OCTE Elementary SAFEdoc

Safe Activity Foundations in Education Document (SAFEdoc)

Science and Technology, Grades 1-8

September 2019

ONTARIO COUNCIL FOR TECHNOLOGY EDUCATION

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SECTION 1: GENERAL

Safe Activity Foundation in Education:

This ***SAFEdoc*** was designed to provide safety resources for all technology educators. While originally developed as a resource for the Science and Technology curriculum, it is available for any environment where hands-on activities and tools are being used.

Teachers are encouraged to add to this ***SAFEdoc*** with data sheets, tests or other materials on an ongoing basis. Additions or revisions to this document will be posted on the **Ontario Council for Technology Education (OCTE)** website (http://www.octe.on.ca) periodically.

This document is a practical safety resource that compliments and elaborates on other recommended resources for science and technology teachers.

It is imperative that all students are made aware of the issues of health and safety particular to your class, and that you have assessed and evaluated their understanding before they are allowed to work in a technological design environment or on specific procedures or tools. The use of Safety Passports, Safety Agreements, and Safety Tests are highly recommended.

While it is important to give students initial safety training and testing at the beginning school year, it is also important to reinforce specific safety procedures and rules each day before initiating new procedures or using equipment. For example, before students use a scroll saw, review the setup and ask key questions of students before allowing its use.

It is important that teachers are knowledgeable about their own Board and school policies regarding safety, and that they are familiar with local municipal regulations.

Responsibilities for Safety

[From the Ontario Ministry of Education The Ontario Curriculum (Revised) 2007, Science and Technology, Grades 1-8 (page 29-30)]

HEALTH AND SAFETY IN SCIENCE AND TECHNOLOGY EDUCATION

Teachers must model safe practices at all times and communicate safety expectations to students in accordance with school board and Ministry of Education policies.

To carry out their responsibilities with regard to safety, it is important not only that teachers have concern for their own safety and that of their students, but also that they have:

- the knowledge necessary to use the materials, tools, and procedures involved in science and technology safely;
- knowledge concerning the care of living things – plants and animals – that are brought into the classroom;
- the skills needed to perform tasks efficiently and safely.

Note: Teachers supervising students using power equipment such as drills, sanders, and saws need to have specialized training in handling such tools.

Students demonstrate that they have the knowledge, skills, and habits of mind required for safe participation in science and technology activities when they:

- maintain a well-organized and uncluttered work space;
- follow established safety procedures;
- identify possible safety concerns;
- suggest and implement appropriate safety procedures;
- carefully follow the instructions and example of the teacher;
- consistently show care and concern for their safety and that of others.

Delegating the Responsibilities for Safety

As well, there are key areas of responsibility that must be clearly delegated for all technological subject areas and they must be addressed for their individual board, school and facility.

These may include administration, science and technology teachers, students, board facilities, custodian/maintenance and other local partners or board-defined roles.

** An original source of this delegation example has been adapted from the Toronto District School Board – Experiential Learning Department – Technological Education 'Front Matter' for the purposes of the SafeDOC revision 2013. Please note that this section is not original to the SafeDOC writers, but is a result of collaboration between the TDSB and OCTE. This in no way refers any responsibility to the TDSB for this information, and has been provided as a guideline reference only.*

Administration

The responsibility rests with the Principal or his or her designate to ensure that each teacher who is teaching Technological Education has received the information and instruction on the safe use of equipment in the classroom.

In order to achieve safety goals the School Board, Superintendents and Principals should:

- establish and maintain a written Board safety policy and program
- emphasize and enforce the safety policy and procedures
- ensure that each Teacher has been satisfactorily trained on the use of equipment within the classroom
- ensure in-service education sessions are held for Teachers concerning the safety policy and procedures therein, such as machine guarding, lock-out, fire prevention, first aid, personal protective equipment
- be aware of current legal issues about liability for classroom accidents; ensure that such is part of in-service sessions for staff
- assist and encourage the teacher to correct and avoid situations that could result in

liability to the Teacher and the school

- provide for proper safety equipment in all technology areas
- hold staff accountable for safety practices in their respective areas
- analyze accident records in order to determine the most frequent causes of accidents and the more severe types of accidents
- take corrective measures to change accident-causing conditions
- ensure that staff health and safety training and information is current
- make safety literature, posters, and safety promotional material available to all persons associated with the technology program
- ensure that all Occasional Teachers working in the Technology areas are informed about and understand the standard accident and emergency procedures
- not permit the overcrowding of classes, taking into account the physical size of a room, the arrangement of the equipment, furniture and facilities in the room, and the kind of activities that are being carried out in the room
- ensure that the use of space has not changed unless changes have been designed by a qualified architect or engineer
- at the beginning of the year, make the Science and Technological Education Teacher aware of any student medical condition that could result in a safety problem
- ensure that individuals are designated to be responsible for safety
- limit after-hours access to the Science and Technological Education facilities and equipment to qualified personnel

Technology Teacher

In order to provide a safe environment for students involved in any Technological Education course, the following procedures must be adhered to:

- Teachers must be aware of their Board Safety Documents that outline safety procedures for machinery, tools, equipment, and procedures by completing advised Board Training.
- Use of Board Safety Documents is required as the minimum basis for safety instruction. Enhancements and additions to these documents are permitted to meet program needs.
- Students and employees must receive instructions on the safe and proper operating procedures for specific machinery and equipment by a qualified Science and Technological Education Teacher before permission is given to use tools, machinery, and equipment.

[From the Ontario Ministry of Education The Ontario Curriculum (Revised) 2007, Science and Technology, Grades 1-8 (page 29-30)]

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- carefully follow the instructions and example of the teacher;
- consistently show care and concern for their safety and that of others.

Teachers should also:

- ensure that each technological education area has a floor plan posted in a strategic place to show the locations of items such as:

  ✔ fire extinguishers
  ✔ emergency power stop buttons
  ✔ emergency kit
  ✔ eyewash station(s)
  ✔ emergency exits
  ✔ special shut-off valves (gas, etc.)
  ✔ nearest fire pull station

- ensure that a first-aid kit is available in each technological education area
- inform the Principal when the physical condition or other factors in the classroom may detrimentally affect safe instruction
- inform the Principal, in writing, of any known or potential safety hazard
- ensure that current inventories of Material Safety Data Sheets (MSDSs) are

maintained

- ensure that no unapproved or unsafe equipment, materials, or procedures are used in the area. Equipment should be purchased through Board-approved vendors.
- ensure that no lesson requiring the use of tools shall take place during their absence or when an unqualified Teacher in Technological Education is supervising the class
- ensure that all accidents and incidents are recorded and reported on the appropriate forms

Custodian / Maintenance

- Daily removal of garbage, scraps, and waste must be organized and coordinated with the Caretaking staff.
- After the Teacher informs the custodian, it is the custodian's responsibility to clean. Filters and ducts that are subject to accumulation of sawdust deposits should be inspected and cleaned regularly.
- Be aware of the hazards in the technological education areas.
- Know the hazard warning signs and symbols and proper safety precautions.
- Do not handle unfamiliar materials. Do not handle or move chemicals in the shop.
- In the event of an emergency or concern, know the individuals who should be contacted and how to reach them.
- Know the proper handling and disposal of materials before disposing.
- Ensure that the technological education areas are secure during non-class hours after school, and at night. This is especially important if the school building is used after school by the community user groups.

Board Facilities

- Inspect the technological education areas on at least an annual basis with respect to maintenance items such as electrical outlets, safety indicators or signs, ventilation, and any other potential hazards.
- Report the results of the inspection to the Principal.
- If work is planned in a technological education area, ensure the Teachers are informed and check for special hazards which may be present.
- Before working in a technological education room, inform the Teacher what will be done, and when the work will be starting and finishing. The classroom Teacher is responsible for ensuring that the work area within the room is free from physical and chemical

hazards.

- In situations where the hazard cannot be totally removed, specific work procedures must be developed in conjunction with the Teacher and the Health and Safety Officer.

Locking Out and Tagging of Equipment

The process for Teachers for locking out and tagging out equipment is as follows:

- Lockout is always required when repairs/adjustments are being performed on any piece of equipment.
- If the equipment can be locked out by way of a power switch located on the actual piece of equipment, by use of a padlock, then the Teacher can lock it out.
- If the power cannot be locked out at the equipment, then the Custodian must be notified and the power should be locked out at the panel box.
- Once the equipment is locked out, it must be “Tagged Out” by attaching an appropriated tag in a conspicuous location, showing the worker’s name and reason for lockout, along with the date and time.
- Notify the school Administration and the Custodian once lockout and tag-out have occurred.

SECTION 2: Maintaining Records and Demonstration of Competence

Teachers

Teachers of Technological Education must carefully maintain records of student attendance and records of safety instruction given.

Teachers are expected to be able to provide documentation:

1. that the student was present on the date each safety lesson was taught (dated lesson plans, attendance records clear and unambiguous)
2. of the safety lesson that was delivered (e.g., PowerPoint, note taking, signed safety pledge, pre-printed sheets, successful passing on an announced written test that is dated and stored by the teacher, correction of errors completed)
3. that indicates student understanding of the safety lesson (e.g., completed evaluation tool, student notes)
4. of how students are reminded of safe practice throughout the course (e.g., notation in

teacher daybook)

5. that the work and learning environments are kept safe, tidy, and in good condition (e.g., photos, focus on machines with guards in place, maintenance records, safety inspections, cleanup procedures, student safety stewards, modeling of best practices), and that the custodian is informed of any maintenance issues

6. that students' different learning styles and needs are taken into account, both during the delivery of the safety lessons and during any follow-up evaluation (e.g., use of visuals, opportunities to demonstrate understanding orally, use of a translator)

7. that safety procedures are explained using various strategies such as verbal explanation, demonstrations through modeling, and accompanied by both written and pictorial explanations that are posted throughout the work and learning environments

8. that accommodations and, if necessary, modifications are made to the curriculum and included in the Individual Education Plan (IEP) in the event that the student cannot manage all curriculum expectations safely

9. that each student has signed the annual acknowledgment form, stating that he/she has been informed of the safety procedures

Students

Students demonstrate that they have the knowledge, skills, and habits of mind required for safe participation in Science and Technology activities when they:

- maintain a well-organized and uncluttered workspace
- follow established safety procedures
- identify possible safety concerns
- suggest and implement appropriate safety procedures
- carefully follow the instructions and example of the Teacher
- consistently show care and concern for their own safety and that of others

Student Conduct Agreement

A signed agreement that outlines the student's responsibilities is one way of establishing the seriousness of daily safety vigilance. An agreement covers the elements common to all technology classrooms and labs and lays out the framework for a safe and healthy working environment for both staff and students. An example of an agreement is given below.

Safety Awareness

Personal Protective Equipment [PPE]

1. Wear gloves, safety eyewear, aprons, masks, and other PPE as per instructed when powered instruments and tools.
2. Ensure other workers and visitors are protected before performing operations that can be dangerous.

Equipment

1. Operate equipment or tools only after receiving proper instruction and permission from the teacher.
2. Never leave equipment tools unattended.
3. Do not attempt to repair any electrical connections, see your teacher.
4. Tell your teacher of any equipment or tools that need repairing.

To Be Used As An Example Only; Please See Board/School Policy

STUDENT CONDUCT AGREEMENT FORM

I, **agree to:**

Ensure a safe workplace

1. Inform teachers of all injuries, damaged equipment and potentially dangerous situations.
2. Make sure I know all fire exits and power shutdown switches and how to use them during emergency situations.
3. Not compromise the safety of others through horseplay or aggressive action.
4. Only use equipment when properly trained, always with any necessary personal protective equipment, and when I fully understand all related safety issues
5. Ask for assistance from the teacher when I am unsure of the proper procedures or health and safety issues

Consequences for Improper Action

I understand that failure to comply with this agreement may result in injury to myself or others, and that failing to comply with safety procedures may result in my temporary removal from the class or shop.

I have read the above and understand the expectations and consequences.

Student signature: _____

Parents signature _____

Date: _____

Technology Lab Safety Passport

The purpose of the safety passport is to ensure that students are fully aware of all safety features on each piece of equipment in the technological education facility prior to using them independently.

The general process is as follows:

1. Teacher Demonstration: When the teacher introduces a new piece of equipment, the teacher records the date of the safety demonstration on their safety passport. The teacher demonstrates techniques for the safe operation and procedures, as well as use of personal protective equipment (e.g. eye protection, secure loose hair, remove jewelry, protective clothing, etc.). The teacher also carefully notes attendance for that day in their daybook if any students are absent for the safety lesson; makeup opportunities must be provided.

2. Test: Each student should complete a written (or oral) test on the safe operation or procedure, outlining all safety features that must be observed. The individual tests are designed to compliment any general facility safety rules. Upon satisfactory completion of the test the student dates the “tested” column and teacher initials this as complete. **IMPORTANT NOTE: A copy of the test should be kept by the teacher. Consider the use of interpreters for ELL students.**

3. Student Demonstration: Students must demonstrate to the teacher that they have a thorough knowledge of the safety rules for the equipment and are able to demonstrate their competency on the equipment. Once the teacher has observed the required safe setup and operation of the equipment by a student the teacher signs off that portion of their passport.

4. Once the student has completed #1, 2 and 3, the teacher signs the final column of student’s safety passport indicating they have permission to use that equipment or perform the procedures.

Form 1- Teacher Copy

Student Name: _____________________ **Course/Class:**

Equipment/Procedure: _________________________							
Attended Teacher Safety Instruction and Demonstration (Notes recorded)		Passed Written or Oral Testing		Demonstrated Safe Set-up and Operation to Teacher		Granted Permission by Teacher	
Date of Lesson	Teacher Initial	Date Tested	Teacher Initial	Date of Demo.	Teacher Initial	Date	Teacher Initial

Equipment/Procedure: _________________________							
Attended Teacher Safety Instruction and Demonstration (Notes recorded)		Passed Written or Oral Testing		Demonstrated Safe Set-up and Operation to Teacher		Granted Permission by Teacher	
Date of Lesson	Teacher Initial	Date Tested	Teacher Initial	Date of Demo.	Teacher Initial	Date	Teacher Initial

Equipment/Procedure: _________________________							
Attended Teacher Safety Instruction and Demonstration (Notes recorded)		Passed Written or Oral Testing		Demonstrated Safe Set-up and Operation to Teacher		Granted Permission by Teacher	
Date of Lesson	Teacher Initial	Date Tested	Teacher Initial	Date of Demo.	Teacher Initial	Date	Teacher Initial

SECTION 3: Safety Topics for the Classroom

Topics

The following are suggested topics for teaching in the classroom. See also your Board, school and relevant municipal policies for local safety rules and procedures.

Emergency Procedures	procedures for handling fire, security threats, and other emergencies
First Aid	procedures for handling breathing difficulties, bleeding, burns, allergic reactions, epileptic seizures, etc.
Personal Protective Equipment	use of eye, hearing, foot, body, respiratory protection
Ergonomics	safe posture when using equipment, avoiding repetitive stress injuries
Material Handling	procedures for safely handling potentially hazardous materials
Housekeeping and Storage	procedures and rules regarding maintaining safe facilities and proper storage of materials and equipment
Fire Protection	location and types of fire protection equipment, procedures to follow in the event of a fire or fire alarm
WHMIS	(Workplace Hazardous Materials Identification System)…identification and safe use of hazardous materials

Communication

It is important to the safety of all students and staff at a school that safety be taught and reinforced on a daily basis. Some basic methods of communication are:

- Safety Notice Board, containing posted minutes from the joint health and safety committee and the Occupational Health and Safety Act (must be posted by law)
- visible WHMIS binders, symbols and MSDS sheets
- readily available manuals for the operation of various types of machinery, tools or equipment
- safety posters around major equipment and work areas
- clear and precise instructions, reinforced each time a procedure or equipment is used
- clearly marked areas that contain safety items such as fire extinguishers, eye wash stations, first aid kits, etc.

Safety Expectations

The following are safety related expectations from The Ontario Ministry of Education The Ontario Curriculum (Revised) 2007, Science and Technology, Grades 1-8

Specific safety expectations are found under the second overall goal of the science and technology program:

> *2. to develop the skills, strategies, and habits of mind required for scientific inquiry and technological problem solving*
>
> *The skills needed for developing scientific and technological literacy are outlined in the second overall expectation and in the related specific expectations found under the heading Developing Investigation and Communication Skills.*
>
> *e.g., 2.1 follow established safety procedures for handling tools and materials*