SCIENCE NORTH SCIENCE NORD
SUDBURY, ONTARIO, CANADA

Safety	Technology and the Skilled Trades Grades 9 and 10

Lesson Plan

Learning Outcomes

Technological Education curriculum:
A4 Following Health and Safety Practices (Grade 9)
A4 Applying Health and Safety Principles (Grade 10)

- Students will learn how to identify potential hazards in various technological settings
- Students will understand how to mitigate risks while using tools and equipment
- Students will demonstrate a safety mindset by creating and fulfilling a safety passport
- Students will discuss proper safety procedures and industry standards for the tech classroom
- Students will discuss accessibility and diversity in technological learning in the classroom and in the tech industry

Specific Expectations

Technological Education curriculum:
A4.1 describe relevant health and safety regulations for the classroom and workplace (for a variety of settings), including mandated roles and responsibilities
A4.2 identify hazards in their environment, and apply strategies to minimize risks
A4.3 use tools and equipment safely, including using personal protective equipment and safety devices (according to safety standards and regulations), as appropriate
A4.4 follow practices that support physical and mental health and well-being
A4.5 follow proper procedures for the safe handling, storage, and disposal of materials and waste products
A4.6 demonstrate a safety mindset by making safety a priority at all times and by engaging in industry-specific safety procedures

Description

Students will create a list of potential hazards in their tech spaces (wood shop, classroom, or auto shop, for example) that will require caution and safety procedures to use properly. Along with their teacher and related safety and standards documents, they will create a protocol for each hazard. All of these will be compiled into a Student Safety Passport. Once completed, the students and teacher will sign off on each hazard when the student has demonstrated that they can safely use each tool, material, or machine.

Materials

- Digital (editable) version of the Student Safety Passport (to be printed out once filled in)
- Digital copies of industry standards and board rules (accessible through teacher resources sheet)

Introduction

There are many rules, regulations, and standards put in place in Ontario to ensure that people in the skilled trades are safe while on the job or in the classroom. In technological education, it is important that students are learning the safety precautions that have been put in place and that they start building good habits. There are many different regulatory documents that may apply to your classroom, depending on what kinds of tools and technologies are available to the students. Using the list provided in the Additional Resources section, as well as any supplementary applicable documents from your school, school board, or municipal government, work with your class to determine which documents apply to your classroom/ shop class.

Regulations: These are legal requirements set by government authorities that govern the practice of skilled trades. Regulations often specify licensing requirements, safety protocols, and operational standards that must be adhered to. In Ontario, these are typically enforced by organizations like the Ontario College of Trades or other regulatory agencies.

Rules: These are specific directives or guidelines that must be followed within the trades. Rules may relate to safety practices, operational procedures, or ethical conduct. They are often established by regulatory bodies to ensure compliance with industry norms and protect public safety.

Standards: These are established criteria or benchmarks that outline the skills, knowledge, and competencies required for various trades. Standards are developed by industry stakeholders and may include guidelines for training, certification, and performance expectations. They ensure consistency and quality in the workforce. There are many regulations that need to be followed when working with different tools, materials, and machines, and in different locations.

Many of the standards that we have in Ontario's Building Code, or the Ontario Health and Safety Act are there because of an incident that has happened. When an injury or near-miss occurs in a workplace, there are standards put in place to prevent it from happening again. This is an important perspective to keep in mind when reading these documents, and to remember why they are there. Introduce your students to some of the documents that will be relevant to them in the classroom. Who made the document? Who enforces it? Why does it apply to your classroom?

Discuss the concept of a safety mindset and what it means for the classroom. Having a safety mindset means being aware of one's surroundings, taking proactive measures to prevent injury, being responsible for one's own safety and the safety of others, and communicating with others to ensure a safe work environment for all.

Some discussion questions to get your class thinking about a safety mindset might be:

- How can we keep each other safe in this classroom?
- If there is a safety issue that comes up, who do you tell about it?
- If someone is being unsafe, how do we talk to them about it?
- Why is it important for everyone in a work environment to take responsibility for their own safety and the safety of others? How can this create a safer environment?
- What does having a safety mindset mean to you? How do you think it can impact your work in the trades or technology fields?
- Is there a way to ensure we address inclusion, equity and accessibility along with safety?

Action

Have your students identify potential hazards that they can see in the room. This could include any other shop classes or areas you might be visiting throughout the semester.

Hazards and consequences are different things, and it is important that students identify the potential hazard (for example, a table saw), rather than the consequence of using the table saw incorrectly (losing a finger).

Create a list of the hazards in the classroom. This list might vary in length depending on what is available to your students. Ensure that the list includes potential hazards students might not typically consider dangerous, such as screwdrivers, ladders, and electrical outlets. Use the Student Safety Passport document in the Additional Resources section to create your list. File each hazard into the categories provided or create your own categories. In the second column, specify what procedures students must follow to mitigate the risk around a certain hazard.

> For example, if the hazard is using a ladder, then the precautions might be that the student is able to assess the safety of the ladder prior to use (checking for rust, loose bolts, cracked rungs, etc.), is able to place the ladder on a flat, sturdy surface free of debris, and is able to safely climb up the ladder using two hands, someone supporting the base, and not stepping on the top step.

A secondary list should be made with the students that includes all personal protective equipment. In the second column, specify how this PPE should be worn to be most effective.

> For example, the student wears safety glasses when needed, makes sure they are in working order and clean before use, and continues to wear them throughout using the tool.

There is also a section in the passport for the proper handling, storing, and disposing of materials. This may apply to disinfectants used in hairstyling and aesthetics, oils or grease used in the kitchen in hospitality and tourism, or cleaning chemicals used in a variety of settings.

Once completed, each student should receive a copy of the passport. Over the next few lessons, teachers and students can go through the different procedures individually, in small groups, or as a class. Once a student has understood and shown that they are able to follow precautions, both the teacher and the student can sign off and date that section of the passport.

Consolidation/Extension

Students need to know what to do if a safety issue or injury does arise in class. Discuss with them who to report safety issues (for example, a frayed power cord on a machine, a burnt-out lightbulb, or a broken tool).

Show students the first aid kit location and what is inside. Make sure that students know the first aid protocols for your classroom, according to your school and school board rules.

Have a class discussion about safety in technological education and in the skilled trade industries. Discuss how these safety practices and principles support our mental health, physical health, and overall well-being. Some questions could be:

- How does knowing that everyone is following the same standards and practices help your mental health?
- Short of preventing medical emergencies, how can the different standards in place support your physical health? What other aspects of our physical health are affected on the job, day-to-day?
- How do these practices and principles help us work better as a team?

It is also important to discuss equity, inclusion, diversity and accessibility in the skilled trades and in technological education. With technological education being mandatory for all students, everyone is coming to the classroom with different backgrounds, experiences, and understandings of skilled trades and technological education. Some questions to start your discussion could be as follows, but it is also important to let students create their own questions and share their own experiences here.

- What connections do you have with creating, imagining, designing, or making things?
- Do you feel that you are represented in what you've seen of skilled trades?
- How might we go about making the skilled trades more diverse and equitable?

Assessment

Students must demonstrate that they are able to successfully follow the precautions on the Student Safety Passport for each hazard listed. Depending on the hazards, the class size, and the tools available, teachers must decide how to assess each student's ability to perform the skills. After each one, both the student and teacher can sign off and date the Student Safety Passport.

Additional Resources

- Student Safety Passport template
- Teacher resources – List of standards and safety information