60 (3)	62 (3)	54 (3)	86 (4)	47 (3)	59 (4)
Missing	22 (1)	17 (1)	19 (1)	25 (1)	20 (1)	22 (2)
13. Would not wear uncomfortable protection						
1 Strongly Agree	162 (9)	209 (10)	105 (6)	167 (9)	72 (5)	103 (7)
2	240 (13)	327 (15)	259 (15)	294 (15)	158 (12)	183 (13)
3	454 (24)	583 (27)	534 (32)	647 (33)	509 (38)	545 (38)
4	437 (24)	486 (22)	398 (24)	392 (20)	312 (23)	267 (19)
5 Strongly Disagree	540 (29)	545 (25)	371 (22)	437 (22)	284 (21)	300 (21)
Missing	23 (1)	18 (1)	20 (1)	21 (1)	21 (2)	24 (2)
14. Shouldn't have child labor laws						
1 Strongly Agree	314 (17)	410 (19)	184 (11)	289 (15)	138 (10)	161 (11)
2	248 (13)	291 (13)	198 (12)	260 (13)	183 (13)	178 (13)
3	627 (34)	705 (33)	615 (36)	782 (40)	580 (43)	595 (42)
4	279 (15)	333 (15)	284 (17)	281 (14)	206 (15)	203 (14)
5 Strongly Disagree	362 (20)	408 (19)	382 (23)	320 (16)	221 (16)	255 (18)
Missing	26 (1)	21 (1)	24 (1)	26 (1)	28 (2)	30 (2)
15. Responsibility to co-workers to do something						
1 Strongly Agree	427 (23)	459 (21)	396 (23)	370 (19)	266 (20)	278 (20)
2	574 (31)	595 (27)	474 (28)	537 (27)	352 (26)	351 (25)
3	604 (33)	798 (37)	596 (35)	766 (39)	567 (42)	580 (41)
4	134 (7)	161 (7)	137 (8)	161 (8)	105 (8)	105 (7)
5 Strongly Disagree	87 (5)	129 (6)	59 (3)	90 (5)	41 (3)	76 (5)
Missing	30 (2)	26 (1)	25 (1)	34 (2)	25 (2)	32 (2)
16. Difficult to ask co-workers to change habits						
1 Strongly Agree	269 (14)	295 (14)	171 (10)	206 (11)	125 (9)	124 (9)
2	423 (23)	466 (21)	354 (21)	381 (19)	246 (18)	252 (18)
3	552 (30)	727 (34)	641 (38)	789 (40)	609 (45)	637 (45)
4	347 (19)	386 (18)	321 (19)	338 (17)	222 (16)	224 (16)
5 Strongly Disagree	238 (13)	270 (12)	176 (10)	215 (11)	130 (10)	157 (11)
Missing	27 (1)	24 (1)	24 (1)	29 (1)	24 (2)	28 (2)
17. Workplace injury or illness could happen to me						
1 Strongly Agree	856 (46)	929 (43)	707 (42)	653 (33)	442 (33)	416 (29)
2	425 (23)	519 (24)	406 (24)	448 (23)	313 (23)	322 (23)
3	396 (21)	514 (24)	416 (25)	624 (32)	468 (35)	509 (36)

Question ¹	Pre-Test N=4024		Post-Test 1 N=3645		Post-Test 2 N=2778	
	Intervention N=1856 No. (%) ²	Control N=2168 No. (%)	Intervention N=1687 No. (%)	Control N=1958 No. (%)	Intervention N=1356 No. (%)	Control N=1422 No. (%)
4	75 (4)	100 (5)	84 (5)	121 (6)	67 (5)	79 (6)
5 Strongly Disagree	74 (4)	84 (4)	46 (3)	79 (4)	34 (3)	64 (5)
Missing	30 (2)	22 (1)	28 (2)	33 (2)	32 (2)	32 (2)
18. SERIOUS injury/illness could happen to me						
1 Strongly Agree	495 (27)	489 (23)	460 (27)	383 (20)	309 (23)	254 (18)
2	403 (22)	472 (22)	401 (24)	440 (22)	332 (24)	312 (22)
3	619 (33)	728 (34)	585 (35)	766 (39)	525 (39)	590 (41)
4	210 (11)	299 (14)	149 (9)	213 (11)	114 (8)	141 (10)
5 Strongly Disagree	101 (5)	159 (7)	67 (4)	129 (7)	48 (4)	97 (7)
Missing	28 (2)	21 (1)	25 (1)	27 (1)	28 (2)	28 (2)
19. Less likely to be injured if identify...unsafe cond.						
1 Strongly Agree	653 (35)	651 (30)	482 (29)	515 (26)	345 (25)	346 (24)
2	512 (28)	650 (30)	531 (31)	530 (27)	356 (26)	350 (25)
3	464 (25)	594 (27)	512 (30)	671 (34)	519 (38)	546 (38)
4	112 (6)	155 (7)	83 (5)	136 (7)	68 (5)	87 (6)
5 Strongly Disagree	85 (5)	93 (4)	59 (3)	75 (4)	36 (3)	62 (4)
Missing	30 (2)	25 (1)	20 (1)	31 (2)	32 (2)	31 (2)
20. Work injuries don't happen to me						
1 Strongly Agree	69 (4)	95 (4)	61 (4)	94 (5)	47 (3)	61 (4)
2	85 (5)	115 (5)	100 (6)	113 (6)	81 (6)	100 (7)
3	419 (23)	532 (25)	458 (27)	619 (32)	469 (35)	513 (36)
4	468 (25)	545 (25)	439 (26)	468 (24)	328 (24)	303 (21)
5 Strongly Disagree	783 (42)	856 (39)	604 (36)	634 (32)	403 (30)	414 (29)
Missing	32 (2)	25 (1)	25 (1)	30 (2)	28 (2)	31 (2)
21. No need for labor laws						
1 Strongly Agree	60 (3)	82 (4)	62 (4)	92 (5)	33 (2)	52 (4)
2	73 (4)	104 (5)	87 (5)	134 (7)	83 (6)	94 (7)
3	307 (17)	392 (18)	381 (23)	519 (27)	445 (33)	440 (31)
4	353 (19)	419 (19)	357 (21)	376 (19)	286 (21)	278 (20)
5 Strongly Disagree	1023 (55)	1146 (53)	767 (45)	801 (41)	479 (35)	527 (37)
Missing	40 (2)	25 (1)	33 (2)	36 (2)	30 (2)	31 (2)
22. WP injuries not a concern of mine						
1 Strongly Agree	143 (8)	217 (10)	94 (6)	149 (8)	81 (6)	110 (8)
2	312 (17)	304 (14)	238 (14)	286 (15)	171 (13)	204 (14)
3	618 (33)	748 (35)	639 (38)	848 (43)	621 (46)	622 (44)
4	394 (21)	465 (21)	394 (23)	386 (20)	260 (19)	261 (18)
5 Strongly Disagree	356 (19)	412 (19)	294 (17)	257 (13)	195 (14)	194 (14)
Missing	33 (2)	22 (1)	28 (2)	32 (2)	28 (2)	31 (2)
23. Don't know what to do in unsafe WP						

Question ¹	Pre-Test N=4024		Post-Test 1 N=3645		Post-Test 2 N=2778	
	Intervention N=1856 No. (%) ²	Control N=2168 No. (%)	Intervention N=1687 No. (%)	Control N=1958 No. (%)	Intervention N=1356 No. (%)	Control N=1422 No. (%)
1 Strongly Agree	130 (7)	168 (8)	87 (5)	135 (7)	57 (4)	68 (5)
2	245 (13)	307 (14)	199 (12)	251 (13)	154 (11)	176 (12)
3	691 (37)	792 (37)	681 (40)	825 (42)	637 (47)	623 (44)
4	453 (24)	556 (26)	436 (26)	452 (23)	295 (22)	316 (22)
5 Strongly Disagree	299 (16)	317 (15)	246 (15)	259 (13)	172 (13)	202 (14)
Missing	38 (2)	28 (1)	38 (2)	36 (2)	41 (3)	37 (3)
24. Worried I'll look like geek						
1 Strongly Agree	131 (7)	193 (9)	98 (6)	130 (7)	78 (6)	85 (6)
2	208 (11)	267 (12)	195 (12)	255 (13)	154 (11)	159 (11)
3	617 (33)	729 (34)	665 (39)	783 (40)	611 (45)	615 (43)
4	475 (26)	512 (24)	422 (25)	448 (23)	305 (22)	297 (21)
5 Strongly Disagree	387 (21)	435 (20)	269 (16)	303 (15)	165 (12)	227 (16)
Missing	38 (2)	32 (1)	38 (2)	39 (2)	43 (3)	39 (3)
25. Individuals can make a difference						
1 Strongly Agree	671 (36)	727 (34)	475 (28)	493 (25)	294 (22)	291 (20)
2	554 (30)	679 (31)	503 (30)	551 (28)	392 (29)	373 (26)
3	460 (25)	558 (26)	534 (32)	697 (36)	521 (38)	589 (41)
4	87 (5)	93 (4)	98 (6)	115 (6)	68 (5)	74 (5)
5 Strongly Disagree	45 (2)	76 (4)	38 (2)	50 (3)	39 (3)	55 (4)
Missing	39 (2)	35 (2)	39 (2)	52 (3)	42 (3)	40 (3)
26. I make co-workers safe when...						
1 Strongly Agree	691 (37)	740 (34)	498 (30)	525 (27)	342 (25)	316 (22)
2	580 (31)	682 (31)	495 (29)	556 (28)	347 (26)	384 (27)
3	416 (22)	553 (26)	520 (31)	671 (34)	528 (39)	556 (39)
4	81 (4)	92 (4)	92 (5)	103 (5)	61 (4)	73 (5)
5 Strongly Disagree	52 (3)	66 (3)	42 (2)	64 (3)	35 (3)	53 (4)
Missing	36 (2)	35 (2)	40 (2)	39 (2)	43 (3)	40 (3)
27. Important to take extra time to be safe						
1 Strongly Agree	561 (30)	593 (27)	402 (24)	458 (23)	254 (19)	291 (20)
2	572 (31)	656 (30)	477 (28)	548 (28)	366 (27)	376 (26)
3	494 (27)	651 (30)	605 (36)	707 (36)	564 (42)	567 (40)
4	134 (7)	135 (6)	110 (7)	129 (7)	85 (6)	84 (6)
5 Strongly Disagree	51 (3)	87 (4)	49 (3)	70 (4)	37 (3)	63 (4)
Missing	44 (2)	46 (2)	44 (3)	46 (2)	50 (4)	41 (3)
28. Workers responsible to ID hazards						
1 Strongly Agree	525 (28)	533 (25)	378 (22)	408 (21)	261 (19)	257 (18)
2	587 (32)	705 (33)	504 (30)	567 (29)	316 (23)	394 (28)
3	554 (30)	675 (31)	615 (36)	737 (38)	601 (44)	584 (41)
4	105 (6)	142 (7)	103 (6)	127 (6)	83 (6)	91 (6)

Question ¹	Pre-Test N=4024		Post-Test 1 N=3645		Post-Test 2 N=2778	
	Intervention N=1856 No. (%) ²	Control N=2168 No. (%)	Intervention N=1687 No. (%)	Control N=1958 No. (%)	Intervention N=1356 No. (%)	Control N=1422 No. (%)
5 Strongly Disagree	46 (2)	74 (3)	44 (3)	73 (4)	45 (3)	56 (4)
Missing	39 (2)	39 (2)	43 (3)	46 (2)	50 (4)	40 (3)
29. Most WP safe, so not concerned about WP injuries						
1 Strongly Agree	92 (5)	121 (6)	83 (5)	99 (5)	51 (4)	57 (4)
2	182 (10)	231 (11)	159 (9)	210 (11)	111 (8)	167 (12)
3	639 (34)	834 (38)	675 (40)	854 (44)	616 (45)	655 (46)
4	577 (31)	626 (29)	485 (29)	507 (26)	360 (27)	336 (24)
5 Strongly Disagree	325 (18)	319 (15)	244 (14)	248 (13)	172 (13)	163 (11)
Missing	41 (2)	37 (2)	41 (2)	40 (2)	46 (3)	44 (3)
30. Good at convincing employer to make safer						
1 Strongly Agree	259 (14)	298 (14)	219 (13)	242 (12)	152 (11)	143 (10)
2	448 (24)	512 (24)	386 (23)	420 (21)	257 (19)	270 (19)
3	810 (44)	931 (43)	767 (45)	954 (49)	702 (52)	731 (51)
4	192 (10)	270 (12)	197 (12)	205 (10)	147 (11)	161 (11)
5 Strongly Disagree	105 (6)	120 (6)	77 (5)	99 (5)	53 (4)	79 (6)
Missing	42 (2)	37 (2)	41 (2)	38 (2)	45 (3)	38 (3)
31. Might remove shields						
1 Strongly Agree	103 (6)	121 (6)	90 (5)	126 (6)	59 (4)	71 (5)
2	164 (9)	207 (10)	186 (11)	201 (10)	128 (9)	141 (10)
3	488 (26)	615 (28)	627 (37)	746 (38)	591 (44)	594 (42)
4	475 (26)	564 (26)	402 (24)	443 (23)	299 (22)	299 (21)
5 Strongly Disagree	582 (31)	625 (29)	337 (20)	394 (20)	233 (17)	276 (19)
Missing	44 (2)	36 (2)	45 (3)	48 (2)	46 (3)	41 (3)
32. Most injuries not serious						
1 Strongly Agree	72 (4)	90 (4)	46 (3)	86 (4)	50 (4)	54 (4)
2	127 (7)	181 (8)	123 (7)	162 (8)	103 (8)	133 (9)
3	516 (28)	652 (30)	604 (36)	780 (40)	558 (41)	606 (43)
4	575 (31)	638 (29)	500 (30)	514 (26)	336 (25)	355 (25)
5 Strongly Disagree	520 (28)	559 (26)	372 (22)	367 (19)	259 (19)	228 (16)
Missing	46 (2)	48 (2)	42 (2)	49 (3)	50 (4)	46 (3)
33. Confident could make good suggestions						
1 Strongly Agree	319 (17)	277 (13)	252 (15)	239 (12)	168 (12)	157 (11)
2	498 (27)	602 (28)	462 (27)	463 (24)	309 (23)	332 (23)
3	776 (42)	929 (43)	721 (43)	933 (48)	691 (51)	684 (48)
4	152 (8)	197 (9)	159 (9)	177 (9)	90 (7)	123 (9)
5 Strongly Disagree	63 (3)	103 (5)	46 (3)	86 (4)	47 (3)	71 (5)
Missing	48 (3)	60 (3)	47 (3)	60 (3)	51 (4)	55 (4)
34. WP injuries can lead to death, disability						
1 Strongly Agree	159 (9)	177 (8)	154 (9)	159 (8)	123 (9)	99 (7)
2	261 (14)	273 (13)	271 (16)	242 (12)	222 (16)	174 (12)

Question ¹	Pre-Test N=4024		Post-Test 1 N=3645		Post-Test 2 N=2778	
	Intervention N=1856 No. (%) ²	Control N=2168 No. (%)	Intervention N=1687 No. (%)	Control N=1958 No. (%)	Intervention N=1356 No. (%)	Control N=1422 No. (%)
3	819 (44)	997 (46)	791 (47)	991 (51)	703 (52)	737 (52)
4	365 (20)	419 (19)	294 (17)	321 (16)	192 (14)	233 (16)
5 Strongly Disagree	220 (12)	271 (13)	140 (8)	211 (11)	80 (6)	146 (10)
Missing	32 (2)	31 (1)	37 (2)	34 (2)	36 (3)	33 (2)
35. Not much individual can do to prevent injuries						
1 Strongly Agree	70 (4)	95 (4)	58 (3)	68 (3)	42 (3)	46 (3)
2	187 (10)	217 (10)	170 (10)	199 (10)	95 (7)	142 (10)
3	593 (32)	731 (34)	633 (38)	803 (41)	592 (44)	615 (43)
4	575 (31)	709 (33)	508 (30)	550 (28)	387 (29)	378 (27)
5 Strongly Disagree	398 (21)	388 (18)	284 (17)	304 (16)	201 (15)	204 (14)
Missing	33 (2)	28 (1)	34 (2)	34 (2)	39 (3)	37 (3)
36. Serious WP injuries are so rare, not worth worrying						
1 Strongly Agree	60 (3)	93 (4)	55 (3)	75 (4)	52 (4)	52 (4)
2	154 (8)	180 (8)	153 (9)	198 (10)	119 (9)	120 (8)
3	569 (31)	729 (34)	608 (36)	812 (41)	584 (43)	611 (43)
4	604 (33)	685 (32)	527 (31)	529 (27)	344 (25)	389 (27)
5 Strongly Disagree	426 (23)	446 (21)	303 (18)	303 (15)	219 (16)	210 (15)
Missing	43 (2)	35 (2)	41 (2)	41 (2)	38 (3)	40 (3)
37. WP injury could change my life						
1 Strongly Agree	585 (32)	627 (29)	448 (27)	429 (22)	306 (23)	262 (18)
2	491 (26)	582 (27)	447 (26)	476 (24)	328 (24)	340 (24)
3	529 (29)	648 (30)	586 (35)	772 (39)	553 (41)	608 (43)
4	137 (7)	168 (8)	114 (7)	155 (8)	80 (6)	111 (8)
5 Strongly Disagree	73 (4)	111 (5)	54 (3)	91 (5)	48 (4)	63 (4)
Missing	41 (2)	32 (1)	38 (2)	35 (2)	41 (3)	38 (3)
38. Reluctant tell employer						
1 Strongly Agree	153 (8)	179 (8)	110 (7)	122 (6)	85 (6)	64 (5)
2	294 (16)	304 (14)	226 (13)	297 (15)	174 (13)	173 (12)
3	789 (43)	999 (46)	847 (50)	955 (49)	751 (55)	757 (53)
4	372 (20)	398 (18)	318 (19)	365 (19)	199 (15)	241 (17)
5 Strongly Disagree	209 (11)	255 (12)	148 (9)	182 (9)	107 (8)	150 (11)
Missing	39 (2)	33 (2)	38 (2)	37 (2)	40 (3)	37 (3)
39. Alerting employer no use						
1 Strongly Agree	80 (4)	103 (5)	74 (4)	79 (4)	54 (4)	51 (4)
2	188 (10)	235 (11)	169 (10)	200 (10)	130 (10)	153 (11)
3	595 (32)	739 (34)	674 (40)	861 (44)	639 (47)	659 (46)
4	571 (31)	674 (31)	489 (29)	492 (25)	327 (24)	325 (23)
5 Strongly Disagree	381 (21)	384 (18)	242 (14)	288 (15)	162 (12)	198 (14)
Missing	41 (2)	33 (2)	39 (2)	38 (2)	44 (3)	36 (3)
40. Quick better than safe						

Question ¹	Pre-Test N=4024		Post-Test 1 N=3645		Post-Test 2 N=2778	
	Intervention N=1856 No. (%) ²	Control N=2168 No. (%)	Intervention N=1687 No. (%)	Control N=1958 No. (%)	Intervention N=1356 No. (%)	Control N=1422 No. (%)
1 Strongly Agree	71 (4)	76 (4)	61 (4)	76 (4)	52 (4)	48 (3)
2	111 (6)	159 (7)	133 (8)	167 (9)	94 (7)	116 (8)
3	508 (27)	622 (29)	607 (36)	785 (40)	591 (44)	596 (42)
4	512 (28)	611 (28)	422 (25)	469 (24)	305 (22)	325 (23)
5 Strongly Disagree	606 (33)	662 (31)	418 (25)	417 (21)	271 (20)	295 (21)
Missing	48 (3)	38 (2)	46 (3)	44 (2)	43 (3)	42 (3)
41. Following rules is safer						
1 Strongly Agree	735 (40)	778 (36)	496 (29)	512 (26)	325 (24)	350 (25)
2	534 (29)	593 (27)	501 (30)	516 (26)	344 (25)	323 (23)
3	400 (22)	547 (25)	523 (31)	695 (35)	530 (39)	559 (39)
4	91 (5)	127 (6)	82 (5)	128 (7)	75 (6)	95 (7)
5 Strongly Disagree	55 (3)	88 (4)	44 (3)	70 (4)	36 (3)	60 (4)
Missing	41 (2)	35 (2)	41 (2)	37 (2)	46 (3)	35 (2)
42. Might not wear protective gear if faster						
1 Strongly Agree	95 (5)	137 (6)	89 (5)	106 (5)	77 (6)	83 (6)
2	209 (11)	231 (11)	210 (12)	231 (12)	141 (10)	158 (11)
3	547 (29)	704 (32)	637 (38)	832 (42)	600 (44)	613 (43)
4	449 (24)	544 (25)	394 (23)	386 (20)	273 (20)	280 (20)
5 Strongly Disagree	513 (28)	511 (24)	311 (18)	362 (18)	217 (16)	250 (18)
Missing	43 (2)	41 (2)	46 (3)	41 (2)	48 (4)	38 (3)
43a. Could ID most hazards						
1 Very Confident	314 (17)	412 (19)	309 (18)	358 (18)	226 (17)	241 (17)
2	684 (37)	678 (31)	558 (33)	540 (28)	353 (26)	359 (25)
3	703 (38)	872 (40)	674 (40)	877 (45)	649 (48)	674 (47)
4	80 (4)	117 (5)	80 (5)	86 (4)	57 (4)	58 (4)
5 Not Confident	35 (2)	53 (2)	26 (2)	57 (3)	22 (2)	52 (4)
Missing	40 (2)	36 (2)	40 (2)	40 (2)	49 (4)	38 (3)
43b. Could tell employer of unsafe conditions						
1 Very Confident	400 (22)	450 (21)	285 (17)	342 (17)	211 (16)	226 (16)
2	692 (37)	728 (34)	536 (32)	558 (28)	351 (26)	375 (26)
3	545 (29)	739 (34)	660 (39)	826 (42)	616 (45)	625 (44)
4	135 (7)	159 (7)	124 (7)	123 (6)	96 (7)	104 (7)
5 Not Confident	45 (2)	53 (2)	41 (2)	64 (3)	30 (2)	56 (4)
Missing	39 (2)	39 (2)	41 (2)	45 (2)	52 (4)	36 (3)
43c. Could convince employer to make changes						
1 Very Confident	344 (19)	399 (18)	257 (15)	313 (16)	192 (14)	211 (15)
2	596 (32)	637 (29)	494 (29)	461 (24)	294 (22)	307 (22)
3	631 (34)	810 (37)	683 (40)	880 (45)	671 (49)	681 (48)
4	181 (10)	192 (9)	155 (9)	171 (9)	111 (8)	125 (9)
5 Not Confident	61 (3)	86 (4)	48 (3)	83 (4)	38 (3)	59 (4)

Question ¹	Pre-Test N=4024		Post-Test 1 N=3645		Post-Test 2 N=2778	
	Intervention N=1856 No. (%) ²	Control N=2168 No. (%)	Intervention N=1687 No. (%)	Control N=1958 No. (%)	Intervention N=1356 No. (%)	Control N=1422 No. (%)
Missing	43 (2)	44 (2)	50 (3)	50 (3)	50 (4)	39 (3)
43d. Could ask co-workers to change WP behaviors						
1 Very Confident	290 (16)	327 (15)	231 (14)	278 (14)	187 (14)	196 (14)
2	510 (27)	607 (28)	441 (26)	472 (24)	291 (21)	300 (21)
3	691 (37)	837 (39)	736 (44)	882 (45)	653 (48)	680 (48)
4	237 (13)	239 (11)	167 (10)	199 (10)	118 (9)	135 (9)
5 Not Confident	82 (4)	122 (6)	66 (4)	81 (4)	59 (4)	70 (5)
Missing	46 (2)	36 (2)	46 (3)	46 (2)	48 (4)	41 (3)
43e. Making good suggestion						
1 Very Confident	384 (21)	415 (19)	304 (18)	324 (17)	214 (16)	224 (16)
2	609 (33)	635 (29)	505 (30)	507 (26)	305 (22)	339 (24)
3	596 (32)	827 (38)	663 (39)	850 (43)	645 (48)	646 (45)
4	158 (9)	167 (8)	125 (7)	152 (8)	103 (8)	110 (8)
5 Not Confident	57 (3)	84 (4)	41 (2)	73 (4)	39 (3)	57 (4)
Missing	52 (3)	40 (2)	49 (3)	52 (3)	50 (4)	46 (3)
44a. Safe workplace the law						
TRUE	1510 (81)	1737 (80)	1309 (78)	1400 (72)	966 (71)	960 (68)
FALSE	72 (4)	70 (3)	77 (5)	107 (5)	65 (5)	85 (6)
Don't Know	235 (13)	324 (15)	257 (15)	417 (21)	276 (20)	335 (24)
Missing	39 (2)	37 (2)	44 (3)	34 (2)	49 (4)	42 (3)
44b. Employer does not pay for work injury						
TRUE	318 (17)	397 (18)	241 (14)	283 (14)	211 (16)	203 (14)
FALSE	863 (46)	969 (45)	836 (50)	886 (45)	553 (41)	585 (41)
Don't Know	633 (34)	762 (35)	565 (33)	751 (38)	544 (40)	598 (42)
Missing	42 (2)	40 (2)	45 (3)	38 (2)	48 (4)	36 (3)
44c. Illegal to fire if report hazard						
TRUE	1132 (61)	1284 (59)	1041 (62)	1041 (53)	745 (55)	720 (51)
FALSE	304 (16)	388 (18)	238 (14)	320 (16)	196 (14)	218 (15)
Don't Know	378 (20)	455 (21)	363 (22)	557 (28)	367 (27)	445 (31)
Missing	42 (2)	41 (2)	45 (3)	40 (2)	48 (4)	39 (3)
44d. <18 yr old work restrictions						
TRUE	224 (12)	254 (12)	163 (10)	185 (9)	124 (9)	124 (9)
FALSE	1204 (65)	1345 (62)	1117 (66)	1154 (59)	825 (61)	799 (56)
Don't Know	386 (21)	529 (24)	362 (21)	578 (30)	358 (26)	462 (32)
Missing	42 (2)	40 (2)	45 (3)	41 (2)	49 (4)	37 (3)
44e. No use of power equipment when < 16 yrs old						
TRUE	664 (36)	773 (36)	891 (53)	741 (38)	660 (49)	562 (40)
FALSE	580 (31)	679 (31)	295 (17)	464 (24)	205 (15)	268 (19)
Don't Know	564 (30)	674 (31)	453 (27)	714 (36)	442 (33)	555 (39)

Question ¹	Pre-Test N=4024		Post-Test 1 N=3645		Post-Test 2 N=2778	
	Intervention N=1856 No. (%) ²	Control N=2168 No. (%)	Intervention N=1687 No. (%)	Control N=1958 No. (%)	Intervention N=1356 No. (%)	Control N=1422 No. (%)
Missing	48 (3)	42 (2)	48 (3)	39 (2)	49 (4)	37 (3)
44f. No employment for < 14 yrs old						
TRUE	858 (46)	1086 (50)	673 (40)	884 (45)	566 (42)	630 (44)
FALSE	442 (24)	461 (21)	494 (29)	367 (19)	300 (22)	220 (15)
Don't Know	512 (28)	576 (27)	473 (28)	666 (34)	440 (32)	529 (37)
Missing	44 (2)	45 (2)	47 (3)	41 (2)	50 (4)	43 (3)
44g. Worker education most effective prevention						
TRUE	1345 (72)	1524 (70)	1122 (67)	1122 (57)	779 (57)	777 (55)
FALSE	89 (5)	110 (5)	124 (7)	150 (8)	108 (8)	96 (7)
Don't Know	378 (20)	490 (23)	393 (23)	644 (33)	418 (31)	508 (36)
Missing	44 (2)	44 (2)	48 (3)	42 (2)	51 (4)	41 (3)
44h. Can hold breath for toxic rescue						
TRUE	300 (16)	388 (18)	269 (16)	343 (18)	207 (15)	218 (15)
FALSE	877 (47)	954 (44)	816 (48)	790 (40)	608 (45)	548 (39)
Don't Know	633 (34)	782 (36)	552 (33)	784 (40)	490 (36)	617 (43)
Missing	46 (2)	44 (2)	50 (3)	41 (2)	51 (4)	39 (3)
45. Could identify hazards at fast food restaurant						
No	1240 (67)	1423 (66)	1062 (63)	1003 (51)	711 (52)	599 (42)
Yes	554 (30)	686 (32)	560 (33)	892 (46)	586 (43)	773 (54)
Missing	62 (3)	59 (3)	65 (4)	63 (3)	59 (4)	50 (4)
46. Could give example of long term hazard						
No	1140 (61)	1433 (66)	997 (59)	1351 (69)	906 (67)	1069 (75)
Yes	657 (35)	672 (31)	626 (37)	552 (28)	387 (29)	313 (22)
Missing	59 (3)	63 (3)	64 (4)	55 (3)	63 (5)	40 (3)
47. MOST effective prevention method						
Educ., Barr. & Rules	16 (1)	28 (1)	16 (1)	13 (1)	14 (1)	13 (1)
Education	816 (44)	909 (42)	775 (46)	867 (44)	614 (45)	641 (45)
Barriers	456 (25)	538 (25)	456 (27)	569 (29)	352 (26)	401 (28)
Rules	509 (27)	629 (29)	375 (22)	440 (22)	307 (23)	325 (23)
Educ. & Rules	2 (0)	7 (0)	1 (0)	1 (0)	3 (0)	0 (0)
Barr & Rules	0 (0)	0 (0)	3 (0)	0 (0)	0 (0)	1 (0)
Educ. & Barr.	2 (0)	1 (0)	2 (0)	0 (0)	0 (0)	3 (0)
Missing	55 (3)	56 (3)	59 (3)	68 (3)	66 (5)	38 (3)
48. I will make WP safer						
1 Always	350 (19)	403 (19)	283 (17)	316 (16)	213 (16)	241 (17)
2	603 (32)	667 (31)	518 (31)	492 (25)	311 (23)	316 (22)
3	721 (39)	886 (41)	729 (43)	953 (49)	678 (50)	718 (50)
4	81 (4)	100 (5)	65 (4)	82 (4)	55 (4)	57 (4)

Question ¹	Pre-Test N=4024		Post-Test 1 N=3645		Post-Test 2 N=2778	
	Intervention N=1856 No. (%) ²	Control N=2168 No. (%)	Intervention N=1687 No. (%)	Control N=1958 No. (%)	Intervention N=1356 No. (%)	Control N=1422 No. (%)
5 Never	49 (3)	60 (3)	43 (3)	59 (3)	32 (2)	51 (4)
Missing	52 (3)	52 (2)	49 (3)	56 (3)	67 (5)	39 (3)
49. Will use safety equip.						
1 Always	589 (32)	661 (30)	404 (24)	437 (22)	268 (20)	305 (21)
2	586 (32)	644 (30)	520 (31)	524 (27)	365 (27)	339 (24)
3	488 (26)	632 (29)	596 (35)	785 (40)	575 (42)	611 (43)
4	95 (5)	112 (5)	76 (5)	97 (5)	51 (4)	76 (5)
5 Never	45 (2)	64 (3)	38 (2)	61 (3)	27 (2)	49 (3)
Missing	53 (3)	55 (3)	53 (3)	54 (3)	70 (5)	42 (3)
50. Will check for unsafe conditions						
1 Always	287 (15)	363 (17)	263 (16)	291 (15)	168 (12)	198 (14)
2	506 (27)	534 (25)	420 (25)	410 (21)	277 (20)	315 (22)
3	701 (38)	861 (40)	717 (43)	932 (48)	676 (50)	674 (47)
4	186 (10)	238 (11)	165 (10)	172 (9)	115 (8)	117 (8)
5 Never	122 (7)	115 (5)	65 (4)	96 (5)	52 (4)	75 (5)
Missing	54 (3)	57 (3)	57 (3)	57 (3)	68 (5)	43 (3)
51. Will talk with employer						
1 Always	336 (18)	401 (18)	276 (16)	303 (15)	188 (14)	231 (16)
2	553 (30)	620 (29)	488 (29)	484 (25)	320 (24)	313 (22)
3	676 (36)	811 (37)	672 (40)	864 (44)	647 (48)	657 (46)
4	156 (8)	183 (8)	131 (8)	169 (9)	80 (6)	109 (8)
5 Never	79 (4)	99 (5)	63 (4)	84 (4)	48 (4)	66 (5)
Missing	56 (3)	54 (2)	57 (3)	54 (3)	73 (5)	46 (3)
52. Heavy lifting...will ask for help						
1 Always	646 (35)	754 (35)	488 (29)	526 (27)	291 (21)	324 (23)
2	478 (26)	533 (25)	404 (24)	440 (22)	303 (22)	306 (22)
3	425 (23)	529 (24)	527 (31)	713 (36)	546 (40)	568 (40)
4	156 (8)	174 (8)	139 (8)	121 (6)	90 (7)	94 (7)
5 Never	93 (5)	125 (6)	69 (4)	96 (5)	50 (4)	85 (6)
Missing	58 (3)	53 (2)	60 (4)	62 (3)	76 (6)	45 (3)
53. Illegal condition...will talk to employer						
1 Always	427 (23)	503 (23)	322 (19)	359 (18)	192 (14)	256 (18)
2	433 (23)	540 (25)	395 (23)	417 (21)	286 (21)	283 (20)
3	638 (34)	717 (33)	671 (40)	872 (45)	634 (47)	642 (45)
4	187 (10)	200 (9)	156 (9)	150 (8)	105 (8)	121 (9)
5 Never	111 (6)	147 (7)	79 (5)	96 (5)	61 (4)	73 (5)
Missing	60 (3)	61 (3)	64 (4)	64 (3)	78 (6)	47 (3)
54. Would role model put safety over speed, comfort						
Definitely	486 (26)	586 (27)	416 (25)	519 (27)	298 (22)	350 (25)
Probably	649 (35)	678 (31)	532 (32)	579 (30)	387 (29)	373 (26)

Question ¹	Pre-Test N=4024		Post-Test 1 N=3645		Post-Test 2 N=2778	
	Intervention N=1856 No. (%) ²	Control N=2168 No. (%)	Intervention N=1687 No. (%)	Control N=1958 No. (%)	Intervention N=1356 No. (%)	Control N=1422 No. (%)
Not Sure	495 (27)	635 (29)	503 (30)	584 (30)	466 (34)	462 (32)
Probably Not	125 (7)	131 (6)	113 (7)	118 (6)	75 (6)	100 (7)
Definitely Not	44 (2)	71 (3)	60 (4)	102 (5)	50 (4)	85 (6)
Missing	57 (3)	67 (3)	63 (4)	56 (3)	80 (6)	52 (4)
55. Would fellow students put safety first						
Almost All	120 (6)	144 (7)	113 (7)	172 (9)	103 (8)	123 (9)
More than Half	354 (19)	415 (19)	329 (20)	352 (18)	262 (19)	293 (21)
Half	766 (41)	861 (40)	654 (39)	734 (37)	521 (38)	555 (39)
Less than Half	405 (22)	495 (23)	378 (22)	411 (21)	267 (20)	249 (18)
Almost None	144 (8)	186 (9)	148 (9)	223 (11)	120 (9)	148 (10)
Missing	67 (4)	67 (3)	65 (4)	66 (3)	83 (6)	54 (4)
56. Grade level						
Freshman (9)	667 (36)	901 (42)	625 (37)	814 (42)	0 (0)	0 (0)
Sophomore (10)	501 (27)	714 (33)	463 (27)	678 (35)	601 (44)	475 (33)
Junior (11)	688 (37)	553 (26)	599 (36)	466 (24)	450 (33)	666 (47)
Senior (12)	0 (0)	0 (0)	0 (0)	0 (0)	305 (22)	281 (20)
Missing	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
58. Gender						
Male	917 (49)	1048 (48)	818 (48)	935 (48)	644 (47)	667 (47)
Female	901 (49)	1083 (50)	820 (49)	988 (50)	646 (48)	718 (50)
Missing	38 (2)	37 (2)	49 (3)	35 (2)	66 (5)	37 (3)
59. Live on a farm						
No	1346 (73)	1699 (78)	1175 (70)	1507 (77)	913 (67)	1053 (74)
Yes	451 (24)	407 (19)	444 (26)	384 (20)	364 (27)	313 (22)
Missing	59 (3)	62 (3)	68 (4)	67 (3)	79 (6)	56 (4)
61. Hispanic						
No	1746 (94)	2027 (93)	1573 (93)	1845 (94)	1225 (90)	1319 (93)
Yes	57 (3)	85 (4)	57 (3)	64 (3)	56 (4)	56 (4)
Missing	53 (3)	56 (3)	57 (3)	49 (3)	75 (6)	47 (3)
62. Race						
African American/Black	16 (1)	16 (1)	20 (1)	19 (1)	13 (1)	14 (1)
Native American	11 (1)	53 (2)	8 (0)	37 (2)	9 (1)	20 (1)
Asian American	19 (1)	21 (1)	29 (2)	27 (1)	23 (2)	19 (1)
Hawaiian/Pacific Islander	1 (0)	3 (0)	3 (0)	9 (0)	4 (0)	7 (0)
Caucasian	1681 (91)	1906 (88)	1510 (90)	1738 (89)	1166 (86)	1257 (88)
Other	65 (4)	116 (5)	53 (3)	87 (4)	59 (4)	58 (4)
Missing	63 (3)	53 (2)	64 (4)	41 (2)	82 (6)	47 (3)
63a. Father's education						
Some High School	88 (5)	127 (6)	90 (5)	117 (6)	79 (6)	97 (7)
High School Graduate	483 (26)	447 (21)	418 (25)	369 (19)	339 (25)	292 (21)
Vocational/Technical	262 (14)	269 (12)	232 (14)	263 (13)	177 (13)	191 (13)
Some College	100 (5)	139 (6)	90 (5)	127 (6)	68 (5)	73 (5)

Question ¹	Pre-Test N=4024		Post-Test 1 N=3645		Post-Test 2 N=2778	
	Intervention N=1856 No. (%) ²	Control N=2168 No. (%)	Intervention N=1687 No. (%)	Control N=1958 No. (%)	Intervention N=1356 No. (%)	Control N=1422 No. (%)
College Graduate	634 (34)	763 (35)	537 (32)	704 (36)	385 (28)	456 (32)
Don't Have	19 (1)	31 (1)	33 (2)	23 (1)	27 (2)	38 (3)
Don't Know	176 (9)	279 (13)	183 (11)	260 (13)	163 (12)	175 (12)
Missing	94 (5)	113 (5)	104 (6)	95 (5)	118 (9)	100 (7)
63b. Mother's education						
Some High School	82 (4)	81 (4)	81 (5)	63 (3)	66 (5)	63 (4)
High School Graduate	371 (20)	390 (18)	310 (18)	320 (16)	273 (20)	248 (17)
Vocational/Technical	248 (13)	260 (12)	213 (13)	242 (12)	165 (12)	182 (13)
Some College	131 (7)	203 (9)	124 (7)	169 (9)	87 (6)	111 (8)
College Graduate	753 (41)	857 (40)	666 (39)	802 (41)	473 (35)	519 (36)
Don't Have	15 (1)	12 (1)	12 (1)	14 (1)	16 (1)	27 (2)
Don't Know	143 (8)	243 (11)	171 (10)	219 (11)	142 (10)	162 (11)
Missing	113 (6)	122 (6)	110 (7)	129 (7)	134 (10)	110 (8)
64a. Thrill seeking behavior						
Never	193 (10)	256 (12)	181 (11)	245 (13)	170 (13)	197 (14)
Once	153 (8)	172 (8)	136 (8)	155 (8)	100 (7)	106 (7)
2-3 times	375 (20)	411 (19)	308 (18)	367 (19)	233 (17)	248 (17)
4-6 times	240 (13)	306 (14)	237 (14)	247 (13)	169 (12)	175 (12)
7-10 times	223 (12)	247 (11)	179 (11)	209 (11)	105 (8)	135 (9)
11-20 times	155 (8)	168 (8)	136 (8)	135 (7)	104 (8)	110 (8)
21+ times	433 (23)	527 (24)	435 (26)	526 (27)	388 (29)	397 (28)
Missing	84 (5)	81 (4)	75 (4)	74 (4)	87 (6)	54 (4)
64b. Risk for excitement						
Never	203 (11)	253 (12)	185 (11)	247 (13)	162 (12)	195 (14)
Once	159 (9)	196 (9)	135 (8)	169 (9)	118 (9)	113 (8)
2-3 times	365 (20)	411 (19)	319 (19)	351 (18)	223 (16)	241 (17)
4-6 times	221 (12)	267 (12)	207 (12)	246 (13)	148 (11)	152 (11)
7-10 times	225 (12)	226 (10)	196 (12)	202 (10)	133 (10)	158 (11)
11-20 times	158 (9)	205 (9)	141 (8)	155 (8)	113 (8)	106 (7)
21+ times	449 (24)	525 (24)	428 (25)	509 (26)	374 (28)	394 (28)
Missing	76 (4)	85 (4)	76 (5)	79 (4)	85 (6)	63 (4)

¹For complete survey question, see complete survey instrument, Appendix B.

²Percents are rounded to nearest whole number; values <0.5% are rounded to 0.

Table 11. Reliability of Constructs Used to Measure Outcome Factors

Outcome Factor	Number of Items Comprising Factor	Range of Possible Scores for Factor¹	Criteria for Missing data²	Cronbach's alpha
Intent	6	6-30	2 or more	0.84
Knowledge	8	0-8	Missing response set to "wrong answer"	0.64
Perceived Barriers	5	5-25	2 or more	0.59
Perceived Benefits	11	11-55	3 or more	0.82
Perceived Severity	4	4-20	1 or more	0.39
Perceived Susceptibility	6	6-30	2 or more	0.66
Self Efficacy	10	10-50	3 or more	0.78

¹Knowledge score is the number of correct true-false answers; other scores represent the summed responses to survey items that are each on a 1 to 5 scale, coded so that lower values are in the "desired" direction.

²If less than this number of responses is missing from a student survey, then missing responses were set to the mean of remaining non-missing responses.

Table 12: Mixed Model Estimates for Intent, Knowledge, and Health Belief Model Outcomes: Post-Test 1, Post-Test 2

Outcomes ¹	Post-Test 1		Post-Test 2	
	Intervention Effect ²	<i>p value</i>	Intervention Effect ²	<i>p value</i>
Intent	-0.372	<i>0.151</i>	0.270	<i>0.280</i>
Knowledge	0.630	<i>0.004*</i>	0.174	<i>0.419</i>
<i>Perceived</i>				
Benefit	-0.509	<i>0.420</i>	0.444	<i>0.302</i>
Barriers	-0.388	<i>0.073</i>	0.172	<i>0.326</i>
Susceptibility	-0.780	<i>0.038*</i>	0.050	<i>0.861</i>
Severity	-0.601	<i>0.001*</i>	-0.396	<i>0.025*</i>
Self Efficacy	-0.348	<i>0.265</i>	0.125	<i>0.699</i>

* *p value* <0.05

¹Each outcome is defined by a set of survey questions; responses were summed for a numeric score. Higher scores indicate greater knowledge; for all other outcomes, lower scores represent the desired direction.

²Intervention Effect is the difference of the baseline-adjusted means for Intervention minus Control, from mixed linear model analysis. Except for Knowledge, a negative value for Intervention Effect indicates that the Intervention had a desirable effect.

Table 13: Intervention Effects by Covariates, Post-Test 1 and Post-Test 2

Outcome Factor ¹	Covariate	Post-Test 1		Post-Test 2	
		Intervention Effect ²	<i>p value</i>	Intervention Effect ²	<i>p value</i>
Gender					
Intent	Boys	-0.157	0.485	0.089	0.732
	Girls	-0.590	0.109	0.235	0.432
Benefit	Boys	-0.467	0.286	0.377	0.394
	Girls	-0.632	0.456	0.172	0.749
Barriers	Boys	-0.199	0.304	0.097	0.650
	Girls	-0.581	0.070	0.119	0.573
Susceptibility	Boys	-0.670	0.020*	0.043	0.873
	Girls	-0.918	0.071	-0.183	0.600
Severity	Boys	-0.494	0.002*	-0.237	0.280
	Girls	-0.704	0.003*	-0.604	0.003*
Self Efficacy	Boys	-0.162	0.579	-0.011	0.979
	Girls	-0.424	0.351	0.171	0.671
Knowledge	Boys	0.362	0.169	0.077	0.759
	Girls	0.833	0.001*	0.360	0.276
Grade					
Intent	9	-0.664	0.176	0.014	0.970
	10	0.075	0.872	0.595	0.184
	11	-0.048	0.870	-0.137	0.745
Benefit	9	-0.336	0.778	0.150	0.822
	10	-0.143	0.903	0.739	0.311
	11	-0.347	0.412	-0.729	0.541
Barriers	9	-0.348	0.425	0.180	0.484
	10	-0.167	0.639	0.129	0.663
	11	-0.248	0.257	-0.082	0.793
Susceptibility	9	-0.999	0.147	-0.426	0.291
	10	-0.402	0.472	0.236	0.548
	11	-0.483	0.055	0.088	0.894
Severity	9	-0.899	0.002*	-0.896	0.000*
	10	-0.440	0.073	-0.225	0.428
	11	-0.164	0.300	-0.020	0.930

Outcome Factor ¹	Covariate	Post-Test 1		Post-Test 2	
		Intervention	<i>p value</i>	Intervention	<i>p value</i>
		Effect ²		Effect ²	
Self Efficacy	9	-0.380	0.511	-0.160	0.644
	10	0.018	0.970	0.402	0.491
	11	-0.377	0.298	-0.600	0.654
Knowledge	9	0.960	0.007*	0.613	0.106
	10	0.382	0.257	-0.136	0.700
	11	0.182	0.319	0.101	0.600
Farm Residence					
Intent	No	-0.465	0.116	0.276	0.350
	Yes	-0.163	0.701	0.098	0.813
Benefit	No	-0.535	0.431	0.357	0.505
	Yes	-0.735	0.346	0.649	0.211
Barriers	No	-0.479	0.047*	0.057	0.789
	Yes	-0.274	0.317	0.266	0.344
Susceptibility	No	-0.848	0.044*	-0.198	0.553
	Yes	-0.788	0.056	0.223	0.461
Severity	No	-0.562	0.005*	-0.301	0.172
	Yes	-0.854	0.000*	-0.738	0.002*
Self Efficacy	No	-0.299	0.296	0.056	0.875
	Yes	-0.421	0.430	0.068	0.899
Knowledge	No	0.610	0.016*	0.189	0.512
	Yes	0.666	0.013*	0.236	0.454
Work Experience					
Intent	No	-0.489	0.234	0.549	0.303
	Yes	-0.202	0.513	0.168	0.491
Benefit	No	-0.787	0.263	0.530	0.427
	Yes	-0.508	0.465	0.328	0.495
Barriers	No	-0.770	0.047*	0.353	0.197
	Yes	-0.242	0.242	0.049	0.824
Susceptibility	No	-0.942	0.024*	0.145	0.731
	Yes	-0.795	0.047*	-0.085	0.777
Severity	No	-0.516	0.025*	-0.532	0.024*

Outcome Factor ¹	Covariate	Post-Test 1		Post-Test 2	
		Intervention		Intervention	
		Effect ²	<i>p value</i>	Effect ²	<i>p value</i>
Self Efficacy	Yes	-0.635	<i>0.001*</i>	-0.382	<i>0.061</i>
	No	-0.670	<i>0.122</i>	-0.095	<i>0.840</i>
	Yes	-0.232	<i>0.494</i>	0.166	<i>0.658</i>
Knowledge	No	0.630	<i>0.016*</i>	0.488	<i>0.169</i>
	Yes	0.536	<i>0.028*</i>	0.139	<i>0.579</i>
Farm Experience					
Intent	Never Worked	-0.489	<i>0.234</i>	0.549	<i>0.303</i>
	Farm Experience	-0.484	<i>0.231</i>	-0.096	<i>0.774</i>
	No Farm Experience	-0.115	<i>0.743</i>	0.281	<i>0.349</i>
Benefit	Never Worked	-0.787	<i>0.263</i>	0.530	<i>0.427</i>
	Farm Experience	-0.766	<i>0.287</i>	0.018	<i>0.976</i>
	No Farm Experience	-0.587	<i>0.444</i>	0.328	<i>0.591</i>
Barriers	Never Worked	-0.770	<i>0.047*</i>	0.353	<i>0.197</i>
	Farm Experience	-0.207	<i>0.404</i>	0.018	<i>0.957</i>
	No Farm Experience	-0.352	<i>0.195</i>	-0.001	<i>0.996</i>
Susceptibility	Never Worked	-0.942	<i>0.024*</i>	0.145	<i>0.731</i>
	Farm Experience	-0.973	<i>0.025*</i>	-0.380	<i>0.300</i>
	No Farm Experience	-0.716	<i>0.116</i>	-0.088	<i>0.822</i>
Severity	Never Worked	-0.516	<i>0.025*</i>	-0.532	<i>0.024*</i>
	Farm Experience	-0.727	<i>0.003*</i>	-0.750	<i>0.009*</i>
	No Farm Experience	-0.645	<i>0.007*</i>	-0.278	<i>0.322</i>
Self Efficacy	Never Worked	-0.670	<i>0.122</i>	-0.095	<i>0.840</i>
	Farm Experience	-0.476	<i>0.257</i>	-0.372	<i>0.536</i>
	No Farm Experience	-0.130	<i>0.747</i>	0.115	<i>0.772</i>
Knowledge	Never Worked	0.630	<i>0.016*</i>	0.488	<i>0.169</i>
	Farm Experience	0.677	<i>0.029*</i>	0.298	<i>0.268</i>
	No Farm Experience	0.584	<i>0.020*</i>	0.106	<i>0.706</i>
Previous Work Injury					
Intent	No	-0.340	<i>0.353</i>	0.076	<i>0.768</i>
	Yes	-0.074	<i>0.891</i>	0.441	<i>0.387</i>
Benefit	No	-0.425	<i>0.576</i>	0.118	<i>0.825</i>
	Yes	-0.792	<i>0.206</i>	0.855	<i>0.227</i>

Outcome Factor ¹	Covariate	Post-Test 1		Post-Test 2	
		Intervention		Intervention	
		Effect ²	<i>p</i> value	Effect ²	<i>p</i> value
Barriers	No	-0.277	0.262	0.051	0.840
	Yes	0.032	0.942	0.257	0.526
Susceptibility	No	-0.635	0.123	-0.116	0.714
	Yes	-1.200	0.029*	0.501	0.269
Severity	No	-0.609	0.004*	-0.400	0.058
	Yes	-0.672	0.016*	-0.496	0.111
Self Efficacy	No	-0.198	0.612	0.118	0.785
	Yes	-0.582	0.303	0.305	0.647
Knowledge	No	0.500	0.045*	0.189	0.445
	Yes	0.817	0.004*	-0.022	0.950
Father's Education					
Intent	≤High School	-0.668	0.072	0.401	0.400
	> High School	-0.256	0.336	0.325	0.241
Benefit	≤High School	-0.769	0.287	0.212	0.741
	> High School	-0.517	0.445	0.703	0.138
Barriers	≤High School	-0.478	0.111	0.199	0.447
	> High School	-0.388	0.076	0.225	0.248
Susceptibility	≤High School	-0.893	0.053	-0.024	0.955
	> High School	-0.826	0.060	0.041	0.895
Severity	≤High School	-0.647	0.006*	-0.431	0.114
	> High School	-0.612	0.001*	-0.278	0.114
Self Efficacy	≤High School	-0.710	0.096	0.089	0.861
	> High School	-0.207	0.589	0.073	0.851
Knowledge	≤High School	0.429	0.090	0.160	0.587
	> High School	0.663	0.005*	0.219	0.461
Mother's Education					
Intent	≤High School	-1.051	0.008*	-0.039	0.910
	> High School	-0.205	0.475	0.496	0.080
Benefit	≤High School	-0.359	0.619	0.169	0.794
	> High School	-0.790	0.255	0.326	0.447
Barriers	≤High School	-0.352	0.232	0.153	0.544

Outcome Factor ¹	Covariate	Post-Test 1		Post-Test 2	
		Intervention		Intervention	
		Effect ²	<i>p value</i>	Effect ²	<i>p value</i>
Susceptibility	> High School	-0.568	<i>0.021*</i>	0.170	<i>0.391</i>
	≤High School	-0.581	<i>0.224</i>	-0.086	<i>0.839</i>
	> High School	-1.010	<i>0.017*</i>	-0.131	<i>0.645</i>
Severity	≤High School	-0.441	<i>0.103</i>	-0.624	<i>0.021*</i>
	> High School	-0.759	<i>0.000*</i>	-0.360	<i>0.035*</i>
Self Efficacy	≤High School	-0.658	<i>0.096</i>	-0.422	<i>0.308</i>
	> High School	-0.368	<i>0.334</i>	0.158	<i>0.685</i>
Knowledge	≤High School	0.501	<i>0.067</i>	0.377	<i>0.227</i>
	> High School	0.689	<i>0.009*</i>	0.108	<i>0.720</i>
Ethnicity					
Intent	Non Hispanic	-0.326	<i>0.221</i>	0.238	<i>0.328</i>
	Hispanic	0.382	<i>0.708</i>	1.634	<i>0.224</i>
Benefit	Non Hispanic	-0.469	<i>0.457</i>	0.439	<i>0.279</i>
	Hispanic	-0.152	<i>0.936</i>	-2.871	<i>0.374</i>
Barriers	Non Hispanic	-0.372	<i>0.088</i>	0.213	<i>0.207</i>
	Hispanic	-0.876	<i>0.273</i>	-3.246	<i>0.004*</i>
Susceptibility	Non Hispanic	-0.766	<i>0.044*</i>	0.023	<i>0.932</i>
	Hispanic	-1.883	<i>0.029*</i>	-1.268	<i>0.328</i>
Severity	Non Hispanic	-0.595	<i>0.001*</i>	-0.405	<i>0.022*</i>
	Hispanic	0.157	<i>0.775</i>	0.475	<i>0.611</i>
Self Efficacy	Non Hispanic	-0.296	<i>0.351</i>	0.093	<i>0.773</i>
	Hispanic	0.166	<i>0.882</i>	0.378	<i>0.839</i>
Knowledge	Non Hispanic	0.581	<i>0.016*</i>	0.154	<i>0.573</i>
	Hispanic	0.590	<i>0.151</i>	0.554	<i>0.296</i>
Race					
Intent	Non-White	-0.695	<i>0.316</i>	-0.564	<i>0.594</i>
	White	-0.315	<i>0.256</i>	0.315	<i>0.213</i>
Benefit	Non-White	-1.067	<i>0.449</i>	-0.124	<i>0.944</i>
	White	-0.372	<i>0.575</i>	0.410	<i>0.312</i>
Barriers	Non-White	-0.674	<i>0.215</i>	-0.324	<i>0.682</i>
	White	-0.338	<i>0.125</i>	0.188	<i>0.282</i>

Outcome Factor ¹	Covariate	Post-Test 1		Post-Test 2	
		Intervention		Intervention	
		Effect ²	<i>p value</i>	Effect ²	<i>p value</i>
Susceptibility	Non-White	-1.182	0.099	0.435	0.622
	White	-0.680	0.075	0.003	0.992
Severity	Non-White	-0.664	0.168	-0.091	0.880
	White	-0.559	0.003*	-0.403	0.022*
Self Efficacy	Non-White	0.037	0.962	1.023	0.425
	White	-0.302	0.355	0.076	0.809
Knowledge	Non-White	0.622	0.111	0.739	0.125
	White	0.558	0.020*	0.128	0.638
Thrill Seeking Behavior					
Intent	Never	-1.316	0.038*	-0.141	0.855
	1-6 times	-0.350	0.207	0.515	0.058
	7-20 times	0.147	0.755	0.117	0.801
	21+ times	-0.056	0.884	0.111	0.784
Benefit	Never	-2.023	0.037*	-2.041	0.018*
	1-6 times	-0.932	0.207	0.393	0.406
	7-20 times	0.113	0.904	0.037	0.956
	21+ times	-0.004	0.995	1.189	0.049*
Barriers	Never	-1.252	0.016*	-0.710	0.078
	1-6 times	-0.489	0.070	0.230	0.240
	7-20 times	-0.208	0.447	0.194	0.509
	21+ times	0.063	0.855	0.237	0.428
Susceptibility	Never	-1.245	0.028*	-1.596	0.002*
	1-6 times	-1.006	0.012*	0.044	0.895
	7-20 times	-0.358	0.477	0.004	0.993
	21+ times	-0.894	0.029*	0.494	0.157
Severity	Never	-1.046	0.001*	-0.981	0.003*
	1-6 times	-0.739	0.001*	-0.438	0.031*
	7-20 times	-0.176	0.489	-0.343	0.240
	21+ times	-0.572	0.017*	-0.327	0.255
Self Efficacy	Never	-1.250	0.070	-1.477	0.035*
	1-6 times	-0.719	0.115	0.462	0.309
	7-20 times	0.182	0.765	0.074	0.888
	21+ times	0.238	0.619	-0.172	0.756
Knowledge	Never	0.437	0.204	0.653	0.110
	1-6 times	0.801	0.000*	0.232	0.411

Outcome Factor ¹	Covariate	Post-Test 1		Post-Test 2	
		Intervention Effect ²	<i>p</i> value	Intervention Effect ²	<i>p</i> value
	7-20 times	0.417	0.192	0.421	0.165
	21+ times	0.271	0.319	-0.326	0.311
Excitement Behavior					
Intent	Never	-0.908	0.163	-0.254	0.727
	1-6 times	-0.422	0.175	0.531	0.064
	7-20 times	-0.001	0.999	0.101	0.819
	21+ times	0.000	0.999	-0.102	0.800
Benefit	Never	-1.079	0.216	-1.995	0.042*
	1-6 times	-1.122	0.136	0.594	0.262
	7-20 times	0.104	0.884	0.455	0.420
	21+ times	-0.128	0.831	0.347	0.600
Barriers	Never	-1.148	0.021*	-0.711	0.088
	1-6 times	-0.519	0.039*	0.228	0.253
	7-20 times	-0.170	0.528	0.504	0.087
	21+ times	-0.044	0.886	-0.052	0.858
Susceptibility	Never	-0.934	0.090	-1.533	0.006*
	1-6 times	-1.154	0.004*	0.089	0.802
	7-20 times	-0.163	0.708	-0.057	0.867
	21+ times	-0.959	0.020*	0.214	0.555
Severity	Never	-1.041	0.001*	-1.132	0.002*
	1-6 times	-0.743	0.000*	-0.257	0.194
	7-20 times	-0.035	0.900	-0.427	0.060
	21+ times	-0.615	0.006*	-0.492	0.131
Self Efficacy	Never	-0.358	0.633	-1.442	0.072
	1-6 times	-0.864	0.031*	0.465	0.331
	7-20 times	0.316	0.477	0.125	0.794
	21+ times	-0.073	0.865	0.004	0.994
Knowledge	Never	0.465	0.142	0.651	0.076
	1-6 times	0.730	0.002*	0.202	0.498
	7-20 times	0.611	0.037*	0.374	0.245
	21+ times	0.280	0.256	-0.061	0.849

* *p* value <0.05, not adjusted for multiple comparisons.

¹Each outcome is defined by a set of survey questions; responses were summed for a numeric score. Higher scores indicate greater knowledge; for all other outcomes, lower scores represent the desired direction.

²Intervention Effect is the difference of the baseline-adjusted means for Intervention minus Control, from mixed linear model analysis. Except for Knowledge, a negative value for Intervention Effect indicates that the Intervention had a desirable effect.

Table 14: Outcomes Measured in *WSWS* Pilot Test 1997-2001. Mixed Model Estimates for Intent, Knowledge, and Health Belief Model Outcomes, Post-Test 1 and Post-Test 2.**

Outcomes ¹	Post-Test 1		Post-Test 2	
	Intervention Effect ²	<i>p value</i>	Intervention Effect ²	<i>p value</i>
Intent	-0.608	<i>0.048*</i>	-0.749	<i>0.097</i>
Knowledge	0.699	<i>0.005*</i>	0.493	<i>0.246</i>
<i>Perceived</i>				
Benefit	-1.064	<i>0.072</i>	-1.164	<i>0.176</i>
Barriers	-0.368	<i>0.258</i>	-0.365	<i>0.273</i>
Susceptibility	-0.899	<i>0.043*</i>	-0.747	<i>0.265</i>
Severity	-0.769	<i>0.027*</i>	-0.583	<i>0.136</i>
Self Efficacy	-0.626	<i>0.039*</i>	-0.726	<i>0.168</i>

* *p value* <0.05

** Pilot Test (see Background) involved five intervention schools and six control schools in three adjacent rural Minnesota counties (excluded from present study). Schools were not randomized.

¹Each outcome is defined by a set of survey questions; responses were summed for a numeric score. Higher scores indicate greater knowledge; for all other outcomes, lower scores represent the desired direction.

²Intervention Effect is the difference of the baseline-adjusted means (Intervention minus Control), from mixed linear model analysis. Except for Knowledge, a negative value for Intervention Effect indicates that the Intervention had a desirable effect.

**Table 15. Number of *Work Safe Work Smart* Downloads from MDH Web Site
Sept 1, 2003 – August 25, 2004.**

Curriculum Component	Sept.-Dec. 2003	Jan.-Aug. 2004	Total
Complete Curriculum	1,210	943	2,153
Background	62	210	272
Cover	16	80	96
Introduction	56	110	166
Lesson 1: An Introduction to Worker Safety	255	219	474
Lesson 2: Recognizing Workplace Hazards	426	602	1028
Lesson 3: Preventing Workplace Injuries and Illnesses	156	249	405
Lesson 4: Applying Prevention Strategies in the Workplace - Part I	160	183	343
Lesson 5: Applying Prevention Strategies in the Workplace - Part II	482	134	616
Lesson 6: The Importance of Worker Safety Laws	523	432	955
Lesson 7: Worker Safety Laws and You	137	198	335
Lesson 8: Addressing Unsafe Workplace Conditions	328	204	532
Lesson 9: Putting Work Safety into Practice	64	172	236
Glossary and Resources	77	190	267
Internet Resources	75	123	198
Related Graduation Standards	16	85	101
		TOTAL	8,177

REFERENCES

- Aherin, R. A., D. J. Murphy, et al. (1990). Changing farm worker behavior: a literature review of injury control strategies, ASAE Technical Paper.
- Belville, R., S. H. Pollack, et al. (1993). "Occupational injuries among working adolescents in New York State." Jama **269**(21): 2754-9.
- Boyle, D., D. L. Parker, et al. (1995). "Agricultural auger-related injuries and fatalities - Minnesota 1992-1994." MMWR **36**: 657-60.
- Boyle, D., G. Wahl, et al. (1996). "Suffocations in grain bins - Minnesota, 1992-1995." MMWR **45**(39): 837-41.
- Brown, M., D. Parker, et al. (1997). "Five years of work-related injuries and fatalities in Minnesota. Agriculture: a high-risk industry." Minn Med **80**(8): 29-32.
- Bruvold, W. H. (1993). "A meta-analysis of adolescent smoking prevention programs." Am J Public Health **83**(6): 872-80.
- Butler, M. and C. Beal (1994). Rural-Urban Continuum Codes for Metro and Nonmetro Counties, Agriculture and Rural Economy Division, Economic Research Service, U.S. Department of Agriculture.
- Curry, S. J., S. H. Taplin, et al. (1993). "A randomized trial of the impact of risk assessment and feedback on participation in mammography screening." Prev Med **22**(3): 350-60.
- Elias, M. J. and J. S. Kress (1994). "Social decision-making and life skills development: a critical thinking approach to health promotion in the middle school." J Sch Health **64**(2): 62-6.
- Gielen, A. C. and D. Sleet (2003). "Application of behavior-change theories and methods to injury prevention." Epidemiol Rev **25**: 65-76.
- Goldenhar, L. M. and P. A. Schulte (1994). "Intervention research in occupational health and safety." J Occup Med **36**(7): 763-75.
- Lerman, Y., Y. Feldman, et al. (1998). "Evaluation of an occupational health education program among 11th grade students." Am J Ind Med **34**(6): 607-13.
- Madery, G. and D. Parker (1993). "Fatalities attributed to entering manure waste pits - Minnesota, 1992." MMWR **42**: 325-29.
- Marcus, A. C., D. B. Baker, et al. (1986). "ICWU cancer control education and evaluation program: research design and needs assessment." J Occup Med **28**(3): 226-36.
- Munshi, K., D. L. Parker, et al. (2002). "Causes, nature, and outcomes of work-related injuries to adolescents working at farm and non-farm jobs in rural Minnesota." Am J Ind Med **42**(2): 142-9.
- Murray, D. M. (1998). Design and Analysis of Group-Randomized Trials. New York, Oxford University Press.

- National Research Council (1998). Protecting Youth at Work: Health, Safety, and Development of Working Children and Adolescents in the United States. Washington DC, National Academy Press.
- NIOSH (1999). Promoting Safe Work for Young Workers: A Community-Based Approach, United States Department of Health and Human Services, NIOSH,.
- NIOSH (2003). NIOSH Alert: Preventing Deaths, Injuries, and Illnesses of Young Workers. Cincinnati, NIOSH: 22.
- Parker, D. L., D. Merchant, et al. (2002). "Adolescent work patterns and work-related injury incidence in rural Minnesota." Am J Ind Med **42**(2): 134-41.
- Parker, D. L. and G. Wahl (1999). "Childhood work-related agricultural fatalities - Minnesota 1994-1997." MMWR **48**: 332-5.
- Perry, C. L., K. A. Komro, et al. (2003). "A randomized controlled trial of the middle and junior high school D.A.R.E. and D.A.R.E. Plus programs." Arch Pediatr Adolesc Med **157**(2): 178-84.
- Perry, C. L., E. J. Stone, et al. (1990). "School-based cardiovascular health promotion: the child and adolescent trial for cardiovascular health (CATCH)." J Sch Health **60**(8): 406-13.
- Reed, D. B., P. S. Kidd, et al. (2001). "Agricultural Disability Awareness and Risk Education (AgDARE) for high school students." Inj Prev **7**(Suppl 1): i59-63.
- Reed, D. B., S. C. Westneat, et al. (2003). "Observation study of students who completed a high school agricultural safety education program." J Agric Saf Health **9**(4): 275-83.
- Rimer, B. K., N. Resch, et al. (1992). "Multistrategy health education program to increase mammography use among women ages 65 and older." Public Health Reports **107**(4): 369-80.
- Runyan, C. W. and R. C. Zakocs (2000). "Epidemiology and prevention of injuries among adolescent workers in the United States." Annu Rev Public Health **21**: 247-69.
- Schutske, J. (1994). "An educator's perspective on childhood agricultural injury." J Agrimedcine **4**: 31-45.
- Skinner, C. S., V. J. Strecher, et al. (1994). "Physician's recommendatons for mammography: Do tailored messages make a difference." Am J Pub Health **84**: 43-9.
- Strecher, V. J. and I. M. Rosenstock (1997). The Health Belief Model. Health Behavior and Health Education. K. Glanz, F. M. Lewis and B. K. Rimer. San Francisco, Jossey-Bass: 41-59.
- Weissberg, R. P. and M. J. Elias (1993). "Enhancing young people's social competence and health behavior: an important challenge for educators, scientists, policymakers, and funders." Applied and Preventive Psychology **2**: 179-90.
- Zaidman, B. (2004). Minnesota Workplace Safety Report: Occupational Injuries and Illnesses, 2002. St. Paul, Minnesota Department of Labor and Industry: 1-64.
- Zwerling, C., L. H. Daltroy, et al. (1997). "Design and conduct of occupational injury interventon studies: a review of evaluation strategies." Am J Ind Med **32**: 164-79.

Appendix A

Work Safe Work Smart Curriculum

Credits

This curriculum was developed by the Minnesota Department of Health with a grant from the National Institute for Occupational Safety and Health (NIOSH).

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Gibbon-Fairfax-Winthrop High School	
ACGC High School	

Participating Control Schools

Howard Lake-Waverly-Winsted Public School	McLeod-West Public School
Dassel-Cokato Public School	Hutchinson Public School
Buffalo Lake-Hector Public School	Kimball Public School
Norwood-Young America Public School	

Other Credits

Portions of this curriculum were adapted from materials developed by the Center for Occupational and Environmental Health, University of California, Berkeley.

Thanks to the Minnesota Department of Health, Fatality Assessment and Control Evaluation (FACE) program and the Sentinel Event Notification Systems For Occupational Risks (SENSOR) program for contributions to this curriculum.

Special thanks to the following people, who also assisted in the development and review of these curriculum materials: Deborah Merchant, Margee Brown, Paul Schiermeier, and George Wahl, all of the Minnesota Department of Health, and Lee Engfer.

Special Message To Teachers

Each day, countless numbers of teens work in jobs, at which they could potentially be injured or killed due to unsafe work conditions. This curriculum is designed to address this issue by raising student awareness of workplace hazards and of the steps one can take to prevent these hazards from causing injuries. Ultimately, the curriculum’s goal is to reduce the number of work injuries occurring among youth.

In designing this curriculum, we brought together experts from the field of occupational health and safety, skilled educators from Minnesota classrooms, and other individuals concerned about worker safety issues. Many people gave a great deal of their time and expertise to create this “**Work Safe Work Smart**” curriculum. The “Teacher Tip” sections of this curriculum were provided by classroom teachers.

The “**Work Safe Work Smart**” curriculum is not industry specific. The skills gained in this program are relevant and transferable to a variety of today’s workplace settings. “**Work Safe Work Smart**” is focused on changing teens’ knowledge and attitudes. Students are empowered with knowledge about worker safety laws, equipped with tools to recognize safety hazards, and introduced to skills necessary to effectively advocate for safe working conditions.

For some of you this information may be new; for others, familiar. This curriculum is designed to support whatever your knowledge and experience level may be. If you want to learn more about work safety issues, refer to the list of additional resources at the end of this curriculum. This list includes resources on worker safety and health education, child labor laws, worker safety organizations, and Internet resources.

We encourage you to have fun and exercise creativity while using this curriculum. Together, we can help keep our students working safe and working smart.

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For additional copies of this curriculum, contact the Minnesota Department of Health, Center for Occupational Health and Safety at (612) 676-5216 or send an e-mail to workerhealth@health.state.mn.us. You can also visit our web site at <http://www.health.state.mn.us/divs/dpc/cdee/cdee.htm>.

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About This Curriculum

Goals of the Curriculum

The goals of this curriculum are as follows:

- Raise students' awareness of workplace hazards that could cause injuries or illnesses.
- Equip students with prevention strategies that will protect them from injuries or illnesses in a variety of workplace settings.
- Raise students' awareness of their rights in the workplace and the laws and resources available to help maintain those rights.
- Encourage students to be active participants in creating safe and healthy work environments.

Intended Audience

The lessons in this curriculum target students in **grades 9-12**. With some adaptation, these lessons could also be used with a younger audience.

Key Components of the Curriculum

- The lessons were designed and developed to integrate into existing coursework in **social studies, health, agriculture, career exploration, and school-to-work**. This curriculum also could be taught as an interdisciplinary unit that combines several of these subject areas.
- This curriculum could be enhanced by combining it with field trips to a variety of workplace settings. These field trips could involve interviews with workers and evaluations of workplace hazards and safety measures.
- The lessons focus on **higher-order thinking skills**, such as **decision-making** and **evaluation**, as well as skills in **cooperative learning** and **oral communication**.

Lesson Format

This curriculum consists of **nine lessons of varying length**. Most lessons can be completed during a 50-minute time period. Some may require more time but can be extended over several class periods, if desired.

Lessons 1 through 5 explore the health-related issues of workplace hazards and their prevention. Each lesson deals with the following:

Lesson 1: Students are introduced to the issue of worker safety through a disability exercise and a discussion about workplace injuries and hazards.

Lesson 2: Students discuss the effect of potential workplace injuries on their lives, brainstorm a list of different types of workplace hazards, and then map out potential hazards in a work environment.

Lesson 3: Students brainstorm ways to apply the ABC prevention strategies to example hazards. They also discuss the reasons workers choose to take risks in the workplace, even when they know hazards are present.

Lesson 4: Students create a workplace safety plan for a simulated work environment, including developing a hazard map and safety action steps.

Lesson 5: Students present their workplace safety action plans for a simulated work environment, and unit content is briefly reviewed.

Lessons 6 through 9 explore the legal rights and communication skills related to addressing workplace safety issues. Each lesson deals with the following:

Lesson 6: Students are introduced to the importance of worker safety laws through a presentation of their history and by creating laws for simulated case studies.

Lesson 7: Students review current worker safety laws by playing a game and discussing some present-day scenarios.

Lesson 8: Students debate the benefits and limitations of worker safety laws and are taught the basic steps needed to address workplace safety issues.

Lesson 9: Students practice, through a role-play exercise, the basic skills needed to address workplace safety issues. They also identify unsafe situations at work or other places in which they could use these skills.

Each lesson includes the following components:

TEACHER TIP:

Photocopy all the unit fact sheets ahead of time and hand them out in a packet at the beginning of the unit. **Optional:** Make class copies rather than individual copies.

- **Fact:** Interesting fact that helps put a particular lesson into perspective.
- **Description:** Brief description of lesson activities.
- **Learner Outcomes:** Intended cognitive, attitudinal, and behavioral outcomes for the lesson.
- **Key Concepts:** Key ideas presented in the lesson.
- **Materials Needed:** Necessary materials for presenting the lesson, including handouts and overheads.
- **Preparation Needed:** Necessary steps to prepare for the lesson.
- **Directions:** Step-by-step instructions for completing the lesson, including a lesson script in bold type.
- **Taking It Home:** Homework assignments to be completed in preparation for the next class lesson.

Resources

A glossary and a list of educational resources on worker safety and health issues are included at the end of the curriculum.

Introduction to Worker Safety Issues

This introduction will help prepare you to discuss worker safety issues with your students. You may wish to use some of this information in your lessons or reproduce parts of it for interested students.

Why Is Worker Safety an Important Issue?

Most of us will spend almost one-third of our lives working. Although we work to earn money to live, work can also be rewarding in many ways. It can be very satisfying to do a job well, to contribute to society, and to be independent and productive. Work is a big part of most teens' lives, too. By 12th grade, at least 90% of Minnesota teens have held at least one job.¹

But work also can be dangerous. Every week in Minnesota, on average, one to two people die at work, eight to ten people lose fingers, 10 to 20 develop work-related cancers, and 3,000 sustain other kinds of injuries.² A personal story lies behind each statistic.

Joshua's Story

Joshua, a seventeen-year-old, enjoyed playing basketball on the local high school team and helping his father on their family farm. Joshua was operating the combine one summer day, when he noticed that it was clogged. Because it was getting late and Joshua was tired, he didn't bother turning off the combine before he opened the side of the machine to investigate the clog. Inside the combine, Joshua saw some jammed weeds and decided to reach his arm in and pull them out. As he began pulling out the weeds, Joshua's hand slipped and became entangled in the combine's moving belt.

As a result of the accident, Joshua lost the thumb and two fingers of his right hand, his dominant hand. Joshua spent the rest of the summer in hospitals and therapy. He had to learn again how to write, eat, dress, and tie his shoes. Joshua has been feeling depressed and self-conscious about his injury. He doesn't know if he'll be able to play basketball again. Joshua also wonders how his injury will affect his ability to take over his family's farming operation.

Maria's Story

Maria, a sixteen-year-old, works as a nursing assistant in a local nursing home. Due to her age, Maria was told in her employee orientation training not to lift any of the residents. As she arrived for her evening shift one day, she learned that the nursing home was short-staffed. Due to the shortage, a fellow nursing assistant asked Maria to help transfer a large gentleman from his wheelchair to his bed. Maria didn't want to disappoint her co-worker, so she agreed to help.



*90% of
Minnesota
teens have
at least one
job.*



As they were transferring the man, he became anxious and started flinging his arms in all directions. Maria lost her grip, and the man began to fall to the floor. She tried to grab him to break his fall. As she did, Maria felt a strain in her lower back. As she stood up, her back muscles began to spasm. Maria was sent home and went to a doctor for treatment.

Maria is now worried about the long-term effects of her injury. Maria enjoys dancing and had planned to become a dance teacher. She now worries that her back injury may prevent her from taking the advanced jazz dance lessons she'd need to become a teacher. Her back also gets sore if she sits too long, and sometimes, at night, she wakes up in pain.

Injuries and illnesses have a variety of causes and can occur in every type of workplace. As Joshua's and Maria's stories show, work-related injuries and illnesses can be permanently damaging — physically, emotionally, and financially.

The solution to the problem of workplace injuries and illnesses lies in prevention. Each of us can become more aware of health and safety issues in the workplace. By learning all we can about our responsibilities as employers and employees, we can help keep ourselves and our coworkers safe.

Evaluating the health and safety of our work environment is as important as doing quality work and getting paid well. Our health and the health of those we work with depend on it.



*Approximately
70 workers
under 18 die
every year.*



Why Teach Adolescents about Worker Safety?

Many students begin working at a regular job at the age of 14 or 15. Even before their first regular paying jobs, however, many students work for a neighbor or on a family farm. The number of adolescents working in the United States today is estimated to be approximately 4 million.³ A more meaningful number to you may be the number of responses you get when you ask your students, “How many of you work at either paid or unpaid jobs?”

The vast majority of your students have had or will soon have some work experience. Students who live on farms probably already have worked for years in a very hazardous work environment. Most students work at temporary or intermittent jobs that require little technical skill and likely provide little or no safety training.

Although laws are in place to protect adolescent workers, law enforcement alone cannot keep teens safe. As teachers, you are in a unique position to teach students about work safety, advocate for them in their current jobs, and prepare them for safe work experiences in the future.

Adolescent workers have about the same risk of being fatally injured at work as adult workers.⁴ Even though federal law prohibits people under

age 18 from working in the most hazardous professions, their injury rate is as high as that of adults.

Nationally, approximately 70 workers under 18 die every year as a result of work injuries. Each year, approximately 200,000 adolescents are injured at work and 64,000 are treated in emergency rooms.⁵ In other words, in a class of 20 teenagers, one or two students are likely to be injured at work this year.

Over two-thirds of 14- to 16-year-olds who are injured at work are limited in their normal activities for at least one day (with, for example, burned hands or strained backs). One-fourth are limited for a week or more (with, for example, broken arms or cuts requiring stitches). Most of these adolescents never received safety training on how to prevent the injury they suffered.⁶

But Don't Accidents Just Happen?

When someone is injured at work, people often say “accidents happen.” But do accidents just happen? If you were to review the events leading up to an injury, you would find that the injury likely could have been predicted and, therefore, prevented.

Work-related injuries are predictable, preventable events. This curriculum challenges students to work backwards from injury events to the hazards that caused them and then to the possible strategies that could have prevented the injury from occurring in the first place.

By proactively implementing prevention strategies, most, if not all, work-related injuries and illnesses can be prevented. Addressing potential worker safety issues **before** they occur is the best way to keep workers safe. Fixing the problem after an injury happens is often costly and results in unnecessary disability.

How Does Worker Safety Relate to Other Adolescent Health Issues?

As you read through this curriculum, you may notice similarities between decision-making skills used to deal with work-related injury or illness issues and other health-related issues, such as smoking, drug use, diet, and physical activity. Realizing the consequences of risk-taking behavior, recognizing the dangers to health, and learning ways to avoid or minimize these dangers are part of most health maintenance and disease prevention strategies.

In this curriculum, students use their own and other students' personal experiences to discuss the risks of work-related hazards and the best ways to prevent injury and illness from those hazards.

Injury prevention is complicated, because unhealthy or unsafe behaviors often happen in the context of socially positive goals, such as completing tasks on time, working quickly, or simply getting the job done. Although these goals are admirable and often necessary, a problem arises when they conflict with safety. These goals then become dangerous. Worker safety



Work-related injuries are predictable, preventable events.



Unit Framework

Key Concepts	Corresponding Learner Outcomes			Activities
	Cognitive	Attitudinal	Behavioral	
<p>Day 1: An Introduction To Worker Safety</p> <p>1. Worker safety is an important issue for all workers.</p> <p>2. Workers may become permanently impaired by workplace injuries or illnesses.</p> <p>3. A workplace hazard is anything at work that can harm a person — physically or mentally.</p>	<p>Students will:</p> <p>1. Define the term “workplace hazard.”</p> <p>2. Give examples of workplace injuries and illnesses.</p>	<p>Students will:</p> <p>1. Perceive that worker safety is an important issue for adolescents because many are working or soon will work.</p> <p>2. Perceive that workplace injuries or illnesses could affect them personally or those close to them.</p>	<p>Students will:</p> <p>1. Participate in daily activities while simulating a disability.</p>	<p>1. Experience “simulated” disabilities caused by workplace hazards.</p> <p>2. Discuss students’ experiences with workplace injuries or illnesses.</p>
<p>Day 2: Recognizing Workplace Hazards</p> <p>1. Workplace hazards can be divided into three categories: biological; chemical; and physical.</p> <p>2. Hazards may cause both temporary and permanent injuries and illnesses.</p> <p>3. Hazards may cause immediate injuries or illnesses. Other hazards may not cause injuries or illnesses until much later in life.</p>	<p>Students will:</p> <p>1. Identify the effects serious injuries or illnesses could have on their lives.</p> <p>2. Give examples of different types of workplace hazards.</p> <p>3. Recognize hazards in the workplace.</p>	<p>Students will:</p> <p>1. Perceive the importance of evaluating potential hazards in their workplaces.</p>	<p>Students will:</p> <p>1. Actively participate in class discussions of workplace hazards.</p> <p>2. Create hazard maps for simulated workplaces.</p>	<p>1. Discuss students’ experiences with simulated disabilities.</p> <p>2. Create hazard maps of different workplaces.</p> <p>3. Identify hazards associated with students’ experience with workplace injuries or illnesses.</p>

Unit Framework (continued)

Key Concepts	Corresponding Learner Outcomes			Activities
	Cognitive	Attitudinal	Behavioral	
<p>Day 3: Preventing Workplace Injuries and Illnesses</p> <ol style="list-style-type: none"> Most workplace injuries and illnesses can be avoided by taking the right preventative steps. Three main ways to prevent workplace injuries and illnesses are Administration, Building barriers, and Communication. The best prevention strategies usually are engineering controls (part of Building barriers), because they don't depend on people making safe choices every time. 	<p>Students will:</p> <ol style="list-style-type: none"> Describe three strategies used to prevent workplace injuries or illnesses. List examples within each prevention strategy. Identify the pros and cons of taking risks in the workplace. 	<p>Students will:</p> <ol style="list-style-type: none"> Perceive that all workplace injuries or illnesses can be prevented. Identify the attitudes that help a person remain safe in the workplace. 	<p>Students will:</p> <ol style="list-style-type: none"> List specific practices within each prevention strategy. Actively participate in class discussions about risk and its role in workplace safety. 	<ol style="list-style-type: none"> Discuss the worker safety attitude survey. Review ABC prevention strategies. Discuss the concept of risk and its effect on personal safety in the workplace.
<p>Day 4: Applying Prevention Strategies in the Workplace—Part I</p> <ol style="list-style-type: none"> Each workplace has potential hazards that should be identified. Each person can take proactive steps to prevent injuries and illnesses in the workplace. Once prevention strategies are identified, they can be used to make the workplace safer. 	<p>Students will:</p> <ol style="list-style-type: none"> Identify hazards within a workplace environment. Select appropriate prevention strategies for workplace hazards. Create a plan by prioritizing the order in which these prevention strategies will be implemented. 	<p>Students will:</p> <ol style="list-style-type: none"> Demonstrate a positive problem-solving attitude toward workplace hazards. Perceive that they can personally take steps to make a workplace safer. 	<p>Students will:</p> <ol style="list-style-type: none"> Create written prevention plans for simulated workplaces. 	<ol style="list-style-type: none"> Cooperate in a group to identify the hazards and prevention strategies in a workplace. Create a plan to implement these prevention strategies.

Unit Framework (continued)

Key Concepts	Corresponding Learner Outcomes			Activities
	Cognitive	Attitudinal	Behavioral	
<p>Day 5: Applying Prevention Strategies in the Workplace—Part II</p> <ol style="list-style-type: none"> Each workplace has potential hazards that should be identified. Prevention strategies can make a workplace safer by reducing the possibility of injuries or illnesses. Employers must provide a safe workplace for employees. Workers should communicate any safety concerns to their employers. 	<p>Students will:</p> <ol style="list-style-type: none"> Summarize their prevention plans in the form of presentations. Evaluate the plans presented by others. 	<p>Students will:</p> <ol style="list-style-type: none"> Communicate safety information effectively. 	<p>Students will:</p> <ol style="list-style-type: none"> Effectively communicate the rationale for the prevention strategies they selected. Evaluate their current work situations using the ABC's of prevention. 	<ol style="list-style-type: none"> Cooperate in groups to complete their case studies and present their plans to the class. Review cards with key prevention steps. Review information learned up to this point.
<p>Day 6: The Importance of Worker Safety Laws</p> <ol style="list-style-type: none"> Before worker safety laws, working conditions for many young people were dangerous and unhealthy. Child labor laws were made to protect young workers. 	<p>Students will:</p> <ol style="list-style-type: none"> Describe the state of worker safety before laws were enacted. Recognize the need for worker safety and child labor laws. 	<p>Students will:</p> <ol style="list-style-type: none"> Perceive that worker safety laws are important in protecting the health of young workers. Perceive that everyone has a right to a safe workplace. 	<p>Students will:</p> <ol style="list-style-type: none"> Actively participate in the new law development exercise. 	<ol style="list-style-type: none"> Review photographs and stories of young workers. Develop laws that would protect these young workers.

Unit Framework (continued)

Key Concepts	Corresponding Learner Outcomes			Activities
	Cognitive	Attitudinal	Behavioral	
<p>Day 7: Worker Safety Laws and You</p> <ol style="list-style-type: none"> Every employer should follow worker safety laws. Worker safety laws are made to protect workers, not to limit their opportunities for employment. 	<p>Students will:</p> <ol style="list-style-type: none"> Describe current worker safety laws. Apply these laws to specific work situations. 	<p>Students will:</p> <ol style="list-style-type: none"> Perceive that workers have the right to expect a safe work environment. Perceive that employers have a right to expect employees to behave safely. 	<p>Students will:</p> <ol style="list-style-type: none"> Stop any work practices that are illegal for them to perform. 	<ol style="list-style-type: none"> Play a game to review worker safety laws. Read case studies of workplace safety situations and apply current laws to these situations.
<p>Day 8: Addressing Unsafe Workplace Conditions</p> <ol style="list-style-type: none"> Worker safety laws are meant to protect workers, not to limit their opportunities for employment. Each employee can take basic steps to address unsafe work conditions. Every worker has the right and responsibility to address safety concerns in the workplace. 	<p>Students will:</p> <ol style="list-style-type: none"> Describe the benefits and drawbacks of worker safety laws. Give examples of helpful steps to resolve workplace safety issues. Apply these steps to a worker safety issue. 	<p>Students will:</p> <ol style="list-style-type: none"> Perceive that worker safety laws are important, even though they may be restrictive. 	<p>Students will:</p> <ol style="list-style-type: none"> Discuss appropriate safety communication skills in different situations. 	<ol style="list-style-type: none"> Discuss the benefits and drawbacks of worker safety laws. Discuss the steps to take in addressing a workplace safety issue.

Unit Framework (continued)

Key Concepts	Corresponding Learner Outcomes			Activities
	Cognitive	Attitudinal	Behavioral	
<p>Day 9: Putting Work Safety Into Practice</p> <p>1. Every worker has the right and responsibility to address safety concerns in the workplace.</p> <p>2. An employer does not have the legal right to fire an employee, if the employee refuses to work in a situation in which danger is imminent.</p> <p>3. Employees can take basic steps to address unsafe work conditions</p> <p>4. Workplace safety can be achieved through cooperative problem-solving.</p>	<p>Students will:</p> <p>1. Describe steps to help resolve workplace safety issues.</p> <p>2. Apply these steps to real-life work situations.</p>	<p>Students will:</p> <p>1. Perceive the importance of addressing unsafe work issues with their employers.</p>	<p>Students will:</p> <p>1. Demonstrate the steps used in resolving workplace safety issues.</p> <p>2. Adopt safe and lawful practices at their workplaces or homes.</p>	<p>1. Role-play scenarios in which students must confront employers with worker safety issues.</p> <p>2. Discuss real-life workplace safety situations.</p>

Related National Education Standards and Goals

This chart shows which national education standards or goals are related to each lesson in this curriculum.

Education Standards	Curriculum Lessons								
	1	2	3	4	5	6	7	8	9
National Health Education Standards									
Comprehend concepts related to health promotion and disease prevention.	•	•	•	•	•	•	•	•	•
Demonstrate the ability to access valid health information and health-promoting products and services.							•		
Demonstrate the ability to practice health-enhancing behaviors and reduce health risks.		•	•	•	•			•	•
Demonstrate the ability to use interpersonal communication skills to enhance health.	•	•	•	•	•	•	•	•	•
Demonstrate the ability to use goal-setting and decision-making skills to enhance health.		•	•	•	•	•			•
Demonstrate the ability to advocate for personal, family, and community health.								•	•
National Social Studies Goals									
Time and History							•		
Individuals, Groups, and Institutions							•	•	•
Economic Processes and Organization								•	•
Citizenship							•	•	•

Lesson Description and Preparation

Lesson Title	Lesson Description	Preparation Needed
1. An Introduction to Worker Safety	Students are introduced to the issue of worker safety through a disability exercise and a discussion of workplace injuries and hazards.	<ul style="list-style-type: none"> • Send letter regarding disability exercise to parents and teachers, if desired. • Prepare disability materials (ear plugs, tape, face make-up, arm slings, crutches). • Make Overhead 1.1—one for each class period. • Photocopy handouts and sets of fact sheets. • Read through the hazard fact sheets.
2. Recognizing Workplace Hazards	Students discuss the effect of potential workplace injuries on their lives, brainstorm lists of different types of workplace hazards, and then map out potential hazards in work environments.	<ul style="list-style-type: none"> • Familiarize yourself with the example hazard maps. • Make Overheads 2.1, 2.2, 2.3, 2.4, and 2.5. • Photocopy one handout.
3. Preventing Workplace Injuries and Illnesses	Students brainstorm ways to apply the ABC prevention strategies to example hazards. They also discuss the reasons workers choose to take risks in the workplace, even when they know hazards are present.	<ul style="list-style-type: none"> • Review the fact sheets. • Review the attitude survey. • Think through the costs and benefits of different safety measures. • Use Overhead 1.1 completed in Lesson 1—one per class. • Photocopy handouts. • Make Overheads 3.1, 3.2, 3.3, 3.4, and 3.5.
4. Applying Prevention Strategies in the Workplace—Part I	Students create workplace safety plans, including hazard maps and safety action steps, for simulated work environments.	<ul style="list-style-type: none"> • Photocopy workplace scenario descriptions and maps—one set for each group member assigned the scenario. • Photocopy the other two handouts. • Make sets of overheads of workplace maps—one set for each class. • Make Overhead 4.1.

Lesson Description and Preparation

Lesson Title	Lesson Description	Preparation Needed
5. Applying Prevention Strategies in the Workplace—Part II	Students present their workplace safety plans for simulated work environments. Content of the last five lessons also is reviewed.	<ul style="list-style-type: none"> • Photocopy one handout. • Laminate and cut out the game cards.
6. The Importance of Worker Safety Laws	Students are introduced to the importance of worker safety laws through a presentation of their history and a discussion of the rights of young workers.	<ul style="list-style-type: none"> • Read through the child labor script a few times. • Review the photos. • Photocopy handouts.
7. Worker Safety Laws and You	Students review current worker safety laws by playing a game and discussing scenarios.	<ul style="list-style-type: none"> • Set up the game show. • Photocopy two handouts.
8. Addressing Unsafe Workplace Conditions	Students discuss the benefits and drawbacks of worker safety laws and learn the basic steps for addressing workplace safety issues.	<ul style="list-style-type: none"> • Review the list of benefits and drawbacks for each law. • Make Overheads 8.1 and 8.2. • Photocopy one handout.
9. Putting Work Safety into Practice	Students practice, through a role-play exercise, the basic skills needed to address workplace safety issues. They also identify barriers and solutions to overcoming challenges when addressing safety concerns in the workplace.	<ul style="list-style-type: none"> • Use Overhead 8.2. • Think through the S.A.F.E. steps in role-plays. • Think through possible responses by an employer. • Photocopy and cut out the role-play scenarios. • Photocopy handouts.

LESSON 1

An Introduction to Worker Safety



Description:

Students are introduced to the issue of worker safety through a discussion about workplace injuries and hazards and a disability exercise.

Learner Outcomes:

Students will be able to do the following:

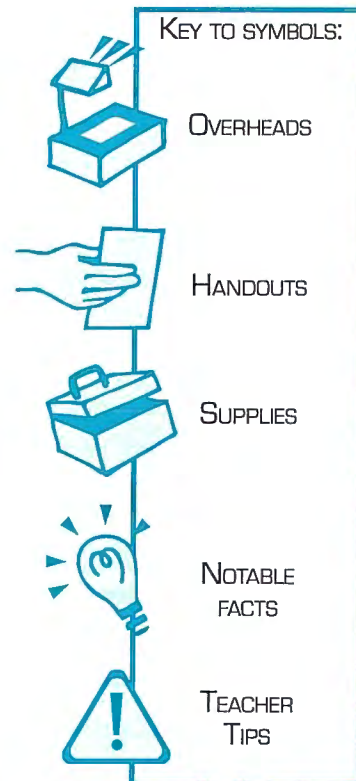
1. Give examples of workplace injuries and illnesses.
2. Define the term “workplace hazard.”
3. Perceive that worker safety is an important issue for adolescents, because many of them are or soon will be working.
4. Perceive that workplace injuries or illnesses could affect them personally or those close to them.
5. Perceive that worker safety is important, because they could become injured or ill from workplace hazards and because some of those injuries or illnesses could cause permanent impairments.

Key Concepts:

1. Workplace safety is an important issue for all workers.
2. Workers may become **permanently** impaired by workplace injuries or illnesses.
3. A workplace hazard is anything at work that can harm a person — physically or mentally.

Fact:

Virtually all Americans have held regular jobs by the time they reach 20 years of age. Work is the leading cause of injury for teens age 17 or older.¹ Injuries are common; almost 10% of working teenagers are injured at work each year.



Materials

Needed:

- Overhead 1.1 (one overhead per class; class examples will be used in Lessons 2 and 3)
- Letter to parents/teachers
- Disability props (e.g., ear plugs, athletic tape, face make-up or nose and scar wax, arm slings, crutches, or wheelchair)
- Scissors
- “Performance Criteria and Checklist” handout (one per student)
- “Injury Scenarios” sheet
- “My Experience With A Workplace Disability” handout (one per student)
- Workplace hazard fact sheets (one set per student)

Preparation Needed:

1. Read through the “Introduction To Worker Safety Issues” section on pages vii-x in this curriculum. **You may want to share the information in this introduction with students during your class discussion.**
2. Make copies of the handouts (one per student).
3. Make copies of the workplace hazard fact sheets (one set per student). You may want to make classroom sets rather than individual sets.
4. Read through the workplace hazard fact sheets, so you are familiar with the categories of hazards and the examples within each category.
5. Set up the overhead projector and overhead.
6. Inform school staff of the disability exercise, since it may impact them in other classes. A prepared letter of explanation is included in this lesson. It can be distributed to other teachers, sent home with students to describe the exercise to their parents, or both.
7. Prepare the disability exercise materials, including cutting the tape into pieces of the correct size. You can order athletic tape and inexpensive ear plugs from school supply catalogs. Ask your school nurse for arm slings, crutches, or wheelchairs. Ask your drama department for the face makeup.

Directions:

Life After An Injury – Part I:

Simulated Disability Experience (10 minutes)

Begin this exercise right after the students enter the classroom to allow students in-class time to experience their disabilities. As with any newly disabled person, it may take the students time to adjust to their disabilities. To mirror life, students should not choose what disabilities they are given.

1. Explain:
In order to help you understand what it might feel like to experience a serious and permanent work injury, I would like each of you to participate in a little experiment.

I am going to give each of you a simulated disability. It may be a loss of hearing. It may be an amputated thumb on your dominant hand. It may be an amputated arm, a broken leg, or a scar on your face.

TEACHER TIP:

Assign disabilities to students the day before. Then set up stations at which students can pick up their disabilities when they first arrive at school.



I want to challenge each of you to wear this “disability” until you go to sleep tonight. Your parents and other teachers know what we are doing.

During the day, be aware of what you can and cannot do, what you think or feel about the situation, how you might need to adapt your activities, and how people react to you. We will discuss your experiences in our next class. It may seem uncomfortable or embarrassing, but imagine if you really did have this disability. You would be experiencing the very same feelings.

2. Give each student in the room one of the following: ear plugs; a piece of 12-inch athletic tape to tape down the thumb of their dominant hand; face make-up (scar and nose wax) to mold a disfigurement or make a scar on their face; or other items you may be able to borrow from your school nurse, such as arm slings, crutches, or wheelchairs.



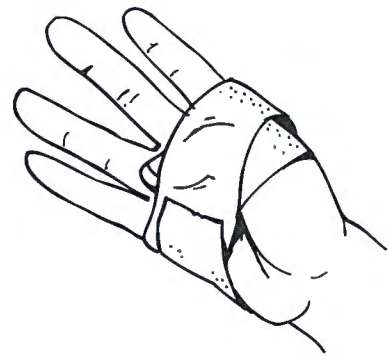
EAR PLUGS, TAPE, MAKE-UP,
OTHER ITEMS

3. Explain:
I have given something to each of you.

a. **For those with ear plugs**, squish each ear plug so the end going in your ear is smaller. Pull the ear backward and gently insert one ear plug into each ear. The ear plug should be lodged in place without hurting.

b. **For those with thumb tape**, tape the thumb on your dominant hand (the hand you write or eat with). Stretch the thumb toward your palm. Tape your thumb in place so that it cannot move but is still comfortable.

c. **For those with arm slings, crutches, or wheelchairs**, please see me for special instructions.



(Consult with your school nurse for specialized instructions and safeguards.)

d. **For the facial disfigurement**, make a scar or some kind of mark on your face with a portion of the nose and scar wax or the face make-up.

Have only one or two people per class do this example. Other kinds of scar-making material can be substituted for the scar and nose wax, if you are unable to obtain this product. You may choose to buy a ready-made scar, or you might have another idea about how to construct a facial disfigurement. Creativity is encouraged in this exercise.

Add any other disabilities you can think of. Make sure you do not ask students to do anything that could put them at risk of injury.

Injury in the Workplace Discussion

(30 minutes)



"PERFORMANCE CRITERIA
AND CHECKLIST" HANDOUT

1. Give each student a copy of the "Performance Criteria and Checklist." Explain to the students that their participation in the next five class sessions will be graded using the criteria outlined on this form. Read through the form and answer any questions students may have about the tasks or the quality of work expected.

Students can keep track of their progress by placing an X in the left-hand column as they complete each task. **Take time at the end of each class period to have students check off tasks they completed that day.** At the end of the unit, teachers should review each student's work and place an X or grade next to each task that he or she has completed.

2. Have each student get out a piece of paper and a pencil or pen. Say: **Write down three careers you are interested in and three things you enjoy doing in your free time.**
3. Ask a few students to share what they wrote. After each student shares, ask him or her what would happen to their career aspirations or free time pursuits, if they were seriously and permanently injured. For example, if they broke their back and were paralyzed or lost an arm, leg, or thumb on their dominant hand.

Students may say they would continue pursuing these things. Briefly discuss the hurdles they would have to overcome to be able to continue pursuing these things.

4. Explain:
None of us ever expects to be injured in this way. But if we were, it could change our lives. We might still pursue our dreams and past times, but the pursuit would be much more difficult.

For the next five (or nine) class periods, we are going to be talking about a very important topic—staying safe at work. Believe it or not, it is fairly common for people to be injured at work. In fact, one out of ten teenagers gets hurt at work every year. If our whole class were working, that would mean _____ (*insert a number representing 10% of your class*) of you could get hurt this year.

That percentage is high. Some of those injuries are really serious. Some teens even die. For those of you who are working, this is an important topic for you now. For those of you who aren't working yet, these classes will provide you with information to be safer at work in the future. What

we are going to be learning could protect you from being seriously hurt or killed!

Most of you have career goals. Each of you enjoys doing a lot of fun things in your free time. A serious work injury could put an end to those pursuits or make them extremely difficult to pursue. We want to do all we can to make sure that doesn't happen.

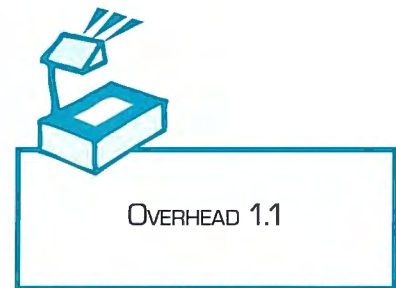
5. Explain:

Let's spend a few minutes talking about the work experiences you or others you know have had.

- How many of you have ever worked?
- What jobs have you had?
- How many of you plan to work in the near future?
- How many of you have brothers or sisters who work?
- Do you know someone who became injured or ill because of work?

6. Write students' examples of workplace injuries or illnesses in the left column on Overhead 1.1. Cover up the right column for now. Make a separate overhead for each class period. The following are questions you can ask to promote more discussion of the injury events, if necessary:

- How did the injury or illness happen?
- What was the result of this injury or illness?
- Was the injury or illness temporary or permanent?
- How did this person's life change (even temporarily)?
- How would you feel, if you were in the same situation?
- Do you think an injury or illness such as this one is common?
- Do you think an injury or illness such as this one could happen to you?



7. The goal of this discussion and your questions is to help students realize that worker safety is an important issue for them personally. Take enough class time to allow your students to talk about as many examples as possible.

Your role is to draw as many students as possible into the discussion. This discussion sets the stage for students developing a personal interest in worker safety and health.

If students do not have examples of their own, use the scenarios provided at the end of this lesson or news stories involving teen work injuries. You do not need to use both the scenarios and student examples.



A workplace hazard is anything at work that can harm us—physically or mentally.



WORKPLACE HAZARD FACTS
HANDOUTS

8. Ask:
Based on these examples, do you think worker safety is an important issue? Why? Why not?

Allow two or three students to express their view.

9. Explain:
Some people may think workplace injuries and illnesses happen because people do “stupid” things. They are sure they would never do the same. The fact is, we **all** make mistakes. All of us, no matter how intelligent we are, make mistakes. We **all** could get injured at work.

To prevent injuries, we need to make the workplace safe, not rely on people to always act safely. The first step in making the workplace safe is to identify the hazards that are there.

Introduction to Workplace Hazards (10 minutes)

1. Explain:
The examples of workplace injuries or illnesses we just discussed all involved “workplace hazards.”

Write the following definition on the board:

- *A workplace hazard is anything at work that can harm us—physically or mentally.*

A workplace hazard is the thing that **caused an injury, not the injury itself**. For example, a burn on your arm is not the hazard. It is the hot oil or hot oven that caused the burn. A broken arm is not the hazard. It is the elevation or height from which you fell.

Special Note: Students have a tendency to identify the hazard as the event. They may state that the “fall” is the hazard instead of the “height,” which is the real hazard. Reviewing these examples before the class session will help you feel prepared and comfortable discussing the hazard situations with your students.

2. Give each student a set of the workplace hazard fact sheets.

Say:

Here are some examples of different types of hazards. Take a few minutes to read through them.

Allow students five minutes to read through the fact sheets. You may want to discuss some of the “Did You Know??” examples with your students. Additional information about these hazards can be found in the educational resources listed in the back portion of this curriculum.

3. **Explain:**
Hazards exist in most jobs. To prevent injuries, it is very important that we know what hazards to look for in the workplace. Next session, we will talk more about how to identify hazards in a workplace.
4. Have students read through their “Performance Criteria and Checklist” and check those Lesson 1 activities they completed today.

Taking It Home:

Have students complete the following homework assignment. Give each student a copy of the “My Experience With A Workplace Disability” hand-out or write the assignment on a chalkboard.

Explain:

Write a two- to three-paragraph essay discussing your experience wearing the ear plugs, arm sling, taped down thumb, crutches, wheelchair, or scar on your face. Focus on how you felt, what you thought, and what you could and could not do.

Also, describe how this disability would affect the three careers and three free time activities you listed at the beginning of the class period. Be prepared to discuss and hand in your essay during the next session.



Footnotes:

¹ Brooks, D.R., Davis, L.K., and S.S. Gallagher. “Work-related Injuries Among Massachusetts Children: A Study Based On Emergency Department Data.” *American Journal of Industrial Medicine* 24 (1993): 313-324.

Workplace Injury
Or Illness Examples

Hazards Causing
The Injury/Illness

Class Period: _____

Date

Dear Parent/Teacher:

Students in my class are learning about the importance of worker safety. Most teenagers are or soon will be involved in the working world. Unfortunately, work-related injuries are common among adolescents. Some of these injuries can result in permanent injury, disfigurement, or even death.

We are teaching students about worker safety to help them become more aware of hazards in the workplace and how injuries or illnesses from those hazards can be prevented.

To increase students' appreciation for worker safety, they are being asked to participate in a day-long exercise that will simulate the experience of living with a physical impairment due to a work injury. These simulated impairments include: hearing loss (wearing earplugs); arm amputations (wearing arm slings); thumb amputations (immobilizing thumbs with tape); or facial disfigurements (wearing fake scars).

Students will be asked to "wear" these physical impairments throughout the whole day on (Add date here) so as to gain an appreciation for the long-term impact work-related injuries may have on their lives.

This exercise may limit students' participation somewhat in other classes or duties at home. We are asking for your cooperation in this exercise. We hope this day of inconvenience will provide long-term benefits of increased student awareness of the consequences of work-related injury.

We appreciate your willingness to allow your student(s) to participate in this exercise. Discussion of students' feelings and the personal challenges associated with having a disability is encouraged. If you have any concerns or questions, please contact me.

Sincerely,

Name
Teaching Position
School
Phone Number

Name: _____ Class Period: _____

Performance Criteria and Checklist

Place a check mark in the appropriate box when the criterion is met. Corresponding lessons are listed in ().

Student Checklist	Performance Criteria	Teacher Checklist
	1. Accurately defines what a hazard is. (1 and 2)	
	2. Identifies common hazards found in the workplace. (1, 2, 4)	
	3. Creates a hazard map that is accurate and thorough. (2 and 4)	
	4. Writes clearly and in an organized and thorough manner. (1, 3, 4)	
	5. Participates fully in class discussions. (1, 2, 3, 4, and 5)	
	6. Participates fully in small group projects. Completes equal amounts of work and interacts respectfully with other group members. (2 and 4)	
	7. Prepares thorough, organized, and creative class presentations. (5)	
The following decision-making criteria should be met when developing safety action plans:		
	8. Accurately identifies the major hazards in a simulated workplace. (1, 2, and 4)	
	9. Develops a logical list of preventative steps to deal with at least four of these hazards. (3 and 4)	
	10. Identifies and prioritizes a logical list of criteria for choosing these preventative steps. (4)	
	11. Clearly explains how criteria were used to select the order of preventative steps. (4 and 5)	

Injury Scenarios

To be used if students do not come up with examples. These events actually took place in Minnesota.

Case # 1: A 12-year-old farm boy was injured when he came in contact with the shaft of an auger while loading corn. His arm was broken and his right thumb was severed, resulting in amputation and extensive blood loss. He was hospitalized for eleven days and had three surgeries in an attempt to save his thumb. He is back in school, but, because he is right-handed, has had to adapt to writing with four fingers.

Case # 2: A 17-year-old was working at a construction site. He was riding on the side of a bulldozer being driven by another 17-year-old. As the equipment was going over an old railroad bridge, the bridge collapsed. The bulldozer fell into the creek below and the 17-year-old passenger, who was caught beneath it, drowned. The driver watched helplessly as his friend died. It is illegal for 17-year-olds to be working at construction sites.

Case # 3: A 16-year-old girl was working at a local grocery store. After packing an especially heavy order, she was asked to carry the groceries out to the car. As she was lifting the bags from the carrying cart into the trunk of the car, she felt a pull in her lower back. When she stood up she realized she had strained her back.

Case # 4: An 18-year-old boy was snowblowing the church driveway when the snowblower became clogged with wet snow. He was using his right hand to unclog it when the blade caught his glove and pulled his hand in. His index and middle fingers were amputated to the first joint.

Case # 5: A 13-year-old was killed while helping his father remove corn from a grain bin. The boy climbed to the roof of the bin and opened the cover. He sat on the roof ladder watching the corn being removed.

After fifteen minutes, the boy's father noticed his son was no longer on the ladder. He climbed the ladder to look in the bin but did not see his son. When he returned to the ground, he saw a tennis shoe come out the discharge opening. He stopped the auger and went for help. The boy was removed from the bin but later died.

Case # 6: An 18-year-old girl was cleaning the blade of a meat slicer. The scrubbing pad slipped, and her hand went under the blade. She severely cut her right thumb.

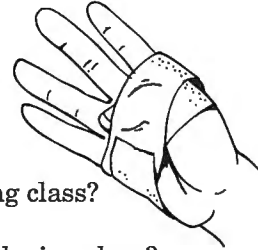
Case # 7: A 17-year-old boy was helping paint the barn on his family's farm. He was on a ladder 12 feet above the ground. As he was reaching to paint a spot, his foot slipped and he fell to the ground. The boy severed his spine and was paralyzed from the waist down. He is now learning to adjust to life in a wheelchair.

Case # 8: A 16-year-old girl was working at a fast food restaurant. She was asked to filter some hot oil. She was carrying it outside, when her foot slipped on the greasy floor and the oil spilled, burning her right arm and leg.

My Experience With A Workplace Disability

Write a two- to three-paragraph essay below discussing your experience with a simulated disability. Focus on answering the following questions:

- How did you feel having the disability?
- What couldn't you do?
- What could you do but differently than usual?
- How would this disability affect the three career choices you listed during class?
- How would this disability affect the three free time activities you listed during class?



Workplace Physical Hazard Facts

Workplace physical hazards cause injuries or illnesses by transferring energy between objects and workers.






	Type of Physical Hazard	Examples	Did You Know??
	Elevations or Heights —Any situation in which a person may fall or have objects fall on them.	Ladder Elevated walkway Walkway over a pit Stairs Boxes on a high shelf	If you fall three feet and hit your head, it will cause injuries similar to running as fast as you can into a brick wall.
	Slippery Surfaces —Wet or oily surfaces can cause falls.	Wet floor Waxed floor Oily/greasy floor	Strains and sprains are some of the most common injuries among construction workers. Falls due to unstable footing, holes, and falls from scaffolding and ladders are very common.
	Electricity —Electrocution can result when a person comes in contact with an electrical current, either indoors or outdoors.	Electrical wire Electrical outlet Lightning Batteries Electrical equipment	Electrical injuries may not look immediately serious. However, as the electricity passes through a person's body, it causes extensive internal injuries. These injuries gradually may get worse after the electrocution.
	Confined Spaces —Any space with limited openings and poor ventilation may cause harm due to toxic gases or lack of oxygen.	Grain bin Manure pit Underground pipe	You can lose consciousness in a manure pit within a few breaths and have brain damage within two minutes. One of the most common ways for more than one worker to be killed at a time is when someone tries to rescue another person from a confined space without using proper protective equipment.
	Noise —Loud noises can damage a person's hearing suddenly or gradually over time.	Tractor engine Explosives Loud music Machinery Power tools	At first, loud noises may cause only a temporary loss in hearing. This effect may last up to a full day. Continued exposure to loud noises can result in permanent hearing loss.
	Sharp Objects —Any sharp object that is operated or held in the hand(s) can cause cuts or even amputations.	Power saw Meat slicer Box cutter Knife	Each year, almost 15,000 American workers lose at least one finger.
	Moving Parts —Moving parts, both slow and fast, can cause bodily harm, such as amputation or crushing.	Power takeoff Engine parts Drill Auger	If you become entangled in a power takeoff rotating at 1000 rpm, over five feet of clothing can become entangled in less than one second!

Workplace Physical Hazard Facts (continued)

Type of Physical Hazard	Examples	Did You Know???
	<p>Repetitive Motions—Work that requires doing the same actions over and over again may cause injury over time.</p>	<p>Computer keyboard Assembly lines</p> <p>Physical injuries, such as carpal tunnel syndrome, may develop as a result of repetitive motions, even though the motions seem easy.</p>
	<p>Heavy Loads—Loads that are too heavy or that are lifted improperly may cause back or neck injuries.</p>	<p>Boxes Hay bales People</p> <p>Back strains are the most common work injury. However, many workers also have chronic knee or shoulder problems.</p>
	<p>Heavy Machinery—A person can be run over, rolled on, or crushed by large machinery.</p>	<p>Tractors Circular baler Skid loader Trucks</p> <p>An average of six to nine Minnesota farmers die each year in accidents involving large machinery.</p>
	<p>Heat—Any hot surface or overexposure to sunlight may cause burns and dehydration.</p>	<p>Sun exposure Furnace Fryer, grill, or oven Running engine</p> <p>A healthy worker can lose over 16 pounds of sweat in an eight-hour workday. This sweating can easily cause heat stress.</p>
	<p>Cold—Overexposure to cold or being trapped in a cold place may cause frostbite, hypothermia, and, potentially, death.</p>	<p>Outdoors in winter Refrigerator/freezer</p> <p>When you are cold, your body automatically decreases the amount of blood going to your skin. This decrease in blood flow to the skin keeps your inner body temperature higher by limiting heat loss. An inner body temperature of 95 degrees or less is a true emergency.</p>
	<p>Weapons—Weapons may be misused, causing injury to self and others. Workplaces may be robbed by people using weapons.</p>	<p>Guns Knives</p> <p>The United States leads the industrialized world in rates of firearm deaths among children. In 1997, the Federal Centers for Disease Control and Prevention reported that 86 percent of firearm deaths among children less than 15 years old occurred in the U.S.</p>
	<p>Miscellaneous—Any other physical objects that can cause injury or illness.</p>	<p>Ill-fitting equipment X-ray machines Radiation</p> <p>Accidental exposures to x-rays are numerous and often involve extremely high exposures to small portions of the body. Most accidental exposures happen during non-routine uses, such as when equipment is partially disassembled or shield covers had been removed.</p>




Workplace Chemical Hazard Facts

Workplace chemical hazards are chemicals that may cause injury or illness to workers if they are inhaled, swallowed, or absorbed through the skin. Chemicals may also cause explosions.

	Form of Chemical Hazard	Examples	Did You Know??
	Solid —Any chemical found in a solid form.	Dry Paint	Dry paint may contain lead. It tastes sweet and is sometimes eaten by small children. Ingestion of lead paint may cause brain damage.
	Dusts —Dusts are tiny particles of solids. You may be exposed to dust from materials that are already in dust form, or from work processes that create dust.	Bags of cement Glass fibers Asbestos Some herbicides	Under certain conditions, dusts can explode (for example, in a silo or flour mill). During the 1960's, asbestos had over 3,000 uses. Today, asbestos is known to cause lung cancer.
	Liquid —Any chemical found in a liquid form at room temperature. Liquid chemicals may cause poisoning by ingestion, inhalation, or absorption.	Fertilizers Herbicides Pesticides Paints Cleaners	Pesticides are used to kill animals, and, so, can be very poisonous to humans.
	Vapors —Vapors are tiny drops of liquid that are suspended in the air. Vapors from some chemicals may irritate the eyes and skin.	Cleaners Paints Pesticides	Some paints may contain lead or mercury. Both of these may affect small children more than adults. Both may cause brain damage.
	Gases —Some chemicals are in gas form when they are at room temperature. Other solid or liquid chemicals become gases when they are heated.	Aerosols Carbon monoxide Vehicle fumes Grain silo gases Hydrogen sulfide	Hydrogen sulfide gas from manure pits may cause a person to become unconscious in as few as two breaths. A few breaths more will cause death. Never enter a manure pit without proper protective equipment!

Workplace Biological Hazard Facts

Workplace biological hazards are living things or their byproducts that may cause injury or illness to workers.

	Type of Biological Hazard	Examples	Did You Know???
	Animals —A variety of injuries and illnesses can be caused by physical contact with an animal or its byproducts (such as its wastes).	Bites Skin contact Dander Manure Manure pits	An estimated 10-20% of individuals working with rodents, rabbits, cats, and other animals may eventually develop allergies and asthma.
	Humans —A variety of illnesses may be passed from one person to another through contact with the infected person's bodily fluids.	Blood Saliva Mucus Human waste	One drop of HIV- or hepatitis-infected blood in a needle, if it pricks a health care worker, may transmit disease.
	Plants —A variety of illnesses may be caused by contact with plants or portions of plants.	Grain dust Moldy hay Pollen	Dusts from moldy hay or other types of mold may cause an acute illness that acts like the flu. This illness may last several weeks.

LESSON 2

Recognizing Workplace Hazards



Description:

Students discuss the effect of potential workplace injuries on their lives, brainstorm lists of different types of workplace hazards, and then map potential hazards in work environments.

Learner Outcomes:

Students will be able to do the following:

1. Identify the range of effects serious injuries or illnesses could have on their lives.
2. Give examples of different types of workplace hazards — biological, chemical, and physical.
3. Recognize hazards in a workplace environment.
4. Perceive the importance of evaluating potential hazards in their workplaces.

Key Concepts:

1. The many kinds of workplace hazards are divided into three categories:
 - **Physical**—hazards due to a transfer of energy between an object and a worker (e.g., falling from a height, a burn

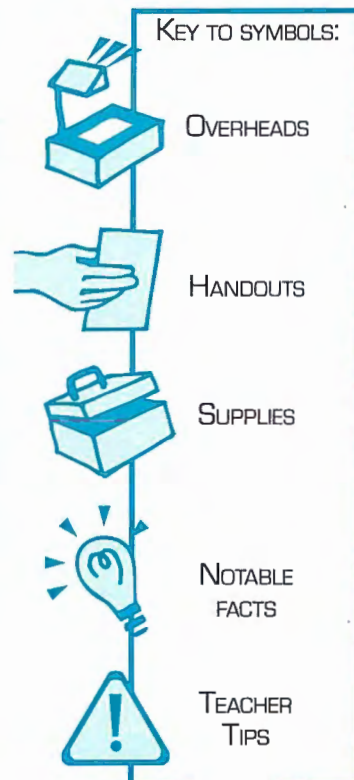
- **Chemical**—hazards due to contact with chemicals (e.g., cleaners, pesticides, fertilizers).
- **Biological**—hazards due to contact with living organisms or their by-products (e.g., molds, bacteria, HIV, grain dust).

These categories are not mutually exclusive; they are important only in that they give structure to a broad topic.

2. Hazards may cause both **temporary** and **permanent** injuries and illnesses.
3. Some hazards will create an injury or illness **right away**. Other hazards may not cause an injury or illness until **much later in life**. For this reason, workers should take all hazards seriously, even if they do not experience problems right away.
4. It is important for all workers to be aware of potential hazards when they enter a workplace.

Fact:

In a New York state study, agriculture, which employs only 3% of working adolescents, was the second most dangerous occupation for teens, accounting for the highest number of injuries among 16- and 17-year-old workers.¹ Farming consistently has been identified as Minnesota's most hazardous occupation.



Materials

Needed:

- Overheads 2.1, 2.2, 2.3, 2.4, and 2.5
- Chalkboard or blank overhead
- Large sheets of butcher paper
- Markers (at least one per group of four students)
- “Teacher’s Key: Possible Hazards Identified on Student Hazard Maps”
- “Workplace Safety Attitude Survey” handout

Preparation Needed:

1. Set up the overhead projector. Place the overheads in order according to the lesson outline.
2. Draw the three hazard categories (Physical, Chemical, and Biological) on the chalkboard or overhead before class begins.
3. Familiarize yourself with the example hazard maps (Overhead 2.4 and 2.5), so you can explain them to the class.
4. Make copies of the “Workplace Safety Attitude Survey” (one per student).

Optional Activity: You may want to invite a guest speaker to class who has experienced a workplace injury or permanent disability. The individual may have suffered a sudden injury such as a loss of a limb or finger or paralysis due to a fall. Or perhaps the individual has experienced an injury or illness that developed gradually over time, such as a loss of hearing due to working with loud machinery or lung-related conditions due to working in dusty or hazardous environments.

Hearing the story of someone who has a workplace injury may help make the material “real” to students and reinforce the concepts presented in this lesson. Perhaps one of your students may have suffered a serious workplace injury and may be willing to share his or her own experience with the rest of the class.

If you are not sure where to find a speaker for your class, local organizations who serve people with disabilities may have suggestions.

Directions:

You may want to extend this lesson over a two-day period to allow more time for discussion and completion of the hazard maps.

Life After An Injury — Part II (10 minutes)

Optional: You may want to allow students time to complete their “My Experience With A Workplace Disability” essays at the beginning of class, if they were not able to complete them as homework assignments.

1. Have one or two students from each disability group describe their experiences with the simulated disabilities during the previous class day. Ask other students from the same group, if they would like to add anything about their experiences.

If students do not include the following information, ask them:

- What was your experience like?
- What activities did you have to change, because you could not use your thumb, arm, legs, or hearing?
- For those with the disfigurement, what did you experience?
- How might your life be different, if this situation was permanent for you?

2. Explain:

You experienced what it was like to be injured at work, to lose a thumb, an arm, a leg, your hearing, or to have scarring on your face. Most of you found it difficult. People who are really injured at work in these ways do not have the option to go back to life before the injury.

People often are injured at work. It is not uncommon for a person to lose their hearing, if they work in a noisy workplace for a long period of time. It is not uncommon for a person to lose a limb or finger while working around large, moving machinery.

3. Show Overhead 2.1. Explain:

Some workplace injuries or illnesses affect us only for a short time. Getting a burn that heals in a week or feeling nauseous for a few hours after using a strong chemical cleaner are examples of temporary injuries or illnesses.



Ask:

What are some other examples of temporary work injuries or illnesses?

(Example answers: small cuts; bruises; strains; sunburns)

Explain:

Other injuries or illnesses affect us for a long period of time, maybe even for the rest of our lives. Losing an arm in a power takeoff or losing the ability to walk after breaking your back in a fall are two examples of **permanent** injuries or illnesses. Having a scar on your face is also a permanent injury.

Ask:

What are some other examples of **permanent** work injuries or illnesses?

(Example answers: losing a finger; losing your eyesight; developing work-related asthma)

4. Explain:
You can also look at workplace injuries or illnesses in another way. Some hazards create an injury or illness **immediately**. For example, if you touch a hot grill, you get a severe burn right away.
5. Ask:
What are some other examples of immediate work injuries or illnesses?
(Example answers: cutting your finger in a meat slicer; hurting your back when you fall)
6. Explain:
Other hazards may not cause an injury or illness until **later in life**. For example, a person who works in a very dusty workplace may have no problems right away but may develop lung problems after years of exposure.
7. Ask:
What are some other examples of work injuries or illnesses that show up later in life?
(Example answers: loss of hearing gradually over time; carpal tunnel caused by repetitive motions over time; back problems caused by repeated lifting; cancer or lung disease caused by prolonged exposure to harmful chemicals).

Note: Spend some time talking about injuries or illnesses that show up later in life. Students may not always be aware of or concerned with these hazards. Future health problems may not seem as important as getting a job done quickly now. Discuss the problem with this short-sighted view on work safety.

Explain:

When we think of workplace injuries or illnesses, we often think of those that happen immediately, but the hazards that cause injuries or illnesses later in life are just as serious. For this reason, workers should take all hazards seriously, even if they do not experience problems right away.

Identifying and Defining Hazards

(20 minutes)

1. Ask:
All workplace injuries or illnesses are caused by hazards. What was the definition of a “workplace hazard”?
(Answer: A workplace hazard is anything at work that can harm a person—physically or mentally.)

Explain:

Remember, the hazard is what **caused** the injury or illness, not the injury or illness itself. For example, hot oil is the hazard, not the burn the hot oil caused.

The hazard is also not the action that was taking place at the time of the injury. For example, painting is not the hazard, it is the height the painter fell from that is the hazard. Of course, painting may cause muscle strain or repetitive stress injuries.

2. Show Overhead 2.2. Explain:

You may be exposed to hazards at work in a number of ways. You may be exposed to a physical hazard whenever a transfer of energy between you and an object is possible. How many of you have studied physical science? Can you explain what a transfer of energy involves?

A difference of temperature between an object and a person creates the potential for heat energy to be transferred, if the person and object come in contact. For example, if your bare hand touches a hot oven, the heat energy of the oven is transferred to you through touch, causing a burn.

A moving object also has energy that can be transferred. A box sitting on a high shelf gains a lot of momentum as it falls. If the box hits you, that energy is transferred to you, causing an injury. In the same way, if you fall from a height, your body gains a lot of momentum, causing it to be injured when you hit the floor.

3. Show Overhead 2.3. Explain:

You may also be exposed to biological and chemical hazards by breathing them in (inhalation), absorbing them through the skin (absorption) or through breaks in the skin, or swallowing them (ingestion).

To prevent injuries, it is important to think about how your body comes into contact with hazards. For example, if you work with chemicals in the workplace and forget to wash your hands before lunch, you may ingest the chemical while you eat without realizing it. Even if the chemical causes no immediate discomfort, why could ingesting it be a problem?

(Answer: Illnesses may occur later due to repetitive actions over time.)



- Draw a three-column table on the chalkboard or blank overhead. Label one column “Physical Hazard,” one column “Chemical Hazard,” and one column “Biological Hazard.”

Say:

Now without using the fact sheets, just using your memories or personal experiences, give me some examples of workplace hazards.

- As students list the hazards, decide as a class which category they fit under and write them in the appropriate column.

Again, make sure students are mentioning hazards, not injuries or illnesses. Students may be somewhat confused with the difference between categories. Biological hazards deal with any fluid or product from an animal. A person’s blood, if infected with HIV, is a biological hazard. Lifting a person, though the same object, is a physical hazard.

Refer to the workplace hazards fact sheets for more examples. Your completed chart may look like the following:

Physical	Chemical	Biological
Loud noises Ladders, staircases Hot ovens Power takeoff Tractor Freezer, cold places Very hot or cold weather	Pesticides Cleaning products Paints Fertilizers	Grain dust Human blood Large animals Manure pits

- Ask:
Looking at these lists of hazards we just created, which ones can be found on a farm?

Star the agricultural hazards.

Mapping Hazards (30 minutes)

Note: You may not have enough time to complete this activity during this class period. You may want to extend this activity to your next class session. Students will map hazards again in Lesson 4 as part of designing a prevention plan. Mapping hazards here will prepare students to complete the activities in Lesson 4 in less time and give them an opportunity to use workplaces that are familiar to them.

1. Explain:

Once you know the basic kinds of hazards, you can begin to identify them in the workplace. When you walk into a workplace, use what you know about hazards to identify them.

Although each workplace is unique, the types of dangers in each are not. In any workplace you may find physical hazards such as noise, moving machine parts, or other dangerous equipment. Chemical hazards, such as pesticides or cleaning products, or biological hazards, such as human blood, grain dust, or manure pits, also may be present. If you remember the basic hazard categories, it will be easier to see them in many different workplaces.

Hazards at a workplace may change from day to day. If, for example, a large shipment of supplies comes in and needs lifting and carrying, a new physical hazard is created. You will want to be aware of new hazards that come into your work environment each day. We are going to practice analyzing work environments for hazards by developing hazard maps.

2. Show the class Overhead 2.4. Explain:

This simple map shows the basic layout of a grocery store. You will be working in small groups to create maps like this of different types of workplaces. Work together using the butcher paper and markers. You do not need to draw fancy maps.

3. Explain:

To begin the map, draw a rough floor plan of the workplace you are studying. The floor plan should show rooms, work areas, major fixtures and equipment, doors, and windows.

TEACHER TIP:

If you want to save time in class, give this exercise as a homework assignment.



Although each workplace is unique, the types of dangers in each are not.



OVERHEAD 2.4



It is always better to ask if something is a hazard than to ignore it and find out later.



4. Show Overhead 2.5. Explain:
Once your floor plan is drawn, decide where the hazards are located. Mark these locations on the floor plan using the markers. Label the type of hazards you find with this code:

- **P** to show physical hazards.
- **C** to show chemical hazards.
- **B** to show biological hazards.

You may want to write this code on the board so students can refer to it. Label a few of the hazards on the overhead using this coding system.

Explain:

If you are not sure whether something is a hazard, mark it anyway. It is always better to ask if something is a hazard than to ignore it and find out later that it was a hazard, because you or someone else became injured or ill.

5. Divide the class into small groups of three or four students. Have each group select a type of workplace to study. It would be best, if they choose one of their own workplaces, but they could also use one of the following:
- Farm (barn, machine shop, feedlot, or cropland)
 - Restaurant
 - Nursing home
 - Movie theater
 - Office

The same workplace can be assigned to more than one group. If possible, each group should include some students who have worked in, or are familiar with, that type of workplace.

Note: If you are short on time, provide the workplace maps for students. Have them fill in the hazards found there.

6. Give each group a set of markers and a large sheet of butcher paper.
7. Allow the groups at least 15 minutes to complete their maps. If some groups get done with their maps before others do, encourage them to go back and read their hazard fact sheets to see if any hazards were missed.
8. Then have each group choose one person to report to the class. Each group's spokesperson will have one or two minutes to explain their map. Have at least four groups report. If groups begin to repeat the same hazards, ask them to focus on hazards that have not yet been mentioned.

Note: Possible hazards for each workplace are listed in the teacher's key included in this lesson.

9. Explain:
Whenever you are in a workplace, make a mental map of where the hazards are, just as you did today. Tomorrow, we will talk about what can be done to reduce the risk of workplace hazards, once they have been identified.
10. Have students fill out their “Performance Criteria and Checklist” for today’s work.



Taking It Home:

Have students do the following assignment:

Give each student a copy of the “Workplace Safety Attitude Survey.”

Explain:

This is a survey about workplace safety attitudes. I would like you to fill this survey out as honestly as you can.

Read each statement and ask yourself whether you agree or disagree with it. Think about your current or past work situations. Does this statement describe your attitude in that workplace?

Take your time reading and considering each statement. No answers are right or wrong. I am looking for your opinions. You will not be graded on your answers, but you will get credit for completing the survey.

Again, be as honest as you can. If you have not worked, think about what your attitudes are **right now** as you think about working in the future. You will hand in this survey during our next class session.



Footnotes:

¹ Belville, R., et al. “Occupational Injuries Among Working Adolescents in New York State.” *Journal of the American Medical Association* 269 (1993): 2754-2759.

Note: Portions of this lesson are adapted from the “Teen, Work, and Safety” curriculum distributed by the Labor Occupational Health Program, Center for Occupational and Environmental Health, University of California, Berkeley.

A Body's Response To Hazards

Temporary
versus
Permanent

Immediate
versus
Later in Life

Pathways of Exposure

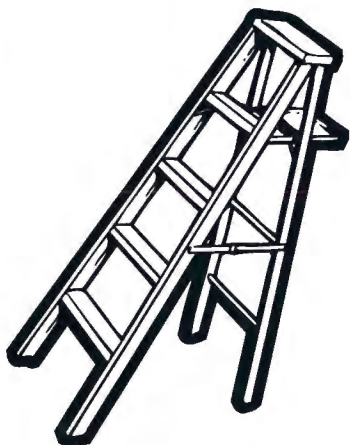
Physical Hazards

Energy is transferred to a worker
in a variety of ways:



Heat (burns)

**Falling
objects**



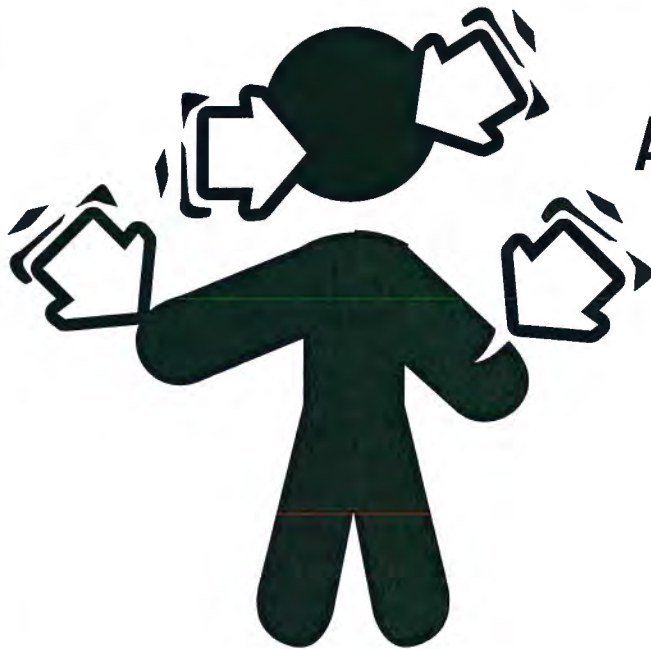
**Falling
from heights**

Pathways of Exposure

Biological and Chemical Hazards

Workers are exposed to these hazards by the following means:

Inhalation (breathing in)

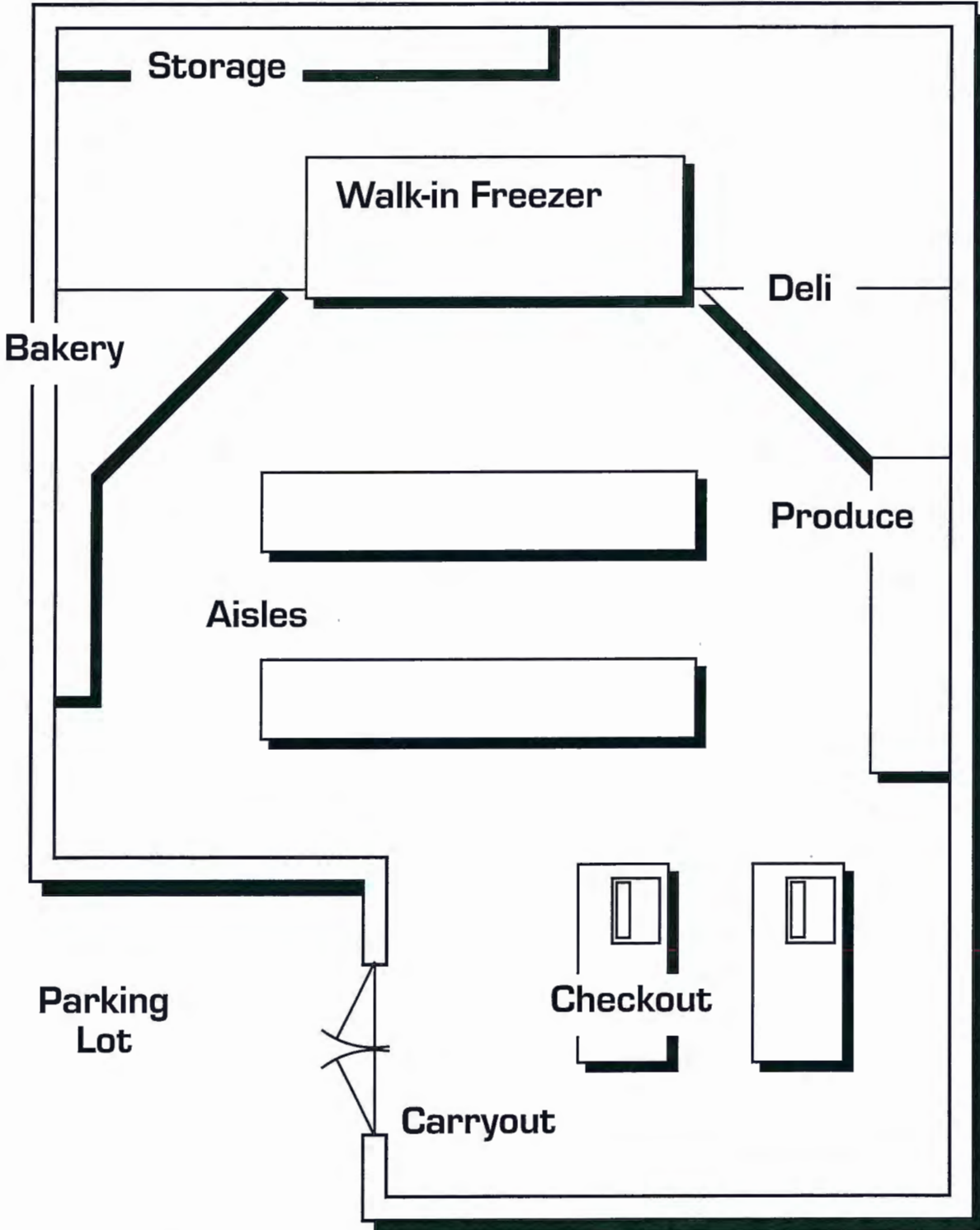


Absorption (passing through skin)

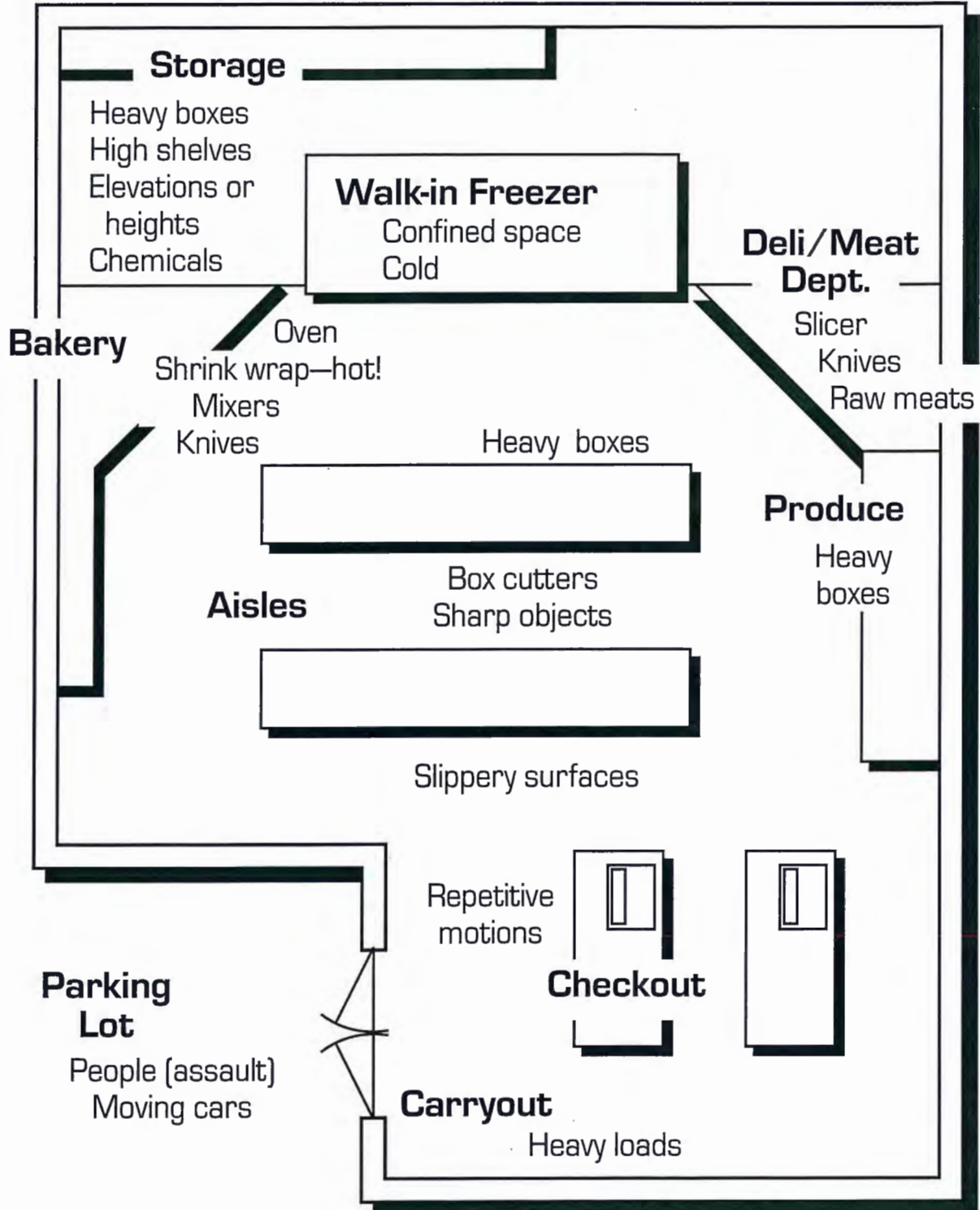
Entrance through cuts or abrasions

Ingestion (swallowing)

Example Hazard Map: A Grocery Store



Example Hazard Map: A Grocery Store



Teacher's Key: Possible Hazards Identified on Student Hazard Maps

On a Farm

In and around a barn:

Ladders or hay loft (falling)
Animals
Dust, molds
Chemicals (milking barns)
Conveyor belts
Manure pits
Silos or other enclosed bins
Tractors

In a machine shop:

Chemicals
Power tools (cuts, electrocution)
Truck or car jack
Dust
Moving parts in motors
Noise
Toxic gases

In and around a feedlot:

Animals
Manure pits (toxic gases)
Silos or other enclosed bins
Grain wagons
Tractor rollovers and runovers
Electric fencing
Barbed wire fencing
Insect bites
Noise

On cropland:

Tractors
Power takeoff
Moving parts (chopping, cutting)
Pesticides and other chemicals
Holes
Sun and heat
Dust, molds, pollen
Noise
Insects

Fast Food Restaurant

Cooking equipment (burns, electrocution)
Sharp knives
Slippery floors
Money (robbery)
Standing for long periods of time

Hot grease
Slicers/meat cutters
Chemicals (cleaners, pesticides)
Heavy objects

Nursing Home

Heavy objects (people)
Chemicals (disinfectants, cleaners)
Needles
Cooking equipment
Moveable beds
Physical violence

Human bodily fluids
Standing for long periods of time
Medicines
Slippery floors
Physical therapy equipment

Movie Theater

Popcorn, hot dog and coffee machines (burns)
Ladders
Money (robbery)
Dark environments (falls)

Slippery floors
Cleaning products
Standing for long periods

Office

Cords or loose carpeting
Poor indoor air quality
Computer monitors
Repetitive work

Electric circuits
Computer keyboards/mouse
Sitting for long periods of time

Workplace Safety Attitude Survey

For each of the following statements, check the response that best fits what you think or believe *right now*. Be as honest as possible. This survey will not be graded.

	Strongly Disagree	Disagree	Agree	Strongly Agree
1. My health is very important to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. A workplace injury or illness will never happen to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. If I do not watch out for my own health, I can't assume anyone else will.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Workplace injuries or illnesses just happen. I can't do anything about them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. It is worth the inconvenience to take the necessary precautions to be safe at work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I do not worry about workplace injuries or illnesses.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. People may think I am strange if I am concerned about safety at work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I am more careful than other people, so I do not think I will get injured at work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. If I had to choose between completing my job quickly and being safe, I would choose to be safe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. If I get injured at work, it will most likely be minor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. A person could get fired by questioning safety on the job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. If someone gets injured at work, it is their own fault.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I do not care what other people think. I would rather be safe than sorry.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. You really cannot predict how or when people are going to get hurt.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. If it would make my job faster, I would remove protective equipment on machinery.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Some jobs, like office work, are totally safe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I would give up a high-paying job if I thought it was unsafe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Even if protective clothing was uncomfortable or seemed unnecessary for the job, I would still wear it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. I do not pay much attention to written safety warnings. Most of them are unnecessary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. If I worked at a job for a long time and never got hurt, I would still be concerned about injuries or illnesses.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

LESSON 3

Preventing Workplace Injuries and Illnesses



Description:

Students are introduced to the ABC's of preventing workplace injuries or illnesses. They then brainstorm ways to apply the ABC prevention strategies to example hazards. They also discuss the reasons workers choose to take risks in the workplace, even when they know hazards are present.

Learner Outcomes:

Students will be able to do the following:

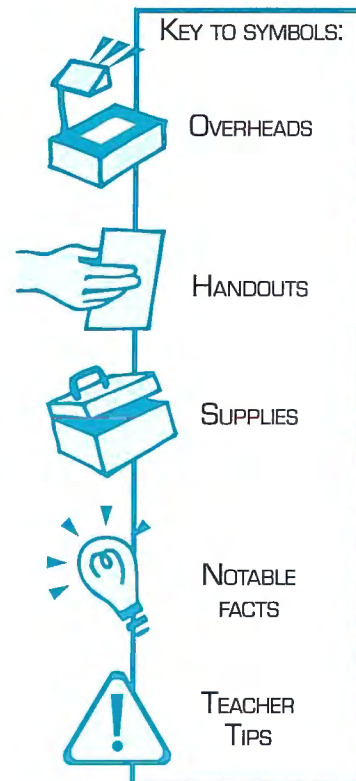
1. Describe three strategies used to prevent workplace injuries or illnesses.
2. List examples within each prevention strategy.
3. Identify the pros and cons of taking risks in the workplace.
4. Perceive that workplace injuries or illnesses can be prevented.
5. Identify the attitudes that help a person remain safe in the workplace.

Key Concepts:

1. Most workplace injuries and illnesses can be avoided by taking the right preventative steps.
2. Three main ways to prevent workplace injuries or illnesses are represented by the letters ABC:
 - **A**dministration
 - **B**uilding barriers
 - **C**ommunication
3. The **best** way to prevent workplace injuries is to design engineering controls (part of **Building barriers**), such as shields, guards, etc. This strategy is the best prevention strategy because it does not depend on people making safe choices every time. You change the environment, which is easier to control and more reliable than people.

Fact:

Of those 14- to 16- year olds who were injured in the workplace, more than half reported they had not received any training on how to prevent the injury. A supervisor was present at the time of the injury in only about 20% of the cases.¹



Materials

Needed:

- Overhead 1.1 (from each class period, Lesson 1 and 2)
- Overheads 3.1-3.5
- “ABC Prevention Strategies” fact sheet
- “Hazard Prevention Worksheet”
- Chalkboard or easel
- “Material Safety Data Sheet”
- “Material Safety Data Sheet Questions and Key”
- Bottle of ammonia cleaner

Preparation Needed:

1. Review the “ABC Prevention Strategies” fact sheet, so you are familiar with the three main prevention strategies and the examples of each. You may want to make class sets of these fact sheets rather than individual sets.
2. Review the “Workplace Safety Attitude Survey” (distributed to students at the end of Lesson 2), so you are familiar with these attitude statements.
3. Think through the costs and benefits of different safety measures.
4. Make copies of the “Material Safety Data Sheet” (MSDS). You may want to make class copies or put this form on an overhead. The ammonia cleaner is a concrete example of a chemical with an MSDS.

Directions:



“ABC PREVENTION STRATEGIES” HANDOUT



OVERHEADS 3.1-3.4

The ABC’s of Injury Prevention (25 minutes)

1. Give each student a copy of the “ABC Prevention Strategies” fact sheet. Explain:

This fact sheet outlines three basic ways to prevent injuries or illnesses in the workplace. These three ways are represented by the letters A, B, and C.

Allow students about five minutes to read through the fact sheet.

2. Show Overhead 3.1. Review each strategy using Overheads 3.2, 3.3, and 3.4.
3. Explain:
Since it is easier and more reliable to change the workplace than the worker, the most important prevention strategies will be those that involve engineering controls (part of **Building barriers**). Employers should apply these strategies first.

For example, if workers often get burns when making french fries in a hot oil fryer, you could teach workers a different way to handle the equipment. To prevent burns, however, people would have to apply this training every time they worked with the fryer.

It would be better to build a barrier, like a shield that prevents oil from splattering on workers. The shield would always be in place, so you wouldn't have to depend on workers doing something correctly to keep themselves safe. The shield does the work. The workers don't have to. That method is the **safest** way to design a workplace.

Distribute the "Hazard Prevention Worksheet" to the students. Allow students time to read the handout. Select several of the hazards listed to review with the students. Allow the opportunity for students to practice the ABC's of prevention by talking through the classification process.



- In order to further practice the ABC's of prevention, draw three columns on the chalkboard or easel. Label them "Administration," "Building Barriers," and "Communication." Say:
Let's work through some hazard situations to show how we may apply the three ways of preventing injuries or illnesses.



- Show Overhead 1.1, which partially was filled out by this class during Lesson 1. Say:
Let's take one of the injuries or illnesses we identified during our first session. First, what are the hazards that caused each of these injuries or illnesses?

Write students' answers in the right-hand column on the overhead. Select one of the hazards from the right-hand column. Ask:
Using the ABC's of prevention, how could we prevent injuries or illnesses from this hazard? Since building barriers is the best prevention, let's begin with "Building barriers." What kind of engineering controls could be built to protect workers?

Write barrier strategies for this hazard on the chalkboard. A variety of hazards are used as examples below. The following are some possible answers:

Building barriers:

Engineering Controls

- Build a shield on application equipment to reduce exposure to fertilizer.
- Purchase equipment with guards around moving parts.
- Install seat belts and rollover protection equipment (ROPS) on tractors.
- Install nonslip flooring.
- Store chemicals in a locked cabinet.
- Install vents to get rid of smoke.

Understanding A Material Safety Data Sheet

(10 minutes)

1. Hold up a bottle of ammonia. Ask:
How many of you use ammonia or some type of cleaner at work? What are the potential hazards of using a product such as this? How can you find out?
2. Explain:
Your employer should always tell you the hazards in your workplace. If you are working with chemicals such as ammonia, they should also provide you with a form called a Material Safety Data Sheet.

Give each student a “Material Safety Data Sheet” or display the overhead.

An MSDS form, as they are called, lists all the hazards related to using a particular chemical. This MSDS form is for an ammonia cleaner. This form tells you what the chemical is made of, what the health effects from being exposed to this chemical could be, and how to store and dispose of the chemical.

You can see, just by looking at this form, that it’s not easy to read. But if you read carefully, it tells you what the health concerns are with using ammonia.

3. Read questions from the “Material Safety Data Sheet Questions and Key” out loud to the group. Then have students locate the answers on the MSDS form. Use the key to check students’ answers. Ask as many questions as time or interest permits.
4. Explain:
If you are ever in a work situation in which you are using chemicals, be sure to ask for an MSDS form and have your employer explain it to you.

Working around hazardous chemicals is very serious. You may not feel the effects right away. Health problems may present themselves later in life. Some of the immediate effects of working with hazardous chemicals are fatigue, headaches, and sleep disturbances. Some effects that show up later may be cancers, memory problems, birth defects, and sterility.



“MATERIAL SAFETY DATA SHEET”

“MATERIAL SAFETY DATA SHEET
QUESTIONS AND KEY”

TEACHER TIP:

Ask your school custodian for examples of MSDS forms for chemical products used at your school. Share these forms with students.



5. **Explain:**
Information on an MSDS may be complicated. If you have any questions, be sure to ask your employer. Your employer is required by law to share this information with you.

Analyzing Workplace Attitudes (15 minutes)

Note: The purpose of this discussion is not to persuade students to your point of view but to help them discover for themselves what their own level of acceptable risk in the workplace is.

Even if students come to a conclusion that you do not agree with, it is important to give students that freedom in this discussion. Do not take an argumentative stance. Your role is to facilitate discussion.

1. **Ask:**
Even if an employer does everything they can to prevent work injuries and illnesses, people still become injured while working. Why do you think that is?

(Possible answers: A worker may not recognize that something is a hazard; even if workers recognize a hazard, they may still continue working around that hazard without using the prevention strategies.)

2. **Ask:**
Why might a person work around hazards without setting up prevention measures?

Look over the workplace safety attitude survey from Lesson 2 you filled out before class. Discuss some of the attitude statements and how those attitudes may affect health.

(Possible answers: Prevention is uncomfortable; busyness and rushing; concern over what the boss or other workers may think; underestimating the danger; not knowing how to fix the danger; habit.)

3. **Ask:**
People sometimes take risks with things they know are hazards. Can you name some things you or other people do, even though they may be risky?

(Possible answers: Drive fast; smoke; boat without wearing a life jacket; ride a motorcycle without a helmet; drink and drive.)

4. **Ask:**
Can you name some things you or other people would not do, because they are too risky?

(Possible answers: Jumping out of a plane without a parachute; racing across railroad tracks right in front of a train.)

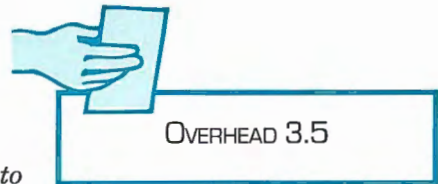
How do you decide how much of a risk you are willing to take? How do you know where to draw the line?

5. Explain:

Each of us has to weigh the costs and benefits of being safe or taking a risk. We have to decide what balance between these two things is acceptable to us.

Let's take the situation of whether to install a guard on a piece of equipment. A guard is a device that prevents you (usually your hand) from getting caught in moving equipment. What are the benefits **for you** of taking this safety measure?

6. Show Overhead 3.5. Write "machine guard" in the "Safety Measures" column. Write the benefits that students describe in the second column.



(Possible answers: Won't lose an arm or finger; won't lose your job due to injury; you can work fast without worrying; don't feel as stressed.)

7. Ask:

What are the costs **to you** in having the machine guard in place? Write these in the third column.

(Possible answers: It may be inconvenient; it may slow you down; it may take more effort to work around it; the chances of you getting hurt may seem so small, it seems like a waste of time.)

Looking at these benefits and costs, how would you weigh the two? Would you leave the machine guard on or take it off? Would you be willing to risk losing your arm, for example, if you thought you could work faster?

(Again, allow students to give an honest, serious answer. Do not try to argue with them.)

8. Work through several examples of safety measures. Discuss the benefits and costs of each measure. Other possible examples could include not wearing hearing protection or not using gloves while using cleaning products.

(Possible answers: Benefits of hearing protection: don't lose hearing; protect ears from having reduced hearing. Costs of hearing protection: can't hear other people; can't listen for other hazards or machinery that sounds wrong; they are hot; they hurt your ears.)

(Possible answers: Benefits of wearing gloves with cleaning products: protect skin from chemicals; hands don't dry out, get chapped, or dirty; can work with a chemical longer; can clean harder. Costs of wearing gloves with cleaning products: hard to grab objects with them; hot; work may take longer; other people may think you are overly concerned.)

9. Explain:

When you enter the work world, you take on a new level of responsibility for yourself and your coworkers.

We are often tempted to go for the short-term convenience of taking a risk rather than the long-term benefits of being safe. But that choice can sometimes lead to long-term injuries or illnesses.

Preventing injuries or illnesses is a two-step process. First, identify the hazard. Second, apply the ABC's to reduce risk and prevent injury. Tomorrow, we will have the opportunity to further practice this two-step process.

10. Have each student turn in their completed "Workplace Safety Attitude Survey." They will be graded on turning in the survey and not on their answers, since the answers are students' opinions.

11. Say (only if students have individual copies of fact sheets):

Remember to bring all your fact sheets to class next time, including the one you received today.

12. Before the session is over, have students check off tasks on their "Performance Criteria and Checklist."

Taking It Home:

No homework assigned for this class session. Remind students to bring all their fact sheets to the next class session (unless you have provided only classroom sets).

Footnote:

¹ Centers for Disease Control, NIOSH. *Preventing Deaths and Injuries of Adolescent Workers*, May 1995.

The ABC's of Injury and Illness Prevention

AAdministration

Building barriers

Communication

B

uilding barriers

- **Engineering Controls**

Protecting an employee by putting a barrier between a person and the hazard

- Shields
- Guards
- Ventilation
- Removal of the hazard
- Locked cabinets

- **Protective equipment**

- Earplugs
- Masks
- Gloves
- Respirators
- Boots

C**ommunication**

Training and information provided to workers, so they understand what hazards are in the workplace and how to avoid them

- Teach people about potential hazards
- Train them to do their jobs safely
- Tell people who to talk to when they have questions about worker safety

Safety

Measures

Benefits

Costs

ABC Prevention Strategies

Once workplace hazards have been identified, strategies can be used to prevent these hazards from causing injuries or illnesses. Three main prevention strategies are listed below. They are easily remembered by thinking of the letters ABC. Most often, the employer will use these strategies to make the workplace safe. Workers can also suggest these strategies to their employers. Once these strategies are in place, workers should use them.

Prevention Strategies	Examples
<p>A Administration</p> <p>Definition: The rules and procedures put in place by an employer to limit workers' exposures to hazards.</p>	<ul style="list-style-type: none"> • Establishing a rule that requires workers to wear personal protective equipment, such as gloves, goggles, or respirators. • Requiring people to rotate jobs, so a worker is only exposed to a hazard for a short time. • Disciplining workers, if they remove protective guards on machinery. • Setting a rule that workers should not lift more than a certain weight. • Establishing a rule that requires workers to wash their hands after working with hospital patients.
<p>B Building barriers</p> <p>Definition: Creating a physical barrier between a hazard and a worker by the following means:</p> <ul style="list-style-type: none"> • Removing the hazard. • Putting space between the worker and the hazard. • Putting a physical object between the hazard and the worker. 	<p>Engineering Controls (removing the hazard or changing equipment to eliminate the hazard):</p> <ul style="list-style-type: none"> • Using less toxic cleaners or pesticides (removing the hazard from the workplace). • Installing ventilation to remove toxic gases or smoke. • Using machines that require two hands to start, so both hands are out of the way. • Properly storing hazardous chemicals in a locked cabinet. • Keeping controls a safe distance from the hazard (e.g., x-ray machines). <p>Guards and Shields:</p> <ul style="list-style-type: none"> • Putting shields or guards in front of dangerous equipment (e.g., saws or augers). <p>Personal Protective Equipment:</p> <ul style="list-style-type: none"> • Wearing personal protective equipment such as hard hats, steel-toed boots, gloves, hearing protection, respirators, goggles, and face shields.
<p>C Communication</p> <p>Definition: Training and information provided to workers, so they understand what hazards are found in the workplace and how to avoid them.</p>	<ul style="list-style-type: none"> • Requiring safety training for all workers. • Providing each employee with a written safety manual. • Giving copies of Material Safety Data Sheets to workers. These sheets give hazard information about chemicals that workers may be using. • Notifying an employer when equipment is not functioning properly. • Establishing a safety committee which includes workers.

Hazard Prevention Worksheet

The following are examples of ways the ABC's of prevention may be used to prevent injuries or illnesses from different hazards.

Hazard	Administration	Building Barriers	Communication
Heavy Boxes	<ol style="list-style-type: none"> 1. Require heavy boxes to be stored on middle shelves. 2. Limit the amount of weight a person is allowed to carry. 	<ol style="list-style-type: none"> 1. Store boxes close to where they need to be carried. 2. Move heavy boxes with a forklift. 3. Replace heavy boxes with smaller, lighter boxes. 	<ol style="list-style-type: none"> 1. Train workers to carry heavy objects correctly.
Cash Register	<ol style="list-style-type: none"> 1. Require at least two employees to be in the store at all times. 	<ol style="list-style-type: none"> 1. Install bulletproof glass around the cash register. 2. Store most of the money in a safe, for which only security (and not even the manager) knows the combination. 	<ol style="list-style-type: none"> 1. Show workers how to transfer money from the cash register to a safe. 2. Teach workers what to do in emergencies.
Cleaning Products	<ol style="list-style-type: none"> 1. Develop cleaning procedures that protect the worker. 	<ol style="list-style-type: none"> 1. Use the least toxic cleaning products possible. 2. Use protective equipment (e.g., gloves, mask). 3. Store cleaning products in a cabinet away from workers. 	<ol style="list-style-type: none"> 1. Train employees to use cleaning products correctly.
Lawn-mower	<ol style="list-style-type: none"> 1. Set procedures for using the mower. 	<ol style="list-style-type: none"> 1. Use machines that automatically turn off when the handle grip is released. 2. Install guards on all rotating equipment, with which employees may come into contact. 3. Provide protective equipment (e.g., steel-toed shoes, earplugs, gloves). 	<ol style="list-style-type: none"> 1. Train employees to recognize and avoid unsafe conditions associated with operating lawn mowers.
Indoor Paint	<ol style="list-style-type: none"> 1. Rotate work whenever possible, so workers spend less time around toxic fumes. 2. Require workers to take breaks. 	<ol style="list-style-type: none"> 1. Open windows and doors to allow ventilation. 2. Use the least toxic paints possible. 3. Provide protective equipment (e.g., respirators). 	<ol style="list-style-type: none"> 1. Train workers to work with paints in the safest way possible.

Hazard Prevention Worksheet (continued)

Hazard	Administration	Building Barriers	Communication
Outdoor Work	<ol style="list-style-type: none"> 1. Provide shaded rest areas. 2. Rotate workers to minimize exposure to sun. 	<ol style="list-style-type: none"> 1. Wear protective creams to avoid exposure to ultraviolet light. 2. Wear broad-brimmed hats that shade head, neck, face, and ears. 3. Provide drinking water. 	<ol style="list-style-type: none"> 1. Teach workers about the hazards associated with sun exposure.
Deep Fryer	<ol style="list-style-type: none"> 1. Require employees to allow oil to cool before cleaning the fryer. 2. Require employee training before use. 	<ol style="list-style-type: none"> 1. Set up shields, so workers do not come into contact with splattered hot oil. 2. Provide protective equipment for workers. 3. Purchase a fryer that is easier to use and clean. 	<ol style="list-style-type: none"> 1. Train workers to properly use and clean the fryer.
Human Infections	<ol style="list-style-type: none"> 1. Require workers to wash their hands after contacting contaminated materials. 2. Set up procedures for proper disposal of contaminated materials. 	<ol style="list-style-type: none"> 1. Use needles that do not require recapping. 2. Provide protective equipment (e.g., gloves, masks). 3. Provide infectious waste containers. 4. Provide clothing different from regular street clothes. 5. Provide proper ventilation and disinfection of work areas. 	<ol style="list-style-type: none"> 1. Train workers to properly work with infected persons and waste products.
Power Auger	<ol style="list-style-type: none"> 1. Require use of safety guards whenever the machine is operated. 2. Set up procedures for proper use of a power auger. 	<ol style="list-style-type: none"> 1. Provide protective guards on the power auger. 2. Set controls at a distance from the power auger. 3. Set up controls so a person has to use both hands to start the auger. 	<ol style="list-style-type: none"> 1. Train workers to properly use the auger.

Material Safety Data Sheet

24 Hour Emergency Telephone:
ACME Chemical: 1-800-XXX-XXXX

Ammonia Solution, Strong

MSDS Number: A5472 --- Effective Date: 10/01/97

1. Product Identification

Synonyms: Ammonia Aqueous; Aqua Ammonia.
CAS No.: Not applicable to mixtures.
Molecular Weight: Not applicable to mixtures.
Chemical Formula: Not applicable to mixtures.
Product Codes: 9724, 9726

2. Composition/Information on Ingredients

<u>Ingredient</u>	<u>CAS No.</u>	<u>Percent</u>	<u>Hazardous</u>
Ammonia	7664-41-7	27 - 31%	Yes
Water	7732-18-5	69 - 73%	No

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE ALKALINE SOLUTION. CAUSES BURNS TO ANY AREA OF CONTACT. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN.

J. T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 1 - Slight
Reactivity Rating: 2 - Moderate
Contact Rating: 3 - Severe (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White Stripe (Store Separately)

Potential Health Effects

Ammonia is very alkaline and reacts corrosively with all body tissues.

Inhalation:

Corrosive. Extremely destructive to tissues of the mucous membranes and upper respiratory tract. Symptoms may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting. Inhalation may be fatal as a result of

5. Exposure Controls/Personal Protection

Airborne Exposure Limits:

For Ammonia:

—OSHA Permissible Exposure Limit (PEL) - 50 ppm (TWA)

—ACGIH Threshold Limit Value (TLV) - 25 ppm (TWA), 35 ppm (STEL).

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a full facepiece respirator with an ammonia/methylamine cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Material Safety Data Sheet Questions and Key



1. What chemical is this MSDS for?
Strong Ammonia Solution
This chemical is common ammonia cleaner found in most grocery stores.
2. What are the ingredients that make up this chemical?
Ammonia and water
3. What “warning words” would you find on the chemical’s label (see Section 3 of the MSDS)?
POISON! DANGER! CORROSIVE ALKALINE SOLUTION. CAUSES BURNS TO ANY AREA OF CONTACT. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN.
4. Is this chemical . . . (Fill in the words listed in the MSDS Section 3)
Flammable: *slightly*
Corrosive: *severely*
Reactive when mixed with other chemicals: *moderately*
5. What protective equipment should you wear when using this chemical?
Goggles and shield; lab coat & apron; vent hood; proper gloves
6. What would happen to you if you ingested this chemical?
Swallowing could cause severe burns of the mouth, throat, and stomach, leading to death. Ingestion could also cause sore throat, vomiting, and diarrhea.
7. What would happen if this chemical came into contact with your skin or eyes?
May produce pain, redness, severe irritation or full thickness burns. May be absorbed through the skin with possible systemic effects. May cause blurred vision, redness, pain, severe tissue burns and eye damage. Eye exposure may result in temporary or permanent blindness.
8. What would happen to you if you were exposed to this chemical over a long period of time (chronic exposure)?
Prolonged exposure may cause dermatitis. Prolonged or repeated exposure may also cause eye, liver, kidney, or lung damage.
9. What are some first aid measures you should take if the chemical is inhaled?
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
10. What do you think is the purpose of a MSDS?

LESSON 4

Applying Prevention Strategies in the Workplace - Part I



Description:

Students create workplace safety plans for simulated work environments. The plans include hazard maps and safety action plans.

Learner Outcomes:

Students will be able to do the following:

1. Identify hazards within a workplace environment.
2. Select appropriate prevention strategies to address workplace hazards.
3. Create a plan by prioritizing the order in which these prevention strategies will be implemented.

4. Demonstrate a positive problem-solving attitude toward workplace hazards.
5. Perceive that they can personally take steps to make a workplace safer.

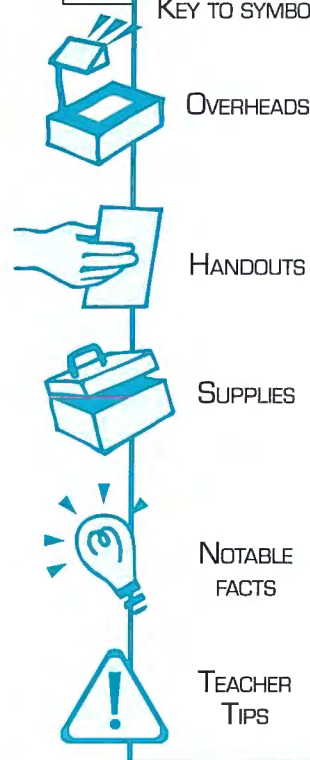
Key Concepts:

1. Each workplace has potential hazards (physical, chemical, biological) that should be identified.
2. Each person can take proactive steps to prevent injuries or illnesses in his or her workplace.
3. Once prevention strategies are identified, they can be used to make the workplace safer.

Fact:

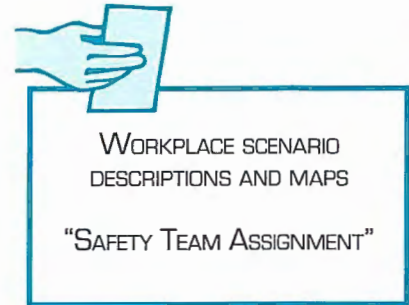
In 1996, workplace injuries and illnesses cost the nation \$121 billion. These costs included losses in wages and productivity, medical costs, and administrative expenses. During that year, workers lost 125 million hours due to injuries.¹

KEY TO SYMBOLS:



During this class, you will be mapping the hazards in your workplaces, developing prevention plans for those hazards, and preparing to present your plans to your employers. Your fellow students will act as employers, during our next class session.

3. Divide students into groups of four. You may want to divide the students into groups based on their interest in or knowledge of the specific work environments. Give each student a copy of the “Safety Team Assignment” sheet. Students may read along as you give the instructions for this project, or the sheet may be distributed to the students once they are in their small groups.
4. Give each person on a team a workplace scenario description and map for one business. Also give each team the overhead map for their business or workplace and an overhead marker. Have each person silently read the description of their workplace.
5. When the students are done, say:
Team members are all employees of the same company and are developing the plan at work.



Mapping The Hazards (20 minutes)

1. Explain:
The first step is to identify the potential hazards in this workplace. The map you have gives you a basic layout of the work area. From this map, identify the hazards there. Write these hazards on your overhead map using the overhead marker.

Have groups assign one person to write these hazards on the overhead map. The rest of the group members can study their individual paper copy of the map to brainstorm ideas.

The person writing on the overhead should write clearly. Groups will be presenting this version of their map to the rest of the class, so it should be easy to read.

2. Say:
Label the different types of hazards using the following code:
 - **P** to show physical hazards.
 - **C** to show chemical hazards.
 - **B** to show biological hazards.

You may want to write these codes on the chalkboard or easel.

3. Explain:
Remember to include hazards that could cause injuries or



In most cases, the best preventions require a change in the workplace, not a change in worker behavior.



OVERHEAD 4.1

illnesses right away and those that could cause injuries or illnesses later in life.

If you are not sure what the hazards are, make your best guess based on what you know about the types of hazards and this type of workplace. Use your fact sheets from past classes as a guide. Carefully read the description of your workplace and look at the workplace map.

The quality of your safety action plans will be determined by how thoroughly you analyze your workplace. You also will be presenting your plans to the rest of the class next session, so the map should clearly identify as many hazards as possible.

4. Allow teams about 15 minutes to identify the hazards in their worksite. Make sure they do not rush through this part of the project, even though they may have created hazard maps before.

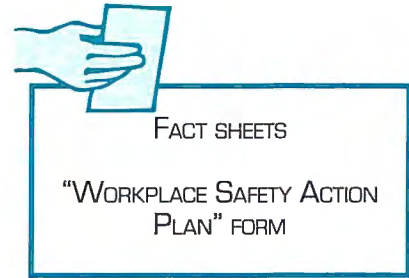
Developing the Prevention Plan (20 minutes)

1. Explain:
Now that you have identified the hazards in your workplace, you need to develop plans to prevent injuries or illnesses that could be caused by these hazards. We will use a “Workplace Safety Action Plan” to complete this step.
2. Show Overhead 4.1 as an example of a completed “Workplace Safety Action Plan.” Read through the completed form using the following narrative, so students get an idea of how to fill it out:

First write the name of your company or organization at the top of the sheet. Then fill in the left-hand column with the hazards you identified. You should have only one hazard in each row. You will be filling in more than one sheet.

Then, using the ABC formula (Administration, Building Barriers, Communication), identify possible prevention steps for each hazard. Try to identify two or three preventative steps for each ABC category. Write them in the space provided.

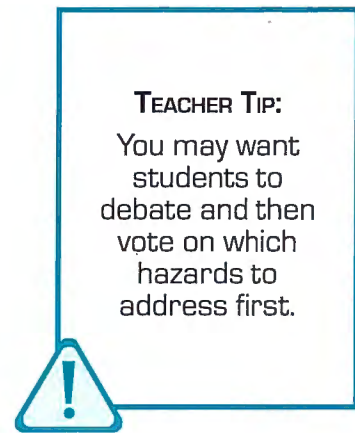
3. Give each team copies of the “Workplace Safety Action Plan” form. Have students take out their fact sheets from previous lessons and use these fact sheets as reference material for identifying prevention strategies.



4. Say:
Fill out “Workplace Safety Action Plan” forms for **at least four** of the hazards you identified on your map (one hazard per group member).

Possible hazards and corresponding prevention strategies have been included with each scenario. These checklists are only for the teacher’s use in grading student projects.

5. When groups are done listing prevention strategies, ask:
How do you decide which prevention strategies to use? In most cases, the best preventions are those that require a change in the workplace, not a change in worker behavior. In most cases, changing the workplace will involve building barriers of some type.



6. Explain:
After you have filled in forms for a number of hazards, decide as a group which two hazards you will address first. Which hazards seem the most serious? Write a paragraph describing the two hazards and why you chose to address them first. Also describe which prevention strategy you will use for each hazard and why. Thoroughly explain your choices.

7. Explain:
You have been requested by your employers to produce top notch safety plans and present the plans to them during our next class session. Your safety action plans and presentations will be graded on the following criteria:

- a. You demonstrate that you followed a clear decision-making process.
- b. Your plan and presentation are well-organized.
- c. Your plan and presentation are thorough.
- d. You demonstrate creativity by, for example, coming up with unique solutions.

Workplace Safety Action Plan (Example)

Company/Organization Name: _____

Hazard	Administration	Building Barriers	Communication
Cleaning Products	<ol style="list-style-type: none"> 1. Require workers to wear rubber gloves when cleaning. 	<ol style="list-style-type: none"> 1. Use the least toxic cleaning products available. 2. Use protective equipment (e.g., gloves, mask). 3. Store cleaning products in locked cabinets away from workers. 	<ol style="list-style-type: none"> 1. Train employees to use cleaning products correctly. 2. Give copies of Material Safety Data Sheets to workers.
Walk-in Freezer (Confined Space, Cold)	<ol style="list-style-type: none"> 1. Require workers to inform another employee before entering the freezer area. 	<ol style="list-style-type: none"> 1. Install a two-way lock to prevent employees from becoming trapped inside the freezer. 2. Install an emergency call button in the freezer that rings throughout the store. 3. Have winter coats, gloves, and hats available outside of the freezer for workers to wear while working in the freezer area. 	<ol style="list-style-type: none"> 1. Provide safety training to workers regarding dangers of freezer area. 2. Post visible safety reminder signs on the outside of the freezer.
Meat slicer	<ol style="list-style-type: none"> 1. Require training in the use of the meat slicer prior to working in the deli. 2. Require use of a guard whenever meat slicer is in operation. 	<ol style="list-style-type: none"> 1. Install machine guards or shields on the meat slicer. 	<ol style="list-style-type: none"> 1. Train employers to use the slicer and knives properly. 2. Provide ongoing supervision to spot-check safety techniques.
Heavy Loads	<ol style="list-style-type: none"> 1. Establish a weight limit that can be lifted by workers. 2. Rotate workers between stocking and other jobs that don't require lifting. 	<ol style="list-style-type: none"> 1. Use carts and lifting aids for heavy boxes. 2. Lift boxes with the help of a coworker. 	<ol style="list-style-type: none"> 1. Train employees in safe lifting techniques.

Name: _____ Class Period: _____

Workplace Safety Action Plan

Company/Organization Name: _____

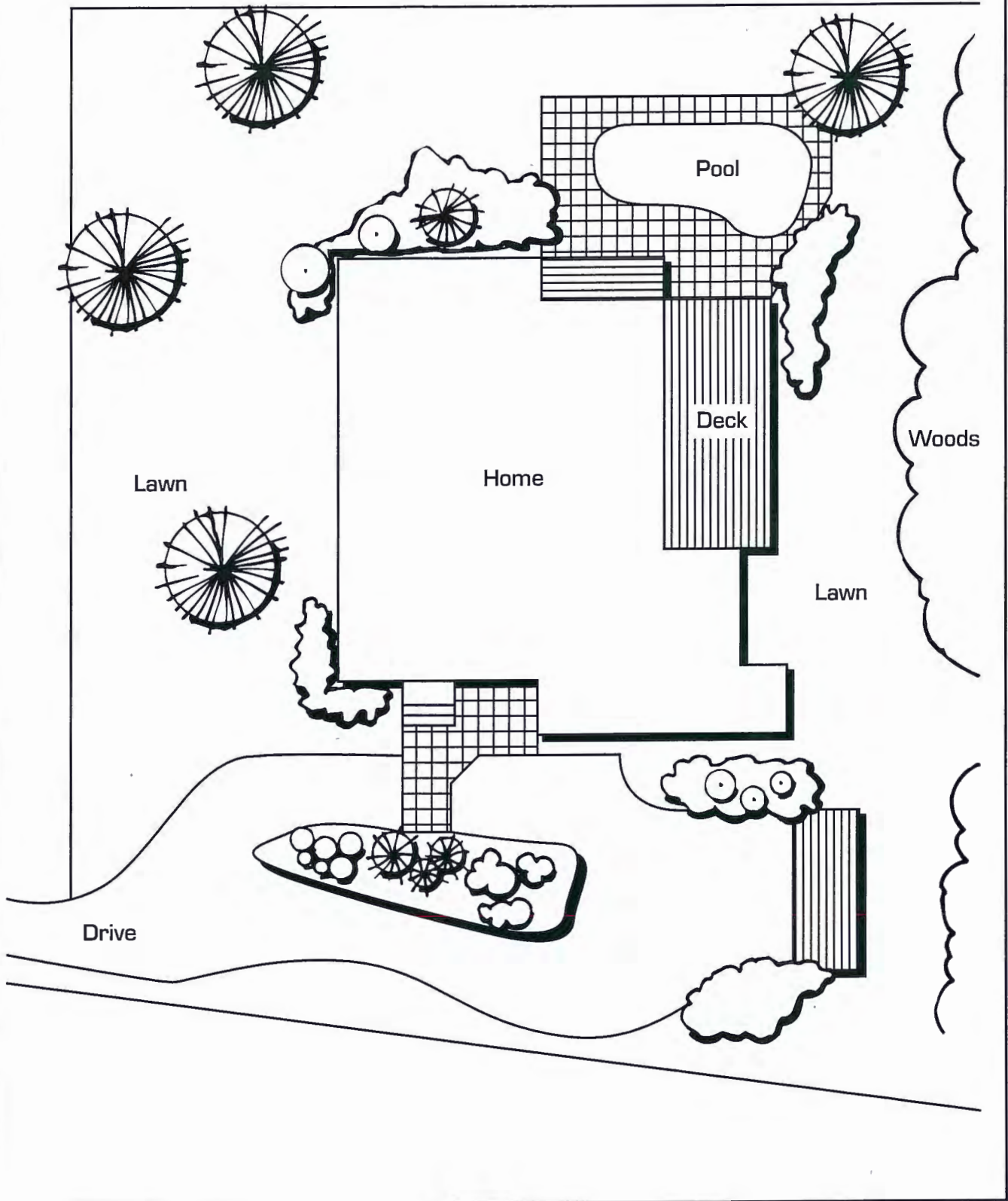
Hazard	Administration	Building Barriers	Communication

Safety Team Assignment

1. Read through the description of your business or workplace.
2. Identify all the possible hazards in your workplace using the description and map.
3. Write these hazards on the overhead map using an overhead marker. Write clearly, so the whole class will be able to read your writing.
4. Label the different types of hazards using this code:

 P to show physical hazards
 C to show chemical hazards
 B to show biological hazards
5. Fill out at least one “Workplace Safety Action Plan” form.
 - a. List one hazard in each box in the left-hand column.
 - b. Brainstorm at least two prevention strategies for this hazard in each of the three categories—**Administration**, **Building barriers**, and **Communication**.
6. For each hazard, decide which prevention strategy you will use. Building barriers is usually the best choice.
7. Decide which two hazards seem the most serious. You will want the company to take care of these hazards first.
8. As a group, write a paragraph describing these two hazards and why you chose to take care of them first. Explain your choices thoroughly.
9. Plan a five minute presentation of your “Workplace Safety Action Plan” and map. You will be graded on the following:
 - a. Your plan demonstrates a clear decision-making process.
 - b. Your plan and presentation are well-organized.
 - c. Your plan and presentation are thorough.
 - d. Your group demonstrates creativity in finding unique solutions.
10. Your group presentation should include the following:
 - a. Description of the workplace.
 - b. Description of the major hazards found in this workplace.
 - c. Description, by each group member, of one hazard and the prevention strategies the group came up with for that hazard.
 - d. Description of which hazards your group is going to take care of first and why you chose those hazards.

Workplace Scenario Map—Green Thumb Landscaping



Burger Express

Burger Express is a chain of fast food restaurants. Five years ago, the first restaurant opened. Today there are twenty, and the chain is growing at a rate of one new restaurant a month. The stores are very busy from the time they open at 11:00 a.m. until 11:00 p.m. The restaurants close at 1:00 a.m.

The menu consists of hamburgers, roast beef and chicken sandwiches, and salads. French fries or onion rings are included with every sandwich. All the meats and vegetables are chopped and prepared in the restaurant. The vegetables and meats are restocked from boxes in the freezer/refrigerator. Clean-up begins at 11:00 p.m., when the floors, bathrooms, and all non-cooking surfaces are cleaned. The deep fryer is also turned off at closing and immediately emptied, so it can be filled with fresh oil the next morning. One person remains after 1:00 a.m. to close out the register.

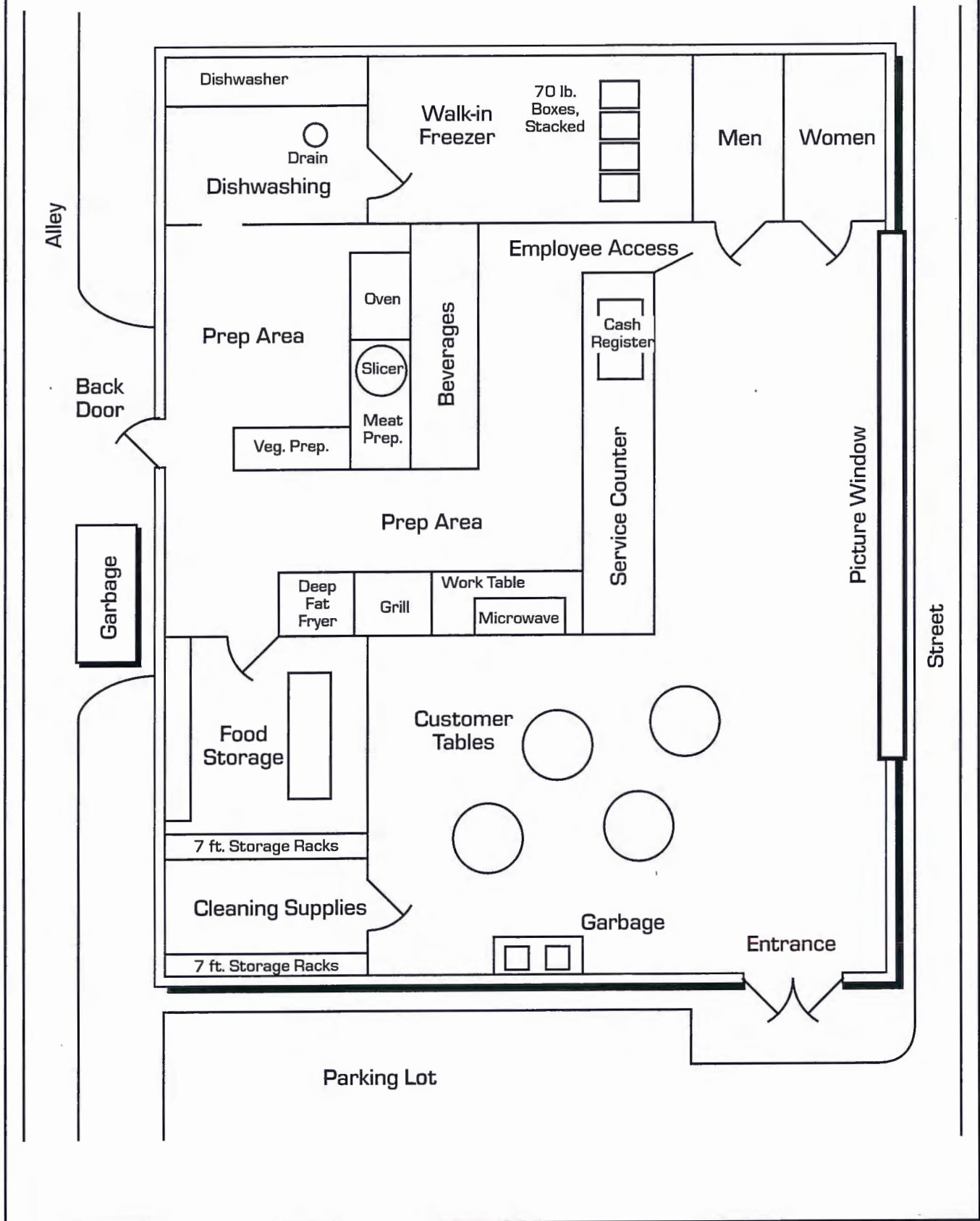
An employee usually works at one job for the entire shift. Employees receive thirty minutes of training on that particular job when they are hired. However, when someone calls in sick or there is a backup in one of the work areas, an employee may be asked to work at another station on the spur of the moment. Not many procedures are set for clean-up during the day. Workers do what they have time to do during slow periods.

Recently, Burger Express has had a number of worker injuries. Many of them have been minor, such as bruises from slipping on the floor by the deep fryer and soda machines. The company recognizes the potential for more serious injuries, however, as the business expands and more employees are hired.

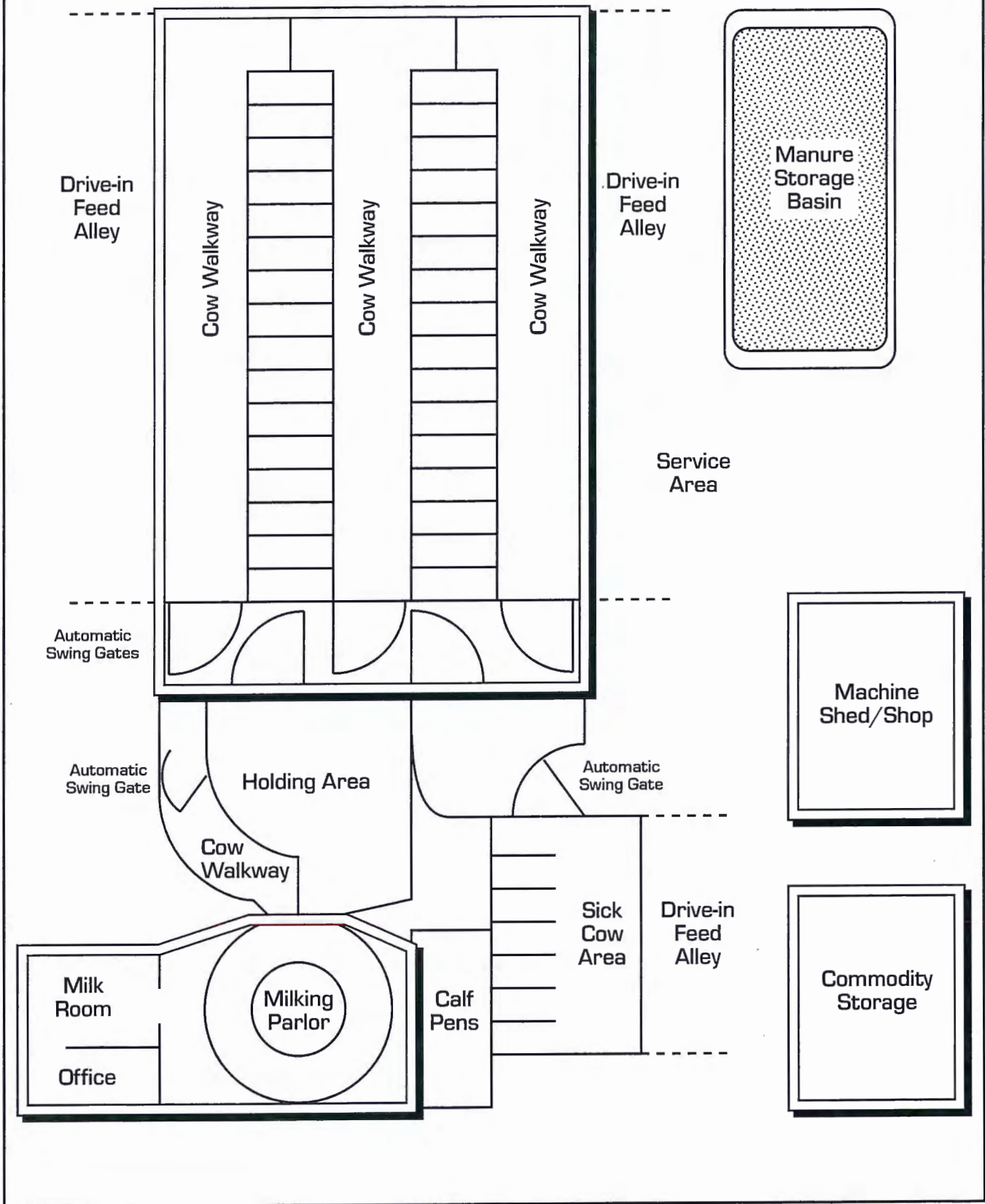
Due to the fast growth, the owners have not had time to put a safety action plan together for their restaurants. Each restaurant is built exactly the same, so a single plan will work at all restaurants. They are interested in safety ideas related to the design of the building and work procedures.

Note: There are many jobs that are illegal for teens to do. It is illegal for employers to make teens do some of the tasks listed above.

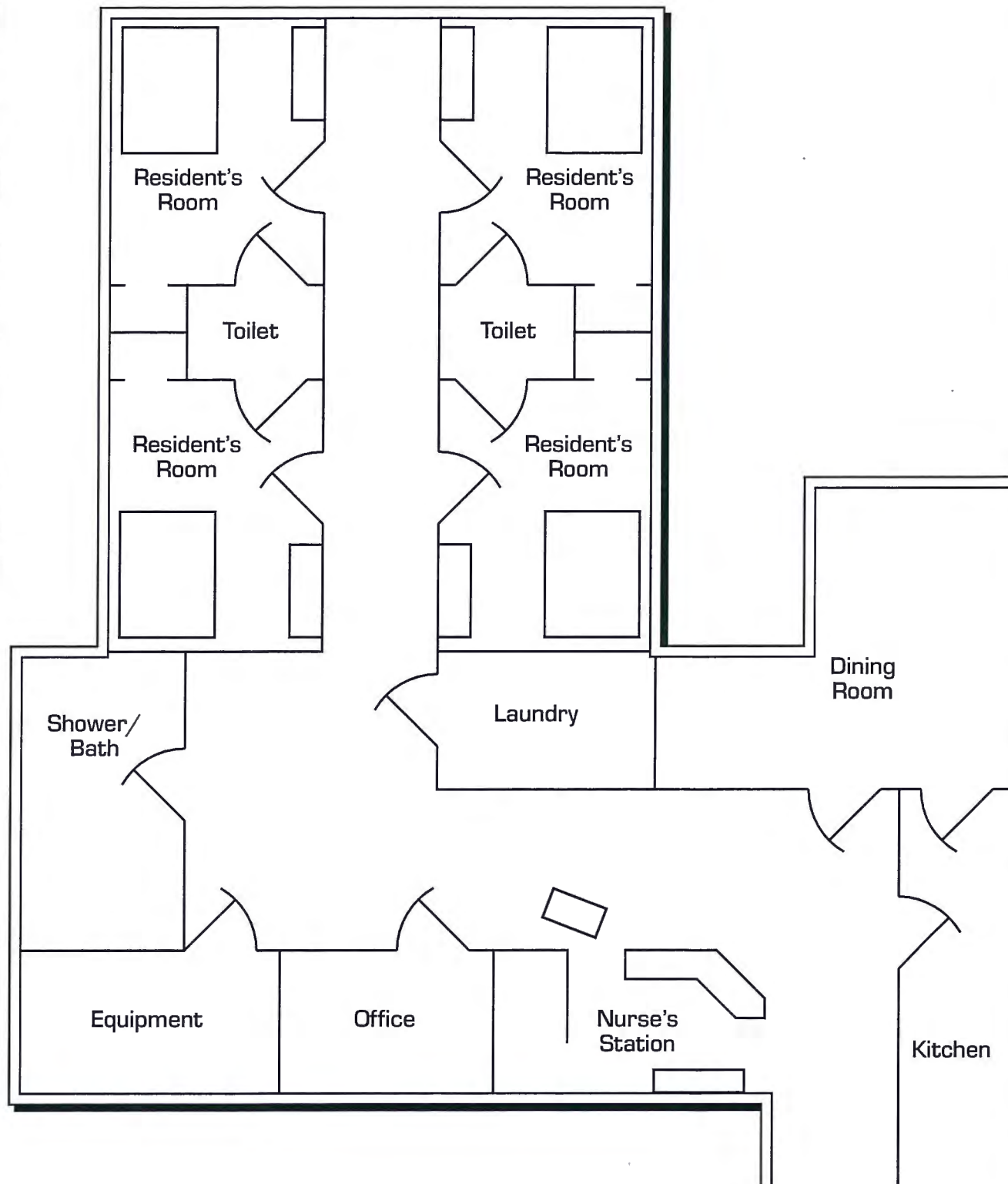
Workplace Scenario Map—Burger Express



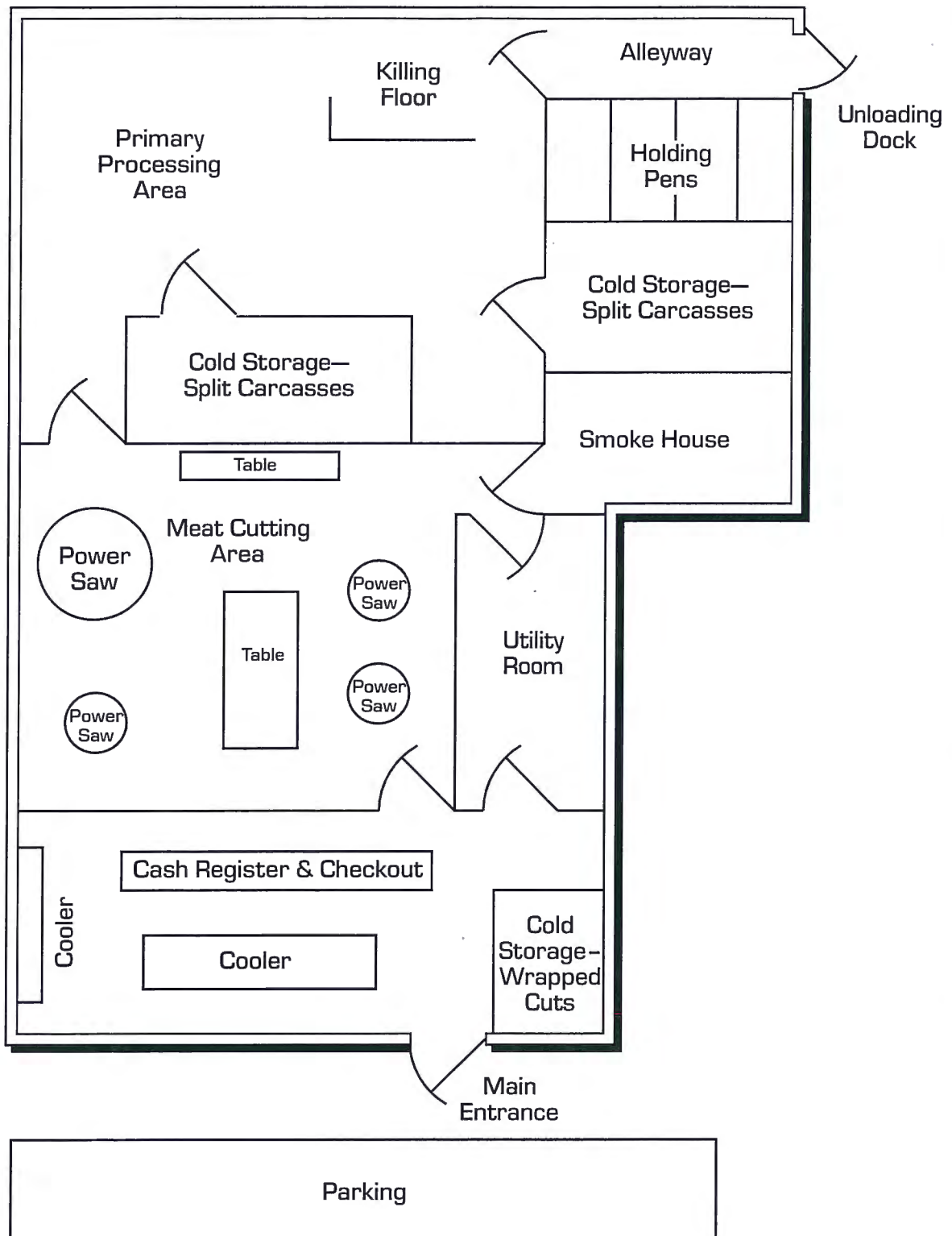
Workplace Scenario Map—DairyLand Dairy Farms



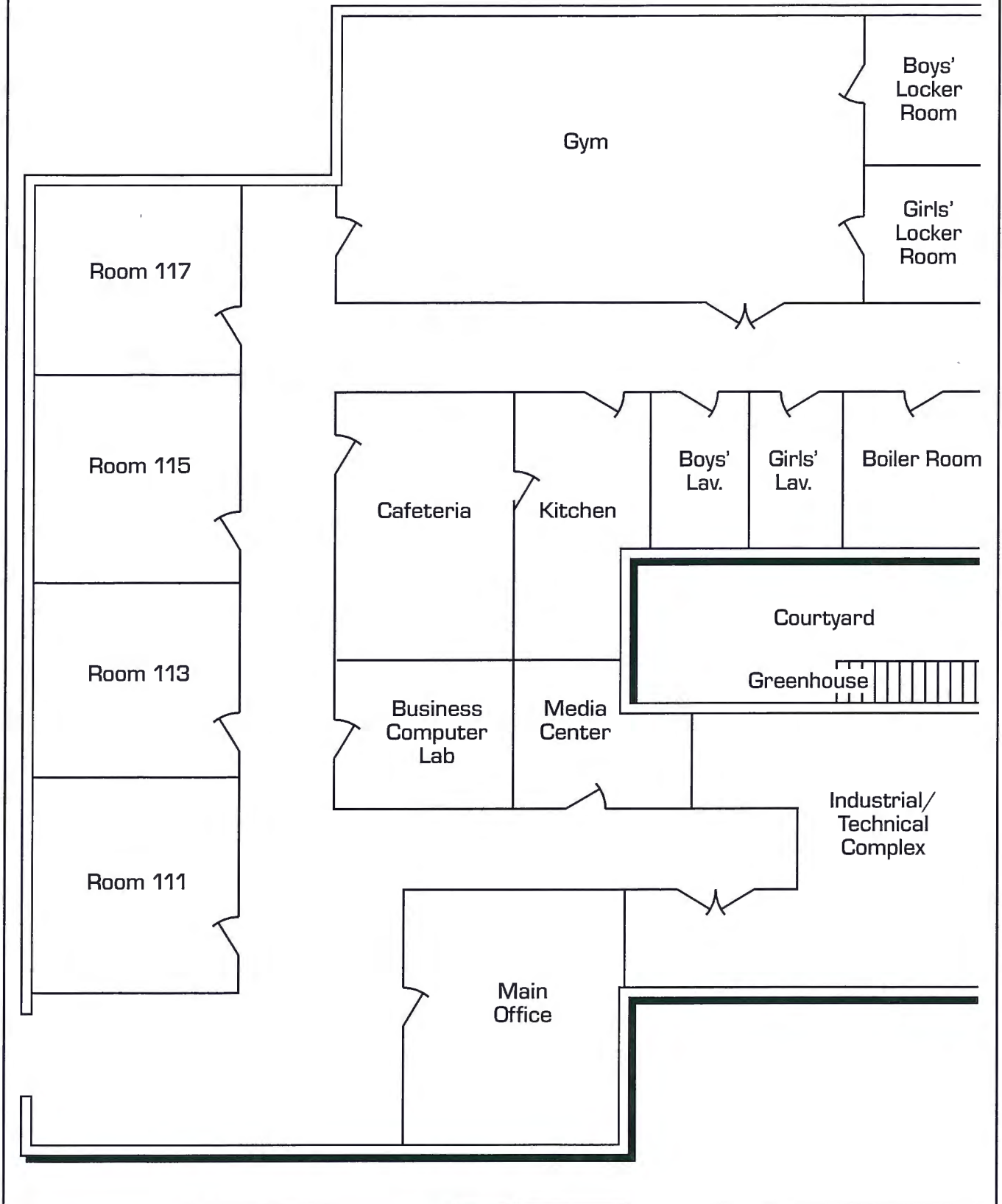
Workplace Scenario Map—Pleasant Meadow Nursing Home



Workplace Scenario Map—Prairie View Meat Processors



Workplace Scenario Map—Washington High School



Quick-Stop Convenience Store

Quick-Stop Convenience Store is a service station, grocery store, and deli under one roof. The station offers basic car service, such as gas pumping, oil changes, tire rotation, tune-ups, and simple repairs. In addition, there is an automatic car wash.

The grocery store and deli offer a variety of food products. Quick-Stop hires a number of high school students to work as clerks in the grocery store/deli and as assistants in the auto service center.

Employees in the grocery store/deli are responsible for food preparation, including slicing deli meats and cheeses, filling hot display racks with pizzas and egg rolls, and restocking shelves and coolers. Restocking involves lifting and carrying boxes to and from the storage room and freezer/refrigerator.

The grocery store/deli portion of the business is open 24 hours a day. Usually, only one or two people are working in the store in the evenings. Employees clean during the evenings when store traffic is low. Usually, no adult employees are in the store at this time.

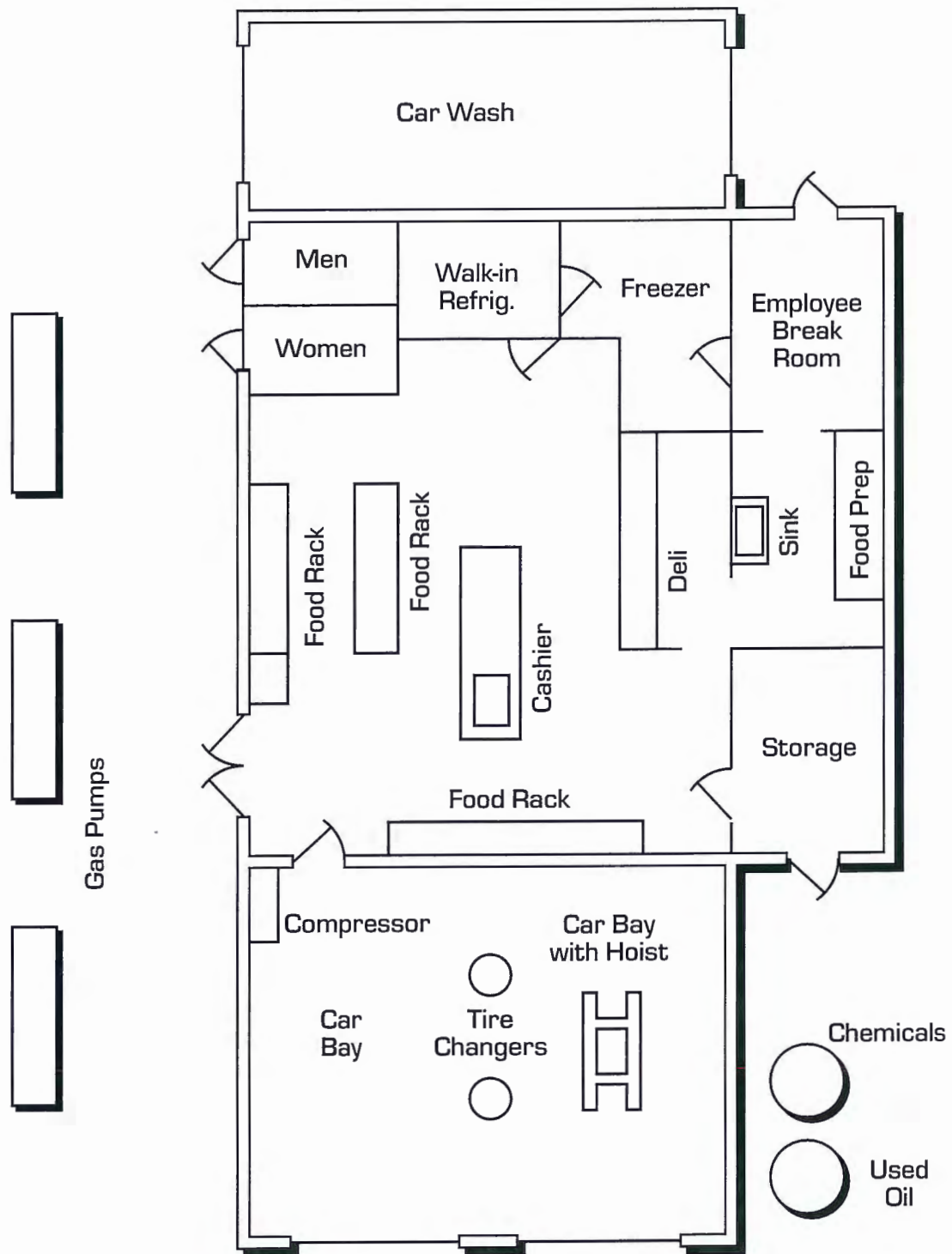
High school employees who work in the auto service center help with general auto maintenance. They are often asked to help raise cars using the hoist. When the cars are elevated, an open bay which is about six feet deep, is exposed beneath the car. Employees are asked to carry auto wastes and chemicals to storage bins out back.

Some customers have complained about the noise in the building. Several workers have complained of injuries due to lifting objects and slipping on floors. During the winter, air quality is an issue, since the service center is attached to the grocery store and the gas pumps are only eight feet from the doors.

The owners are planning to build a new store in a nearby town, and they want to address all safety concerns in the existing store before they build a new one. The owners are looking for your help in developing a safety plan for their existing store and service center.

Note: There are many jobs that are illegal for teens to do. It is illegal for employers to make teens do some of the tasks listed above.

Workplace Scenario Map—Quick-Stop Convenience Store



Teacher's Key: Hazard Checklists for Workplace Scenarios

FOR TEACHER USE ONLY

Prevention examples are listed after each possible hazard.

Green Thumb Landscaping

PHYSICAL HAZARDS

Working around heavy machinery.

Install warning device that beeps when equipment is backing up.

Train staff to use equipment properly.

Require employees to wear bright-colored clothing.

Heavy lifting.

Provide machinery to lift bags of sand.

Buy smaller, lighter bags of sand.

Train staff in proper lifting techniques.

Underground electrical wiring.

Set up procedures that must be followed to authorize any digging.

Power hand tools.

Adequately guard tools.

Train staff on potential danger of each tool.

Repetitive motions (raking, shoveling).

Rotate jobs.

Train staff on the safe way to shovel.

Limit the number of hours working at these types of jobs.

CHEMICAL HAZARDS

Fertilizers, pesticides, dust.

Store chemicals in safe locations.

Give MSDS to employees.

Provide masks when workers are in dusty environments.

Train staff to use, store, and dispose of chemicals properly.

BIOLOGICAL HAZARDS

Contact with blood.

Provide gloves in first aid kit.

Train staff about ways to avoid infection.

Burger Express

PHYSICAL HAZARDS

Falling objects on high storage racks.

Replace racks with lower, wider racks.

Provide appropriate safety ladders to reach top shelves.

Store light objects (e.g., toilet paper, and paper towels) on top shelves.

Heavy boxes.

Use mechanical aids for lifting boxes.

Train employees on proper lifting techniques.

Walk in freezer.

Install latch on freezer door that can be opened from the inside.

Slippery floors near dishwasher, beverage machine, and deep fryer.

Use non-slip flooring.

Require mopping and drying of floor every hour.

Meat slicer.

Place guard on slicer.

Instruct all employees on correct use of slicer.

Require use of shield whenever slicer is in use.

Knives used for cutting.

Use food processor instead of knives.

Teach correct cutting techniques

Hot oven.

Provide rack puller.

Provide mitts for use with hot items.

Inspect mitts regularly for damage.

Hot oil.

Set a rule requiring the temperature of the oil to be below a certain temperature before it may be thrown away.

Create a spigot with a long handle that allows the oil to drain into an enclosed, spill-proof disposal unit.

Grill.

Use grill surface that changes color when hot.

(Burger Express continued next page)

Teacher's Key: Hazard Checklists for Workplace Scenarios (continued)
FOR TEACHER USE ONLY

(Burger Express, continued)

Picture window - late night closing.

Replace clear glass with glass that allows light in but cannot be seen through.

Close earlier.

Require at least two employees to close the store.

Unlit parking lots and back alleys.

Put lights in the parking lots.

Require at least two people to close and walk out together.

CHEMICAL HAZARDS

Cleaning supplies for bathrooms, cooking surfaces, and floors.

Provide gloves.

Require glove use.

Provide Material Safety Data Sheets and train staff how to use MSDS.

BIOLOGIC HAZARDS

Bathrooms and raw meat.

Require hand washing.

Provide educational information on biologic hazards.

GENERAL

Train workers in all tasks they will ever be expected to do. Require refresher training.

DairyLand Dairy Farms

PHYSICAL HAZARDS

Movement of large animals.

Install gates to limit animal movement.

Make sure staff are trained in how to handle large animals.

Low floor in parlor. People constantly reaching could cause back injuries.

Have an adjustable platform for workers.

Cement floors are very slippery after being washed.

Install non-slip flooring.

Slips and falls when scraping down the barns.

Provide boots with adequate traction.

(DairyLand, continued)

Moving parts in the auger.

Provide guards.

Require all guards to be in place prior to operation of the auger.

Injury when treating sick animals.

Use restraining equipment.

Train staff on restraining method.

Provide biologic hazard containers for disposal of used needles.

CHEMICAL HAZARDS

Spills from chemical barrels.

Put drip guards on chemical containers.

Contact with harmful chemicals.

Use proper protective equipment.

Use less toxic chemicals.

Train employees to use caution and read labels when using chemicals.

Install a device to remove a chemical without placing a hand into the chemical barrel.

BIOLOGICAL HAZARDS

Injury from needles when giving animals treatments.

Provide needles that don't require recapping.

Train staff on appropriate procedures.

Come in contact with infectious diseases.

Provide protective equipment.

Require proper disposal methods.

Train staff on appropriate procedures.

Pleasant Meadow

Nursing Home

PHYSICAL HAZARDS

Falls on slippery floors.

Install non-slip flooring.

Set up warning signs in slippery areas.

Heavy lifting.

Repair broken Hoyer lift.

Train staff in proper lifting techniques.

(Pleasant Meadow continued next page)

Teacher's Key: Hazard Checklists for Workplace Scenarios (continued)

FOR TEACHER USE ONLY

(Pleasant Meadow, continued)

Physical and verbal abuse; stress.

Limit careloads.
Hire more staff.
Set up protocol to alert supervisors to abusive patients.
Train staff to handle behavioral problems.
Assign senior staff to work with the most difficult cases.

CHEMICAL HAZARDS

Cleaning chemicals.

Purchase nontoxic cleaners.
Train staff to use, store, and dispose of chemicals properly.

Cleaners for patient care.

Provide rubber gloves.
Train staff on proper use.

BIOLOGICAL HAZARDS

Contact with blood, communicable diseases, and bacteria.

Teach staff how to clean patients properly.
Set up procedures for disposal of needles and syringes.
Provide disposal bins for soiled items.
Post signs for hand washing.
Require immunizations for Hepatitis B.
Require yearly tuberculosis screening.
Train staff about infectious diseases.

Prairie View Meat Processors

PHYSICAL HAZARDS

Noise concerns.

Provide hearing protection devices.
Insulate walls.

Slippery floors.

Install non-slip flooring.
Require custodians to clean in these areas at regular intervals.
Slippery floor surfaces.
Install non-slip flooring.

Smokehouse/curing of meat.

Provide proper breathing apparatus.

(Prairie View, continued)

Freezer/refrigerators.

Install latch on freezer door that can be opened from the inside.
Provide proper clothing.
Provide time out of cold areas on a regular basis.

Meat-cutting equipment.

Insure all guards are used and maintained.
Give proper instruction.
Use steel-mesh gloves to prevent cuts.
Rotate jobs to prevent repetitive motion injuries.

Live animal control and movement.

Design the facility with proper stalls and gates to insure safety.
Give safety instructions.

Sharp objects.

Provide steel-mesh gloves.
Train in proper cleaning precautions.
Set up procedures for safely storing objects.

BIOLOGICAL HAZARDS

Bloodborne pathogens contracted through handling of meat.

Use gloves in all meat handling.

GENERAL HAZARDS

Language barriers.

Post safety instructions in English and other languages as needed.
Color code machines and areas with tape or paint to indicate hazards.

Washington High School

PHYSICAL HAZARDS

Boxes on high shelves.

Store heavy items down low.
Train people in proper lifting.

Walk-in freezer.

Provide a door handle on the inside.
Provide protective clothing.

(Washington High School continued next page)

LESSON 5

Applying Prevention Strategies in the Workplace - Part II



Description:

Students present their workplace safety plans for simulated work environments. Fellow classmates have the opportunity to evaluate the presentations, as if they were employers. Content of the first five lessons in this unit also is reviewed.

Learner Outcomes:

Students will be able to do the following:

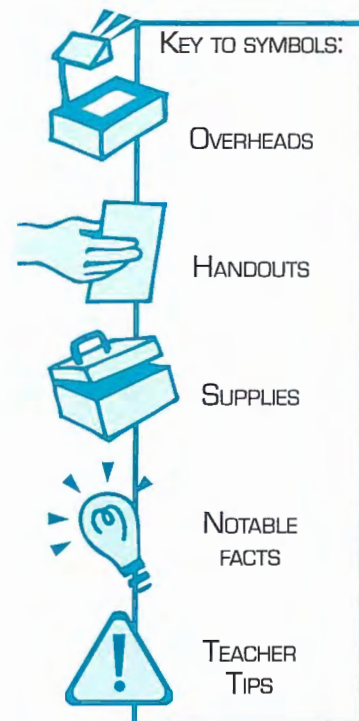
1. Summarize their prevention plans in the form of presentations.
2. Evaluate the plans presented by others.
3. Effectively communicate the rationale for the prevention strategies they selected.
4. Communicate safety information effectively.
5. Evaluate their current work situations using the ABC's of prevention.

Key Concepts:

1. Each workplace has potential hazards (physical, chemical, and biological) that should be identified.
2. Prevention strategies can make a workplace safer by reducing the possibility of injuries and illnesses.
3. Employers must provide a safe workplace for employees. Workers should communicate any safety concerns to their employers. Practicing communication strategies through role-playing allows students the opportunity to learn how to effectively advocate for safe working conditions.

Fact:

Over 50,000 synthetic chemicals are in use today. Some of these chemicals' health effects are unknown. The effects of multiple chemicals acting together in the body is also unknown. For example, studies suggest that children have increased susceptibility to pesticides, but little is known about the long-term effects of pesticides on older children and adolescents.



Materials

Needed:

- “Presentation Evaluation Form” (one per person)
- “Worker Safety Action Plan” (groups will present their plans in class)
- “ABC’s of Prevention Cards” sheet
- Heavy cardstock paper
- Lamination paper
- Scissors
- “Performance Criteria and Checklist” found in Lesson 1 (one for each student)

Preparation Needed:

1. Photocopy the “Presentation Evaluation Form.” Review the qualities students will be looking for in these presentations.
2. Photocopy the “ABC’s of Prevention Cards” sheet, so you will have one card per student. Laminate and cut out the “ABC’s of Prevention Cards.”

Directions:

Worker Safety Presentations (45 minutes)

1. Review again with students what should be covered in their class presentations. Group presentations should include the following:
 - Description of the workplace they studied.
 - Description of the major hazards found in their workplace.
 - Description, by each group member, of one hazard and the prevention strategies the group came up with for that hazard.
 - Description of the two hazards they are going to take care of first and why they chose those two hazards.

If needed, allow each safety team about five minutes to get ready for their presentation.

2. Hand out a copy of the “Presentation Evaluation Form” to each student. Explain:
As each team is presenting their safety plans, I want you to evaluate their presentation and plans, as if you were their employers. It is very important to employers to keep their employees healthy.

When you are presenting to employers, it is critical that you are able to list specific hazards, be clear and factual in your presentation, and be willing to offer creative suggestions to make the workplace safer for all employees. This exercise will give you the opportunity to practice these skills and also learn how it feels to be the employer faced with employee safety concerns.



You will evaluate each safety team in four areas:

(Have students read along on the bottom of their evaluation form. Discuss each of these categories further, so students understand what they are evaluating.)

- **Decision-Making**— Does the plan demonstrate a clear decision-making process with specific reasons for the prevention strategies chosen?
- **Organization**—Is the content of the plan and presentation organized? Does it have a clear flow? Does it make sense?
- **Thoroughness**—Did the presenters cover all the major hazards in this workplace? Did they identify an adequate number of prevention strategies? Did they adequately explain the reasons for prioritizing strategies?
- **Creativity**—Did the plan suggest any original solutions or creative prevention strategies?

Use the form to evaluate each of the above areas. Giving a score of 5 means you think the team did an excellent job, 4 = good, 3 = fair, 2 = poor, 1 = not sufficient.

3. Ask:

Are there any questions about this exercise or how you will evaluate your fellow classmates' presentations?

4. Begin the presentations. Allow each group approximately five to seven minutes to present their plan, depending upon the number of groups and amount of time you have. Try to keep teams to this time frame, so every group will have adequate time to present during the class period. After each presentation is finished, allow time for the student evaluators to fill out their evaluation forms.
5. After each presentation, you may want to ask further questions about the group's plan. Some possible questions include:
 - a. Which additional hazards would you have talked about, if you hadn't been limited to two?
 - b. Do you think the process of creating a worker safety action plan in this workplace would be different in real life? How so?
 - c. Why do you think a plan like this would be helpful to this company?
6. When all the presentations are done, collect student evaluation forms. Have each group turn in their worker safety action presentation and plan materials. All these materials will be used during final grading.

TEACHER TIP:

After each presentation, lead a discussion with the whole class. Example questions include:

1. What other hazards would you add to this group's list?
2. What other prevention strategies would you add to this group's list?



TEACHER TIP:

If you think you will be short on time, draw team names and have only a few teams present their plans, or plan to extend this activity over two days.



Worker Safety Unit – A Review (5 minutes)

1. Explain:

Let's quickly review some of the key points we talked about in this unit:

- a. Workplace injuries and illnesses do happen to people, even high school students.
- b. Getting a workplace injury or illness could dramatically change your life forever. Some injuries are serious and some are permanent.
- c. Each worker should expect a safe work environment. If a workplace is not safe, you have the right to ask questions and take steps to make it so.
- d. Workplace injuries and illnesses can be prevented, but to accomplish this, some aspects of the workplace may need to be changed. You should follow the ABC's of prevention when looking to make the workplace safer.



2. Give each person one of the "ABC's of Prevention Cards." Explain:

This card outlines the key safety steps you should take every time you enter a workplace. I suggest you keep this card with you to evaluate the safety of your current or future workplace.

The card serves as a reminder to be alert to potential hazards in the workplace and to the key prevention steps you or your employer can take to make your job safer.



3. Before this session is over, have students check off tasks on their "Performance Criteria and Checklist."

4. After this session, fill out the teacher side of the "Performance Criteria and Checklist" (found in Lesson 1) for each student based on the quality of their work in completing the tasks outlined on the form. The tasks and criteria apply to student work during Lessons 1-5.

Taking It Home:

1. Encourage students to evaluate current work situations using the "ABC's of Prevention Cards."



Presentation Evaluation Form

Fill in the scores for each team presenting a safety action plan. Give a 5 if you think the team did an excellent job of meeting the criteria, 4 = good, 3= fair, 2= poor, 1 = not sufficient. Total each team's scores.

Names of students on each safety team	Safety Action Plan and Presentation				
	Decision-Making	Organization	Thoroughness	Creativity	Total Score
Team #1					
Team #2					
Team #3					
Team #4					
Team #5					
Team #6					
Team #7					
Team #8					

Decision-Making—Does the plan demonstrate a clear decision-making process with specific reasons for the hazards to be addressed and the prevention strategies chosen?

Organization—Is the content of the plan and presentation organized? Does it have a clear flow? Does it make sense?

Thoroughness—Did the presenters cover all the major hazards in this workplace? Did they identify an adequate number of prevention strategies? Did they adequately explain the reasons for prioritizing strategies?

Creativity—Did the plan suggest any original solutions or creative prevention strategies?

ABC'S of Prevention Cards (fronts)



ABC'S of Prevention Cards (backs)

- Have you received safety training for this job?
- Do you know who to talk to in the company, if you have safety or health questions?
- What are the hazards at this job?
 - physical hazards? –chemical hazards?
 - biologic hazards?
- What prevention strategies are in place to protect you from these hazards?

Minnesota OSHA 1(877)470-6742
Minnesota Wages and Hours 1(800)342-5354

- Have you received safety training for this job?
- Do you know who to talk to in the company, if you have safety or health questions?
- What are the hazards at this job?
 - physical hazards? –chemical hazards?
 - biologic hazards?
- What prevention strategies are in place to protect you from these hazards?

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 - physical hazards? –chemical hazards?
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- What prevention strategies are in place to protect you from these hazards?

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LESSON 6

The Importance of Worker Safety Laws



Description:

Students are introduced to the importance of worker safety laws through a presentation of their history, a review of child labor standards, and a discussion of the rights of young workers.

Learner Outcomes:

Students will be able to do the following:

1. Describe the state of safety in the workplace before laws were enacted.
2. Perceive that worker safety laws are important in protecting the health of young workers.

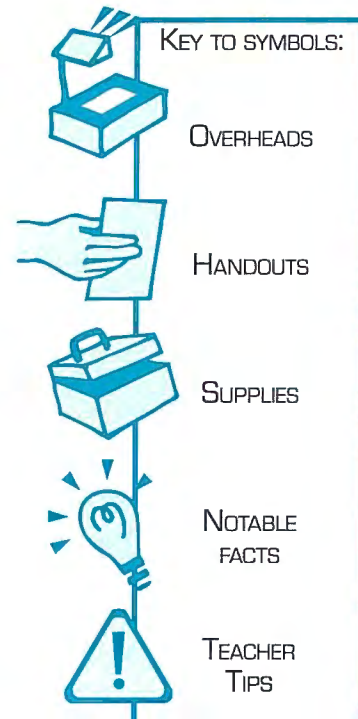
3. Recognize the need for worker safety and child labor laws.
4. Perceive that everyone has the right to a safe workplace.

Key Concepts:

1. Before the enactment of worker safety laws, working conditions for many young people were dangerous and unhealthy. In some places, problems still exist.
2. Child labor laws were made to protect young workers.

Fact:

In 1900, over two million American children under the age of 16 were employed in factories, mines, farms, and other workplaces.¹ At that time, children were three times as likely to get injured as were adults.² Even today, some American children continue to work long hours picking vegetables and doing other field work.



Materials

Needed:

- “Performance Criteria and Checklist” (one per student)
- Photographs 1 through 6 (one set per student group)
- “Looking at the Lives of Child Laborers” script for teacher review
- “Child Labor Photo Assignment” (one per student)
- Chalkboard or easel
- “Workplace Safety Laws” fact sheet (one per student)
- “Examining Workplace Safety Laws” homework assignment (one per student)



“PERFORMANCE CRITERIA AND CHECKLIST” HANDOUT

Preparation Needed:

1. Read through the “Looking at the Lives of Child Laborers” script a few times, so you can read it smoothly.
2. Review the photographs and their descriptions. Think about your own reactions to the images. How would you answer the questions outlined in the lesson? Remember, no answers are right or wrong.
3. Make copies (one per student) of the “Performance Criteria and Checklist,” “Child Labor Photo Assignment,” and “Workplace Safety Laws” fact sheet.
4. Make class copies of the “Examining Workplace Safety Laws” homework assignment.
5. The laws discussed in this lesson represent a summary of the child labor laws. If you want to review a more comprehensive list of child labor laws, please refer to the web sites listed in the back of the curriculum under “Worker Safety and Health Education Resources.”

Directions:

A Brief History of Child Labor (20 minutes)

1. Give each student a copy of the “Performance Criteria and Checklist.” Say:

Your participation in the next four class sessions will be graded on the tasks outlined on this form.

Read through the form and answer any questions students may have about the tasks or the quality of work you expect.

Students can keep track of their progress by placing an X in the left-hand column as they complete each task. Take time at the end of each class period to have students check off tasks they completed that day. At the end of the unit, review each student’s work and place an X or grade next to each task that he or she has completed.

2. Explain:
Previously, you learned about hazards in the workplace and how workplace injuries and illnesses can be prevented. During the next two class sessions, we will focus on the role that worker safety laws play in protecting you in the workplace.
3. Ask:
How many of you are currently working? How many think you will have a job before you finish high school? How many

of you are aware of the laws that govern safety at work and the work done by people under 18? Who can describe any of these laws?

Take a few minutes to allow students to share what they know about worker safety laws.

4. Explain:

You may or may not know about the laws that are in place to keep you safe in the workplace. These laws address many issues, including how long you can work, what kind of work you may do, and the minimum amount you must be paid.


Before we discuss these laws, I would like to talk about the working conditions of children in the United States before worker safety laws were in place. The child labor laws we are going to talk about today were created because of abusive child labor situations. During our country's earlier history, many children were exploited as a source of cheap labor with little regard for their health and well-being.

We are also going to talk about the working conditions of children in other parts of the world. Even today, many of these children are not protected by any kind of worker safety laws.


5. Have students form pairs. Give each pair of students copies of photographs 1 through 6. Read the "Looking at the Lives of Child Laborers" script. The script indicates when to stop your presentation to discuss the corresponding pictures.

Discuss the following questions as you look at each picture:

- How would you describe the child in this picture? What do you notice about his or her face or expression?
- What might this person be thinking? What might he or she be feeling?
- How would you feel, if you were in the same situation?



TEACHER TIP:
You may want to use only a few of the photographs and shorten the script, so you have more time for discussion.



PHOTOGRAPHS 1-6
"LOOKING AT THE LIVES OF CHILD LABORERS" SCRIPT

Creating Laws to Protect Workers

(30 minutes)

1. Ask:

If you could do something about the tremendous hardships of these young workers, what would you do? Imagine for a few minutes that you work in the government and are in

charge of creating laws to protect the health and safety of these workers. You don't own or work at the companies they work at. You are in charge of making laws by which these companies must abide.



2. Assign each pair of students one of the child labor photographs. More than one pair of students may be working on each photograph. Give the "Child Labor Photo Assignment" handout to each student. Each pair should discuss possible laws they would create to protect the young worker in the photograph and record their answers on the handout. Encourage each pair to come up with at least 10 specific laws. Remind them that no answers are right or wrong. Collect the handout at the end of this activity.
3. Explain:
Discuss the situation and develop a list of reasonable laws you think would improve these childrens' lives. We will discuss each situation and your lists of laws when you are done. You will have ten minutes to develop your lists. Once you have completed this assignment, we will discuss each photograph. You will be turning in this assignment for a grade.
4. When done, discuss each photograph and the laws recommended for that worker. Have all the pairs assigned that photograph contribute some of the possible laws. If time allows, have the whole class add to each list, if they can.

Possible Laws For The Scenarios:

- Establish a minimum age for children to work.
- Limit hours and number of days children are allowed to work in a week.
- Require children to go to school.
- Require the minimum wage be based on hours children work and not on how much they do.
- Make the minimum wage the same for adults and children.
- Make it illegal for children to work around dangerous equipment or chemicals.
- Require employers to give adequate breaks, places to sit, and proper ventilation, heat, or shade.
- Make it illegal for children to work in dangerous occupations (e.g., on fishing platforms or in tanning drums).
- Require employers to provide proper protective equipment (e.g., shoes, gloves, hats).
- Limit the amount of weight children may carry.
- Make it mandatory for children to get vacation and sick time.
- Make it mandatory for children to get leave time for family emergencies, funerals, etc.
- Allow children to get workers' compensation if they are injured at work.
- Require frequent parental visits or leave to visit families.
- Make it illegal for parents to forge papers.
- Allow children to form a union.
- Require verification of children's ages.
- Require unannounced inspections on a regular basis.

5. Explain:
 Dangerous and unhealthy situations, such as those we discussed today, motivated people to create laws to protect young workers. Your right to work in a safe and healthy workplace is a direct result of these laws.

We are going to spend the remainder of this unit looking more closely at the laws that protect you in the workplace. We will discuss what these laws are, how these laws work for you, and who can help you, if you are in a work situation in which these laws are not being followed.

6. Ask:
 Based on what you learned today, what would you say are the benefits of worker safety laws? List students' ideas on the chalkboard or easel.

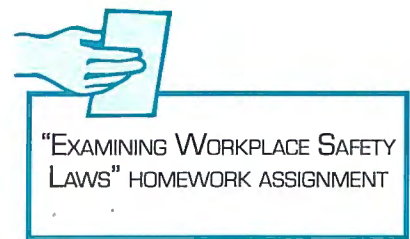
(Possible answers: These laws protect children from being exploited; children are encouraged to be in school so they can live better lives; children's health is improved; children can really enjoy their childhoods; the laws protect workers from injuries or illnesses.)

7. Give each student a copy of the "Workplace Safety Laws" fact sheet. Have students read through the fact sheet silently or read it together as a class. Students should be prepared to discuss and apply these laws during the next two class sessions.
8. Have each pair of students hand in their list of laws at the end of class.
9. Have students read through their "Performance Criteria and Checklist" and check the Lesson 6 activities they participated in today.



Taking It Home:

Give each student a copy of the "Examining Workplace Safety Laws" homework assignment, or write the assignment on the chalkboard. Have each student complete this assignment before the next class session.



Footnotes:

- ¹ Saller, Carol. *Working Children*. Minneapolis: Carolrhoda Books, Inc., 1998.
- ² Mofford, Judith H. *Child Labor in America*. Carlisle: Discovery Enterprises, Ltd., 1997.

Resources Consulted In Developing the Lesson Script and Scenarios:

- Mofford, Judith, ed. *Child Labor in America*. Carlisle: Discovery Enterprises, Ltd., 1997.
- Parker, David. *Stolen Dreams: Portraits of Working Children*. Minneapolis: Lerner Publications Company, 1998.
- Saller, Carol. *Working Children*. Minneapolis: Carolrhoda Books, Inc., 1998.

Name: _____ Class Period: _____

Performance Criteria and Checklist

Place a check mark in the appropriate box when the criteria is met. Corresponding lesson is listed in ().

Student Checklist	Performance Criteria	Teacher Checklist
<input type="checkbox"/>	1. Recite the major laws that apply to students (hours, wages, types of jobs). (7)	<input type="checkbox"/>
<input type="checkbox"/>	2. Accurately apply those laws to new work safety situations. (7 and 9)	<input type="checkbox"/>
<input type="checkbox"/>	3. Participate as much as you can in a small group, without dominating the group. (6, 7, and 9)	<input type="checkbox"/>
<input type="checkbox"/>	4. During discussions, speak clearly and think through what you will say before you say it. (6 through 9)	<input type="checkbox"/>

When applying the ten steps to resolve safety issues in the workplace, you do the following:

<input type="checkbox"/>	5. Clearly identify the decision that needs to be made. (9)	<input type="checkbox"/>
<input type="checkbox"/>	6. Clearly identify and describe the choices you have in how you will resolve the problem. (9)	<input type="checkbox"/>
<input type="checkbox"/>	7. Apply specific criteria to help you select the best choice. (9)	<input type="checkbox"/>
<input type="checkbox"/>	8. Deal with the conflict in ways that are respectful. (9)	<input type="checkbox"/>
<input type="checkbox"/>	9. Deal with the conflict in ways that are persuasive. (9)	<input type="checkbox"/>



Photograph 1:

They called them “newsies.” Boys as young as four and five would sell newspapers on the street corners. Joe was often up late at night and early in the morning, peddling newspapers in all kinds of weather. Sometimes he stayed away from home for days at a time. Barefoot and bedraggled, Joe had to watch out for a variety of dangers: getting run over by a street-car or a horse; or being robbed.

Joe was not paid an hourly wage. He was paid by the number of papers he sold. Because he had to pay for the papers he didn't sell, Joe had to work long into the night. Joe had to carry heavy loads while constantly walking up and down the streets. He received no overtime, no breaks, no vacations, and no raises. Joe was forced to turn all his wages over to his father, who was often drunk.

Joe had no time for school or play. He sold newspapers all day long. If he complained about his work conditions, he would be replaced by another worker. If Joe had a family emergency, he could not leave his job or he would be replaced.

Photograph 2:

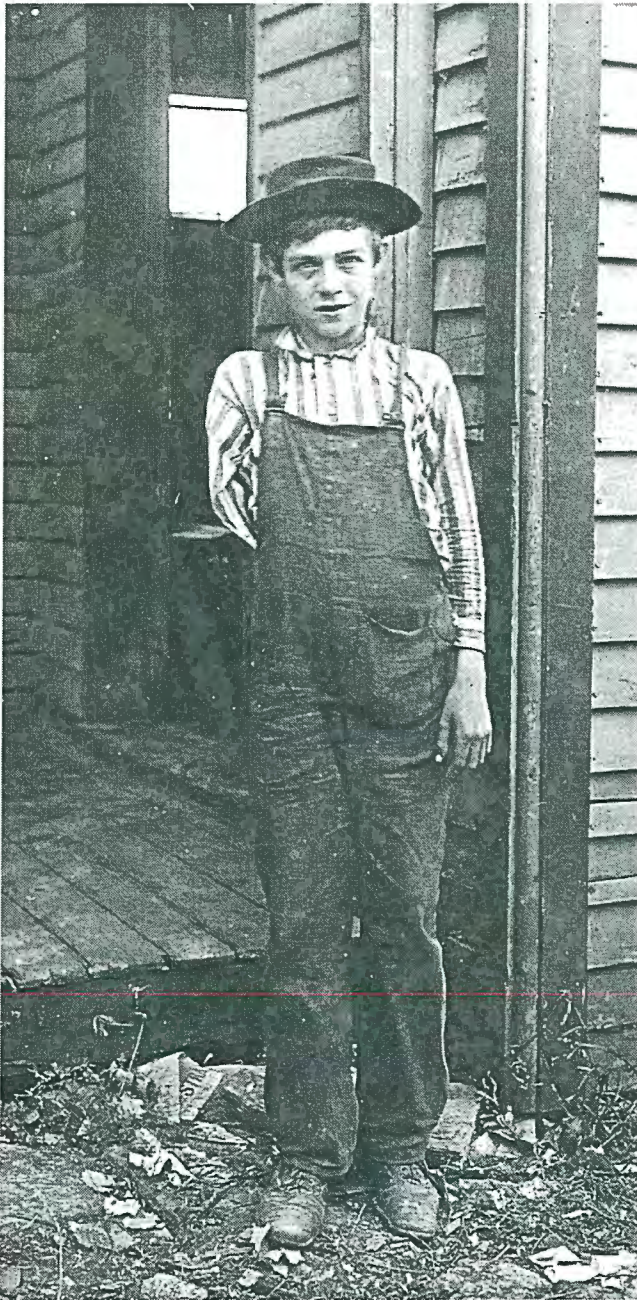
This photograph, taken in 1907, is a picture of a boy named David, whose right arm was cut off by an unguarded saw in a box factory. Factory children as young as six or seven often worked 10- to 12-hour days. David dropped out of school and began working when he was ten.

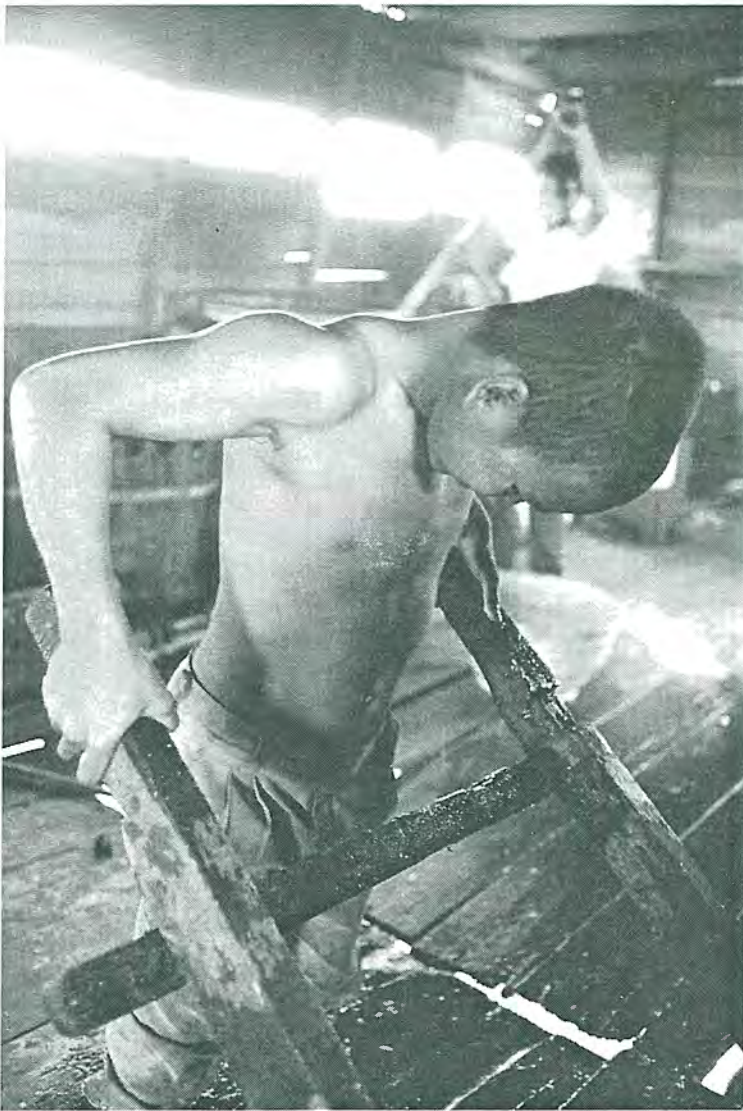
David was forced to work quickly around dangerous equipment, with very few breaks or rests. Some children worked through the night, sleeping on the floor between shifts.

David, like other children, was provided no protective gear or equipment, and the factories had very little ventilation in summer and little heat in the winter.

Children such as David worked for very low wages with no hope of a better future. They had no time for school, play, or vacations. If David complained about the conditions or was sick one day, he was immediately replaced by another worker.

The government never inspected these workplaces, and the factory owners had little regard for their young workers. No one was looking out for the welfare of these children. Without going to school, David had little chance to better his life. Children like David usually ended up working in the same factory for their entire lives.





Photograph 3:

Haji, an Indonesian boy of 12, works on a fishing platform off the coast of Indonesia. Wood platforms on stilts stand anywhere from one-half mile to several miles out to sea.

Boys are taken from their homes to the platforms to help fish for krill. They must stay there for up to six months, away from their families and friends. Each day, they live only on

rice and fish. Fresh fruit and vegetables are a rare treat. Fresh water is scarce. Three to six children sleep on the floor of a shelter that may be no larger than six feet by ten feet.

Haji has no protection from falling into the ocean, and often children like Haji do not know how to swim. The platforms have many holes, and it is easy for children to slip through the floor. Even if the children know how to swim, waves and the force of the current make it difficult for them to get to safety. If a child is killed or injured, he is merely replaced by another worker.

He receives no sick time, vacation, or medical care. He does not attend school. He has no way to better his life. Fishing for krill is all he will know.



Photograph 4:

Amine, a 5-year-old weaver from Nepal, works 10 to 12 hours per day. Her small little hands, like those of many carpet weavers, are bruised, and she suffers from severe skin problems due to the rough course wool. When children knot the carpets, they often cut their hands, and the cuts never have a chance to heal. Amine often has open cuts on her hands, which become sore as she works.

Each knot must be pulled tightly, and the process is repeated up to 100 times or more per square inch in a fine carpet. Amine is pressured to work quickly for long periods of time. Wages are only 30 cents per day.

Amine lives at the factory, sleeping on the floor. She has not seen her family in over a year. She gets outside once a day for only a few minutes; otherwise, she is working at her loom. She is given very little food. No bathroom facilities are in the factory. If Amine, or any other weaver, gets sick or injured, she is replaced by another worker and is thrown out into the street with no place to go and no medical help. If Amine complains about her situation, she will be replaced as well, which would make her family very angry with her.

Amine will never have the opportunity to go to school. She does not know how to read or write and has not learned any other skills. Amine will be weaving carpets for the rest of her life, if her hands can tolerate the work.

Photograph 5:

In Nepal, as in much of the world, bricks are made by hand. After being fired in huge kilns, the bricks are carried to large stacks by children such as Krishna. Even a small brick factory may produce as many as 500,000 bricks a year. Each brick weighs 2 to 4 pounds. Each day, a small child may haul over 1,000 bricks (2,000 pounds) on his or her head or back.



The work is dusty and dangerous. As bricks are removed from the kiln, they may fall several feet onto a worker's unprotected feet. Because of the large amount of dust, the children often get lung diseases that lead to early death. No one inspects the working conditions of these factories. No medical care is available, if the children get injured. If a child, such as Krishna, becomes sick or permanently disabled, he or she is sent away, and a new child worker is brought in to work.

Children as young as five years old are required to work in these factories by their parents. They are given few breaks and very little food during the day. Children work through extreme weather conditions. Children live at the factory and sleep on dirty, dusty floors. They have no time for school or play. They work seven days a week, 10 to 12 hours per day, for no wages other than food and minimum shelter.



Photograph 6:

Mohamed, from Bangladesh, works in a tannery making leather from animal hides. Some of the children in this factory actually work inside the tanning drums, standing bare-foot in hazardous chemicals, such as chromic acid and formaldehyde. The chemicals burn their skin and their lungs when they breathe in the fumes, but they are required to keep working.

Some of the children, like Mohamed, must cart animal waste from the tanning process to a waste dump down the road. No sanitation is provided. Workers are given no protection for their hands, and animal parts such as intestines touch their skin. Diseases from the decaying animal waste may infect the children, causing them to become sick.

Mohamed, along with the other children, works very long hours, seven days a week. He gets no breaks, vacation, or sick time. The wages he earns are very low. If a child gets sick from working at this factory, he or she is simply replaced by someone else. No medical help is available.

Looking at the Lives of Child Laborers

A Script to Assist You

Young people are much the same in every country and time period. They have feelings, hopes, and dreams. They want a life that is happy and filled with good things. Unfortunately, the lives of some young people have not always been easy, because they worked in places or lived during times in which worker safety laws did not protect them. Young workers were, and still are, at the mercy of adults to protect them from being abused and exploited.

Child Labor In The United States

1700s

In our country's early history, it was not uncommon for children to work long hours in hard or dangerous situations. From the time the first colonists arrived in what was to become the United States, children were working. Many served as apprentices to older workers. They worked for those people for several years for no pay, sometimes living away from their families. In some instances, they learned a trade, such as blacksmithing or carpentry. In others, they learned nothing and were just a source of free labor.

After the Civil War, the nation became more industrialized, with large factories turning out textiles, pottery, and other products. Factories were in desperate need of workers, so they hired children as well as adults. Children were not required to go to school, and no labor laws were in place. Children as young as five and six worked 12 hours a day, six days a week.

1800s

Children worked in very dangerous situations, around large machines, sharp knives, and coal cars. Since employers were not required to provide safety equipment, many children were permanently disabled or killed. Injured or sick employees were simply replaced. No compensation was given, if they were injured and could no longer do their jobs.

Life for child laborers was very difficult. They had no childhood. They had no future. Because they did not go to school, all they would know for the rest of their lives was hard work.

Have students look at photographs 1 and 2. These are photographs of child laborers earlier in our country's history. Discuss the photographs using the questions suggested in the lesson.

Gradually, child labor in the United States became regulated. In 1938, most of the Fair Labor Standards Act was passed, protecting the health and well-being of young workers. This act set standards for child labor and established the laws that govern child labor today. The act regulated how many hours a child could work, how old a child had to be to work, and what jobs were too dangerous for children.

Thanks to these laws, if you are under 18 and working today, your workplace is relatively safe, and your health and welfare are protected. Health and safety laws have greatly improved the working conditions of young people in the United States. However, this is not true for migrant workers, who still spend long hours in fields picking vegetables and being exposed to dangerous chemicals.

Child Labor In Other Countries

Unfortunately, workplace health and safety laws do not exist and are not enforced today for 250,000,000 children around the world. In many countries, children still work in very dangerous and unhealthy situations. They are often forced to work at a very young age, sometimes being removed completely from their families.

In some instances, no laws regulate how much or how long a child may work. No laws prohibit children from working around dangerous machinery without protective equipment. No laws require that children receive a fair wage. In some instances, adults doing the same job will earn more money. No sick time, vacation time, or medical insurance is provided. In other instances, laws exist but are not enforced.

Like children in the early history of the United States, these children have no childhood and no future. They are destined to spend their whole lives working for very low wages. They have no time to attend school, so the children end up working in the same job for the rest of their lives. Worker safety laws are not in place to protect them. These same conditions still exist for some American migrant families as well.

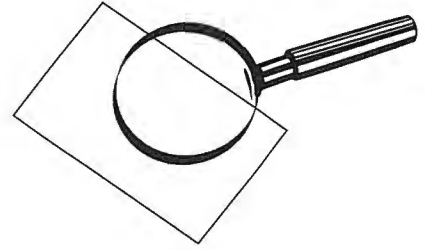
Look at photographs 3 through 6. Complete the student learning activity provided in the lesson. Discuss as many of the photographs as time allows.



Name: _____

Class Period: _____

Child Labor Photo Assignment



1. Describe the photo situation you are writing about.

2. What laws would you create to protect the young worker pictured in this photo? Be specific.
 - A.

 - B.

 - C.

 - D.

Are there any other laws you would add?

Workplace Safety Laws

Protect Your Health. Know Your Rights.

By law, your employer must provide the following:

- A safe and healthy workplace.
- Training about health and safety, including information on chemicals that could be harmful to your health.
- Protective clothing and equipment.
- Payment for medical care, if you get hurt or sick because of your job. You may also be entitled to lost wages.
- At least the minimum wage, which is generally \$5.15 per hour.

You have a right to do the following:

- Report safety problems.
- Work without racial or sexual harassment.
- Refuse to work, if the job is immediately dangerous to your life or health.
- Join or organize a union.
- Get paid overtime, if you work more than 40 or 48 hours per week, depending on the size of the company. Check with your supervisor.

What are my safety responsibilities on the job?

- Follow all safety rules and procedures.
- Use safety equipment and protective clothing when needed.
- Look out for coworkers.
- Keep work areas clean and neat.
- Know what to do in an emergency.
- Report any health or safety hazards to your supervisor.

Should I be working this late or this long?

Child labor laws protect teens from working too long, too late, or too early. This table shows the hours teens may work. Exceptions exist for students in work experience programs.

<u>Work Hours For Teens</u>		
Under 14	Ages 14 and 15	Ages 16 and 17
A person under 14 years of age cannot be employed, except as follows: <ul style="list-style-type: none">• newspaper carrier.• agriculture worker.*• actor, actress, or model.	Between Labor Day and June 1st: <ul style="list-style-type: none">• Not before 7 a.m. or after 7 p.m.• Not over 3 hours/day on a school day, and not over 18 hours/week• Not during school hours.• No more than 8 hours on a non-school day. From June 1st to Labor Day: <ul style="list-style-type: none">• 7 a.m. to 9 p.m.• Not over 8 hours in any 24-hour period.• Not more than 40 hours per week.	<ul style="list-style-type: none">• Not before 5 a.m. or after 11 p.m. on school nights (no restrictions on weekends or holidays).

* Children must be at least 14 to work outside school hours in any agricultural job. Twelve- and 13-year-olds may work, if parental consent is given and if they are working on the same farm as their parent. No age restrictions exist for children who work on their family's farm.

Required Breaks:

Employers should give bathroom breaks for every four hours worked and meal breaks for every eight hours worked.

Workplace Safety Laws (continued)

No worker under 18 may do the following:

Laws protect teens from doing dangerous work. For example, in Minnesota, no worker under age 18 may do the following:

- Work over 12 feet above the ground.
- Work near or with explosives.
- Work in the logging industry or in a sawmill.
- Drive a forklift.
- Use power equipment, such as a saw or punch press.
- Work on a construction site.
- Work with meat slicers or bakery machines.
- Drive as a regular part of their duties.
- Load or unload power-driven paper balers/ compactors.

These are just a few examples. There are other dangerous jobs teens are not allowed to do.

No worker under 16 may do the following:

- Work with any type of power-driven machinery.
- Work in a laundry or dry cleaner.
- Work with power snowblowers or lawn mowers.
- Work on a ladder or scaffolding.
- Cook or bake.
- Lift or carry patients in hospitals or nursing homes.
- Work in walk-in meat freezers or coolers.

No one under 16 is allowed to do the following agricultural work, except on family farms:

- Drive a tractor with greater than 20 horsepower.
- Operate large farm machinery, such as corn pickers, grain combines, hay mowers, or auger conveyors.
- Work with bulls, boars, stud horses, sows with suckling pigs, or cows with calves.
- Ride on a tractor as a passenger or helper.
- Work inside a storage bin, silo, or manure pit.
- Apply agricultural chemicals.
- Transport or apply anhydrous ammonia.

What if I need help?

- Talk to your supervisor about the problem.
- Talk to your parents or teachers.
- If necessary, contact one of these Minnesota government agencies:
 - **Minnesota Occupational Safety and Health Administration** (for any health and safety issues): 1-(877) 470-6742.
 - **Minnesota Department of Labor and Industry (Wage and Hour Division and Labor Standards)** (for any wage, hour, or labor issues): 1-(800) 342-5354.
- Call your safety representative or labor union.

You have a RIGHT to speak up! It is illegal for your employer to fire or punish you for reporting a workplace problem. Workers also have the right to form unions.

This fact sheet includes both federal and state laws. Employers who fail to comply with the Minnesota Child Labor Act are subject to monetary penalties.

Name: _____ Class Period: _____



Examining Workplace Safety Laws Homework Assignment

Think about the photographs you saw in class today. Think about your own work or the work you want to do in the future. After reviewing the handout titled “Workplace Safety Laws,” do the following:

1. Choose three labor laws from the handout.
2. Think about why you agree or disagree with the laws you choose and describe your reasons in the space below. No answers are right or wrong.
3. Include any suggestions you may have for rewriting these laws or changing them in any way.
4. Your assignment should be at least three paragraphs long, one paragraph for each law you choose.

We will discuss the homework assignment during the next class session.

LESSON 7

Worker Safety Laws and You



Description:

Students review current worker safety laws by playing a game and discussing present-day scenarios.

Learner Outcomes:

Students will be able to do the following:

1. Describe current worker safety laws.
2. Apply these laws to specific work situations.
3. Perceive that workers have the right to expect a safe work environment.

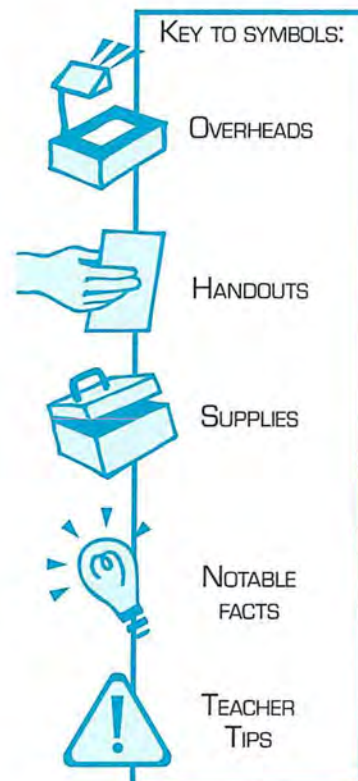
4. Perceive that employers have a right to expect employees to behave in a safe manner.
5. Stop any work practices that are illegal for them to perform.

Key Concepts:

1. Worker safety laws exist and every employer should follow them.
2. Worker safety laws are made to protect workers from injury and permanent disability, not to limit their opportunities for employment.

Fact:

Passage of the Fair Labor Standards Act of 1938 placed, for the first time in U.S. history, federal limitations on the types of nonagricultural work permitted for children and adolescents under the age of 18.



Materials

Needed:

- “Looking at the Laws” cards
- Heavy cardstock paper
- Scissors
- Masking tape
- Coin
- “Workplace Safety Situations” sheet, one per student
- “Additional Worker Safety Resources” fact sheet (one per student)

Preparation Needed:

1. Photocopy the “Looking at the Laws” cards onto heavy cardstock paper (two-sided). Cut each sheet of paper in the middle to separate the cards. Tape the “Looking at the Laws” cards to the chalkboard or wall with the questions facing the chalkboard or wall.
2. Make copies of the “Workplace Safety Situations” (one two-sided sheet per student).
3. Make copies of the “Additional Worker Safety Resources” fact sheet (one per student).

Directions:

“Looking at the Laws” Game Show (25-35 minutes)

1. Divide the class into two teams. Make sure students put their “Worker Safety Laws” fact sheets away during this game. Pick a player from each team to start the game. Have these two players flip a coin to see which team will start first.
2. Have the first player call out the number of one of the cards on the chalkboard. Say:
I will read the question on this card. You will have ten seconds in which to answer the question. If you cannot answer the question correctly, the other team will be given ten seconds in which to answer the question. The team that answers the question correctly will get one point. The team with the most points at the end of the game wins.
3. At the end of the game, say:
This game has helped us review some of the main child labor laws. Let’s try to apply these laws to actual work situations.



“LOOKING AT THE LAWS”
GAME SHOW CARDS



“WORKPLACE SAFETY
SITUATIONS” SHEETS

Worker Safety Situations (15 minutes)

1. Give each student one of the “Worker Safety Situations” sheets. Explain:
Read through each situation and decide which worker safety laws apply to that situation. Write the laws in the space provided below each situation.

2. After about five minutes, have the whole class come back together. Read through each situation and discuss it. Ask:
Which laws are being broken in this situation? Of which laws should the worker be aware?

Answers To Situations:

- # 1: No one under 18 years of age is allowed to work over 12 feet above the ground.
 - # 2: A 15-year-old must not work more than 18 hours per week during the school year.
 - # 3: No one under 18 years of age is allowed to work on a construction site.
 - # 4: A 15-year-old must not work after 7 p.m. on a school night.
 - # 5: No one under 18 years of age is allowed to operate a meat slicer.
 - # 6: No one under 18 years of age is allowed to drive a forklift.
 - # 7: A 15-year-old must not work more than 40 hours per week during the summer.
 - # 8: No one under 16 years of age is allowed to lift or carry people in a nursing facility.
3. Ask:
How many of you have had your employer go over child labor laws with you?
 4. Explain:
It is your employers' responsibility to ensure they are not breaking any laws by what they ask you to do. As workers, however, it is important that you also know the laws.
 5. Spend a few minutes talking about the rationale behind these laws. Many of these laws were put in place to specifically address issues that were causing unsafe work conditions for teens in the past. During Lesson 6, you talked about a number of these conditions, including long hours, few breaks, and dangerous jobs.

Many of the jobs that teens are prohibited from doing are considered to be dangerous or risky. The laws are meant to protect teens from working in these dangerous or risky situations. Many of the industries that employ large numbers of children and adolescents (such as agriculture) have higher-than-average injury rates for workers of all ages.



It's the responsibility of employers to ensure they are not breaking any worker safety laws.



Taking It Home:

No homework for this lesson.

Workplace Safety Situations

Situation # 1:

Ryan is 17 years old. His friend has just offered him a summer job painting houses. Ryan is really excited about the chance to work. The first day at work, Ryan is asked to climb a 20-foot ladder to paint the eaves on a large house. Ryan agrees to do it, even though he is afraid of heights.

Situation # 2:

Fifteen-year-old Angela has been working at the local fast food restaurant for the past six months. She really likes her job. Lately, several workers have quit to go on to college. Due to the shortage of employees, Angela's supervisor has asked her to work every night this week and until closing on Friday. If she does, she will have worked 30 hours during a school week.

Situation # 3:

Fourteen-year-old Mario has been hired to work at a construction site. He will be sweeping and picking up supplies for other workers. The foreman said he cannot drive any heavy equipment.

Situation # 4:

Heather, who is 15, is cashiering at an all-night drugstore. Her manager is short-staffed and asks Heather to work from 6 p.m. until 11:00 p.m. It is a Tuesday night during the school year.

Workplace Safety Situations (continued)

Situation # 5:

Josh, who is 16, just started his new job with the local grocery store. They have asked him to work in different departments. They start him in the deli department slicing luncheon meats. His supervisor trains him to use the equipment and watches him several times to make sure he is doing it right.

Situation # 6:

Stacy, a 17-year-old, is still in high school. She landed a great weekend job working at a large warehouse in town. Most of her job involves inventorying and filling orders. Occasionally, she is asked to drive the forklift to move supplies. She really likes that part of her job.

Situation # 7:

Julie, who just turned 15, got a summer job at the local convenience store. She is working many hours to save up money for college. She is scheduled to work both Saturday and Sunday, so she will have worked almost 65 hours this week.

Situation # 8:

Trevor, who is 15, is working part-time at the nursing home in town. He is often asked to help move patients from their beds to their wheelchairs.

'Looking at the Laws' Game Show

CARD NO.

2

CARD NO.

1

Question # 2:

How many hours a day can 14- and 15-year-olds work on a school day?

Answer: 3 hours

Question # 1:

How late can 16- and 17-year-olds work on school nights?

Answer: 11 p.m.

'Looking at the Laws' Game Show (continued)

CARD NO.

4

CARD NO.

3

Question # 4:

How late can 14- and 15-year-olds work during the school year?

Answer: 7 p.m.

Question # 3:

How many hours a day can 14- and 15-year-olds work on non-school days?

Answer: 8 hours

'Looking at the Laws' Game Show (continued)

CARD NO.

6

CARD NO.

5

Question # 6:

How many hours a week can 14- and 15-year-olds work during the school year?

Answer: 18 hours

Question # 5:

How early in the day can 14- and 15-year-olds start working?

Answer: 7 a.m.

'Looking at the Laws' Game Show (continued)

CARD NO.

8

CARD NO.

7

Question # 8:

How old must a worker be to operate a meat slicer or bakery machine?

Answer: 18

Question # 7:

How old must a worker be to operate a tractor with greater than 20 horsepower?

Answer: 16

'Looking at the Laws' Game Show (continued)

CARD NO.

10

CARD NO.

9

Question # 10:

A person under 14 years old may not work at which of these jobs—fast food restaurant, newspaper carrier, or actor/actress?

Answer: Fast food restaurant

Question # 9:

What is the minimum wage that workers must receive?

Answer: Generally \$ 5.15 per hour

'Looking at the Laws' Game Show (continued)

CARD NO.

12

CARD NO.

11

Question # 12:

How old must you be before you can apply agricultural chemicals?

Answer: 16

Question # 11:

A 17-year-old may not work on a ladder higher than _____ feet?

Answer: 12 feet

'Looking at the Laws' Game Show (continued)

CARD NO.

14

CARD NO.

13

Question # 14:

You must be 18 to do which of these jobs—logger, meat slicer, or nursing assistant?

Answer: Logger and meat slicer

Question # 13:

15-year-olds may work at which of these jobs—cashier, dishwasher, or dry cleaner?

Answer: Cashier and dishwasher

'Looking at the Laws' Game Show (continued)

CARD NO.

16

CARD NO.

15

Question # 16:

How old must you be to operate power equipment, such as a saw or punch press?

Answer: 18

Question # 15:

After how many hours per week must an employer pay a worker overtime pay?

Answer: 40 or 48, depending on the size of the company

Question # 18:

How old must you be to work in walk-in freezers or coolers?

Answer: 16

Question # 17:

14- and 15-year-olds can work how many hours per week during the summer?

Answer: 40 hours

'Looking at the Laws' Game Show (continued)

CARD NO.

20

CARD NO.

19

Question # 20:

How old must a worker be to drive a forklift?

Answer: 18

Question # 19:

How many hours a week can 16- and 17-year-olds work?

Answer: No restrictions

'Looking at the Laws' Game Show (continued)

CARD NO.

22

CARD NO.

21

Question # 22:

Name one government agency you can call for help with worker safety issues.

Answer: MN Occupational Safety and Health Administration or MN Department of Labor and Industry

Question # 21:

How old must workers be to ride as passengers on a tractor, if they are not on their family farm?

Answer: 16

'Looking at the Laws' Game Show (continued)

CARD NO.

24

CARD NO.

23

Question # 24:

How early may 16- and 17-year-olds work on a school day?

Answer: 5 a.m.

Question # 23:

How old do you have to be to work on your family's farm?

Answer: No lower age limit

'Looking at the Laws' Game Show (continued)

CARD NO.

26

CARD NO.

25

Question # 26:

How old must you be to work at a job at which you lift or carry patients in a hospital or nursing home?

Answer: 16

Question # 25:

By law, how often should you be allowed a bathroom break on a job?

Answer: Every four hours

'Looking at the Laws' Game Show (continued)

CARD NO.

28

CARD NO.

27

Question # 28:

How old must you be to work at a job that involves using explosives?

Answer: 18

Question # 27:

What can an employer do to you if you refuse to work in a job that is immediately dangerous to your life or health?

Answer: Nothing

'Looking at the Laws' Game Show (continued)

CARD NO.

30

CARD NO.

29

Question # 30:

What hours can 16- and 17-year-olds work on weekends and holidays?

Answer:

No restrictions

Question # 29:

How old must workers be to work outside school hours in any agricultural job (if not on their family farm or working with a parent)?

Answer: 14

LESSON 8

Addressing Unsafe Workplace Conditions



Description:

Students discuss the benefits and drawbacks of worker safety laws and learn the basic steps for addressing workplace safety issues.

Learner Outcomes:

Students will be able to do the following:

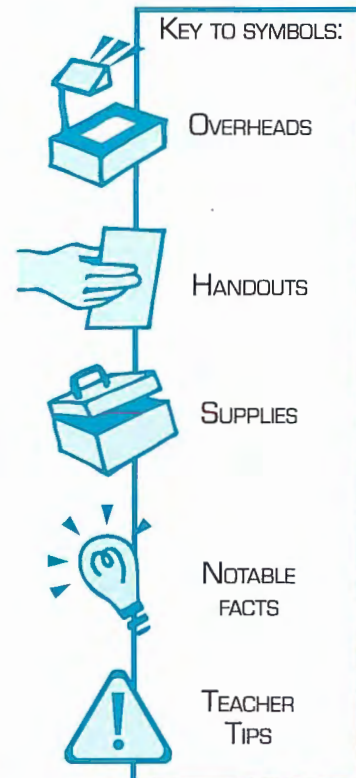
1. Describe the benefits and drawbacks of worker safety laws.
2. Perceive that worker safety laws are important, even though they may be restrictive.
3. Give examples of helpful steps in resolving workplace safety issues.
4. Apply these steps to a worker safety issue.

Key Concepts:

1. Worker safety laws are meant to protect workers, not to limit their opportunities for employment.
2. Employees can take basic steps to address unsafe work conditions.
3. Every worker has the right and responsibility to address safety concerns in the workplace.

Fact:

Most injuries are preventable and, with the right prevention steps, can be avoided.



Materials

Needed:

- Overheads 8.1 and 8.2
- Optional: Photographs used in Lesson 6
- “Teacher’s Key: The Benefits and Drawbacks of Worker Safety Laws”
- “Keep Your Workplace S.A.F.E.” handout (one per student)
- “Teacher’s Key: S.A.F.E. Communication Skills Worksheet”

Preparation Needed:

1. Review the “Teacher’s Key: The Benefits and Drawbacks of Worker Safety Laws” provided in this lesson. Make sure you are familiar with both the possible benefits and the drawbacks of each law, so you can effectively lead the discussion.
2. Think through how you will apply each of the S.A.F.E. concepts to the role-play suggested in the lesson. Prepare how you would discuss the issue with an employer.
3. Review the “S.A.F.E. Communication Skills Worksheet” and accompanying teacher’s key. Practice transforming the negative statements into positive ones, so you can assist your students, if they have difficulty.
4. Set up the overhead projector and overheads.
5. Photocopy the “S.A.F.E. Communication Skills Worksheet.”

Directions:

The Benefits and Drawbacks of Worker Safety Laws (30 minutes)

The purpose of the following discussion is to help students understand that, even though they may not agree with a law, it may have an important purpose—to protect them.

As a society, we have decided people under 18 should be protected from working in hazardous jobs or under difficult conditions (e.g., long hours). Many laws have been put in place for these reasons.

As you discuss these laws, refer to your earlier discussions of working conditions before worker safety laws were in place. You may want to show the photographs from Lesson 6 as a reminder to students. How have the working conditions for people under 18 improved with these laws? Use the list of laws and suggested benefits and drawbacks provided in this lesson as a guide for this discussion.

In this exercise, it is important to allow students to form their own opinions, rather than telling them what to think or believe. It is not your role to defend these laws but to facilitate an open discussion.

1. Explain:

During our last class, we discussed worker safety laws. I would like to talk about the benefits and drawbacks of these laws. Laws are usually made to benefit society, but at the same time, they usually put limitations on some or all of society. In our next group activity, we will examine the benefits and drawbacks of some of these worker safety laws.

Divide the class into groups of four. Assign one law to two groups. One group will focus on the benefits of the law. The other group will focus on the drawbacks of the law.

Choose laws that deal with work time, minimum wage, dangerous equipment, or break time. Information about these laws is provided in the “Teacher’s Key: The Benefits and Drawbacks of Workers Safety Laws” or the “Workplace Safety Laws” handout from Lesson 6.

2. Explain:

We’re going to debate the benefits and drawbacks of several laws. One group of four will present the benefits of a particular law to the class, while another group of four will present the drawbacks of the same law. After hearing the presentations, you’ll vote on whether you think the benefits of this law outweigh the drawbacks.

You’ll have five minutes to develop your lists, and then each group will present their viewpoint to the class. After each group has presented their side, you’ll have a chance to further discuss the law and vote. I will record the answers on the overhead.

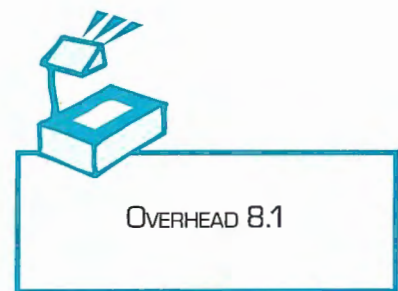
A chalkboard or easel may also be used to record the votes. If an odd number of foursomes results, have more than one group of four present the benefits or drawbacks of a particular law. Encourage students to think through what *they see* as the benefits and drawbacks of the law. No answers are right or wrong.

3. Show Overhead 8.1. Write one of the assigned laws in the left column. Ask the two groups assigned that law to present their opposing viewpoints. Write in the “benefits” and “drawbacks” of each law as they are mentioned.

4. After the “benefit” and “drawback” groups have finished presenting their sides for a particular law, ask the whole group the following questions:

a. What other benefits would you add to the list?

b. What other drawbacks would you add to the list?



- c. Why do you think this law was enacted?
(Refer to the working conditions talked about in Lesson 6.)
- d. Do you think the benefits of this law outweigh the drawbacks?
- e. Why? Why not? How would working conditions be different without this law?

TEACHER TIP:

These are open-ended questions. You do not need to reach a group consensus or have all students agree that these laws are good.



- 5. Discuss the rest of the assigned laws. Use the teacher’s key as a guide. Continue to focus your discussion on weighing the benefits and drawbacks of each example.

Students may not agree with all of the laws. You do not need to convince them otherwise. The goal is to help students see that laws, despite their drawbacks, are in place for good reasons. We cannot reap the benefits of a healthy, safe workplace without giving up something. No matter what the drawbacks are, today’s working conditions are much better than they were 100 years ago, because of the laws.

- 6. Explain:
Safety laws do benefit us in the workplace. They protect us from being asked to do things that are unsafe. If you feel you are being asked to do something unsafe in the workplace, you can address the issue with your employer. Let’s talk about how you might address a safety issue with your employer.

Unsafe Workplace Communication Skills (20 minutes)

- 1. Ask:
Have you, or has anyone you know, ever been in a work situation in which you felt you were being asked to do something unsafe? In what situation were you? What did you do about it?
- 2. Have a few students share their stories. Some students may have gone along, others may have tried to address the issue.
- 3. Ask:
How did you *feel* in that situation?
- 4. Explain:
These situations can be very difficult to handle. It’s hard to question an employer about what you are asked to do or about the safety of the work environment. You may be

afraid of losing your job or appearing uncooperative. The situation may involve your parents, who have always done something the same, perhaps unsafe, way.

At some time in your working career, you may be asked by your employer or another employee to do something that appears unsafe to you. What should you do in these situations?

One of the most important things you can do is work to keep your workplace safe. Let's use the acronym **S.A.F.E.** to help us remember how to address safety issues in the workplace.

5. Display Overhead 8.2 on the overhead projector. Using the information below, discuss each concept represented by the letters S.A.F.E.



S: *SEE the safety issue.*

The first step is to clearly identify what the safety issue is. Why do you feel uncomfortable? What is unsafe about this situation?

Sometimes we feel uncomfortable about something, but do not really acknowledge it until it is too late. It is good to stop and ask yourself why you feel unsafe or uncomfortable. Try to state your concerns in concrete language.

Whether or not a safety law is being broken, if you feel unsafe or uncomfortable, you should address the issue.

A: *ASK the right person or person(s) for help.*

Who is responsible for safety in your workplace? Who should be made aware of the situation? The workplace safety situation cannot be corrected, if no one knows the unsafe situation exists.

It may help to tell coworkers, parents, people at school, or union representatives about the problem. They can support you in your efforts to find a solution. It may also be helpful to have someone go with you when you approach your employer.

- b. You told me to use the meat slicer. Do you want to make me cut my finger off?

(Negative—how could you change this statement into a positive?)

One example of a positive response:

I'm not comfortable using this meat slicer until I have some training. Can you give me more training?

or

I'm only 17. Legally, I'm not supposed to use meat slicers.

- c. Thanks for ordering more rubber gloves. It really helps when we use cleaning products. (Positive)

8. Explain:

Now we're going to work through some more examples.

Pass out the "S.A.F.E. Communication Skills" handout. Have students work individually to complete the handout. Refer to the teacher's key for suggestions regarding each statement on the handout. Once students have completed the worksheet, ask them to share their sentences with the rest of the class. You can record their answers on a chalkboard or easel.

You may have to assist some students in turning the negative statements into positive ones. Talking through the examples and hearing other people's responses may also help those who are having difficulty.

9. Ask:

Do you have any questions about using the S.A.F.E. guidelines when addressing work safety issues? Hopefully, you can remember the word S.A.F.E., whenever you are trying to address a safety issue at work.

10. Say:

Let's apply S.A.F.E. to a workplace situation.

Use the following workplace scenario to walk the class through the acronym S.A.F.E., as you think about how to address the situation. Make a brief presentation of what you would actually say to the employer.

Scenario:

You work at a local golf course mowing the fairways. Your supervisor is hardly ever around. You received no training and no hearing protection equipment. You notice the trac-



tor you are using has nothing to protect you from getting hit by golf balls. It also has no seatbelt or rollbar, and some of the hills are steep.

11. Discuss how you handled the scenario. Ask students if they have any questions.

12. Ask:

How would you use the S.A.F.E. approach, if you saw a family member doing something unsafe on your family farm?

13. Have students read through their “Performance Criteria and Checklist” and check the Lesson 8 activities they participated in today.

Taking It Home:

No homework assignment.

**Worker
Safety Laws**

Benefits

Drawbacks

Keep Your Workplace S.A.F.E. . .

SEE the safety issue.

ASK the right person for help.

FIND a solution.

EMPHASIZE the positive.

Teacher's Key: The Benefits and Drawbacks of Worker Safety Laws

Worker Safety Laws	Benefits	Drawbacks
<p>Limiting <u>how much</u> teens may work.</p>	<ul style="list-style-type: none"> • Protects teens from being over-worked. • Prevents work from interfering with school. • Keeps teens from becoming overly tired. • Prevents teens from being taken advantage of by employers or parents. • Allows teens more time for extracurricular activities that promote their growth. 	<ul style="list-style-type: none"> • Limits amount of money earned. • Limits ability to compete with older workers who can work more. • Limits teens' independence and control of their schedules. • Limits those who are bored and want to work more.
<p>Restricting <u>when</u> teens may work.</p>	<ul style="list-style-type: none"> • Protects teens from having to work instead of going to school. • Prevents teens from having to work late and get up early for school. • Protects teens' health. • Protects teens from being at work late, when crimes are most likely to happen. 	<ul style="list-style-type: none"> • Limits ability to compete with older people who can work more hours. • Limits choice to work late or early.
<p>Limiting the age at which a person may start working.</p>	<ul style="list-style-type: none"> • Protects children from child labor and abuse. • Ensures that children will most likely be in school. • Allows children to enjoy their childhoods. • Allows children to learn and better themselves. • Protects children from jobs that may injure them. 	<ul style="list-style-type: none"> • Keeps children from earning money sooner. • Limits freedom and choice. • Limits children who are capable and desire to work. • Limits families who need the extra income.
<p>Prohibiting jobs that involve driving or other high-risk tasks.</p>	<ul style="list-style-type: none"> • Prevents teens from being in situations in which they may hurt themselves or others. • Protects teens from being given the worst jobs because they are young or new. • Protects teens from being hurt by other careless workers. 	<ul style="list-style-type: none"> • Limits the type of jobs teens can have. • Limits independence and freedom to choose jobs.

S.A.F.E. Communication Skills Worksheet

Directions: Read each statement carefully. Using the S.A.F.E. communication skills, decide if this statement is written in a positive or negative manner. If the statement is negative, rewrite it to address this issue with your employer in a positive way.

1. **All you care about is making money. You won't spend the money for the right equipment. No wonder people are getting hurt.**

Positive or Negative Statement? _____

Rewrite?:

2. **If we trained people on how to use the hot oil fryer, less people would be burned. The restaurant would save money, and your workers would be happier.**

Positive or Negative Statement? _____

Rewrite?:

3. **I don't feel comfortable climbing this ladder and working from this height. Could I do another job that doesn't involve working high above the ground?**

Positive or Negative Statement? _____

Rewrite?:

4. **You can't make me work any more hours. If you do, I'll quit.**

Positive or Negative Statement? _____

Rewrite?:

5. **I'm just 15, and I'm not getting paid enough money in this nursing home to lift that person.**

Positive or Negative Statement? _____

Rewrite?:

Teacher's Key: S.A.F.E. Communication Skills Worksheet

Directions: Read each statement carefully. Using the S.A.F.E. communication skills, decide if this statement is written in a positive or negative manner. If the statement is negative, rewrite it so that it addresses this issue with your employer in a positive way.

1. **All you care about is making money. You won't spend the money for the right equipment. No wonder people are getting hurt.**

Positive or Negative Statement? *Negative*

Suggestion: It seems we could reduce the number of people getting hurt here, if we spent some money for safety equipment. If less people got hurt, we could be more productive and serve our customers better.

2. **If we trained people on how to use the hot oil fryer, less people would be burned. The restaurant would save money, and your workers would be happier.**

Positive or Negative Statement? *Positive*

3. **I don't feel comfortable climbing this ladder and working from this height. Could I do another job that doesn't involve working high above the ground?**

Positive or Negative Statement? *Positive*

4. **You can't make me work any more hours. If you do, I'll quit.**

Positive or Negative Statement? *Negative*

Suggestion: I've already worked the maximum number of hours I'm allowed to by law. Working any more hours today would be against the law.

5. **I'm just 15, and I'm not getting paid enough money in this nursing home to lift that person.**

Positive or Negative Statement? *Negative*

Suggestion: In my orientation, I was told that I'm too young to lift residents in the nursing home. I could find another aide to help you lift this person.

LESSON 9

Putting Work Safety into Practice



Description:

Students practice the basic skills needed to address workplace safety issues through a role-play exercise. They also identify barriers and solutions to overcoming challenges when addressing safety concerns in the workplace.

Learner Outcomes:

Students will be able to do the following:

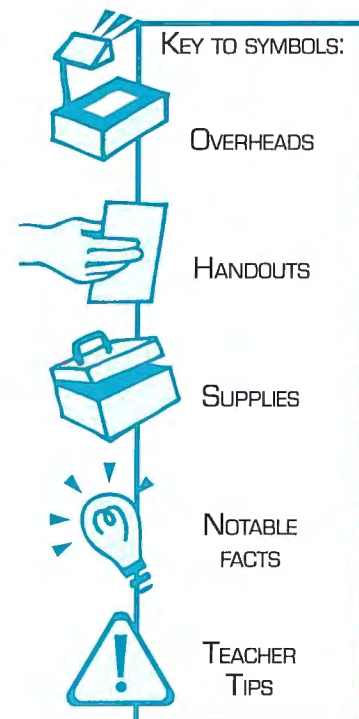
1. Describe the steps that are helpful in resolving workplace safety issues.
2. Demonstrate these steps effectively in resolving workplace safety issues.
3. Perceive the importance of addressing unsafe work issues with their employers.
4. Apply these steps to real-life work situations.

Key Concepts:

1. Every worker has the right and responsibility to address safety concerns in the workplace.
2. An employer does not have the legal right to fire an employee, if the employee refuses to work in a situation in which danger is imminent.
3. Employees can take basic steps to address unsafe work conditions.
4. Workplace safety can be achieved through cooperative problem-solving.

Fact:

Sixty percent of people suffer from back pain over the course of their lifetime. At least 4% are incapacitated for at least six months. According to the National Safety Council, lower back pain accounts for 400,000 work-related injuries each year in the United States.¹



Materials

Needed:

- Overhead 8.2
- “Role-play Scenarios”
- Scissors
- “Role-play Scenarios Worksheet” (one per student)
- “Performance Criteria and Checklist” found in Lesson 6 (one per student)
- “Putting Work Safety Into Practice, In-Class Assignment” (one per student)

Preparation Needed:

1. Read through the S.A.F.E. steps (from Lesson 8) again, so you can discuss each step briefly. These steps help workers when addressing workplace safety issues.
2. Think through the responses you will give as the employer in each role-play.
3. Copy the role-play scenarios and cut them apart. Make copies of the “Role-play Scenarios Worksheet.”
4. Make some extra copies of the role-play scenarios, in case students need to use them for their in-class writing assignment.

Directions:

Workplace Safety Role-play (35 minutes)

1. Explain:
During our last class, we talked about the S.A.F.E. steps you can take to address workplace safety issues. What were these steps?
2. Place overhead 8.2 on the overhead projector but keep it covered with a sheet of paper as you begin this review. As students list the steps, uncover them on the overhead. Briefly discuss each step as it is mentioned. The steps are as follows:

S = SEE the safety issue.

A = ASK the right person for help.

F = FIND a solution.

E = EMPHASIZE the positive.

Briefly review some examples of positive responses to workplace problems.

3. Say:
Today we are going to practice putting these S.A.F.E. steps into practice.
4. Divide the class into pairs. Give each pair one of the “Role-play Scenarios.” Some pairs may end up with the same scenario, depending upon the size of your class. Also give each person a copy of the “Role-play Scenarios Worksheet.”



OVERHEAD 8.2



“ROLE-PLAY SCENARIOS”
AND “ROLE-PLAY SCENARIOS
WORKSHEET”

5. Explain:

I would like each pair to imagine you are coworkers. You are both trying to figure out how to deal with an unsafe work situation. Begin your discussion of the situation by filling out this worksheet. Decide what the safety issue is and the various options you have for dealing with the situation.

Then think through how you will choose an option. Maybe you would suggest a solution that would be the safest choice. Maybe you would suggest the least expensive solution. Decide for yourself how you will pick one option over another. For this exercise, the only option you *cannot* pick is to quit. Each of you will hand in your worksheet at the end of the class period. Discuss the situation together, but fill out your sheet individually.

Once you have decided what you should do about the situation, walk through the S.A.F.E. steps and talk about how you would address the problem with your employer. Practice a brief conversation you both would have with your employer to resolve the issue. Each pair will act out their role-play, while I or other students play the role of your employer. As the employer, I or we may be concerned, unconcerned, angry, or annoyed. Do your best to deal with the situation as it arises.

6. Allow groups about seven minutes to discuss their scenarios, fill in their worksheets, and come up with conversations.

7. Explain:

While you are waiting to do your role-play with me, I want you to do an in-class assignment that is due at the end of the class period.

Pass out the homework assignment handout. Read through the handout and answer any questions students may have.

Students can choose to write about a real life example, if they have one, or use information from situations discussed in the class sessions. The student essays should thoroughly describe the safety situation and how the student would apply the S.A.F.E. steps to that situation. The essays should also describe the type of opposition being faced, and how they would deal with this opposition.

TEACHER TIP:

Other ways to do this exercise:

1. Have one pair act out their role-play with you in front of the whole class.
2. Have two pairs take turns role-playing for each other. Do the role-plays a couple of times with different employer responses.



"PUTTING WORK SAFETY INTO PRACTICE, IN-CLASS ASSIGNMENT"

8. When all the pairs are ready, ask each pair to meet with you one at a time. Set up chairs at the front of the room, so the three of you can meet. You will be playing the role of their employer, while they play the role of your employees. Each pair should **briefly** role-play their conversation with you. As the employer, you will be responding to the pair's concerns. After each pair is done, have a brief discussion about how they handled the situation.
9. After all the groups are done, briefly discuss students' experiences with this exercise. Possible discussion questions:
 - Was this exercise easy or difficult? Remind students that all such conflicts may be difficult.
 - Would you do anything differently next time?

Real-Life Workplace Safety Issues

(15 minutes)

1. Explain:

If you had to address an unsafe workplace situation, how would you use the S.A.F.E. steps and material from the previous class lessons? I would like you to talk about specific work situations you have experienced.

2. Ask for volunteers to discuss specific work situations they have experienced. If you assigned the in-class assignment, have students read their essays. Talk about each situation and how they could have used the S.A.F.E. steps. Discuss any barriers the students must address to resolve the unsafe working conditions. Go through as many examples as time allows. Have students turn in their in-class assignments, if you had them do this exercise in writing.

3. Explain:

Every worker has the right and responsibility to address safety concerns in the workplace. In most cases, your employer will respond positively to your suggestions. Employers benefit when employees are safe too. Less injuries mean less time lost on the job and less money spent for medical expenses.

It is important to remember that an employer does not have the legal right to fire you, if you bring up safety issues at work. You have the right to work in a safe workplace.

You are also responsible for being safe at work. I hope you will put all you have learned about worker safety into practice. I hope you will all do as much as you can to work safe and work smart.

4. After this session, fill out the "Performance Criteria and Checklist" (found in Lesson 6) for each student based on the quality of their work in completing the tasks outlined on the form. These tasks and criteria apply to most activities in Lessons 6 through 9.

Role-play Scenarios

Scenario # 1:

You work in a fast-food restaurant, and your employer asks you to stay until closing on many nights. You do not get home until midnight and must get up for school by 6 a.m. the next day. You are very tired at school and work.

Yesterday, another employee at work was tired and in a hurry to go home. Because of this, he did not let the hot oil cool down enough before removing it, and he was burned. Other coworkers are also concerned about the hours they are asked to work.

Scenario # 2:

You work for a grain elevator in town. It is a very dusty work environment. You usually wear a respirator while you work, but today when you arrive, all the respirators are gone. Your supervisor asks you to work anyway, because the workload is really backed up. The job must get done today and cannot wait for the new order of respirators to arrive. Respirators can be purchased at a hardware store but are more expensive than when the company buys them in bulk.

Scenario # 3:

You work for a landscaping firm and often ride from site to site in a company truck. One of your coworkers, who is old enough to drive on the job, drives the truck. He is a very reckless driver and takes many chances when out of view of your supervisor. You feel very unsafe when riding with him.

Scenario # 4:

You are working on a local farm. The farmer has just started spraying pesticides on his fields, and he has asked you to handle the pesticide containers and sprayers. Neither of you received gloves or respirators or had any training.

The farmer is in a hurry to get the job done before it rains. Rain is expected throughout the remainder of the week. If you ask for gloves and respirators, the farmer will have to go buy these supplies. You could lose several hours of work time.

Scenario # 5:

Both of you work at a local convenience store. Your supervisor has just decided to make each of you take turns working alone in the store in the evenings. This decision makes both of you very nervous. Someone could rob you or assault you, and no one would know. Since your employer trusts you, she specifically wants you both to work the evening shift but doesn't want to have more than one employee working at one time.

Scenario # 6:

You are working as health assistants at a local hospital. You work closely with one of the nursing staff there. She is always in a hurry and asks you to take a lot of risks when working with patients, such as not wearing gloves and handling used needles very carelessly.

Whenever you make suggestions or question her judgment, she brushes you both off and says you do not know anything. You are only teenagers.

Scenario # 7:

You just got summer jobs mowing alongside county roads. Your supervisor asks you both to mow a hillside with a very steep embankment. You notice the tractors have no rollover protection.

Several teenagers applied for these jobs, because they pay very well. Your supervisor chose you both on a trial basis to see if you could handle the job.

Scenario # 8:

You got a job detasseling corn. You work very long hours. On some days, it is incredibly hot work. Your employer is not around very much. She has not supplied you with water or shade, bathroom facilities, or a vehicle to ride in, if someone should get sick or injured.

Name: _____

Class Period: _____

Role-play Scenarios Worksheet

Question # 1: What is the safety hazard in this situation?

Question # 2: Who should you talk to about this situation?

Question # 3: Are there any laws that would protect you in this situation?

Question # 4: List at least three options for handling this situation?

Question # 5: What do you think is the best option?

Question # 6: Who else might help you deal with this safety or health concern?

Now use the S.A.F.E. steps on the overhead to help you prepare for your role-play presentation.

Name: _____ Class Period: _____



Putting Work Safety Into Practice

In-Class Assignment

Write a one- to two-page essay about a safety hazard you've experienced at work or learned about in one of the previous lessons. How would you argue for correction of the hazard, if your employer voiced one of the following objections?

1. I can't afford to make the safety changes.
2. The safety changes will make the job go slower and time is money.
3. We've always done it that way here and nobody has ever gotten hurt. Why should we change?

Use the S.A.F.E. strategies and materials from prior lessons to make your case.



Glossary

Absorption: To take a substance into the body, usually through the skin.

Acute injury or illness: An illness or injury that happens immediately after exposure to a hazard. Acute illnesses and injuries are usually short-term.

Administrative controls: Rules, regulations, or procedures to control or limit employees' exposures to potential hazards.

Benefits: Positive contribution to a person's life; advantages.

Cardboard compactor: A machine that crushes cardboard boxes and ties them into bundles. Bundles are then more easily recycled.

Child labor laws: Laws that protect children's rights in the workplace.

Chronic injury or illness: An illness or injury that persists over time.

Combine: A machine used for harvesting and threshing grain.

Confined space: Any space with limited openings and poor ventilation that can cause harm due to toxic gases or lack of oxygen.

Decibels: The units by which the intensity of sound is measured.

Dust: Tiny particles of solids.

Ear protection: Hearing protection, usually earplugs or earmuffs.

Engineering controls: Protective measures taken to prevent exposure to a hazard by changing the equipment or instruments that are used to do a job.

Ergonomics: Practices that make a job fit the worker instead of force the worker to fit the job.

Fair Labor Standards Act: Enacted in 1938, this act protects the rights of all workers, including children. The act played an important role in making the workplace safer for children.

Grain bin: A container in which grain is stored.

Hazard: Anything that can harm a person—physically or mentally.

Hazard map: A map showing the location of hazards in a workplace.

Hypothermia: An illness caused by loss of heat in the body.

Illness: The condition of being in poor health; sickness; disease.

Ingestion: Taking a substance into the body through the mouth; swallowing.

Inhalation: To breathe a substance into one's lungs. Substances that are inhaled may then spread to the bloodstream.

Injury: Harm or damage done to a person's body.

Limitations: Restrictions or negative results of an action, such as the enactment of a law.

Material Safety Data Sheet (MSDS): Detailed information sheet on chemicals and their ingredients, safety precautions, and use. MSDS generally are prepared and made available by chemical manufacturers.

Microorganisms: Microscopic organisms such as bacteria, viruses, and molds.

Permanent injuries or illnesses: Injuries or illnesses that remain with a person for the rest of his or her life.

Personal protective equipment: Equipment workers wear to act as barriers between themselves and hazards.

Power takeoff: A rotating shaft that powers a moving piece of equipment, often seen on a farm.

Prevention strategy: A variety of actions that can be taken to prevent injuries or illnesses from happening in the workplace. Administrative controls, building barriers, and communication are three main categories of prevention strategies.

Risk: The chance that an injury or illness will happen given certain workplace conditions.

Routes of entry: The different ways hazardous substances can get into the body.

Safety action plan: A guide that is used to implement safety changes in the workplace.

Safety team: A group of people, either employ-

ees or outside consultants, who work to create a safer workplace for a particular business or organization.

Temporary injuries or illnesses: Injuries or illnesses that last a short period of time.

Vapors: Tiny drops of liquid suspended in the air.

Worker safety laws: Laws that protect the health and safety of workers, including children.

Workplace hazard: Anything in the workplace that can harm a person—physically or mentally.

Workplace biological hazard: Hazards in the workplace caused by contact with living things or their byproducts.

Workplace chemical hazard: Any chemical in the workplace that can cause injuries or illnesses.

Workplace physical hazard: Hazards in the workplace caused by the transfer of energy from one object to another.

Worker Safety and Health Education Resources

General Worker Safety Information

- **United States Department of Health and Human Services, Centers for Disease Control and Prevention.** *Preventing Deaths and Injuries of Adolescent Workers.* May, 1995. (NIOSH 95-125)

An 11-page report on adolescent injury statistics and worker safety regulations.

- **U.S. Department of Labor, Occupational Safety and Health Administration.** *Personal Protective Equipment.* (OSHA 3077), 1995. Chicago Office: (312) 353-2220.

A 30-page booklet covering the various regulations related to the use of protective equipment in the workplace.

- **United States Environmental Protection Agency.** *A Guide to Heat Stress in Agriculture.* (EPA-750-b-92-001), 1993. Chicago Office: (312) 886-6006.

A 44-page booklet describing the various safety measures that can be taken to prevent heat stress in agricultural occupations.

- **National Research Council Institute of Medicine.** *Protecting Youth at Work: Health, Safety, and Development of Working Children and Adolescents in the United States.* Washington, D.C.: National Academy Press, 1998.

A general report on health and safety issues of working teens.

Child Labor Information

- **American Federation of Teachers.** *Child Labor: A Selection of Materials on Children in the Workplace.* American Federation of Teachers, International Affairs Department, 555 New Jersey Avenue, N.W., Washington, DC 20001-2079, 1994.

A compilation of journal articles and reports on the current status of child labor around the world. Appropriate as background reading for a teacher.

- **Mofford, Judith, ed.** *Child Labor in America.* Carlisle: Discovery Enterprises, Ltd., 1997.

A collection of stories and photographs depicting the history of child labor in the United States.

- **Parker, David.** *Stolen Dreams: Portraits of Working Children.* Minneapolis: Lerner Publications Company, 1998.

With vivid pictures, the author describes the current state of child labor in developing countries. This book provides timely information at a level appropriate for high school students.

- **Saller, Carol.** *Working Children.* Minneapolis: Carolrhoda Books, Inc., 1998.

Using historical photographs, the author recounts the history of child labor in this country. Geared to students with a lower reading level.

- **Weiner, Myron.** *The Child and the State in India.* Princeton: Princeton University Press, 1991.

This book reviews both the state of child labor in India, as well as the history of child labor in the United States and other countries. This book would be helpful as background reading on the topic.

Worker Safety Curricula

- ***Teens, Work and Safety: A Curriculum for High School Students.*** Labor Occupational Health Program, Center for Occupational and Environmental Health, University of California, Berkeley, 1997.

A comprehensive curriculum providing lesson materials geared to English, science, U.S. government and social studies content areas.

This same organization has developed a series of booklets on workplace safety. Titles include the following:

- “Worker’s Guide To Toxics On The Job”
- “Welder’s Guide To Toxics On The Job”
- “Construction Worker’s Guide To Toxics On The Job”
- “Machinist’s Guide To Toxics On The Job”
- “Collision Repair Workers’ Guide To Toxics On The Job”

Worker Safety Organizations

- ***Farm Safety 4 Just Kids,*** 110 South Chestnut Avenue, P.O. Box 458, Earlham, IA 50072-0458. Phone: 1-800-423-KIDS (5437).

An organization whose sole purpose is to provide educational resources on farm safety for children. Many of their products are geared to elementary age children, but some could be adapted to a teen audience.

- ***Minnesota Department of Labor and Industry,*** 443 Lafayette Road, St. Paul, MN 55155. Phone: (651) 296-2282 Toll-free: 1-800-342-5354
Email: workerhealth@health.state.mn.us

This organization provides up-to-date information on Minnesota’s worker safety laws and legal issues in the workplace.

- **Farm Safety and Health Information Clearinghouse, Department of Biosystems and Agricultural Engineering, 219 Biosystems & Ag. Engr., 1390 Eckles Avenue, St. Paul, MN 55108-6005. Phone: (612) 624-7444**

This organization provides curriculum materials and general information on farm safety.

- **Minnesota Extension Service, University of Minnesota, 240 Coffey Hall, 1420 Eckles Avenue, St. Paul, MN 55108-6070. Phone: (612) 625-1915**

Your local county extension office can give you more information about farm safety. Look in your local phone book for your county office phone number or call this general number for information.

Internet Resources

- **Minnesota Department of Health Center for Occupational Health and Safety**

<http://www.health.state.mn.us/divs/dpc/cdee/cdee.htm>

This website provides information on the programs and activities within the MDH Center for Occupational Health and Safety.

- **U.S. Department of Labor**

<http://www.dol.gov/dol/esa/public/youth/index.htm>

This website has a wealth of information about teen work safety. Learn about worker safety laws and how to be safe in the workplace.

- **Minnesota Department of Labor and Industry**

<http://www.doli.state.mn.us>

This website provides up-to-date information on Minnesota's worker safety laws. Visit this location on their website for information specific to teen labor laws:

<http://www.doli.state.mn.us/laborlaw.html#Child>

- **Minnesota Safety Council**

<http://www.mnsafetycouncil.org/home.cfm>

This website provides general safety information.

- **Farm Safety and Health Information Clearinghouse**

<http://www.bae.umn.edu/~fs/>

This website provides a wealth of information about farm safety. It is an excellent place to start learning about safety issues on a farm.

- **National Farm Medicine Center**

<http://www.marshfieldclinic.org/nfmc>

This website provides information on farm safety issues. By going to the following address on their website, you can find additional links to other resources:

<http://www.marshfieldclinic.org/nfmc/resource/default.htm>

Appendix B

Student Questionnaire
(Curriculum Evaluation Instrument)

Tear off this sheet After test completed

**YOUTH AT WORK:
Work Experience/Work Safety Questionnaire**

MARKING INSTRUCTIONS

- Use a pencil.
- Make heavy dark marks that fill the circle completely.
- If using a pencil, erase cleanly any answer you wish to change
- Make no stray marks on this questionnaire.

CORRECT MARK



INCORRECT MARKS



**Place Student
Label Here**



DO NOT WRITE IN THIS AREA

The next set of questions asks about your opinions about workplace injuries and what a worker can do to avoid them. In answering the questions, think about jobs you have had or what you know about working in general. Mark a number from 1 to 5 for each item that indicates how much you agree with the statement. It is important that your answer indicate what you REALLY think rather than what you SHOULD think.

- | | Strongly
Agree | Strongly
Disagree |
|--|-------------------|----------------------|
| 12. If I have to choose between completing my job quickly or safely, I would always choose, to be safe | ① | ② ③ ④ ⑤ |
| 13. If protective clothing such as goggles were uncomfortable, I would not wear it on the job if I could get away with it | ① | ② ③ ④ ⑤ |
| 14. There should be no child labor laws, such as those that do not allow hiring of teens for some types of jobs, since they decrease opportunities for teens to work | ① | ② ③ ④ ⑤ |
| 15. I have a responsibility to fellow workers to try to do something about unsafe work situations | ① | ② ③ ④ ⑤ |
| 16. I would find it difficult to ask co-workers to change the way they are doing a job in order to make the workplace safer | ① | ② ③ ④ ⑤ |
| 17. A workplace injury or illness could happen to me sometime in my working life | ① | ② ③ ④ ⑤ |
| 18. A <u>serious</u> workplace injury or illness could happen to me sometime in my working life | ① | ② ③ ④ ⑤ |
| 19. I will less likely to be injured at work if I try to identify and change unsafe conditions | ① | ② ③ ④ ⑤ |
| 20. Serious workplace injuries happen to other people - they won't happen to me | ① | ② ③ ④ ⑤ |
| 21. There is no real need for laws that protect workers | ① | ② ③ ④ ⑤ |
| 22. I am not concerned about the possibility of being injured in work situations | ① | ② ③ ④ ⑤ |

- | | Strongly
Agree | Strongly
Disagree |
|--|-------------------|----------------------|
| 23. I wouldn't know what steps to take if I notice an unsafe condition at work | ① | ② ③ ④ ⑤ |
| 24. Worrying about workplace safety would make me look like a geek to the people I work with | ① | ② ③ ④ ⑤ |
| 25. An individual worker's effort to make a workplace safer can make a difference | ① | ② ③ ④ ⑤ |
| 26. When I try to do something about unsafe work situations, I am making the workplace safer for fellow workers | ① | ② ③ ④ ⑤ |
| 27. It is worth the extra time to take safety precautions at work | ① | ② ③ ④ ⑤ |
| 28. Workers have a responsibility to look for unsafe situations in the workplace | ① | ② ③ ④ ⑤ |
| 29. Most work situations are so safe that there is no need to be concerned about workplace injuries | ① | ② ③ ④ ⑤ |
| 30. I would be good at convincing an employer to make a hazardous work situation safer | ① | ② ③ ④ ⑤ |
| 31. If it helps me finish my job faster, I might remove protective equipment, such as shields and guards, on machinery | ① | ② ③ ④ ⑤ |
| 32. There is no need to be concerned about workplace injuries and illnesses since most are not serious | ① | ② ③ ④ ⑤ |
| 33. I'm confident that I could come up with good suggestions to make a dangerous work situation safer | ① | ② ③ ④ ⑤ |

34. Many workplace injuries result in death, permanent changes in appearance, or long-term disability Strongly Agree (1) (2) (3) (4) (5) Strongly Disagree
35. There is not much an individual worker can really do to prevent workplace injuries or illnesses (1) (2) (3) (4) (5)
36. Serious workplace injuries are so rare that they are really not worth worrying about (1) (2) (3) (4) (5)
37. If I had a serious workplace injury, it could change what I do with my life (1) (2) (3) (4) (5)
38. I would be very reluctant to talk to an employer about unsafe conditions I'd noticed at the workplace (1) (2) (3) (4) (5)
39. Alerting an employer to unsafe conditions at the workplace often wouldn't do any good (1) (2) (3) (4) (5)
40. Working quickly is more important than working safely (1) (2) (3) (4) (5)
41. I will be less likely to be injured at work if I follow worksite safety rules (1) (2) (3) (4) (5)
42. If it would make my job faster, I might choose not to wear recommended protective clothing, such as gloves, dust masks or goggles (1) (2) (3) (4) (5)
43. How confident are you that you could do the following in you current workplace or in places where you might be employed in the future? Mark a number 1 to 5 that indicates your level of confidence.
- (a) identify most unsafe conditions or hazards that exist in the workplace Very confident (1) (2) (3) (4) (5) Not at all confident
- (b) point out to your employer a work situation that you think is unsafe (1) (2) (3) (4) (5)
- (c) convince your employer to take steps to make a hazardous work situation safer (1) (2) (3) (4) (5)

- (d) ask co-workers to change the way they're doing a job to make the workplace safer Very confident (1) (2) (3) (4) (5) Not at all confident
- (e) come up with good suggestions to make a dangerous work situation safer (1) (2) (3) (4) (5)

The next questions are about laws regulating labor, types of workplace hazards and what you might do to prevent workplace injuries.

44. Please indicate whether you think these statements are true or false by marking 1 for "true", 2 for "false", or 3 for "don't know".
- | | True | False | Don't Know |
|---|------|-------|------------|
| (a) By law, employers are required to provide a safe and healthy workplace | (1) | (2) | (3) |
| (b) Employers are not required to pay for your medical care if you get sick or hurt from the job | (1) | (2) | (3) |
| (c) It is illegal for your employer to fire or punish you for reporting a workplace safety problem | (1) | (2) | (3) |
| (d) There are no restrictions on the time of day that people under 18 can work | (1) | (2) | (3) |
| (e) Teens younger than 16 are not allowed to work with power-driven equipment, such as lawn mowers and snow blowers | (1) | (2) | (3) |
| (f) By law, a person under 14 cannot be employed at all | (1) | (2) | (3) |
| (g) The most effective way of preventing workplace injuries is to educate workers about workplace hazards and available safety measures | (1) | (2) | (3) |
| (h) I could safely hold my breath and go into a room with toxic gas in order to rescue someone | (1) | (2) | (3) |

45. Pretend for a moment that you are working in a fast food restaurant like McDonald's. Can you think of anything in the workplace that might cause an injury or illness?

- No. I can't think of a possible hazard.
- Yes, a possible hazard might be: _____

46. Can you give an example of a danger in a workplace that might result in a health problem, but not until years after you were exposed to it?

- No. I can't think of an example.
- Yes, the following is an example: _____

47. Which of the following is the MOST effective method for preventing injuries at work?

- Educating workers about how to do their jobs more safely
- Changing the workplace environment to make it safer
- Setting up rules and procedures for workers to follow that will make their jobs safer

The next few items are about what you think you will do regarding workplace safety in your future working life. On a scale of 1 to 5 when "1" means "Always" and "5" means "Never", for each item mark the number that indicates how often you think you will take action. **It is important that your answers reflect what you think you will really do rather than what you think you should do.**

48. If I see an unsafe situation at work, I will do what I can to make it safer Always Never
..... ① ② ③ ④ ⑤

49. I will use required protective equipment and follow worksite safety rules ① ② ③ ④ ⑤

50. I will check places where I work for unsafe conditions ① ② ③ ④ ⑤

51. I will talk to my employer about working conditions that I think are unsafe Always Never
..... ① ② ③ ④ ⑤

52. When lifting something that seems too heavy, I will ask for help ① ② ③ ④ ⑤

53. I will talk to my employer about working conditions that I believe are illegal ① ② ③ ④ ⑤

The next few items refer to people you know

54. Of all the adults you know personally, think of one you see as a role model. Would that person rank work safety above speed, productivity and comfort on the job?

- Yes, definitely
- Yes, probably
- I'm not sure
- No, probably not
- No, definitely not

55. Of all the students you go to school with, how many would rank work safety above speed, productivity and comfort on the job?

- Almost all
- More than half
- About half
- Less than half
- Almost none

56. In which grade are you?

- 9th
- 10th
- 11th
- 12th

57. Your date of birth

Mo.		Day		Year	
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9



58. What gender are you?

- Female Male

59. Do you live on a farm?

- No Yes

60. What are your initials?

First	Mid.	Last
A	A	A
B	B	B
C	C	C
D	D	D
E	E	E
F	F	F
G	G	G
H	H	H
I	I	I
J	J	J
K	K	K
L	L	L
M	M	M
N	N	N
O	O	O
P	P	P
Q	Q	Q
R	R	R
S	S	S
T	T	T
U	U	U
V	V	V
W	W	W
X	X	X
Y	Y	Y
Z	Z	Z

61. Are you of Hispanic or Latino origin or descent?

- Hispanic or Latino
 Not Hispanic or Latino

62. Which of these groups BEST describes you?
 (Mark one or more):

- African American or Black
 American Indian or Alaskan Native
 Asian
 Native Hawaiian/Pacific Islander
 White or Caucasian
 Other (please specify) _____

63. Mark the number that indicates the HIGHEST level of education that your father (or male guardian) and mother (or female guardian) received. (Mark one number of each parent or guardian)

	Father or male guardian	Mother or female guardian
Did not graduate from high school.....	①	①
Graduated from high school.....	②	②
Attended vocational or business school after high school graduation	③	③
Attended college but did not graduate.....	④	④
Graduated from college.....	⑤	⑤
Don't have one.....	⑥	⑥
I don't know	⑦	⑦

64. How often have you done the following?

(a) Something dangerous just for the thrill of it

- Never 7-10 times
 Once 11-20 times
 2-3 times 21 or more times
 4-6 times

(b) Some pretty risky things because it was exciting

- Never 7-10 times
 Once 11-20 times
 2-3 times 21 or more times
 4-6 times

65. Today's Date

Mo.	Day	Year
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

Thank you for completing this questionnaire.

This questionnaire has been developed by the Minnesota Department of Health for the grant Youth at Work
 Minnesota Department of Health, 717 Delaware Street S.E., Minneapolis, Minnesota 55440-9441

Appendix C

Youth at Work Recruitment Materials:

- (1) Fact Sheet with Logo
- (2) Curriculum Brochure
- (3) Letter from Health Commissioner
- (4) Letter from Study Directors



Youth at Work

A Partnership for Adolescent Work Safety

About our Partnership

The *Youth at Work* partnership is comprised of teachers, school administrators, parents, public health personnel and people concerned with adolescent work safety. Initial studies at the Minnesota Department of Health (MDH) show that Minnesota youth residing in Greater Minnesota are working long hours both in farm and non-farm work. When compared to adults, adolescents are injured at nearly twice the rate of adults.

Through a scientific research grant from the National Institute for Occupational Health and Safety (NIOSH), the *Youth at Work* partnership received funding to further investigate the issues of adolescent work safety in Greater Minnesota. The NIOSH study also provides the MDH with the opportunity to further evaluate the impact of the *Work Safe Work Smart* curriculum. *Work Safe Work Smart* was designed in conjunction with Minnesota high school teachers to try to reduce the number of workplace injuries and fatalities among our young adults.

By joining the *Youth at Work* study partnership your school is providing national health leadership in protecting one of our most valuable resources, our young people. We encourage you to read on and discover what *Youth at Work* can do for the students in your school.

Youth at Work Grant Activities

Youth at Work is a partnership with educators and other interested individuals across the state whose goal is to better understand the work habits of our youth living in Greater Minnesota and to try to reduce unintentional injury among our adolescents.

Our goal is to accomplish this by working with schools to:

- learn how many students work, what kinds of jobs they are doing and what types of injuries they have had;
- work with educators to teach a curriculum designed to reduce injury (*Work Safe Work Smart*); and
- evaluate the impact of the *Work Safe Work Smart* curriculum in reducing work injury in young adults.

What Partnership Schools Provide

- Professional staff to teach a curriculum designed to reduce students' risk of work-related injury in their current and future work life.
- Student input toward understanding both work patterns and injury incidence among young adults.

What We Will Offer Participating Schools

- School specific reports on work and injury information we have learned from your students.
- A teacher-developed and teacher-tested curriculum, *Work Safe Work Smart*, that focuses on reducing the number of working youth that are injured or die each year.
- Financial reimbursement for activities associated with *Youth at Work*.

What Your School Will Be Asked To Do

- Schedule several brief meetings and agree to complete specific study activities. Study tasks can be delegated to a teacher or administrative liaison.
- Students complete surveys throughout the course of two school years. Each survey will be completed within one class period.
- Schools will be asked to either teach the *Work Safe Work Smart* curriculum or serve as a control school. Students in control schools will complete surveys as mentioned above.

For More Information Contact:

*Debora Boyle or Teresa Hillmer
Minnesota Department of Health
717 Delaware Street S.E. P.O. Box 9441
Minneapolis, MN 55440-9441
Phone 612-676-5216 Toll Free 1-888-642-8498*

Why is workplace safety important?

Work is a big part of most teenagers' lives. By the 12th grade, at least 80% of Minnesota teens have held at least one job.

Work can also be dangerous. Every week in Minnesota, on average, one to two people die at work, eight to ten lose a finger, and 10 to 20 develop work related cancer, and 3,000 sustain other injuries.

Work Safe Work Smart is an interactive curriculum designed to help keep teens safe at work. Along with Minnesota teachers, experts in the field of Occupational Health & Safety developed a curriculum to help reduce workplace injuries among teenagers and keep our kids safe.

Who is Work Safe Work Smart for?

This curriculum is designed for students in grades 9-12.

Work Safe Work Smart equips students with: prevention strategies that will protect them from injuries or illnesses in a variety of workplace settings, knowledge of workplace laws, and the skills needed to advocate for a safe workplace in any setting.

Administration Building Barriers Communication

WORK
SAFE

WORK
SMART

KNOWLEDGE AND SKILLS FOR A LIFE AT WORK

F A CT:

Virtually all Americans have held regular jobs by the time they reach 20 years of age. Injuries are common; almost 10% of working teenagers are injured at work each year.

F A CT:

In a New York state study, agriculture, which employs only 3% of working adolescents, was the second most dangerous occupation for teens, accounting for the highest number of injuries among 16- and 17-year-old workers. Farming consistently has been identified as Minnesota's most hazardous occupation.

F A CT:

Of those 14- to 16-year olds who were injured in the workplace, more than half reported they had not received any training on how to prevent the injury. A supervisor was present at the time of the injury in only about 20% of the cases.

F A CT:

Passage of the Fair Labor Standards Act of 1938 placed, for the first time in U.S. history, federal limitations on the types of nonagricultural work permitted for children and adolescents under the age of 18.

F A CT:

Most injuries are preventable and, with the right prevention steps, can be avoided.

A HEALTH AND SAFETY CURRICULUM FOR REDUCING WORKPLACE INJURIES AMONG TEENAGERS

WORK
SAFE

WORK
SMART

Facts about the Curriculum

National studies indicate that working youth are getting hurt at nearly twice the rate of working adults. The Work Safe Work Smart curriculum was developed in response to this disturbing rate of illness and injury.

Goals of the Curriculum

- Raise student awareness of workplace hazards that cause injuries or illness
- Equip students with prevention strategies that will protect them from injuries or illness in a variety of workplace settings
- Raise student awareness of employer/ee rights in the workplace
- Raise student awareness of the laws and resources available to help maintain those rights
- Encourage students to be active participants in creating safe and healthy work environments.

Work Safe Work Smart will help your students

- Recognize workplace hazards
- Know their rights in the workplace
- Develop skills to create safe and healthy work environments.

Target Audience

The lessons in this curriculum target students in grades 9-12. With some adaptation, these lessons could also be used with a younger audience.



Key Components of the Curriculum

Lessons were designed and developed to integrate existing social studies, health, agriculture, career and school-to-work subject areas. The curriculum was developed with Minnesota teachers and tested in Minnesota classrooms.

Length of the Curriculum

This curriculum consists of nine, 50-minute lessons to guide teachers in exploring occupational health and safety issues. The timing of lessons can be modified to complement and enhance existing subject areas.

Funding

Work Safe Work Smart was made possible through a grant from the National Institute for Occupational Safety and Health (NIOSH). The curriculum was designed by staff from the Minnesota Department of Health and teachers in Minnesota schools.

Pathways of Exposure

Physical Hazards

Energy is transferred to a worker in a variety of ways:

Heat (burns)



Falling objects



Falling from heights



Each Lesson of Work Safe Work Smart Provides You With:

Teacher Tips:
Tips from teachers who tested the curriculum in Minnesota Classrooms.

Facts:
Interesting facts that help put a particular lesson into perspective.

Descriptions:
Brief description of lesson activities.

Learner Outcomes:
Intended cognitive, attitudinal, and behavioral outcomes for the lesson.

Key Concepts:
Summarize key concepts of the lesson.

Directions:
Step-by-step instructions for completing the lesson, including a lesson script in bold type.

Taking it Home:
Homework assignments to be completed in preparation for the next class lesson.

Resources:
Overheads, handouts, and supplies to be used in the lesson.

To Receive a Copy:

For a FREE copy of the Work Safe Work Smart curriculum, contact Deb Hill at 612-676-5213, 1-888-642-8498, or Deborah.hill@health.state.mn.us. The curriculum can also be downloaded from the Center of Occupational Health website at www.health.state.mn.us/divs/ncpcd/cdeo/occhealth.





Protecting, maintaining and improving the health of all Minnesotans

Date, 2001

Principal
High School
Street
City, MN Zip

Dear Principal _____

I am writing to request your participation in the *Youth at Work* research study. We are excited to report that the Minnesota Department of Health recently received funding from the National Institute for Occupational Safety and Health (NIOSH) to collect information on injury to high school students and evaluate the impact of the Work Safe Work Smart curriculum on these students. The Work Safe Work Smart curriculum was developed in collaboration with Minnesota teachers and state public health personnel.

This project is a statewide expansion of efforts that were initially pilot tested in Meeker, McLeod and Sibley county high schools. Because working adolescents are at higher risk for unintentional injury and death, we believe the implementation of this project is an important component to protecting the health of our young adults.

In the near future a staff member from the Minnesota Department of Health will be contacting you to arrange a convenient time to meet. Minnesota has an opportunity to lead the nation in understanding the number of injuries and death among our working adolescents. It is our hope that you will join our efforts to help keep our rural youth working safe, thus assuring them the opportunity to lead a productive and fulfilling life.

Sincerely,

Jan K. Malcolm
Commissioner
P.O. Box 64882
St. Paul, MN 55164-0882

cc: Superintendent _____



Protecting, maintaining and improving the health of all Minnesotans

February 26, 2001

Principal
Senior High School
Street
City, Minnesota Zip

Dear:

Your school is one of only 41 high schools in Minnesota that have been selected to participate in the *Youth at Work* research study. The Minnesota Department of Health recently received federal funding to improve our understanding of the amount and type of work our adolescents in Greater Minnesota are doing and to reduce the number of injuries at work by implementing an educational intervention. We are writing to request your help with this very important statewide study.

You may know firsthand that working adolescents are at greater risk for both permanent and temporary injury than adult workers. In the United States injuries at work cause approximately 70 adolescents to die each year and over 10,000 to seek emergency room treatment. Through *Youth at Work* we are collecting statewide information on work and injury to adolescents, evaluating the impact of a work safety curriculum in reducing work injury and analyzing the results of the data. Your school will be provided reports describing the impact of work and injury on your students.

We would like the opportunity to meet with you and school staff to describe the *Youth at Work* research study in more detail. In the near future we will be contacting you to answer any questions you may have about the study and set-up a convenient time to meet. If you have any questions, please contact us at 612-676-5216 or 1-888-642-8498.

Sincerely,

A handwritten signature in black ink, appearing to read "Debora Boyle".

Debora Boyle, D.V.M., Ph.D.
Director, Youth at Work

A handwritten signature in black ink, appearing to read "Teresa Hillmer".

Teresa Hillmer, M.P.H., Ph.D.
Director, Youth at Work

cc:

Appendix D

Notification Letters to Parents



Protecting, maintaining and improving the health of all Minnesotans

August 27, 2001

Dear Parent/Guardian:

The *Youth at Work* partnership through the Minnesota Department of Health is comprised of teachers, school administrators, parents, and public health personnel concerned with adolescent work safety. You may know firsthand that working adolescents are at greater risk for both permanent and temporary injury than adult workers. The purpose of this letter is to give you an overview of *Youth at Work* and contact information should you have any questions.

Through *Youth at Work* we are collecting statewide information on work and injury to adolescents, evaluating the impact of a work safety curriculum in reducing work injury, and analyzing the results of the data. The school that your child attends is one of the high schools selected to participate in this study. Students will be asked to complete short surveys in the Fall and the Spring about their work habits and any injuries that may occur to them. The surveys take between 15 and 30 minutes to complete. All information obtained in these surveys will be confidential, and the identity of participants will not be released to others nor will identifiable information be included in any reports. Some schools also will be asked to teach a few classes in selected courses to address workplace injury. We know of no risks to your child that may result from the *Youth at Work* activities, and benefits include an increased knowledge and awareness of occupational health and safety.

Your child does not have to participate if either you or your child do not want to, and participating, or not participating, in the *Youth at Work* activities will not affect you, your child, or your relationships with the participating school in any way. If you have any questions about these activities, please contact Cynthia Hickman or Deborah Merchant at the Minnesota Department of Health at (888) 642-8498. If we do not hear from you by September 14, 2001, we will assume that we have your consent to allow your child to participate in the *Youth at Work* activities as listed above.

Sincerely,

A handwritten signature in black ink, appearing to read "Debora Boyle".

Debora Boyle, D.V.M., Ph.D.
Director, Youth at Work

A handwritten signature in black ink, appearing to read "Teresa Hillmer".

Teresa Hillmer, M.P.H., Ph.D.
Director, Youth at Work

September 18, 2001

Dear Parent/Guardian:

The *Youth at Work* partnership through the Minnesota Department of Health is comprised of teachers, school administrators, parents, and public health personnel concerned with adolescent work safety. You may know firsthand that working adolescents are at greater risk for both permanent and temporary injury than adult workers. The purpose of this letter is to give you an overview of *Youth at Work* and contact information should you have any questions.

Through *Youth at Work* we are collecting statewide information on work and injury to adolescents, evaluating the impact of a work safety curriculum in reducing work injury, and analyzing the results of the data. The school that your child attends is one of the high schools selected to participate in this study. Students will be asked to complete short surveys in the Fall and the Spring about their work habits and any injuries that may occur to them. The surveys take between 15 and 30 minutes to complete. All information obtained in these surveys will be confidential, and the identity of participants will not be released to others nor will identifiable information be included in any reports. Some schools also will be asked to teach a few classes in selected courses to address workplace injury. We know of no risks to your child that may result from the *Youth at Work* activities, and benefits include an increased knowledge and awareness of occupational health and safety.

Your child does not have to participate. If your child does or does not participate in the *Youth at Work* activities it will not affect you, your child, or your relationships with the participating school in any way. If you have any questions about these activities, please contact Cynthia Hickman or Deborah Merchant at the Minnesota Department of Health at (888) 642-8498. If we do not hear from you by October 10, 2001, we will assume that we have your consent to allow your child to participate in the *Youth at Work* activities as listed above.

Sincerely,

Deborah Merchant, M.S.
Project Director Youth at Work

Cynthia D. Hickman, M.P.H.
Project Director Youth at Work

Appendix E

OHRP Instructions to Schools



Protecting, maintaining and improving the health of all Minnesotans

DATE

NAME
SCHOOL
ADDRESS
CITY, STATE ZIP

DEAR NAME:

Thank you for agreeing to participate in the Minnesota Department of Health (MDH) Youth at Work project. Because Youth at Work is considered a human subject research project and is funded through the Centers for Disease Control and Prevention (CDC), there are two requirements that must be completed prior to SCHOOL NAME'S participation.

The first requirement is an online training from the Office of Human Research Protection (OHRP) called the Human Subject Assurance Training. This training can be located at:

http://137.187.172.201/cbttng_ohrp/default.asp?CBTID=2

The training site consists of three modules providing information required by OHRP. Each module should be completed by the designated Youth at Work Signatory Official of SCHOOL NAME. The modules are not lengthy, and step by step log on instructions enable the Signatory Official to complete the required OHRP Human Subject Assurance Training. A printable certificate verifies completion of training.

The second requirement is the enclosed and comes from the U.S. Department of Health and Human Services (DHHS). This document is known as the Federalwide Assurance of Protection for Human Subjects (FWA). The FWA identifies responsible parties related to human subject research. Areas shaded in gray refer to International Institutions and are not pertinent to SCHOOL NAME's participation.

Also enclosed for your information is a copy of the Belmont Report. This document is referenced in the FWA and outlines ethical principles for all participants in the Youth at Work project.

To assure uninterrupted project participation:

- Log on to the OHRP Assurance Training web site
http://137.187.172.201/cbttng_ohrp/default.asp?CBTID=2
- **Complete all three** Human Subject Protection Training modules
- **SIGN** your FWA
- **Return your completed FWA** to me at MDH within 10 business days of receipt of this letter.

If you have any concerns, questions or comments regarding either document please do not hesitate to contact me by phone at (888) 642-8498 or by email at cynthia.hickman@health.state.mn.us or the address listed below.

Looking forward to working with you on this project.

Sincerely,

Cynthia D. Hickman, M.P.H.
State Program Administrative Coordinator
Youth at Work

Enclosures

Appendix F

Teacher Checklists for Each Lesson



Teacher's name

School name

Teacher Checklist Lesson 1 - An Introduction to Worker Safety

Date	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___
Class Period					
Number of students in class					
Number of students absent					
Did you do the following:					
1.1 assigned a simulated disability to each student	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
1.2 asked the students about their work experience	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
1.3 asked students about their occupational injury experience	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
1.4 listed injuries from students experience on the overhead	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
1.5 defined the term workplace hazard	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
1.6 handed out Hazard Fact sheets	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
1.7 assigned the writing exercise describing the disability simulation experience	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
If no to any of the above, please explain the reason.					

How comfortable were you teaching the material in this lesson?	<p>Not at all Extremely</p> <p><u>comfortable</u> <u>comfortable</u></p> <p>1 2 3 4 5 6 7</p>
How would you rate the students' participation in this lesson?	<p>No Very high</p> <p><u>Participation</u> <u>participation</u></p> <p>1 2 3 4 5 6 7</p>
Lesson taught by	<p>1. Classroom Teacher</p> <p>2. Substitute Teacher</p> <p>3. Other (please specify)</p> <p style="text-align: center;">_____</p>

Comments about this lesson:

Please describe any additional activities you included in this lesson.



Teacher's name _____

School name _____

Teacher Checklist

Lesson 2 - Recognizing Workplace Hazards

Date	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___
Class Period					
Number of students in class					
Number of students absent					
Did you do the following:					
2.1 asked students to describe their simulated disability experience	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
2.2 used the Overhead 2.1 to describe temporary vs. permanent illness/injuries and immediate vs. later in life	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
2.3 explained pathways of exposure to physical, biologic and chemical hazards using Overheads 2.2 and 2.3	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
2.4 demonstrated hazard mapping using grocery store layout Overhead 2.4	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
2.5 divided class into groups of four or less and assigned hazard mapping exercise	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
2.6 had each group show the class their maps	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
2.7 handed out Worker Safety Attitude Survey	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes

If no to any of the above, please explain the reason.

How comfortable were you teaching the material in this lesson?	<p>Not at all Extremely</p> <p><u>comfortable</u> <u>comfortable</u></p> <p>1 2 3 4 5 6 7</p>
How would you rate the students' participation in this lesson?	<p>No Very high</p> <p><u>Participation</u> <u>participation</u></p> <p>1 2 3 4 5 6 7</p>
Lesson taught by	<p>1. Classroom Teacher</p> <p>2. Substitute Teacher</p> <p>3. Other (please specify)</p> <p style="text-align: center;">_____</p>

Suggestions changes to this lesson:

Please describe any additional activities you included in this lesson.



Teacher's name

School name

Teacher Checklist

Lesson 3 - Preventing Workplace Injuries and Illnesses

Date	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___
Class Period					
Number of students in class					
Number of students absent					
Did you do the following:					
3.1 handed out ABC Prevention Strategies fact sheet	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
3.2 used Overheads 3.1-3.4 to review ABCs of prevention	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
3.3 explained that the best prevention is to change the work environment	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
3.4 handed out Hazard Prevention worksheet	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
3.5 listed examples of hazards that caused the injuries the class gave during Lesson 1 (Overhead 1.1)	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
3.6 listed prevention strategies for each of the injuries/hazards listed on Overhead 1.1	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
3.7 handed out example of Material Safety Data Sheet (MSDS)	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
3.8 facilitated discussion on why people might take risks with their safety	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
3.9 used Overhead 3.13 to list benefits and costs of a prevention strategy	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes

If no to any of the above, please explain the reason.

How comfortable were you teaching the material in this lesson?	<p>Not at all Extremely</p> <p><u>comfortable</u> <u>comfortable</u></p> <p>1 2 3 4 5 6 7</p>
How would you rate the student's participation in this lesson?	<p>No Very high</p> <p><u>Participation</u> <u>participation</u></p> <p>1 2 3 4 5 6 7</p>
Lesson taught by	<p>1. Classroom Teacher</p> <p>2. Substitute Teacher</p> <p>3. Other (please specify)</p> <p style="text-align: center;">_____</p>

Comments about this lesson:

Please describe any additional activities you included in this lesson.



Teacher's name

School name

Teacher Checklist

Lesson 4 - Applying Prevention Strategies in the Workplace

Date	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___
Class Period					
Number of students in class					
Number of students absent					
Did you do the following:					
4.1 described a workplace safety team to students	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
4.2 divided students into groups of four or less and provided each team with a workplace scenario, an overhead map, markers, and safety team assignment	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
4.3 explained the workplace action plan using Overhead 4.1	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
4.4 required students to develop plans to prevent injuries/illness for at least four of the hazard they identified	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes

If no to any of the above, please explain the reason.

How comfortable were you teaching the material in this lesson?	<p>Not at all Extremely</p> <p><u>comfortable</u> <u>comfortable</u></p> <p>1 2 3 4 5 6 7</p>
How would you rate the student's participation in this lesson?	<p>No Very high</p> <p><u>Participation</u> <u>participation</u></p> <p>1 2 3 4 5 6 7</p>
Lesson taught by	<p>1. Classroom Teacher</p> <p>2. Substitute Teacher</p> <p>3. Other (please specify)</p> <p style="text-align: center;">_____</p>

Comments about this lesson:

Please describe any additional activities you included in this lesson.



Teacher's name

School name

Teacher Checklist

Lesson 5 - Applying Prevention Strategies in the Workplace, Part II

Date	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___
Class Period					
Number of students in class					
Number of students absent					
Did you do the following:					
5.1 handed out copies of Presentation Evaluation form to each student	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
5.2 explained each part of the evaluation form	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
5.3 required student groups to present safety plan	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
5.4 reviewed key points in unit	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
5.5 handed out ABC cards to students	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes

If no to any of the above, please explain the reason.

How comfortable were you teaching the material in this lesson?	<p>Not at all Extremely</p> <p><u>comfortable</u> <u>comfortable</u></p> <p>1 2 3 4 5 6 7</p>
How would you rate the students participation in this lesson?	<p>No Very high</p> <p><u>Participation</u> <u>participation</u></p> <p>1 2 3 4 5 6 7</p>
Lesson taught by	<p>1. Classroom Teacher</p> <p>2. Substitute Teacher</p> <p>3. Other (please specify)</p> <p style="text-align: center;">_____</p>

Comments about this lesson:

Please describe any additional activities you included in this lesson.



Teacher's name

School name

Teacher Checklist

Lesson 6 - The Importance of Worker Safety Laws

Date	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___
Class Period					
Number of students in class					
Number of students absent					
Did you do the following:					
6.1 gave students copies of photographs	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
6.2 read (or paraphrased) script on Looking at the Lives of Child Laborers	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
6.3 facilitated discussion on students' reaction to the photographs	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
6.4 divided class into pairs and gave each group a Working Children scenario	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
6.5 discussed list of laws from each student group	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
6.6 handed out Worker Safety Laws fact sheet	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
6.7 assigned Examining Workplace Safety Laws homework	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes

If no to any of the above, please explain the reason.

How comfortable were you teaching the material in this lesson?	<p>Not at all Extremely</p> <p><u>comfortable</u> <u>comfortable</u></p> <p>1 2 3 4 5 6 7</p>
How would you rate the student's participation in this lesson?	<p>No Very high</p> <p><u>Participation</u> <u>participation</u></p> <p>1 2 3 4 5 6 7</p>
Lesson taught by	<p>1. Classroom Teacher</p> <p>2. Substitute Teacher</p> <p>3. Other (please specify)</p> <p style="text-align: center;">_____</p>

Comments about this lesson:

Please describe any additional activities you included in this lesson.



Teacher's name

School name

Teacher Checklist Lesson 7 - Worker Safety Laws and You

Date	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___
Class Period					
Number of students in class					
Number of students absent					
Did you do the following:					
7.1 divided class into two teams and used Looking at the Laws cards for a classroom game	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
7.2 handed out Worker Safety Situations sheets	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
7.3 discussed students' answers for the Worker Safety Situations	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes

If no to any of the above, please explain the reason.

How comfortable were you teaching the material in this lesson?	<p>Not at all Extremely</p> <p><u>comfortable</u> <u>comfortable</u></p> <p>1 2 3 4 5 6 7</p>
How would you rate the students participation in this lesson?	<p>No Very high</p> <p><u>Participation</u> <u>participation</u></p> <p>1 2 3 4 5 6 7</p>
Lesson taught by	<p>1. Classroom Teacher</p> <p>2. Substitute Teacher</p> <p>3. Other (please specify)</p> <p style="text-align: center;">_____</p>

Comments about this lesson:

Please describe any additional activities you included in this lesson.



Teacher's name

School name

Teacher Checklist Lesson 8 - Addressing Unsafe Workplace Conditions

Date	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___
Class Period					
Number of students in class					
Number of students absent					
Did you do the following:					
8.1 divided class into groups of four or less and assigned one law to two groups, one to name benefits, one drawbacks	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
8.2 listed student responses to the benefits and drawbacks on Overhead 8.1	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
8.3 discussed students' experiences where they felt pressured at work to do something that made them uncomfortable	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
8.4 explained information on the S.A.F.E. Overhead 8.2	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
8.5 gave examples of Emphasizing the Positive	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
8.6 handed out Keep Your Workplace S.A.F.E. handout	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
8.7 discussed students' responses to S.A.F.E. Communications Skills worksheet	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes

If no to any of the above, please explain the reason.

How comfortable were you teaching the material in this lesson?	<p>Not at all Extremely</p> <p><u>comfortable</u> <u>comfortable</u></p> <p>1 2 3 4 5 6 7</p>
How would you rate the student's participation in this lesson?	<p>No Very high</p> <p><u>Participation</u> <u>participation</u></p> <p>1 2 3 4 5 6 7</p>
Lesson taught by	<p>1. Classroom Teacher</p> <p>2. Substitute Teacher</p> <p>3. Other (please specify)</p> <p style="text-align: center;">_____</p>

Comments about this lesson:

Please describe any additional activities you included in this lesson.



Teacher's name

School name

Teacher Checklist Lesson 9 - Putting Work Safety into Practice

Date	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___
Class Period					
Number of students in class					
Number of students absent					
Did you do the following:					
9.1 divided class into pairs and gave each pair a role-play scenario	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
9.2 directed students in filling out the role play scenario worksheet	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
9.3 acted as employer in role play with students	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes
9.4 assigned Putting Work Safety Into Action as an in-class assignment	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes	1. No 2. Yes

If no to any of the above, please explain the reason.

How comfortable were you teaching the material in this lesson?	<p>Not at all Extremely</p> <p><u>comfortable</u> <u>comfortable</u></p> <p>1 2 3 4 5 6 7</p>
How would you rate the students participation in this lesson?	<p>No Very high</p> <p><u>Participation</u> <u>participation</u></p> <p>1 2 3 4 5 6 7</p>
Lesson taught by	<p>1. Classroom Teacher</p> <p>2. Substitute Teacher</p> <p>3. Other (please specify)</p> <p style="text-align: center;">_____</p>

Comments about this lesson:

Please describe any additional activities you included in this lesson.

Appendix G

Instructions to Teachers for Administering
Questionnaires



Protecting, maintaining and improving the health of all Minnesotans

Introduction to Work Experience/Work Safety Questionnaire

Fall, 2001

(to be read to the class by the teacher)

This is a questionnaire about work. It includes questions about your work experiences and your opinions about work and work safety and health.

When filling out this questionnaire, there are two definitions I'd like you to know.

- For the purposes of this questionnaire, the term steady job means that you worked at least once a week, either at or away from your home, including work on a family farm. The work may be either paid or unpaid.
- Another definition in this questionnaire is about injury. In this questionnaire, a work injury is an injury that happens at work and requires medical care from a doctor, nurse, chiropractor, or other medically trained person **OR** restricts normal activities for at least one day.

Please read all the directions carefully.

Think about each question. On the questions that ask for your opinion, answer as honestly as possible about what you really think.

Put only one answer for each question. If you make a mistake, erase the incorrect answer as cleanly as possible.

Hand the questionnaire in to me when you are finished.

Work Experience/Work Safety Questionnaire Instructions

Spring 2002

(For Teachers or Questionnaire Administrator)

- Distribute questionnaire to the student whose name appears on the front page.
It is **very important** the student fill out the questionnaire with the sequence number that was assigned to him/her during Fall 2001 implementation.
- Read “Introduction to Work Experience/Work Safety Questionnaire” to students.
- Make sure all students fill in their correct initials.
- After questionnaire is completed, have students remove the front sheet from the questionnaire along the perforated line.
- Collect completed questionnaires from students.
- Collect separated front sheets from students.
- Return completed questionnaires and separated front sheets to *Youth at Work* Liaison, «liaison».
- Give list of any student who did NOT COMPLETE the questionnaire to «liaison». For each of these students, please include the reason he/she did not complete the questionnaire.

If you have any questions or concerns about the administration of this questionnaire, please contact «liaison» or Cynthia Hickman at (612) 676-5182.

Introduction to Work Experience/Work Safety Questionnaire Spring 2002

(To be read to students by teacher or questionnaire administrator)

This questionnaire asks about your work experiences and your opinions about work and work safety and health.

When filling out this questionnaire, there are two definitions you need to know.

- **For the purposes of this questionnaire, the term steady job means that you worked:**
 - At least once a week
 - Either at or away from your home
 - Including work on a family farm
 - The work may be either paid or unpaid
 - **Another definition in this questionnaire is about injury. In this questionnaire, a work injury is an injury that happens:**
 - At work and restricts normal activities for at least one day;
- AND/OR**
- Requires medical care from a doctor, nurse, chiropractor, or other medically trained person.

Please read all directions carefully.

- Think about each question. On the questions that ask for your opinion, answer as honestly as possible about what you really think.
- Put only one answer for each question. If you make a mistake, erase the incorrect answer as cleanly as possible.
- Hand the questionnaire in to me when you are finished.

Appendix H

Teacher Training Evaluation Survey

WORK SAFE WORK SMART

Training Day Survey

August, 2001

With 1 being “Strongly Disagree” and 5 being “Strongly Agree” please circle the number which reflects your response to each of the following questions.

1. My comprehension of workplace health & safety has improved as a result of this training.

1 2 3 4 5

2. The child labor law presentation contributed to my knowledge of the material.

1 2 3 4 5

3. As a result of this training, I feel confident teaching this curriculum.

1 2 3 4 5

4. I understand how the Work Safe Work Smart curriculum fits into what I teach.

1 2 3 4 5

5. This topic is relevant to the students I teach.

1 2 3 4 5

(continue on back)

Please answer the following questions:

The things I really enjoyed about this training were-

The things I didn't like about this training were-

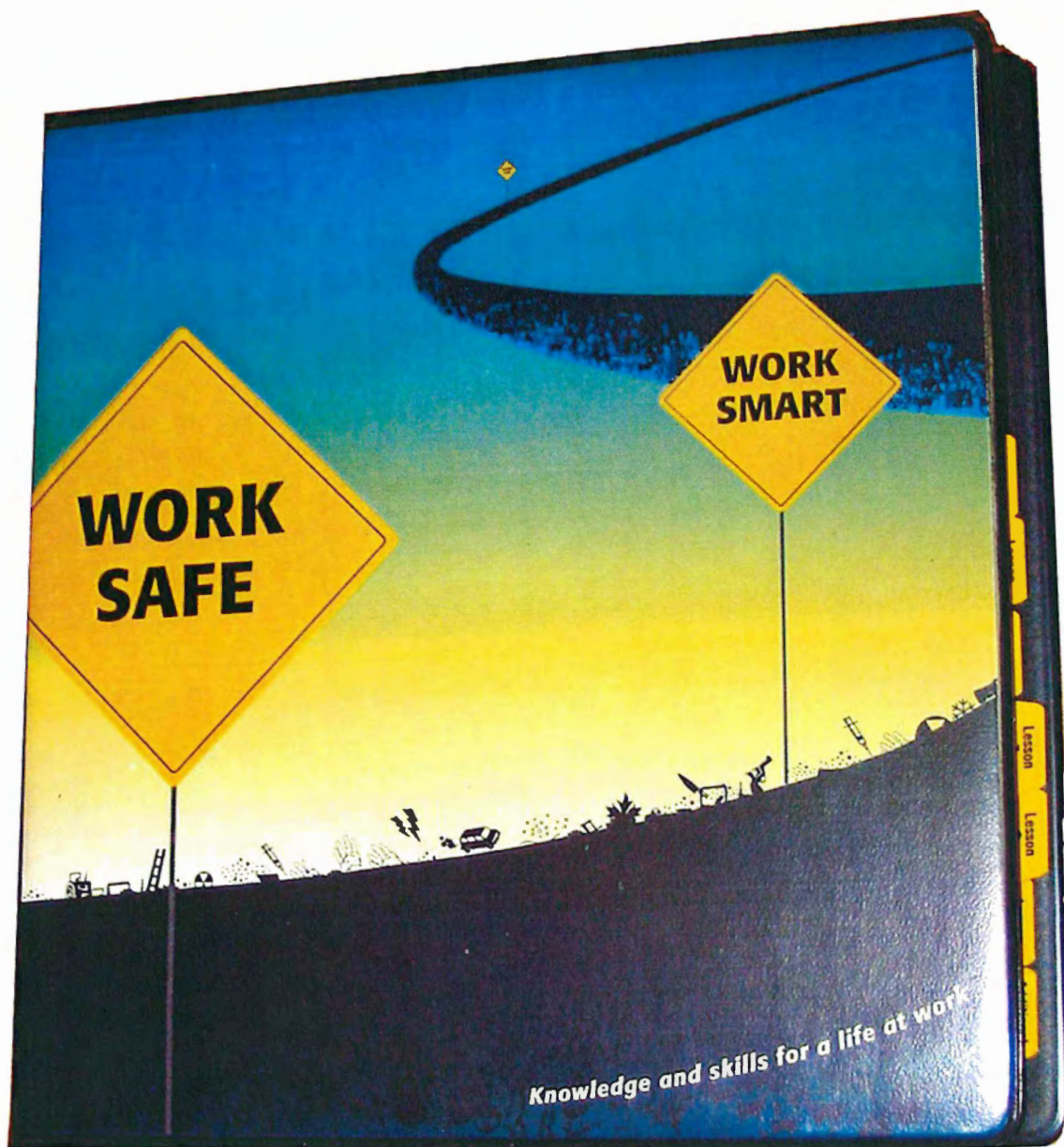
My suggestions for improving this training are-

Additional comments:

Appendix I

Curriculum Binder Cover

Work Safe Work Smart Curriculum Binder Cover

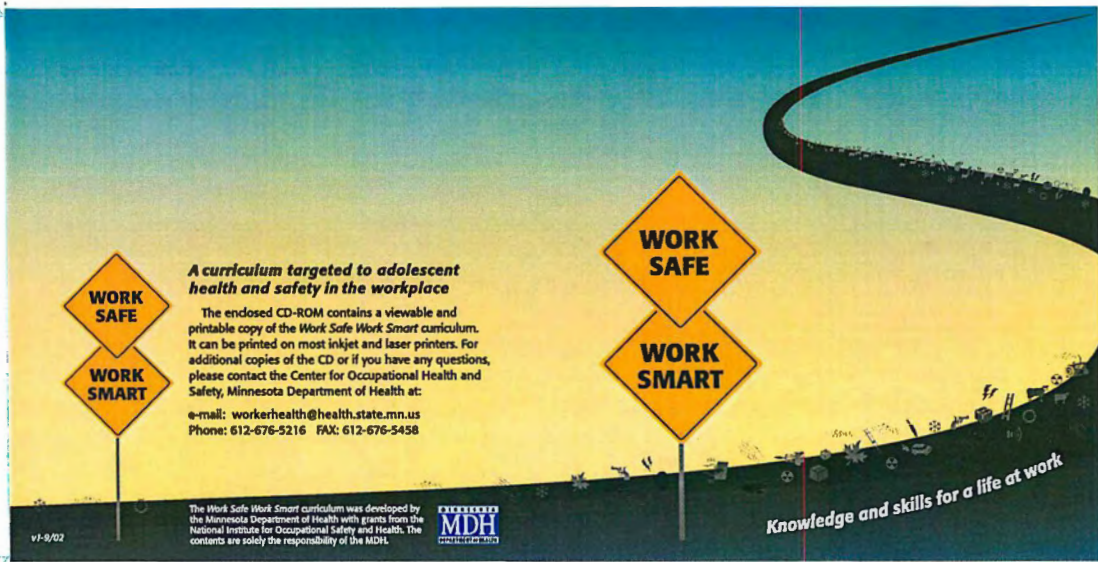


Appendix J

Curriculum CD Jacket



inside panel



A curriculum targeted to adolescent health and safety in the workplace

The enclosed CD-ROM contains a viewable and printable copy of the *Work Safe Work Smart* curriculum. It can be printed on most inkjet and laser printers. For additional copies of the CD or if you have any questions, please contact the Center for Occupational Health and Safety, Minnesota Department of Health at:

e-mail: workerhealth@health.state.mn.us
Phone: 612-676-5216 FAX: 612-676-5458

The Work Safe Work Smart curriculum was developed by the Minnesota Department of Health with grants from the National Institute for Occupational Safety and Health. The contents are solely the responsibility of the MDH.



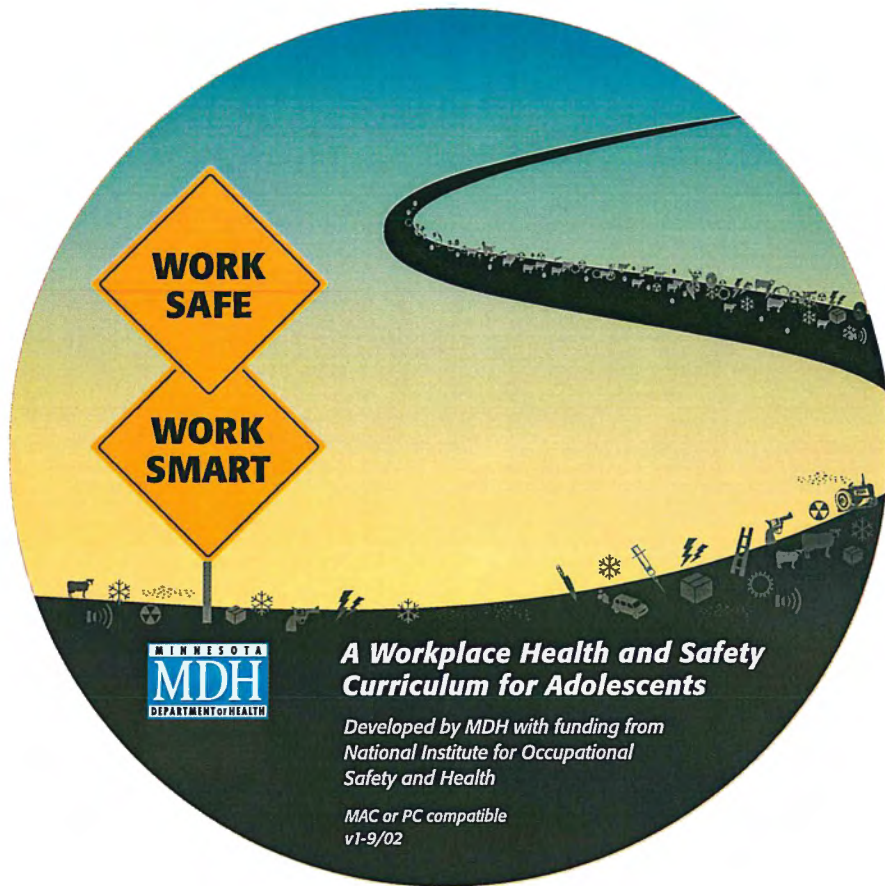
Knowledge and skills for a life at work

back cover

front cover

Appendix K

Curriculum CD Label



**WORK
SAFE**

**WORK
SMART**



***A Workplace Health and Safety
Curriculum for Adolescents***

*Developed by MDH with funding from
National Institute for Occupational
Safety and Health*

*MAC or PC compatible
v1-9/02*