



AFNR CAREER CLUSTER SKILLS

TEACHER RESOURCE GUIDE:
GRAIN SAFETY EXAMPLE

FOUNDATIONAL SAFETY
RELATED TECHNICAL
KNOWLEDGE AND SKILLS





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TEACHER RESOURCE GUIDE: GRAIN SAFETY EXAMPLE

► INTRODUCTION

The SAY Project has developed a National Clearinghouse that assists youth educators with identifying agricultural safety and health curriculum and educational resources that align with to Agriculture, Food and Natural Resources (AFNR) Career Cluster Content Standards.

The purpose of this resource guide is to highlight examples of specific curricula provided in the SAY Clearinghouse and suggestions for integrating the resource within your current classroom activities. This teacher resource guide focuses on two curriculum resources that align to the standard:

- CS.03. *Examine and summarize the importance of health, safety and environmental management systems in AFNR workplaces.*

Within the teacher resource guide, you will find:

1. **Overview** • An overview of the sampled curriculum
Against the Grain: Safe Grain Storage and Handling for Young and Beginning Workers
2. **Standards Alignment** • How the curriculum aligns to the standards
3. **Sample Objectives** • Sample objectives you can use
4. **Activities** • Descriptions of activities provided in the curriculum
5. **Personalized Sample Activities** • Ideas of additional activities you can utilize
6. **Evaluation** • How students' learning can be evaluated

▶ AGAINST THE GRAIN: SAFE GRAIN STORAGE AND HANDLING FOR YOUNG AND BEGINNING WORKERS

Against the Grain is a series of resources developed by the Purdue University Agricultural Safety and Health Program. The course offers a general outline of the safety procedures used when working with grain storage operations.

Against the Grain is a resource to provide basic-awareness level safety and health training needed by youth interested in employment, or who have been recently employed, in the commercial grain industry, or who already work on family operated farms with grain storage operations. The desired outcome is a reduction in the number of injuries and fatalities involving youth engaged in grain storage and handling activities.

Figure 1. shows the landing page for Against the Grain. The course organizes material in five units. Each unit focuses on a specific aspect of grain safety.

1. **Orientation**
2. **Confined Space**
3. **Summary of Grain-related Incidents Involving Youth**
4. **Working Safely Around Grain**
5. **Emergency response strategies**

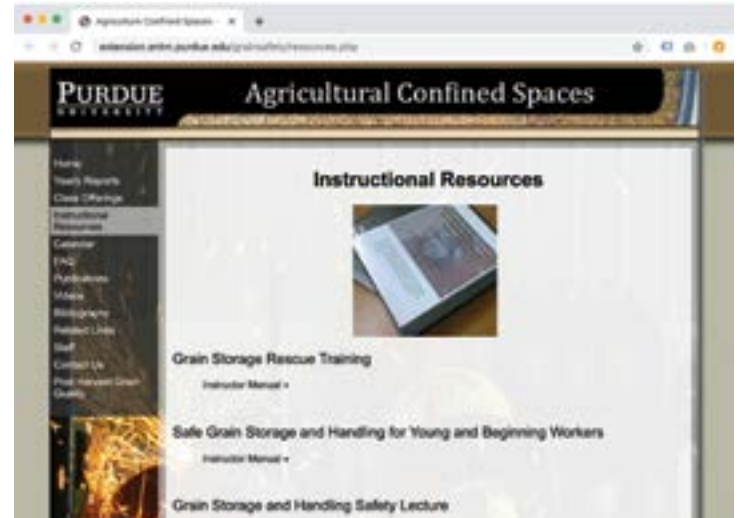


Figure 1. Landing Page for Against the Grain

▶ ALIGNMENT FOR MEASURABLE STUDENT ACTIVITIES

Academic standards outline the knowledge and skills students need for future success within a discipline. Specifically, the AFNR standards serve as a guide for the development of rigorous, well-planned curriculum and assessments for an agricultural career pathway. This grain safety resource can be integrated within current formal (High School programs) and informal (4-H) agricultural education efforts.

This alignment integration provides sample measurements that students might carry out to indicated achievement of knowledge or skills related to a core standard. The levels of proficiency of each measurement are indicated by the last letter within the standard code.

A letter code "a" indicates a proficiency level of "awareness". Letter code "b" indicate proficiency level of "intermediate" and letter code "c" indicate proficiency level of "advanced". *Against the Grain* curriculum aligns to the following measurable activities:

- ▶ CS.03.01.02.a. **Summarize the importance of safety, health and environmental management in the workplace.**
- ▶ CS.03.01.01.b. **Execute health, safety and environmental procedures to comply with regulatory and safety standards.**
- ▶ CS.03.01.02.c. **Construct and implement methods to evaluate compliance with required safety, health and environmental management regulations.**

▶ SAMPLE LESSON OBJECTIVES

Objectives help you plan your lessons or trainings to ensure that what your students are learning align to how they will be evaluated. Using the **ABCD** method, objectives should include an **A**udience, **B**ehavior, **C**onditions, and **D**egree of mastery needed. Bloom's Taxonomy of cognitive learning is a hierarchical framework that instructors can use to promote higher order thinking and learning. Below are example objectives at various levels of Bloom's Taxonomy that teachers can use in their lesson plans with *Against the Grain*.

By the end of this lesson, students will be able to:

- ▶ Identify three to four hazards linked to grain storage, handling, and processing for agricultural production.
- ▶ Demonstrate appropriate safe work practices and how to use three types of personal protective equipment to reduce the risk of injury.
- ▶ Explain in three paragraphs the rights of workers and restrictions related to the employment of youth in agricultural workplaces to ensure safety measures are provided.
- ▶ Identify three career opportunities within the U.S. grain industry.

▶ INTEGRATION ACTIVITIES

Against the Grain curriculum course is comprised of 5 unites with corresponding notes and quizzes. The lessons consist of written information, diagrams, and pictures for students to read and analyze.

Figure 2. shows the Summary of grain-related incidents involving youth curriculum. For example, within this lesson, students will learn about the following subtopics:

- ▶ Explain the scope and magnitude of the U.S. grain industry.
- ▶ Explain the proportion of victims involved in agricultural confined spaces under the age of 21.
- ▶ Describe the nature and characteristics of incidents involving agricultural confined spaces.
- ▶ Describe the characteristics of youth that make them so vulnerable to grain-related incidents.
- ▶ Identify the regions of the U.S. where most grain entrapments occur.
- ▶ Explain the role that out-of-condition grain has on the frequency of grain entrapments.
- ▶ Explain the reasons why youth are the most frequent victims of grain transport vehicles.



Figure 2. Summary of grain-related incidents involving youth, *Against the Grain*

▶ PERSONALIZED SAMPLE ACTIVITIES FOR STUDENT LEARNING

Modalities of learning are ways in which students use their senses throughout the learning process to acquire new skills. Using different modalities when teaching new material can help make sure that all students receive instruction in a way that best matches their personal learning style. Students retain information better when they have a chance to apply what they've learned and use their new skills in a hands-on way. Below are example activities teachers can use to enhance their students' learning.

- ▶ After completing the curriculum, students can demonstrate what they know by applying the skills learned in a real-life scenario. Students could demonstrate how to use lockout/tagout kits and how to use respiratory protection such as a N-95 disposable dust mask.
- ▶ Teaching is the best way to learn! Students can apply what they've learned to plan and facilitate an emergency preparedness plan for other local 4-H students/FFA Members, local community members, etc.
- ▶ Given a variety of worksites, students can use what they learned in the course to assess the risk of an incident. This will require students to use those critical thinking skills!

▶ EVALUATION OF STUDENTS

Evaluation is an essential part of safety training as it gives students a chance to show what they know, as well as an opportunity for teachers to document how well students have achieved the learning objectives. This feedback is important for improving curriculum as well as help teachers determine if they need to provide additional instruction or have students continue to the next lesson/unit.

To evaluate student learning for *Against the Grain* curriculum, there is a pre- and post-test to evaluate student learning. Teachers may develop a rubric and assign a research project to help students understand labor regulations concerning grain handling and young workers. Because it is a teacher-led curriculum, answer keys are provided, and grading may be determined by the teacher. *Against the Grain* also provides a certificate of completion that can be used by instructors once all lessons have been taught. Instructors may choose to develop performance-based evaluations to evaluate learned skills such as how to properly use safety equipment or perform hazard assessments. Videos, student notes, as well as PowerPoint slides are available at <https://extension.entm.purdue.edu/grainsafety/resources.php>

▶ ADDITIONAL RESOURCES TO PREPARE YOUNG WORKERS

The **Grain Handling Safety Coalition (GHSC)** provides numerous resources for students. The GHSC is comprised of industry-related associations, agencies, and individuals with a shared dedication to preventing incidents, injuries and fatalities in grain handling operations on the farm and commercial elevators. Many resources are digital. Poster and print materials are also available. Students can access training and informational videos for free at grainsafety.org.



Ag-Safety.Extension.org/SAY

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