

# SAFE

## TRANSPORTATION TECHNOLOGY



### **SAFE ACTIVITY FOUNDATIONS IN EDUCATION DOCUMENT**

Revision May 2013, Revision July 2022

TTJ2O Transportation Technology: Open  
TTJ3C/4C Transportation Technology: TTJ3 Prerequisite  
TTJ3O Transportation Technology: OPEN  
TTJ4E Transportation Technology: TTJ3 Prerequisite

TTA3C Transportation Technology: Auto Service  
TTB3C Transportation Technology: Auto Body  
TTH3C Transportation Technology: Heavy Duty and Agricultural Equipment  
TTL3C Transportation Technology: Light Aircraft  
TTS3C Transportation Technology: Small Engine and Recreational Equipment  
TTT3C Transportation Technology: Truck and Coach  
TTA4C Transportation Technology: Auto Service  
TTB4C Transportation Technology: Auto Body  
TTH4C Transportation Technology: Heavy Duty and Agricultural Equipment  
TTL4C Transportation Technology: Light Aircraft  
TTS4C Transportation Technology: Small Engine and Recreational Equipment  
TTT4C Transportation Technology: Truck and Coach



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## Disclaimer

This material was designed to assist teachers implement the Ontario Curriculum – Technological Education (revised Grade 10 -12), but is fully adaptable to the Ontario Curriculum Grade 1 – 8 Science and Technology curriculum. This material was created by members of the Ontario Council for Technology Education (OCTE) subject association and is intended as a working guide for classroom, lab or shop activities. Permission is given to reproduce these materials for any purpose except profit. Teachers are encouraged to amend, revise, edit and adapt this material for educational purposes. Please acknowledge the source in all uses. Any references in this document to particular commercial resources, materials or equipment reflect only the opinions of the writers of this material, and do not reflect any official endorsement by the Ontario Council for Technology Education, the Ontario Ministry of Education, or any other agency or government body.

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## SECTION 1: GENERAL

### *Safe Activity Foundation In Education (SAFEdoc): Transportation*

This **SAFEdoc** was designed to provide safety data sheets, posters, safety passports, and safety resources for all technology educators. While originally developed as a resource for the Course Profiles, it is available for any grade level or any technology education environment.

In 2013 another resource called the safetyNET was created by OCTE with many subject-specific exemplars of exciting student projects that incorporate varying levels of safety risk. Please review exemplar [TTJ safetyNET](#) resource documents created 'by teachers for teachers' with experienced tips and customization options for your course projects.

The **SAFEdoc** has been created for eleven separate disciplines per Ontario Ministry Courses:

|                                        |                                |
|----------------------------------------|--------------------------------|
| Communications, (COM)                  | Hospitality and Tourism (HOST) |
| Computer Engineering Technology (CET)  | Manufacturing (MANU)           |
| Construction, Custom Woodworking (CON) | Technological Design (DESIGN)  |
| Green Industries (GREEN)               | Transportation (TRANS)         |
| Hairstyling and Aesthetics (H&A)       | Exploring Technologies (EXPL)  |
| Health Care (HC)                       |                                |

Please note that due to the cross-curricular nature of Technological Education, there may be a need to refer to other **SAFEdocs** for cross-discipline datasheets. For example, a Health Care teacher may need to utilize food production and handling equipment, therefore may need to refer to the HOST **SAFEdoc**. Teachers are encouraged to download ALL **SAFEdocs** for reference.

Teachers are encouraged to add to this **SAFEdoc** with datasheets, 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.ca>) periodically.

This document is a practical safety resource that complements and elaborates on other recommended resources for technology teachers. See the appendix for linking industry associations dedicated to safe working practices.

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 shop environment or on specific procedures or tools. The use of Safety Passports, Safety Agreements, and Safety Tests (provided in this document) is highly recommended.

**NOTE:** While it is important to give students initial safety training and testing at the beginning of the semester, it is also important to practice **JIT Safety Training (Just In Time)**. Reinforce specific safety procedures and rules each day before initiating new procedures or using equipment. For example, before students use a band saw, review the setup and ask key questions of students before allowing its use.

## *Usage of the SAFEdocs*

Teachers are encouraged to use and modify this document as they see fit. Individual pages may be directly printed, or custom formatting may be applied for printing any part of the document.

**General Guidelines** may be used in Board or school policy documents. **Safety Guidelines** may be used as student handouts, as a teacher reference for tests, or printed and mounted as posters around equipment.

The **SAFEdoc** also contains sample **Safety Passports**. These can be used as verification that students have been trained and understand the safety aspects of each equipment or procedure they need to use to accomplish their tasks. There are several formats that may be used. Teachers are encouraged to keep consistent records at all times.

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)2009, Technological Education, Grades 9 and 10 (page 28); Grade 11 and 12(page 33)]

Health and safety is of paramount importance in technological education. In every course, students must be made aware that health and safety is everyone's responsibility at home, at school, and in the workplace. Before using any piece of equipment or any tool, students must be able to demonstrate knowledge of how the equipment or tool works and of the procedures they must follow to ensure its safe use. Personal protective gear must be worn as required.

Classroom practice and all aspects of the learning environment must comply with relevant municipal, provincial, or federal health and safety legislation, including the following:

- the [Ontario Workplace Safety and Insurance Act](#)
- the [Workplace Hazardous Materials Information System \(WHMIS\)](#)
- the [Food and Drugs Act](#)
- the [Ontario Health Protection and Promotion Act](#)
- the [Ontario Building Code](#)
- the [Occupational Health and Safety Act](#)
- Local by-laws

Teachers should make use of all available and relevant resources to make students sufficiently aware of the importance of health and safety. These resources include:

- Ministry of Labour, Immigration, Training and Skills Development – website (<http://www.labour.gov.on.ca/english/>) and related resources
- Workplace Safety and Insurance Board (WSIB) – website (<http://www.wsib.ca/>) and related resources
- Workplace Safety and Prevention Services (WSPS) – website (<https://www.wsps.ca/Home.aspx>) and related resources
- Canadian Centre for Occupational Health and Safety (CCOHS) – website (<http://www.ccohs.ca/>) and related resources
- Ontario Ministry of Health – website (<https://www.ontario.ca/page/ministry-health>) and related resources
- Appropriate Safe Workplace Associations (SWAs) and clinics, such as:
  - the Infrastructure Health & Safety Association of Ontario (IHSAO) – website (<https://www.ihsa.ca/Homepage.aspx>)
  - the Workers Health & Safety Centre (WHSC) – website (<http://www.whsc.on.ca/>)
  - the Occupational Health Clinics for Ontario Workers (OHCOW) – website (<http://www.ohcow.on.ca/>)

Teachers should also be aware of the Occupational Health and Safety Act, Regulations 857, Amended to O. Reg. 352/91. The Occupational Health and Safety Act can be found at: [http://www.e-laws.gov.on.ca/html/reg/english/elaws\\_regs\\_900857\\_e.htm](http://www.e-laws.gov.on.ca/html/reg/english/elaws_regs_900857_e.htm)

## 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, department heads, 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 a 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 Technological Education Teacher 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

- set up a program for the safety orientation for new staff
- 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/semester, make the 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 in the Technology Department
- limit after-hours access to the Technological Education facilities and equipment to qualified personnel

### ***Department Heads / Curriculum Chairs/Program Leaders***

The Department Head is the intermediary between the individual Teacher and Administration. Each Department Head is accountable to his or her Principal to ensure input into the administrative process and enforcement of both the *Occupational Health and Safety Act* and Board policies.

The Department Head should:

- ensure that each Technology area has a floor plan posted in a strategic place to show the locations of items such as:
  - ✓ fire extinguishers
  - ✓ school Defibrillator
  - ✓ posted emergency phone numbers
  - ✓ fire blankets
  - ✓ 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 Technology area
- ensure there is Personal Protective Equipment (PPE) available for Technology staff
- ensure implementation and understanding of the safety policies and procedures. This includes developing specific departmental safety procedures or rules for specific areas.
- ensure a designated Teacher is responsible for specific areas of safety in his or her

specific areas

- inform the Principal when the physical condition or other factors in the classroom may detrimentally affect safe instruction
- when a program is disbanded, ensure equipment is locked-out and room is not accessible (rekeyed)
- inform the Principal, in writing, of any known or potential safety hazard
- encourage the use of safety posters, literature, and audiovisual aids
- advise the Technological Education staff to ensure that all student projects are able to be completed with safety guards in place. Keep safety guard and anti-kickback devices in position, if possible. Use approved alternate safety devices where appropriate.
- advise Teachers to ensure that safety guards are placed back immediately when each process is finished
- where applicable, ensure that there is an appropriate spill kit and spill procedure present
- develop, implement, and post a standard accident emergency procedure in each Technology area
- 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.
- advise Technology staff that any equipment deemed not to be safe must be taken out of service immediately, tagged, locked out, and reported to the Principal
- advise the Technological Education staff to ensure that no practical shop work requiring the use of tools shall take place during their absence or when an unqualified Teacher in Technological Education is supervising the class
- advise any certified Occasional Technological Education Teacher working in a specific subject area not to engage in practical work until familiar with the shop environment
- encourage the Technology staff to receive first-aid training
- ensure that all accidents and incidents are recorded and reported on the appropriate forms
- conduct, along with the Health and Safety representative where appropriate, a follow-up analysis of all accidents and incidents
- notify the Chief Custodian, Facility Services of any special needs or deficiencies in the area
- review, at least annually, all procedures and rules

## 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 must receive instructions on the safe and proper operating procedures for specific machinery and equipment by a qualified Technological Education Teacher before permission is given to use tools, machinery, and equipment. The following excerpt from the Ontario Curriculum document for Technological Education explains this point further:

Teachers are responsible for ensuring the safety of students during technology lab, shop, and classroom activities. Health and safety issues must also be addressed when learning involves cooperative education and other workplace experiences. Teachers need to encourage and motivate students to assume responsibility for their own safety and the safety of others, and they must help students develop the knowledge and skills needed for safe participation in all technology-related activities. For these reasons, teachers must model safe practices at all times and communicate safety expectations to students in accordance with school board policies and procedures, Ministry of Education policies, and Ministry of Labour regulations.

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
- 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. This specific training requirement applies to listed equipment in all areas of technology education specialization.

Teachers of Technological Education courses 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, modelling of best practices), and that the Head Caretaker 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)
7. that safety procedures are explained using various strategies such as verbal explanation, demonstrations through modelling, and accompanied by both written and pictorial explanations that are posted throughout the work and learning environments
8. those 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

### **LOCKING OUT AND TAGGING OUT EQUIPMENT**

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

- 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 Head Caretaker must be notified and the power should be locked out at the panel box.
- Lockout is always required when repairs/adjustments are being performed on any piece of equipment.
- 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 Head Caretaker once lockout and tag-out have occurred.

## 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 and bring this to the attention of the teacher
- 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

## Custodian / Maintenance

- Any references/details to specific duties of custodians and maintenance staff should be reviewed at each school as this is a collective agreement issue and varies from school board to school board.
- 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.
- If the contents of any containers are spilled, the school must adhere to the Spill Procedures. DO NOT TOUCH OR ATTEMPT TO CLEAN UP. Contact the Principal or your supervisor, who will then contact the appropriate person/department.

## Board Facilities

- Inspect the Technology areas on at least an annual basis with respect to maintenance items such as gas leaks, 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 Technology area, ensure the Teachers are informed and check for special hazards that may be present.
- Before working in a shop or on any of the shop services, 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.

## ***Safety Perspective Overview***

### ***Health and Safety Resources and Curriculum***

These resources identify safety rules associated with hazards and processes. They are applicable to a wide range of occupations and situations.

e.g. Occupational Health and Safety Act, 1990

Based on the Ontario curriculum this resource contains safety lessons for technology subjects

### ***Classroom Safety Resources***

These resources identify safety policies and procedures that ensure the safety of people in schools.

e.g. WHMIS Training Sessions, Board Safety Policies, **SAFEdocs**- These resources provide a framework for developing safety procedures in school classrooms

It is highly recommended that all teachers complete an **OCTE SafetyNET** template for their individual experience / program / classroom / school / board. This is an excellent starting point for self-reflection and preparation for MOL/MOE inspection.

### ***Equipment and Hazard-Specific Safety Rules***

These resources are Just-in-Time (JIT) safety rules. They are applicable to specific equipment in the facility and may apply to specific hazards associated with a program emphasis.

These rules are developed at the classroom/school level to implement safe work practices. They may be adapted from a variety of sources including equipment manufacturer's manuals. A summary is often posted near equipment.

### ***Safety Management***

The teacher develops these resources. The daily classroom safety routines and policies are based on the above safety resources and applied to each individual facility/classroom. Protocols developed to teach safe behaviour directly should include managing safe work practices and behaviour through demonstration and reinforcement of safe working procedures, establishment of clear safety rules, safety passports, assignments, quizzes, and research.

Again, it is highly recommended that teachers complete a SafetyNET template to review their unique projects and procedures and consider risks as advised by OSBIE, and other professional health and safety partners.

## Safety Topics for the Classroom

The following are suggested topics for teaching in the classroom. See Appendix A for available resources pertinent to general safety and particular safety rules and procedures for your subject area. See Appendix B for specific resources or links that are associated with Transportation Technology TTJ. See also your Board, school and relevant municipal policies for local safety rules and procedures.

|                                      |                                                                                                                         |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Emergency Procedures</b>          | procedures for handling fire, security threats, Safe exit plan, and other emergencies                                   |
| <b>First Aid</b>                     | procedures for handling breathing difficulties, bleeding, burns, allergic reactions, epileptic seizures, etc.           |
| <b>Hand Washing</b>                  | Health Canada procedures for hand washing require hand washing to last twenty (20) seconds.                             |
| <b>Personal Protective Equipment</b> | use of eye, hearing, foot, body, respiratory protection                                                                 |
| <b>Ergonomics</b>                    | safe posture when using equipment, avoiding repetitive stress injuries                                                  |
| <b>Material Handling</b>             | procedures for safely handling heavy loads, chemicals, potentially hazardous materials                                  |
| <b>Housekeeping and Storage</b>      | procedures and rules regarding maintaining safe facilities and proper storage of materials and equipment                |
| <b>Fire Protection</b>               | location and types of fire protection equipment, procedures to follow in the event of a fire or fire alarm              |
| <b>WHMIS 2015</b>                    | Workplace Hazardous Materials Identification System 2015 governs the 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 SDS sheets
- Readily available manuals for the operation of various types 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, eyewash stations, first aid kits, etc.

## Safety Expectations

The following are safety related expectations from The Ontario Curriculum 2009 (Revised) for Technological Education:

### TTJ20 -TRANSPORTATION TECHNOLOGY

#### Grade 10 – Open

##### B. TRANSPORTATION TECHNOLOGY SKILLS

B2. demonstrate the safe and correct use of a variety of maintenance and repair techniques for servicing powertrain components;

B2.5 demonstrate the safe and correct use of various fabrication and repair techniques (e.g., cutting threads, heating, soldering, welding);

##### D. PROFESSIONAL PRACTICE AND CAREER OPPORTUNITIES

D1. demonstrate an understanding of and compliance with occupational health and safety regulations and standards in transportation technology;

D1.2 demonstrate good housekeeping and safety practices in the work environment (e.g., cleaning up spills and leaks, proper disposal of waste, keeping areas clean and clear of obstructions);

D1.3 use protective clothing and equipment (e.g., eye and hearing protection, gloves, breathing apparatus) as required to ensure their own and others' safety in the work environment.

### TTJ3C TRANSPORTATION TECHNOLOGY

#### Grade 11 College Preparation

##### B. TRANSPORTATION TECHNOLOGY SKILLS

B2. demonstrate the ability to test and repair basic electrical circuits safely and correctly;

B2.3 perform repairs on electrical circuits (e.g., terminal repair, wiring repair) safely and correctly.

##### D. PROFESSIONAL PRACTICE AND CAREER OPPORTUNITIES

D1. demonstrate the use of professional work practices and procedures and compliance with occupational health and safety regulations and standards;

D1.2 demonstrate good housekeeping and safety practices in the work environment (e.g., cleaning up spills and leaks, keeping areas clean and clear of obstructions);

D1.3 use protective clothing and equipment (e.g., eye protection, gloves, breathing mask) as required to ensure their own and others' safety in the work environment;

D1.4 identify potential health risks (e.g., brake dust, fumes from brake fluid and brake cleaner) when servicing vehicles or craft, and demonstrate the use of safe procedures to mitigate these hazards (e.g., use appropriate ventilation and breathing protection);

D1.5 describe and demonstrate the ability to follow appropriate safety precautions required for new technologies when working on vehicles, craft, or power equipment (e.g., precautions regarding high current and voltage, capacitor discharge rate of supplemental restraint systems, extreme temperature of exhaust systems);

D1.6 demonstrate an understanding of professional responsibilities in the transportation industry with regard to personal and public safety (e.g., quality workmanship, integrity, customer service, compliance with manufacturers' standards).

## TTJ30 TRANSPORTATION TECHNOLOGY: VEHICLE OWNERSHIP

### Grade 11 Open

#### B. TRANSPORTATION TECHNOLOGY SKILLS

B2. identify and describe the components and service requirements of major vehicle systems, and related safety precautions, that an owner should be aware of;

B2.3 identify the product information (e.g., tire sizing) and hazards and safety precautions (e.g., battery explosion – wearing safety glasses) that an owner should be aware of when servicing vehicle systems.

B4. identify appropriate repair information and the tools and equipment required for safe basic service and maintenance of a vehicle.

B4.1 consult the owner's manual as required for specific procedures, specifications, and products (e.g., oils, fluids, fuses, bulbs) related to the maintenance of a vehicle;

#### D. PROFESSIONAL PRACTICE AND CAREER OPPORTUNITIES

D2. explain how vehicle ownership and various aspects of the transportation industry affect society.

D2.1 analyse the safety features in today's vehicles (e.g., electronic stability control, airbags, anti-lock brakes, roll-over protection, engine kill switch) from a consumer's point of view;

#### E. PROFESSIONAL PRACTICE AND CAREER OPPORTUNITIES

E1. demonstrate an understanding of and compliance with occupational health and safety regulations and standards related to vehicle maintenance;

E1.2 demonstrate good housekeeping and safety practices in the work environment (e.g., cleaning up spills and leaks, keeping areas clean and clear of obstructions);

E1.3 use protective clothing and equipment (e.g., safety glasses, hearing protection) as required to ensure their own and others' safety in the work environment.

#### OVERALL EXPECTATIONS – TTJ3E

D1. Identify and demonstrate compliance with the health and safety legislation, regulations, and practices that govern the food and beverage services sector of the tourism industry;

#### OVERALL EXPECTATIONS – TTJ4E

D1. Demonstrate an understanding of and compliance with health and safety legislation and regulations and the practices that are essential for a safe and healthy work environment;

## TTJ4C TRANSPORTATION TECHNOLOGY

### Grade 12 College Preparation

#### B. TRANSPORTATION TECHNOLOGY SKILLS

B3. use proper procedures for the inspection, servicing, and repair of steering/control, suspension, brake, and body systems;

B3.2 demonstrate proper procedures and the safe use of specialty tools and equipment in the service and repair of steering/control, suspension, brake, and body system components (e.g., steering/control: tie rod fork, tire balancer; suspension: coil spring compressor; brakes: lathe, dial indicator gauge; body: metal inert gas [MIG] welder).

#### D. PROFESSIONAL PRACTICE AND CAREER OPPORTUNITIES

D1. demonstrate the use of professional work practices and procedures and compliance with occupational health and safety regulations and standards;

D1.2 demonstrate good housekeeping and safety practices in the work environment (e.g., cleaning

up spills and leaks, keeping areas clean and clear of obstructions);

D1.3 identify potential health risks (e.g., asbestos dust, fumes from brake fluid and cleaners) when servicing vehicles or craft, and demonstrate the use of safe procedures to mitigate these hazards (e.g., use appropriate ventilation and breathing protection);

D1.4 use protective clothing and equipment (e.g., eye and hearing protection, gloves, breathing apparatus, hoist, safety stand) as required to ensure their own and others' safety in the work environment;

D1.5 explain the need for and demonstrate the ability to follow appropriate safety precautions applicable to new technologies when working around or servicing vehicles, craft, or power equipment (e.g., precautions regarding high current and voltage, capacitor discharge rate of supplemental restraint systems, extreme temperature of exhaust systems, accumulators in hydraulic systems, pressure vessels);

## TTJ4E TRANSPORTATION TECHNOLOGY

### Grade 12 Workplace

#### B. TRANSPORTATION TECHNOLOGY SKILLS

B1. perform general service and maintenance on vehicles or small-engine products safely, using the owner's manual, repair manuals, tool and equipment manuals, and identification and information labels;

B1.4 demonstrate the correct use of hand, power, machine, and pneumatic tools and equipment required for service tasks (e.g., tire machine, floor jacks and hoists, safety stands, shop tools), store them safely, and maintain them in good working order;

#### D. PROFESSIONAL PRACTICE AND CAREER OPPORTUNITIES

D1. demonstrate an understanding of and compliance with occupational health and safety regulations and standards;

D1.2 demonstrate good housekeeping and safety practices in the work environment (e.g., cleaning up spills and leaks, keeping areas clean and clear of obstruction);

D1.3 use protective clothing and equipment (e.g., eye protection, breathing apparatus) as required to ensure their own and others' safety in the work environment;

D1.4 describe and demonstrate the ability to follow safety precautions applicable to new technologies when working around or servicing vehicles (e.g., precautions regarding high current and voltage, capacitor-discharge rate of supplemental restraint systems, extreme temperature of exhaust systems);

D1.5 identify potential health risks when servicing vehicles and demonstrate the use of safe procedures to mitigate these hazards (e.g., preventive measures to minimize airborne particles and fumes).

## INTERNET ACCEPTABLE USE AGREEMENT FORM

The form below is a sample agreement form that can be used with your board Internet use policy and guidelines.

| INTERNET ACCEPTABLE USE AGREEMENT FORM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>To Students:</p> <p>I, the undersigned, indicate by my signature that I have read and understand fully the Acceptable Use Policy and related guidelines. I agree that I will abide at all times to the rules and responsibilities as outlined in the Acceptable Use Policy and related guidelines. I also agree that I clearly understand the consequences of my failure to abide by these rules and regulations.</p> <p>To Parents/Guardians</p> <p>As a parent or guardian signing below, I indicate that I understand the rules, regulations and consequences of misuse governing my son or daughter's use of the Board's computer and information technology facilities and resources. I understand that all Board staff will make every attempt to ensure proper and acceptable use in line with relevant policies, laws and regulations. I hereby allow my son or daughter to access the Board's supervised facilities and resources.</p> <p><b>Student Name:</b></p> <p><b>Student Signature:</b></p> <p><b>Date:</b></p> <p><b>Parent/Guardian Full Name:</b></p> <p><b>Parent/Guardian Signature</b></p> <p><b>Date;</b></p> |

The teacher/instructor must follow the guidelines/policy as established by their school board.

## To Be Used as An Example Only; Please See Board/School Policy Transportation 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. Avoid wearing loose, baggy clothing or personal accessories, such as watches, chains, rings, or other jewelry, no ties.
2. Wear safety glasses, shields and gloves and other PPE as per instructed.
3. Safety glasses must be worn at all time in the shop area.

#### Lift Support and Movement

1. Move a heavy load only with teacher approval.
2. Use assistance to lift items over 20 kilograms (40 pounds) or two metres (six feet) in length.
3. Secure and support with approved stands only.

#### Machine Tools and Energy

1. Do not direct compressed air or gases towards anyone or towards exposed skin or clothing.
2. Operate equipment, tools or machinery only after receiving proper instruction and permission from the teacher.
3. Never leave equipment or machinery running unattended.
4. Do not attempt to repair any electrical connections.
5. Lockout any equipment which is being repaired.
6. Only one operator per machine is permitted and concentrate on your work.
7. Do not distract the operator of a machine.
8. Always make sure that a machine or power tool has come to a complete stop and has been switched off or unplugged before changing, adjusting or removing bits, cutters etc.

#### Storage and Handling of Compressed Gases

1. Complete WHMIS, symbols and recognition instruction.
2. Maintain all cylinders in an upright position, chained and secured.
3. Change gas bottles only with teacher supervision.

#### Storage and Handling of Chemical Substances

1. Understand and follow WHMIS, and SDS instruction before handling chemical substances.
2. Secure all flammable and corrosives in approved cabinets.
3. Maintain good housekeeping practices when dealing with chemical substances.

#### Waste Disposal and Recycling

1. Be responsible for cleaning up workstations, tools and the shops.
2. Sort waste by category as required using approved containers.
3. Sort recyclable liquids and solids into proper approved storage containers

Sample:

## 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.

| <b>STUDENT CONDUCT AGREEMENT FORM</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <p>I, _____</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p><b>agree to:</b></p> |
| <p>Ensure a safe workplace</p> <ol style="list-style-type: none"> <li>1. Inform teachers of all injuries, damaged equipment and potentially dangerous situations.</li> <li>2. Make sure I know all fire exits and power shutdown switches and how to use them during emergency situations.</li> <li>3. Not compromise the safety of others through horseplay or aggressive action.</li> <li>4. Only use equipment when properly trained, always with any necessary personal protective equipment, and when I fully understand all related safety issues.</li> <li>5. Ask for assistance from the teacher when I am unsure of the proper procedures or health and safety issues</li> <li>6. <b>Respect</b> for the teacher and fellow students and equipment is an absolute must! The shop operates on a "team" basis. We must get along and respect each other in order for the shop to function successfully. Therefore, bullying of <u>any</u> nature will be dealt with immediately and consequences will follow.</li> </ol> |                         |
| <p>Prescribed and Non-prescribed Medications</p> <ol style="list-style-type: none"> <li>1. Report any use of prescription medications and inform teachers of any possible side effects of the medication [e.g., penicillin, phenobarbital]</li> <li>2. Report any use of non-prescription medication and any possible side effects of the medication [e.g., Reactine, Benadryl, cough syrups]</li> <li>3. Never enter a shop or lab carrying, or under the influence of illegal substances</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                         |
| <p>Consequences for Improper Action</p> <p>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 or permanent removal from the class or shop.</p> <p><b>I have read the above and understand the expectations and consequences.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                         |
| <p>Student signature:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>_____</p>            |
| <p>Parents signature</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>_____</p>            |
| <p>Date:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>_____</p>            |

## SECTION 2: SAFETY INFORMATION SHEETS

### SECTION OVERVIEW

This section contains Safety Data Sheets (**listed in alphabetical order**) that can be used as:

- Student handouts
- Safety posters (can be mounted in and around specific equipment or bulletin boards)
- Teacher notes in project binders, safety binders or assessment plans
- Information that can support lesson plans

**Safety Information Sheets** contain information specific to various common tools and procedures. Before using them, ensure they accurately describe your own particular facilities and equipment, and that they align with specific manufacturer's safety instructions.

#### NOTE:

All materials within this document are to be considered as suggestions and recommendations only. These are not legal documents and are not to be considered as legal requirements or as official policy. OCTE or the individual contributors makes no claim to the accuracy or the completeness of the enclosed documents and accepts no responsibility for any damages pertaining to their use. Users of this document should not assume all warnings and precautionary measures are contained herein, that additional information or measures are not required, or that local by-laws, regulations or Board policies are explicitly included.

Please see specific equipment manuals for further safety information, as well as local, Board and school policies and regulations. Please review exemplar [TTJ safetyNET](#) resource documents for experienced teacher tips and customization options for your course projects.

# ANGLE GRINDERS

Angle grinders are versatile hand-held power tools that provide a convenient way to grind, cut, and shape metal parts in the Technology Lab.

1. **Complete a HOT WORK PERMIT and work area inspection.**
2. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING GLOVES, FULL FACE SHIELD AND SAFETY GLASSES** when using an angle grinder.
3. Carefully inspect the grinding disk for cracks, chips, or any flaws before using.
4. Ensure that the grinding disk is secured and seated properly on the arbor according to the manufacturer's instructions, and that the safety guard is properly installed and free from defects.
5. Using an angle grinder on a metal surface produces high heat and sparks. Check the immediate area for any fire hazards such as flammable materials, liquids or batteries. Make sure you are at least 6 metres (20 feet) away from other workers.
6. Start the grinder off the work. Grip the grinder solidly with two hands (beware of the torque). Also make sure you have a solid stance before starting to grind.
7. **ALWAYS** aim the sparks towards the floor and away from others.
8. When you have finished grinding raise the grinder off the work and allow it to stop on its own.
9. The most common cause of injury to operators from angle grinders are lacerations from attachments that break and become projectiles. If the grinder is dropped during use it should be thoroughly inspected by the instructor before being used again. **IF THE GRINDING DISK HAS BEEN DAMAGED IN ANY WAY, IT MUST BE REPLACED BEFORE PROCEEDING.**
10. Improper use of the angle grinder may lead to a dangerous situation called KICKBACK. Kickback happens when the angle grinder suddenly thrusts towards the operator as a result of it grabbing or jamming on the materials being worked on. To prevent kickback, the grinding disk should never be forced into the work so that the grinding disk may become pinched or jammed.

"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"

# ARC/MIG/TIG WELDING

1. **PROTECT YOUR SKIN** by wearing leather or flame-resistant canvas coat and gloves. **PROTECT YOUR HEAD AND EYES** by wearing an approved welding helmet equipped with a minimum shade 10 lens and protective cover glass. Observers must wear **EYE PROTECTION** (as above).
2. STUDENTS WEARING CONTACT LENSES MUST NOT USE AN ELECTRIC WELDER or be exposed to the arc.
3. All welding equipment must be in good operating condition. Never use damaged equipment. Ensure all connectors are fastened securely.
4. **NEVER STRIKE AN ARC** unless you and the onlookers have protective lenses in place.
5. Always place a suitable barrier around the work area to protect others from arc radiation. Use shaded screens (shade 8 minimum) when possible. Be aware of others at all times when welding. Notify others that you are about to weld. This is very important if you are not in a protected welding booth.
6. The area must be free of water and your footwear dry when welding.
7. Ensure the ventilation system is turned on and working.
8. Complete a "Hot Work Permit" and check for flammable substances before beginning to weld &**DO NOT** weld pressurized containers.
9. Take breaks to help relieve arm fatigue.
10. Metal workpieces may be extremely hot. Always pick up hot pieces using tongs or pliers.

Always ensure the teacher is aware of any equipment problems.

**"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"**

# ***BATTERY HANDLING AND CHARGING METHODS***

1. Wear **PERSONAL PROTECTIVE EQUIPMENT** including **SAFETY GLASSES** when working around batteries. **BATTERIES POSE POTENTIAL DANGERS RELATING TO CORROSION, CHEMICAL BURNS, AND EXPLOSION.**
2. Make certain the battery is filled with distilled water if it is a maintenance style of battery. (Do a visual inspection prior to handling the battery or charging.)
3. During cold weather make certain the battery is not frozen.
4. **AVOID SPARKS AND FLAME SOURCES** around the battery and cable areas. When storing a battery, place insulator caps over terminals to prevent shorting and arcing.
5. Disconnect battery charger from AC wall outlet and turn it **off** before battery clamps are connected or disconnected.
6. Connect the **positive charger clamp first** to the battery positive terminal or cable clamp.
7. For a battery **in** the vehicle, connect the **negative charger clamp last** to a metal grounded bracket on the vehicle as far away from the battery as possible. An accessory (alternator, power steering pump, etc.) mount is usually a good choice.
8. For a battery **removed** from the vehicle, connect a negative booster cable clamp to the battery negative terminal or post. Then, connect **negative charger clamp last** to the other end of the booster cable positioned as far **away** from the battery as possible.
9. Charge batteries only in a well-ventilated area. Set controls to correct voltage, recommended time and charging rate. **DO NOT OVERCHARGE THE BATTERY!**
10. To remove the charger, turn it **off** first. Remove **negative charger clamp** that is furthest away from the battery **first**, and then the **positive charger clamp last**.
11. Always make the teacher aware you are going to use the charger.

**"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"**

## ***BENCH GRINDER***

1. Fill out a **HOT WORK PERMIT** and do a work area inspection.
2. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING AN APPROVED SAFETY SHIELD AND/OR SAFETY GLASSES, PROTECTIVE GLOVES, AND PROTECTIVE FOOTWEAR** when using a grinder, even if the grinder is equipped with protective glass shields. Ensure participants or observers are wearing personal protective equipment.
3. Make certain your work area is clean and clear of debris and potentially flammable materials.
4. Always check the **CLEARANCE OF THE TOOL REST** before starting work. Clearance should never be more than **3mm or 1/8 inch**. Always set the tool rest clearance when the wheel is not in motion.
5. When mounting or replacing any grinding wheel, always ensure that it fits properly on the shaft. Always ensure a new grinding wheel has the **CORRECT RPM RATING** for the grinder it is being installed on.
6. When installing the grinding wheel to the spindle, be certain the blotters are affixed to both sides of the wheel and that washers and nuts are of the correct size and are tightened securely.
7. Prior to starting the bench grinder, carefully inspect the grind wheel for any cracks, chips, or other defects that may compromise the structural integrity of the stone grind wheel.
8. When starting up any grinding wheel, **STAND TO ONE SIDE** out of line with the wheel; In the event that the wheel has been damaged, small projectiles may be ejected from the machine.
9. Grind only on the face of the wheel – **NEVER** the sides. Use the entire face to avoid grooving the wheel.
10. Always **FEED THE WORK TO THE WHEEL GRADUALLY**. Too much pressure or striking the wheel suddenly may cause it to fracture.

**STOP THE GRINDER IMMEDIATELY IF IT BEGINS TO CHATTER OR VIBRATE.  
NEVER USE TOOLS OR HANDS TO STOP ANY GRINDER.**

**“AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR”**

# ***BRAKE LATHE***

1. Accurately measure drum or rotor before resurfacing and compare with manufacturer's specifications.
2. Put on your **FACE MASK, SHIELD, and SAFETY GLASSES** before you start the lathe.
3. Do not wear loose clothing, jewelry, or gloves when operating or working around a lathe.
4. Use the correct centering cones. Center the drum or rotor and securely fasten it according to lathe manufacturer's procedures and guidelines.
5. **NEVER LEAVE A WRENCH** or any other tool sitting on the machine. The wrench may fly out and cause injuries when the machine is started.
6. Do not use a wrench or other object to touch revolving work or parts.
7. Never attempt to measure work, feel the surface, or adjust a cutting tool while the lathe is running.
8. Always stand erect to keep your head away from flying metal chips.
9. Never stop the drum/rotor with your hands; allow it to stop by itself.
10. Ensure adequate ventilation while brake lathe is in operation
11. Accurately measure lathe or rotor after resurfacing and compare with manufacturer's specifications. A unit that is undersized is unsafe and must be discarded.
12. Use lathe for rotors and drums only, no other parts or materials.

**"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"**

# COIL SPRING COMPRESSOR

**CAUTION: SERIOUS INJURY POTENTIAL.** COMPRESSED SPRINGS BREAKING FREE CAN CAUSE INJURIES TO OPERATING STUDENT, AS WELL AS STUDENTS IN THE IMMEDIATE AREA.

1. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING SAFETY GLASSES and face shield** when using a coil spring compressor.
2. Make certain the spring is fitted into the compressor properly. **HAVE TEACHER CHECK YOUR SET-UP** before compressing the spring. Use the safety chain around the spring.
3. Always compress slowly.
4. Be aware of other students in the work area.
5. Ensure the spring is compressing in a straight line.
6. Make certain hands and fingers are free and clear.
7. Once the spring is seated correctly, decompress slowly.
8. If the spring fails to compress or decompress correctly, **STOP AND SEEK ADVICE FROM YOUR TEACHER.**
9. Never remove the piston rod nut when there is any spring pressure on the lower spring seat.
10. Never use this equipment without first informing your teacher.

**"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"**

# DRILL PRESS

1. Make sure that your **FACE SHIELD, SAFETY GLASSES & SAFETY GUARDS** are in place before you start the drill press.
2. Always tie back long hair and keep your head and clothes well away from all moving parts of the drill press.
3. Select only drills that are sharp, in good condition and suitable for the job.
4. Remove **CHUCK KEYS/WRENCHES** have been removed from the drill chuck before starting the machine.
5. **CLAMP THE WORK SECURELY** to the table before starting the machine. Attempting to hold the work under the drill with one hand can result in serious and painful injuries.
6. Operate drills at the proper speed and feed. Forcing or trying to feed too quickly can cause drills to break or splinter with the chance of serious injuries.
7. If work slips from the clamp, never stop it with your hands. Never reach around or in back of any rotating drill.
8. Always ensure that the machine has come to a **COMPLETE STOP** and has been switched off and unplugged before you attempt to change drills or the belt for speed regulation.
9. If the drill sticks in the work, stop the motor and rotate the drill by hand to free it from the work.
10. File or scrape all burrs from drilled holes. Be sure that the file is fitted with a proper handle.
11. Round stock must be clamped in a V-Block
12. Always clear away chips and curls with a **HAND BRUSH** – not your hands.  
“AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR”

## ***Electronic and Electrical Devices***

1. Use all computer equipment with care. Electrical devices use and retain potentially lethal voltages.
2. Do not touch equipment that has come in contact with fluids. Risk of electric shock is greater in areas that are wet or damp. Do not operate any electrical equipment or computers in wet or damp areas.
3. When working with cords and cables, grasp the plastic insulation around the plug.
4. To protect equipment from accidental damage, do not place coats, backpacks, food, or beverages on or near computer tables.
5. Respect the rights of others who use the computer room by keeping it tidy and accepting responsibility for equipment used, including protection from theft, damage, or misuse.
6. Inspect any tools, power cords, and electrical fittings for damage or wear prior to each use. Use cords or equipment that are rated for the level of amperage or wattage that you are using. Do not use outlets or cords that have exposed wiring. Report any damage to your teacher and repair or replace damaged equipment immediately.
7. Make sure extension cords cannot present a tripping hazard.
8. Be aware that unusually warm or hot outlets may be a sign that unsafe wiring conditions exist. Unplug any cords to these outlets and do not use until your instructor has checked the wiring.
9. Know where the circuit breakers are located in case of an emergency.
10. Do not touch a person or electrical apparatus in the event of an electrical accident. Always disconnect the electrical current first.

**“AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR”**

## ***Electrical Hazards***

Touching an exposed electrical wire or electrical equipment that has not been grounded properly causes shocks. Shock can vary from a slight tingle to a rocking jolt. A very severe shock can cause death. Do not touch equipment or electrical wires that have been exposed to fluids.

Protect yourself against shocks by following these rules:

1. Check the condition of electrical cords on equipment. Report all problems to your instructor immediately. Replace worn or damaged cords.
2. All extension cords should be provided with three pronged plugs.
3. Eliminate overloading outlets with multiple adaptors or power strips.
4. Ensure easy access to outlet for quick disconnection of power if needed.
5. When disconnecting a cord, pull on the plug. Never pull on the cord. You may loosen the wires and get a shock.
6. Ensure outlets are spread out evenly around the classroom to provide adequate space for every group of students.
7. Never handle electrical equipment with wet hands or while standing in water.
8. Wear rubber-soled shoes to prevent shocks. Rubber does not conduct electricity.
9. Be sure an appliance is turned off before plugging it into an outlet.
10. Make sure you use proper power supplies and cables designated for use with specific pieces of equipment.
11. Store all electrical equipment in areas designated by your instructor.
12. Never change or interfere with the operating environment set up by someone else without permission.
13. Never tamper with Orange high voltage wires on EV or Hybrid vehicles.

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# ***Electrical Current Safety***

| <i>Current</i> | <i>Reaction</i>                           |
|----------------|-------------------------------------------|
| Below 1 mA     | Not perceptible                           |
| 1 mA           | Faint tingle                              |
| 5 mA           | Slight shock (Not painful)                |
| 6-25 mA        | Painful shock, loss of muscle control     |
| 9-30 mA        | Individual cannot let go                  |
| 50-150 mA      | Respiratory arrest                        |
| 1,000-4,300 mA | Rhythmic pumping (Action of heart ceases) |
| 10,000 mA      | Cardiac arrest-burns                      |

If you see someone who is “frozen” on a conductor:

1. Shut off circuit immediately and call your teacher for help.
2. Use non-conducting materials to push or pull the victim away from contact with energized conductor
3. Do not contact victim with your bare hands or any conductive material.

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# ***Repairing Electronic Circuits***

As you prepare for work inside your computer, follow these important procedures to minimize injury and promote safe practices:

1. **Turn off power.** It is imperative that you always remember to turn the power off before servicing any piece of electrical or electronic equipment. Do not open the computer case until you are absolutely sure no power is present. If you see any indicator lights (LED's) on, it is a sign that power has not been completely disabled. There are several makes of power supply units that use a switch on the back to shut off the power. If this is the case, be sure to set this switch to the "OFF" position. Unplug for Added Safety. As an added precaution, unplugging the computer unit from its power source will absolutely ensure that power is now turned off.
2. **Smoke and Burning Smells.** If you detect smoke or a burning smell originating from your electronic circuit you must: a. Stop what you're doing immediately. b. Unplug the power source. c. Call your instructor/supervisor immediately. d. Wait at least 5 minutes for parts to cool before you continue any repairs. A part that has been damaged from overheating should be replaced. Do not attempt to repair a part that has caused either smoke or smell or both. This holds especially true if the part in question happens to be the power supply.
3. **Remove Hand Jewelry.** Hand jewelry will often act as a conductor and can be an easy way for you to receive an electric shock. This holds especially true if the part you contact is the power supply.
4. **Get Grounded.** Grounding yourself by contacting the chassis/frame of the computer is an excellent safety procedure. This will prevent you from destroying components in your system that are susceptible to static charge. A grounding strap is an ideal piece of equipment and should be worn if it is available.
5. **Do Not Contact Capacitors.** Become familiar with capacitors in the system capable of delivering extreme electrical shocks. Capacitors in a computer can store electric charge even after power has been removed from the computer. It is a good practice to wait for up to 5 minutes after removing power from the computer before working on the unit.
6. **Do Not Service the Non-Serviceable.** Some equipment carries a label that reads "No serviceable components inside". This label means exactly what it says. Do not try to circumvent this warning under any circumstance. There are at times parts of a computer system that are not meant to be repaired. This warning is for everyone, including professional computer repair persons. This warning will usually appear on power supply units but can also be found on monitors, hard drives, optical drives and other dangerous or highly sensitive pieces of equipment.

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## ***Hybrid/Electric Vehicle Service***

1. Hybrid and Electric vehicles store up to 800 **Volts and 250 Amps**.
2. The difference between an Electric Vehicle (EV) or a Hybrid Vehicle (HEV) and an Internal Combustion vehicle is the drive train and power source.
3. Hybrid and Electric vehicles have high power electrical lines running under the vehicles. **Always follow manufacturer's instructions to lift these vehicles with floor jacks or hoists.** Damage to the high-power lines or battery could occur if vehicle is raised improperly.
4. Always ensure the system that is being worked on is low voltage.
5. Treat all electrical parts on a EV/Hybrid as if they have High Voltage until you have tested.
6. Hybrid vehicles can start up at any time. Ensure ignition is off and keys are out of range of vehicle prior to starting any repairs.
7. Always follow proper manufactures procedures for servicing components that are not connected to the High Voltage System.
8. Due to their drivetrains and suspension, some HEVs and EVs may need the service or tow mode to be engaged to be able to roll the vehicle. This mode will also prevent damage to the air suspension components when lifted.
9. Some EVs require specialized lifting pads to prevent battery damage
10. More information can be found at the [OCTE](#) Website

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## ***FACILITY EMERGENCY PROCEDURES***

1. Make sure you know the location of all fire alarms, first aid kits, emergency exits, exhaust ventilation switches and emergency power stop buttons
2. Make use you know the proper fire alarm exit procedures
3. EVACUATION ROUTES must be clear at all times.

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# FIRE EXTINGUISHERS

1. Know your Fire Safety Plan
2. If you see a fire, call for attention, get everyone out and pull fire alarm.
3. Stay calm.
4. Ensure that you use the correct classification fire extinguisher required for the fire.  
Ex. Class C Extinguisher for electrical fire
5. If using a fire extinguisher:
  - **PULL THE PIN, AIM LOW AT BASE OF FIRE**
  - **SQUEEZE HANDLE, SWEEP SLOWLY AT BASE OF FIRE**
  - **STAY LOW OUT TO AVOID HEAT AND SMOKE**
6. Have the fire department check to make sure the fire is out.
7. Ventilate when fire is completely out.

|                                               |                                                                                     |                                                                                   |
|-----------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| <b>CLASS A</b><br>water                       |   | <b>Ordinary Combustibles:</b><br>paper, cloth, wood, rubber,<br>many plastics.    |
| <b>CLASS B</b><br>CO <sub>2</sub>             |  | <b>Flammable Liquids:</b><br>oil, grease, gasoline, some<br>paints, solvents etc. |
| <b>CLASS C</b><br>dry chemical                |  | <b>Electrical:</b><br>wiring, fuse boxes, electrical<br>equipment etc.            |
| <b>CLASS D</b><br>special liquid or<br>powder |  | <b>Combustible Metals:</b><br>magnesium, sodium.                                  |

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# ***FIRST AID***

The immediate response to an emergency often involves First Aid. First Aid involves assisting an injured person until professional medical help can be provided.

The general action tips in the list below should be followed in an emergency. They do not replace the need to be properly trained in first aid. Your teacher will provide you with instructions in what to do in cases of emergencies.

1. Check the scene for dangers, (e.g. electrical shock hazards, chemical spills, hot objects, fire), stay calm and call out for help. Do not touch the victim until immediate dangers such as electrical current are removed.
2. Assist if asked by your teacher to keep the victim comfortable and calm.
3. Call the office for medical help if requested by the teacher.
4. Care for the victim by administering first aid according to your teacher's instructions.
5. Help keep people who are not needed away from the victim.

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# FIRST AID KITS

**Maintaining a properly stocked first aid kit is a requirement in every school and industrial workplace in Ontario.**

1. By using safe work practices and by working in a safety conscious manner, students may never need to use any of the contents, but it is important to know and understand the proper procedures to follow in the event of an accident.
2. **IN ALL CASES OF INJURY OR DISEASE, STUDENTS MUST:**
  1. Get first aid immediately.
  2. Inform the instructor of the circumstances leading up to the incident.
3. **ALL INJURIES**, no matter how slight, must be reported to the instructor.
4. Record the names of any students who may have witnessed the incident, as this information may be required at a later time.
5. Report ANY USE of the first aid kit to the instructor to ensure that any supplies that are used can be replaced.
6. Below is a suggested list of basic first aid kit contents. Add specific items according to your school's needs.

St. Johns Ambulance First Aid Manual

Masks

Disposable latex gloves

Pair of scissors

Plastic Emesis basin

Wooden splints

Rolls of splint padding

Adhesive strip bandages

3"x3" sterile gauze pads

4" compress bandages

6" Tensor bandages

Triangular bandages

Safety Pins

Sterile gauze bandages

Sterile gauze field dressing

1 ½" width roll adhesive tape

Antiseptic swabs

Burn cream

Instant cold packs

See WSIB Regulation 1101, Required first aid kit items (at  
[https://www.wsib.ca/sites/default/files/2019-09/0455\\_english\\_2014.pdf](https://www.wsib.ca/sites/default/files/2019-09/0455_english_2014.pdf))

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## ***FLAMMABLE LIQUID HANDLING/STORAGE***

1. Always wear safety glasses when handling flammable liquids & only handle fuel in a well-ventilated area.
2. Fuel containers should never be filled right to the top. Gasoline expands in warmer temperatures and spillage may occur. Be sure to keep it away from direct sunlight and any source of ignition.
3. Gasoline should be used only as a fuel. Never use it as a cleaning solvent.
4. Fuel containers must be stored in approved flammable-proof storage cabinet.
5. When you're using any gasoline-powered equipment/tool, always let it cool completely (about 10 minutes) before refilling the tank.
6. When storing gasoline powered equipment (small engine, lawnmowers) always remove all the fuel from the tank prior to storage.
7. ONLY use approved containers to carry or store fuel (CSA- or ULC-labeled).
8. If gasoline is swallowed, death can occur. Never try to siphon gasoline by mouth.
9. If you spill fuel on your clothes, you should do the following: avoid open flames, remove the clothing slowly (to avoid ignition by static electricity), take a shower as soon as possible bathing contaminated skin with warm water and soap, change into clean clothes and launder the gasoline-soaked clothing as soon as possible with lots of water.
10. When working on fuel-injected vehicles, fuel systems may contain fuel pressure. Use extreme caution!

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# FUEL HANDLING

**WARNING: GASOLINE IS EXTREMELY FLAMMABLE AND CAN BE EXTREMELY DANGEROUS IF NOT HANDLED OR STORED SAFELY.**

1. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING SAFETY GLASSES** when working with gasoline.
2. Never smoke, or operate any personal electronic devices when handling gasoline. Keep all fuels away from ignition sources like heat, sparks, and flames **AT ALL TIMES.**
3. Avoid prolonged exposure to gasoline vapours. If headache, dizziness or confusion develops from exposure to gasoline, take the person to fresh air and **NOTIFY THE INSTRUCTOR IMMEDIATELY.**
4. While working with gasoline, accidental skin contact may occur causing local irritation and skin reactions. Wash any areas of skin contact with soap and water.
5. Accidental splashes of gasoline entering the eye may cause irritation and discomfort. In the event of eye contact, flush the eyes with water using the emergency eye wash station and **NOTIFY THE INSTRUCTOR IMMEDIATELY.**
6. Gasoline must only be stored in a ULC (Underwriters Laboratories of Canada) or CSA (Canadian Standards Association) approved, and **SEALED** container. Sealed containers must be stored inside the school's FLAMMABLE MATERIALS locker when not in use.
7. **ALWAYS** use a funnel when transferring fuel from one container to another. **NEVER** siphon gasoline using your mouth. Use an approved transfer pump if siphoning gasoline from one container to another.
8. **NEVER** use gasoline as a solvent or as parts cleaner. An accidental spark could result in a dangerous fire.
9. **NEVER** attempt to start an engine after there has been a fuel spill in the vicinity. In the event of a spill involving gasoline, use an appropriate method of spill control and **NOTIFY YOUR INSTRUCTOR IMMEDIATELY.**

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## ***GENERAL HOUSEKEEPING***

**Keeping an organized workspace is essential to maintaining a safe, productive and professional working environment.**

1. Everything has a proper storage location. If you don't know where it is, please ask.
2. Never block fire exits, fire pull alarms, doorways, walkways, equipment controls or electrical breakers. These areas must remain unobstructed at all times.
3. If you notice a broken tool or piece of equipment, report it to the instructor immediately. **NEVER USE A TOOL OR PIECE OF EQUIPMENT IF IT HAS BEEN DAMAGED IN ANY WAY.**
4. If you're done with it, return it. Tools and equipment should be cleaned after use and promptly returned to their proper storage locations so that they are available for other students.
5. Oil, gas, and other automotive fluids all have approved storage containers and designated storage locations. **NEVER** mix chemicals or fluids.
6. In the event of a fluid spill, floor dry absorbent material must be applied immediately. Fluid spills on the shop floor present a serious slipping hazard. Do not leave the spill unattended until after the floor-dry absorbent material has been applied. **INFORM YOUR INSTRUCTOR OF ANY FLUID SPILLS.**
7. Individuals are responsible for cleaning up after themselves. Once you have completed a task, return the tools and equipment, clean up your workstation, and/or sweep the floor as required. Each student should leave their work area in the same condition, as they would expect to find it.
8. Dirt, dust and debris are harmful to your safety and the safety of those working around you. For this reason, the final **10 MINUTES** of each class will be set aside for general Transportation shop housekeeping duties. It is the responsibility of **EACH STUDENT** to ensure that the shop is kept as a safe, productive and professional working environment.

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# HAND TOOLS

**We use common hand tools every day in the Transportation Technology shop, but hand tools are responsible for a vast number of injuries when used incorrectly or in an unsafe manner.**

1. Wear **EYE PROTECTION** whenever using hand tools.
2. Inspect every tool before using it. Inspect for cracks, loose handles, or visual damage. If any damage is noted, do not use the tool and **REPORT IT TO THE INSTRUCTOR IMMEDIATELY.**
3. Never leave tools on floor, hanging over edges, on ramps or hoists where they could be forgotten or cause a tripping hazard.
4. After using a tool, **CLEAN** it, and **RETURN** it to its proper storage location.
5. “A dull knife is more dangerous than a sharp knife”. Maintain sharp cutting tools, as dull tools are more likely to slip. Only use chisels, knives, blades that are in sharp condition.
6. Use tools only for their intended purpose. For example, screwdrivers should not be used as pry bars – if they bend under load they are no longer useful and may be dangerous to use as a screwdriver.
7. Keep punches and chisels properly dressed. Mushroomed heads may cause pieces of metal to fly off violently when in use.
8. **NEVER** use a “cheater wrench”, or other device designed to increase a tool’s leverage. Damage to the tool or injury to the user may result.
9. **NEVER STAND BEHIND** anyone who is swinging a hammer. If you have to observe what is being done, stand off to the side out of the way of the hammerhead.

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# HYDRAULIC FLOOR JACKS

**WARNING: IMPROPER USE OF FLOOR JACKS CAN LEAD TO SERIOUS INJURY OR DEATH**

1. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING SAFETY GLASSES** when jacking up a vehicle.
2. Check the rated **LIFTING CAPACITY** of the floor jack and safety stands to confirm that they will safely support the weight of the vehicle.
3. Make certain that the vehicle is parked on a level surface, then apply the vehicle's emergency brake and block the wheels to prevent any movement of the vehicle when jacking.
4. Perform an **UNDERBODY INSPECTION** before attempting to raise a vehicle using a floor jack. Severe corrosion or other frame damage may compromise the vehicle's structural integrity. If excessive corrosion or other underbody damage is noted, **INFORM THE INSTRUCTOR BEFORE PROCEEDING.**
5. Locate the proper **VEHICLE LIFT POINTS** according to the vehicle manufacturer's specifications. These are structural components built into the vehicle's body that have been engineered to safely support the weight of the vehicle.
6. Close all vehicle doors and double check the placement of the jack. Improper floor jack placement can result in severe mechanical damage to the vehicle and/or personal injury to the user. **HAVE THE TEACHER CHECK YOUR SET-UP BEFORE PROCEEDING.**
7. Raise vehicle to desired working height, checking periodically to ensure the jack stays positioned. No person is to be partially or completely under the vehicle until it is secured on safety stands.
8. Position the safety stands under frame or axle area using a push rod.
9. **SLOWLY** lower the vehicle onto the safety stands and ensure the stands are correctly placed and they are carrying an even distribution of weight. Push on each bumper to check for stability before proceeding under vehicle. Be aware of the exit points from under the vehicle. **HAVE THE TEACHER CHECK YOUR SET-UP BEFORE PROCEEDING.**
10. Before lowering a vehicle ensure everyone is clear and away from potential pinch or contact points.
11. Inform the instructor anytime you are raising or lowering a vehicle using a floor jack.  
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# IMPACT WRENCH

**Using an Impact Wrench in the shop is a fast and effective way of removing common automotive fasteners, however, proper procedures must be followed to ensure safe use.**

1. Wear EYE PROTECTION whenever using an impact wrench.
2. Only use sockets and accessories that are specifically designed for use with an impact wrench. Chrome sockets designed for use with hand tools are not designed to withstand the pounding forces that impact wrenches generate and severe injury may result.
3. Carefully inspect each socket and/or accessory for signs of visible damage before use. Damaged tools must be reported to the instructor.
4. Always disconnect the air hose before installing sockets or accessories onto the impact wrench, or before performing any tool maintenance
5. Impact wrenches vibrate while being operated. Exposure to vibrations may cause tingling, numbing, or painful sensations in the hands, fingers or arms. If you experience any of these sensations, stop using the impact wrench and advise your instructor.
6. An air-powered impact wrench can create noises of up to 105 decibels. Hearing protection should be worn while using this tool.
7. Because the impact wrench is capable of generating very high torque levels, care must be taken not to over-tighten fasteners. Always use a torque wrench or impact gun torque stick adapter to ensure proper torque is applied to all fasteners. SEE YOUR INSTRUCTOR IF UNSURE!
8. Never operate the impact wrench with sockets or accessories installed unless using it on a fastener. Spinning the socket freely in the air may cause the socket to fly off, resulting in severe injury to the tool operator and/or bystanders.

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# LIFTING

A strain is a feeling of stiffness or soreness from using muscles too long or the wrong way. Strains usually occur in the lower back, the weakest point of the spinal column. In the motive power industry service, lifting heavy loads incorrectly often causes strains. Once your back has been strained or weakened, it can easily be injured again.

1. In the Province of Ontario, unassisted manual lifting is limited to 23 kg (51 pounds). Do not lift any load if it cannot be handled safely due to its size/shape.
2. You can prevent back strain by lifting with your strong leg muscles. When you must lift a heavy object, squat with knees bent, feet apart, and back straight. With your arms straight, get a firm grip on the load. Stand up keeping your back straight. Make your leg muscles do the work. Do not twist or bend.
3. Set objects down by using the same method in reverse. Ask for help if the object is too heavy. Use a cart/dolly to carry/move heavy objects any distance.
4. Heavy parts/components should be stored on the floor or bottom shelves.

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# MACHINERY GUARDS

**Machinery guards are in place for your safety. Guards are intended to prevent hair, clothing, hands, etc. from becoming entangled with parts of the machine, or to protect you from flying material, which could result in injuries.**

1. Always wear **EYE PROTECTION** when using power tools and machines. Long hair must be contained in a cap or net. Don't wear loose clothing or jewelry.
2. **BEFORE OPERATING ANY MACHINE FOR THE FIRST TIME**, ask your instructor to explain the function of the guards and to demonstrate them in operation.
3. Certain types of guards are adjustable. Make sure that the guards are adjusted to provide maximum protection.
4. Machines with **LOOSE OR POORLY SECURED GUARDS** must not be operated until guards have been properly adjusted.
5. **NEVER OPERATE ANY MACHINE WITH THE GUARDS REMOVED OR DAMAGED.** Inform your supervisor or instructor of the situation.
6. **ALWAYS CHECK YOUR MACHINE GUARDS** to make sure they are in place and operating, before using the machine. Re-check the guards after every set-up of the machine.
7. If you have occasion to remove a machine guard for any purpose, ensure that the **MACHINE IS SECURELY "LOCKED OUT"** to prevent its being activated while the guard is out of place. Your instructor must supervise this operation.
8. When you replace a guard check its performance before using machine.
9. Report all **UNGUARDED AND INADEQUATELY GUARDED** equipment promptly to your instructor.

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## ***METAL CUT OFF SAW***

The metal cut-off saw is commonly used for cutting and modifying exhaust parts, cutting metal, and for fabrication purposes, however; proper procedures must be followed to ensure safe use.

1. Fill out a **HOT WORK PERMIT** and do a work area inspection.
2. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING GLOVES, FULL FACE SHIELD, SAFETY GLASSES AND PROTECTIVE FOOTWEAR** when using a metal chop saw.
3. Make certain your work area is clean, free of debris, and that there are no flammable materials nearby.
4. All jewelry must be removed, and long hair tied back securely.
5. Stand to the side of the disc assembly when operating the saw.
6. Students who are left-handed should use their right hand for cutting operations.
7. Clamp material firmly in place and ensure you are aware of the blade path before you make your cut. Long stock pieces should be supported safely.
8. Prior to using the saw, check the condition of the cord and the abrasive cutting disc.
9. Using the metal cut-off saw to cut metal produces high heat and sparks. Check the immediate area for any fire hazards such as flammable materials, liquids or batteries. Make sure you are at least 6 metres (20 feet) away from other workers
10. Ensure the guard is functioning correctly during operations.
11. When making angle cuts ensure the cutting disc has adequate clearances.
12. Start the saw off the metal and gradually make the cut with even force on the abrasive disc.
13. Pieces of metal that have just been cut will have **SHARP EDGES AND WILL BE HOT** to touch. **USE CAUTION** when handling hot metal parts.  
"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"

# OXY-ACETYLENE TORCHES

Oxy-Acetylene torches are used extensively in the Transportation Technology shop. They can be used for heating up parts, cutting metal, and welding purposes, however; **proper procedures must be followed to ensure safe use.**

1. Fill out a HOT WORK PERMIT and complete a work area inspection.
2. Know the location of a fire extinguisher before beginning any work with Oxy-Acetylene torches.
3. Wear **EYE PROTECTION** in the form of cutting goggles with a minimum 'shade 5' level of protection. Safety glasses alone are not adequate due to the bright lights created when using Oxy-Acetylene torches. **ALL INDIVIDUALS** observing the procedure need to wear appropriate eye protection.
4. Ensure that all regulators, hoses, and torches are in good condition, free from leaks, and that the hoses are equipped with approved **FLASHBACK ARRESTORS**. Regular leak tests should be part of preventative maintenance procedures.
5. Oxygen and acetylene cylinders must be secured upright at all times and stored in a well-ventilated area.
6. Full and empty cylinders must be clearly marked, and stored separately, in accordance with your school's policy.
7. All unused gas cylinders must have **PROTECTIVE CAPS** in place during storage and transportation.
8. Use only approved, pressure-reducing regulators with each gas cylinder.
9. Keep all Oxy-Acetylene torches and equipment free from oil and grease; oxygen combines with oil and grease to cause violent fires. **NEVER** use oxygen to blow dust off clothing.
10. Protect yourself and your clothing from burns by wearing leather or flame-resistant clothing, leather gloves, and protective footwear.
11. Oxy-Acetylene torches should only be ignited using a striker – NEVER attempt to light the torches with a lighter!

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# ***PNEUMATIC TOOLS***

**Pneumatic Tools can make our jobs easier and more efficient while working in the shop however; proper procedures must be followed to ensure safe use.**

1. Wear **EYE PROTECTION** whenever using pneumatic tools.
2. Compressed air can be dangerous. Inspect all hoses, fittings and connections before connecting an air supply to any pneumatically powered tool. **REPORT ANY DAMAGE TO YOUR INSTRUCTOR.**
3. As operation may vary from one manufacturer to another, review the manufacturer's instructions before using any pneumatically powered tool.
4. Never operate a pneumatically powered tool at an air pressure above the manufacturer's rating.
5. Turn off the air pressure to the hose when not in use, or when changing tools.
6. Be sure to use only manufacturer approved adapters and accessories on any pneumatically powered tool.
7. Avoid creating trip hazards caused by hoses laid across walkways or curled underfoot.
8. All pneumatically powered tools have an exhaust through which the compressed air is vented. This exhaust air must be directed away from the user whenever operating a pneumatic tool.
9. Treat compressed air with respect: never direct compressed air at another person.

**"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"**

## ***RUNNING ENGINES***

1. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING SAFETY GLASSES** when running a shop engine. Ensure all participants or observers are wearing personal protection equipment. Make certain your work area is clean and clear of debris. Clean-up oil or water spills to remove the danger of accidental slipping or falls.
2. Perform an inspection of engine peripherals and support systems including hoses, belts, and fluid levels. **DO NOT REMOVE THE RADIATOR CAP IF THE ENGINE IS WARM.**
3. **THE EXHAUST FROM RUNNING ENGINES CONTAINS DEADLY CARBON MONOXIDE GAS.** Always connect an exhaust ventilation system to the exhaust of the engine.
4. Connect the positive battery cable first, and the negative cable last, ensuring terminals are tight and polarities are correct. **DO NOT CREATE SPARKS AROUND THE BATTERY.**
5. Ensure the fuel tank is an approved fuel container and the fuel lines are fastened tight and secured away from moving parts. **GASOLINE HAS A LOW FLASHPOINT AND DOES NOT NEED A SPARK TO IGNITE.** Know where the nearest fire extinguisher is available.
6. Connect all meters or test equipment prior to starting the engine. Secure all equipment and leads away from moving parts. **HAVE THE TEACHER CHECK YOUR SET-UP BEFORE PROCEEDING.**
7. Crank the engine using only the starter motor. **KEEP FINGERS AND HANDS AWAY FROM ALL MOVING PARTS, ESPECIALLY THE FAN.** When the engine starts, watch for leaks or loose components and listen for abnormal noises.
8. As the engine warms up be cautious of the exhaust components. **CAUTION NEEDS TO BE EXERCISED AT ALL TIMES AS BURNS CAN OCCUR FROM TOUCHING HOT ENGINE PARTS, OR SCALDING MAY RESULT FROM THE HIGH TEMPERATURE OF THE ENGINE COOLANT.**

**"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"**

# ***SHOP PRESS***

1. Wear **EYE PROTECTION AND OTHER PERSONAL PROTECTIVE EQUIPMENT** when using a press.
2. Ensure that the guard is operational and in place when using shop press
3. Mount all work to be pressed square and well supported on the worktable
4. Apply pressure in a steady manner. If the bearing/shaft doesn't move, make the teacher aware of the problem.
5. If you are pressing out a bearing, you should be aware that the shaft may fall to the floor, so watch where your feet, tools, and equipment are placed.
6. Choose the appropriate opening for the shaft size to slide through.
7. Ensure that you use the correct size adaptors when pressing bearings or shafts.
8. Be aware that if you force too hard you will strain yourself or you may overtax the equipment and it may fail. This may result in the equipment breaking or the bearing flying apart resulting in injury. Injury could result from equipment failure.

**"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"**

# ***TIRE CHANGING MACHINE***

## **WARNING: COMPRESSED AIR IN USE.**

1. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING SAFETY GLASSES and hearing protection** when using a tire changing machine.
2. Visually inspect the tire and rim for defects.
3. Make certain the work area is free and clear of parts and debris.
4. Deflate air from tire by removing valve core.
5. Follow the proper operational procedure to break the bead of the tire from the rim. **KEEP FINGERS AND HANDS AWAY FROM ALL PINCH POINTS AND MOVING PARTS OF THE MECHANISM.** (The manufacturer's documentation outlines the proper procedure)
6. Follow the proper operational procedure to mount the tire and rim onto the machine and remove the tire. **BEWARE OF PINCH POINTS AS THE TIRE IS ROTATED.** (The manufacturer's documentation outlines the proper procedure)
7. Follow manufacturer's procedures to reinstall the tire safely.
8. Safely inflate tire to manufacturer's recommended pressure. **DANGER, DO NOT OVER INFLATE AS TIRE MAY EXPLODE AND CAUSE SERIOUS INJURY.**

**"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"**

# VEHICLE HOIST

**WARNING: IMPROPER USE OF VEHICLE HOIST CAN LEAD TO SERIOUS INJURIES OR DEATH.**

1. Wear personal protective equipment including **SAFETY GLASSES** when raising a vehicle on a vehicle hoist.
2. **ONLY THE TEACHER IS ALLOWED TO DRIVE VEHICLES IN AND OUT OF SHOP.**
3. Students must be out of the safety zone surrounding the hoist whenever a vehicle is entering or exiting the shop.
4. The vehicle's G.V.W.R. (Gross Vehicle Weight Rating) must not exceed the hoist manufacturer's maximum lifting capacity. This maximum lifting capacity should always be posted on the hoist, near the controls.
5. Perform an **UNDERBODY INSPECTION** before attempting to raise a vehicle on a hoist. Severe corrosion or other frame damage may compromise the vehicle's structural integrity. If excessive corrosion or other underbody damage is noted, **INFORM THE INSTRUCTOR BEFORE PROCEEDING.**
6. Locate the proper **VEHICLE LIFT POINTS** according to the vehicle manufacturer's specifications. These are structural components built into the vehicle's body that have been engineered to safely support the weight of the vehicle.
7. Close all vehicle doors and ensure the hoist arms and locks are in place and secure before raising the vehicle. **HAVE THE TEACHER CHECK YOUR SET-UP BEFORE PROCEEDING.**
8. Raise the hoist until the wheels of the vehicle clear the ground and perform the **BOUNCE TEST**: shake the vehicle to check for stability. If the vehicle is stable, continue to raise the hoist to a comfortable working height.
9. Once the vehicle is at the desired working height, lower it on to the hoist's safety locks.
10. Caution should be used while working under the vehicle as you may injure your head and hands. Head injuries from accidental contact with metal parts, and burns from hot exhaust parts are common. Take care to avoid these risks.
11. Clean up the area when you are finished working on the vehicle **BEFORE** lowering it.
12. EV or Hybrid vehicles require special attention to lift points to avoid battery damage.

**"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"**

# VEHICLE MOVEMENT

CAUTION: ANY VEHICLE BROUGHT INTO THE TRANSPORTATION FACILITY FOR REPAIR MUST HAVE A LEGITIMATE WORK ORDER FILLED OUT AND SIGNED BY THE OWNER.

1. **Transportation teachers are the only persons authorized to drive vehicles in and out of shops on school property.**
2. The radio must be turned off when the vehicle is being moved.
3. Students must be out of the area or zone the vehicle is entering. All students in the shop must be informed when a vehicle is going to be moved.
4. Once in the shop, a vehicle must be turned off and the parking brake applied.
5. When a vehicle is removed from the shop the brakes must be pumped to ensure they are working before the vehicle is moved.
6. Extra caution is needed when backing out of the shops.

"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"

# ***WHEEL BALANCER***

1. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING SAFETY GLASSES** when using a wheel balancing machine.
2. Visually inspect the tire and rim for defects, and make certain the work area is free and clear of parts and debris.
3. Remove old balancing weights from rim. Remove gravel and mud from tire.
4. Select the correct size of centering cone and securely mount the wheel on the balancer. **LARGE TIRES ARE HEAVY. PROPER LIFTING AND HANDLING PROCEDURES ARE TO BE FOLLOWED.**
5. Safely follow the wheel balancer's operational procedure (as listed by the manufacturer of the machine) and accurately calibrate the machine for the wheel being balanced.
6. Ensure the protective hood is down prior to starting the machine, and that **HANDS/FINGERS ARE FREE OF THE ROTATIONAL AREA.**
7. Open the hood only when rotation has completely stopped.
8. Use the special weight pliers to install the recommended weights.
9. Re-spin the tire on the machine to verify the tire is balanced and that it will perform vibration free on the vehicle.
10. Carefully remove the wheel from the machine to avoid personal injury and to prevent damage to the machine.
11. Make certain you control the bounce of the tire on removal.
12. Ensure the teacher is aware that you are about to use this equipment.

**"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"**

# ***CHEMICAL HANDLING***

1. Before handling any chemicals, ensure you understand the safe handling procedures as outlined on container labels, WHMIS 2015 data sheets, designated instructions or posted classroom procedures as appropriate. If you are unsure, see your instructor before proceeding.
2. Place any chemicals in approved, labeled containers ONLY.
3. DO NOT mix chemicals without prior knowledge of the consequences.
4. Discard any used chemicals in approved disposal containers ONLY. Inform your instructor of near-full containers. DO NOT dispose of chemicals down drains. Ask your instructor for proper disposal methods and procedures.
5. Ensure that there is adequate ventilation when using chemical substances.
6. Do not use any chemical for any other purpose other than what it is designed for.
7. Use appropriate PPE (personal protection equipment) at all times when handling chemicals. PPE includes eye protection, faceshield, skin protection, gloves, coveralls, foot protection, as required under safe operating procedures.

**"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"**

# ***SDS SAFETY LABELS***

***GENERIC SAFETY DATA SHEETS FOR PERSONAL ENHANCEMENT PRODUCTS  
PROTECTED BY TRADE SECRET LAWS (SDS)***

## **MATERIAL IDENTIFICATION**

TRADE NAME/MATERIAL NAME

PRODUCT USE

OTHER NAMES:

MANUFACTURER'S/SUPPLIER'S NAME:

ADDRESS:

EMERGENCY TELEPHONE:

FIRST AID PROCEDURE

**"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"**

# WHMIS 2015 REGULATIONS

- The acronym WHMIS stands for *Workplace Hazardous Materials Information System*
- Canada aligned the Workplace Hazardous Materials Information System (WHMIS) from 1988 with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) in 2015.
- Suppliers and employers must use and follow the WHMIS 2015 requirements for labels and safety data sheets (SDSs) for hazardous products sold, distributed, or imported into Canada.
- SDS stands for *Safety Data Sheets*
- SDS is a print out on paper that identifies how to handle, store, use, health effects if exposed, emergency procedures, and protective measures
- Employers will be required to make sure that all hazardous products (as defined by the *Hazardous Products Regulations*) have an up-to-date SDS when it enters the workplace.
- The SDSs must be readily available to the workers who are exposed to the hazardous product, and to the health and safety committee or representative.
- A label will be required to be updated when the supplier becomes aware of any "significant new data". According to the regulation, the definition of significant new data is:
  - "New data regarding the hazard presented by a hazardous product that changes its classification in a category or subcategory of a hazard class, or result in its classification in another hazard class, or change the ways to protect against the hazard presented by the hazardous product." (Source: *Canada Gazette*, Part II, Hazardous Products Regulations, Section 5.12 (1))
- Labels will be required to be updated within 180 days of the supplier being aware of the new information. If you purchase a product within this 180-day time period, the supplier must inform you of the changes, and the date they became available, in writing.

**"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"**

## WHMIS 2015 LABELS

**Supplier labels** must be attached to the controlled product container which has detailed information about the product. Legislation states that 10 kg or more of a controlled product or hazardous material from a supplier must contain the following information:

- the hatched border that was required under WHMIS 1988 is not required under WHMIS 2015. However, it is also not forbidden to use the hatched border, so you may see it on a WHMIS 2015 label.
- labels must be in English and French. They may be bilingual (as one label), or be presented as two labels (one each in English and French).
- the pictogram, signal word, and hazard statement are to be grouped together,
- to be clearly and prominently displayed on the container,
- to be easy to read (e.g., you can see it easily without using any item except corrective glasses), and
- to be in contrast with other information on the product or container.
- Labels will be required to be updated within 180 days of the supplier being aware of the new information. If you purchase a product within this 180 day time period, the supplier must inform you of the changes, and the date they became available, in writing.
- **Product identifier** – the brand name, chemical name, common name, generic name or trade name of the hazardous product.
- **Initial supplier identifier** – the name, address and telephone number of either the Canadian manufacturer or the Canadian importer\*.
- **Pictogram(s)** – hazard symbol within a red "square set on one of its points".
- **Signal word** – a word used to alert the reader to a potential hazard and to indicate the severity of the hazard.
- **Hazard statement(s)** – standardized phrases which describe the nature of the hazard posed by a hazardous product.
- **Precautionary statement(s)** – standardized phrases that describe measures to be taken to minimize or prevent adverse effects resulting from exposure to a hazardous product or resulting from improper handling or storage of a hazardous product.
- **Supplemental label information** – some supplemental label information is required based on the classification of the product. For example, the label for a

mixture containing ingredients with unknown toxicity in amounts higher than or equal to 1% must include a statement indicating the percent of the ingredient or ingredients with unknown toxicity. Labels may also include supplementary information about precautionary actions, hazards not yet included in the GHS, physical state, or route of exposure. This information must not contradict or detract from the standardized information.

**In addition to this and if the container has more than 100 milliliters the following information must be on the label:**

- Risk time factors
- Precautionary measures while using or being exposed to the product/chemical
- First aid measures to address immediate injuries and not progressive illnesses

**Workplace labels** must be identified on a container that is not from the supplier, and must contain the following information:

- Product name (matching the SDS product name).
- Safe handling precautions, may include pictograms or other supplier label information.
- A reference to the SDS (if available).
- First aid measures

**“AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR”**

# Product K1 / Produit K1



## Danger

Fatal if swallowed.  
Causes skin irritation.

### Precautions:

Wear protective gloves.  
Wash hands thoroughly after handling.  
Do not eat, drink or smoke when using  
this product.

Store locked up.  
Dispose of contents/containers in  
accordance with local regulations.

IF ON SKIN: Wash with plenty of water.  
If skin irritation occurs: Get medical  
advice or attention.  
Take off contaminated clothing and  
wash it before reuse.  
IF SWALLOWED: Immediately call  
a POISON CENTRE or doctor.  
Rinse mouth.

## Danger

Mortel en cas d'ingestion.  
Provoque une irritation cutanée.

### Conseils :

Porter des gants de protection.  
Se laver les mains soigneusement après manipulation.  
Ne pas manger, boire ou fumer en manipulant  
ce produit.

Garder sous clef.  
Éliminer le contenu/récipient conformément aux  
règlements locaux en vigueur.

EN CAS DE CONTACT AVEC LA PEAU : Laver  
abondamment à l'eau.  
En cas d'irritation cutanée : Demander un avis  
médical/consulter un médecin.  
Enlever les vêtements contaminés et les laver  
avant réutilisation.  
EN CAS D'INGESTION : Appeler immédiatement un  
CENTRE ANTIPOISON ou un médecin.  
Rincer la bouche.

Compagnie XYZ, 123 rue Machin St, Mytown, ON, N0N 0N0 (123) 456-7890

This is an example of an updated 2015 supplier label using the Globally Harmonized System.

More information can be found on the Government of Canada, Canadian Centre for Occupational Health and Safety Website. See the link below.

[https://www.ccohs.ca/oshanswers/chemicals/whmis\\_ghs/pictograms.html](https://www.ccohs.ca/oshanswers/chemicals/whmis_ghs/pictograms.html)

## WHMIS 2015 Pictograms

|                                                                                     |                                                                                                                    |                                                                                    |                                                                                               |                                                                                      |                                                                                                   |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
|    | <b>Exploding bomb</b><br>(for explosion or reactivity hazards)                                                     |   | <b>Flame</b><br>(for fire hazards)                                                            |   | <b>Flame over circle</b><br>(for oxidizing hazards)                                               |
|    | <b>Gas cylinder</b><br>(for gases under pressure)                                                                  |   | <b>Corrosion</b><br>(for corrosive damage to metals, as well as skin, eyes)                   |   | <b>Skull and Crossbones</b><br>(can cause death or toxicity with short exposure to small amounts) |
|   | <b>Health hazard</b><br>(may cause or suspected of causing serious health effects)                                 |  | <b>Exclamation mark</b><br>(may cause less serious health effects or damage the ozone layer*) |  | <b>Environment*</b><br>(may cause damage to the aquatic environment)                              |
|  | <b>Biohazardous Infectious Materials</b><br>(for organisms or toxins that can cause diseases in people or animals) |                                                                                    |                                                                                               |                                                                                      |                                                                                                   |

\* The GHS system also defines an Environmental hazards group. This group (and its classes) was not adopted in WHMIS 2015. However, you may see the environmental classes listed on labels and Safety Data Sheets (SDSs). Including information about environmental hazards is allowed by WHMIS 2015.

## WHMIS 2015 Pictograms



The **flame** pictogram is used for the following classes and categories:

- Flammable gases (Category 1)
- Flammable aerosols (Category 1 and 2)
- Flammable liquids (Category 1, 2 and 3)
- Flammable solids (Category 1 and 2)
- Pyrophoric liquids (Category 1)
- Pyrophoric solids (Category 1)
- Pyrophoric gases (Category 1)
- Self-heating substances and mixtures (Category 1 and 2)
- Substances and mixtures which, in contact with water, emit flammable gases (Category 1, 2 and 3)
- Self-reactive substances and mixtures (Types B\*, C, D, E and F)
- Organic peroxides (Types B\*, C, D, E and F)



The **flame over circle** pictogram is used for the following classes and categories:

- Oxidizing gases (Category 1)
- Oxidizing liquids (Category 1, 2 and 3)
- Oxidizing solids (Category 1, 2 and 3)

## WHMIS 2015 Pictograms



The **gas cylinder** pictogram is used for the following classes and categories:

- Gases under pressure (Compressed gas, Liquefied gas, Refrigerated liquefied gas, and Dissolved gas)



The **corrosion** pictogram is used for the following classes and categories:

- Corrosive to metals (Category 1)
- Skin corrosion/irritation – Skin corrosion (Category 1, 1A, 1B and 1C)
- Serious eye damage/eye irritation – Serious eye damage (Category 1)

## WHMIS 2015 Pictograms



The **exploding bomb** pictogram is used for the following classes and categories:

- Self-reactive substances and mixtures (Types A and B\*)
- Organic peroxides (Types A and B\*)



The **skull and crossbones** pictogram is used for the following classes and categories:

- Acute toxicity –
  - Oral (Category 1, 2 and 3)
  - Dermal (Category 1, 2 and 3)
  - Inhalation (Category 1, 2 and 3)

## WHMIS 2015 Pictograms



The **health hazard** pictogram is used for the following classes and categories:

- Respiratory or skin sensitization – Respiratory sensitizer (Category 1, 1A and 1B)
- Germ cell mutagenicity (Category 1, 1A, 1B and 2)
- Carcinogenicity (Category 1, 1A, 1B, and 2)
- Reproductive toxicity (Category 1, 1A, 1B and 2)
- Specific Target Organ Toxicity – Single exposure (Category 1 and 2)
- Specific Target Organ Toxicity – Repeated exposure (Category 1 and 2)
- Aspiration hazard (Category 1)



The **exclamation mark** pictogram is used for the following classes and categories:

- Acute toxicity – Oral, Dermal, Inhalation (Category 4)
- Skin corrosion/irritation – Skin irritation (Category 2)
- Serious eye damage/eye irritation – Eye irritation (Category 2 and 2A)
- Respiratory or skin sensitization – Skin sensitizer (Category 1, 1A and 1B)
- Specific target organ toxicity – Single exposure (Category 3)



The **biohazardous infectious** materials pictogram remains the same for WHMIS 1988 and WHMIS 2015 and is used for the following classes and categories:

- Biohazardous Infectious Materials (Category 1)



**Environment.** May cause damage to the aquatic environment.

The Global Harmonized System has defined an environmental hazard group. This group was not adopted in WHMIS 2015, However you may see this symbol on labels and Safety Data Sheets, and WHMIS allows this so we are including it in this document

WHMIS Chemical Hazards Pictograms 2015

| WHMIS<br>1988<br>Hazard Class | WHMIS<br>1988<br>Symbols                                                            | WHMIS<br>2015<br>Symbols                                                                                                                                                | WHMIS<br>2015<br>Hazard Class                                                                                                 |
|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| A                             |    |                                                                                        | Gases Under Pressure                                                                                                          |
| B1 to B6                      |    |                                                                                        | Flammables, Self-Heating, Emit Flammable Gases, Pyrophoric Gases, Liquids & Solids Organic Peroxides                          |
| C                             |    |                                                                                        | Oxidizing Gases, Liquids, Solids                                                                                              |
| D1                            |    |       | Acute Toxicity - Oral, Dermal, Inhalation                                                                                     |
| D2                            |    |       | Eye Irritation, Skin Irritation<br>Skin/Respiratory Sensitization,<br>Carcinogenicity<br>Mutagenicity<br>Reproductive Hazards |
| D3                            |  |                                                                                      | Biohazardous Infectious Materials                                                                                             |
| E                             |  |                                                                                      | Skin/Eye Corrosion<br>Corrosive to Metals                                                                                     |
| F                             |  |   | Self-Reactive Substances<br>Organic Peroxides                                                                                 |
| N/A                           | N/A                                                                                 |                                                                                      | Explosive Substances (Explosives are still covered under WHMIS exclusions for now)                                            |
| N/A                           | N/A                                                                                 |                                                                                      | Aspiration, STOT<br>(Single Exposure, Repeated Exposure)                                                                      |
| N/A                           | N/A                                                                                 | N/A                                                                                                                                                                     | Combustible Dusts                                                                                                             |
| N/A                           | N/A                                                                                 | N/A                                                                                                                                                                     | Simple Asphyxiants                                                                                                            |
| N/A                           | N/A                                                                                 | Use appropriate symbol                                                                                                                                                  | Physical Hazards Not Otherwise Classified,<br>Health Hazards Not Otherwise Classified                                         |

## WHMIS 1988 VS. WHMIS 2015

### WHMIS 1988

Controlled products regulations

Controlled products

6 hazard classes, 3 divisions

Label:

- Hatched border
- No standardized phrases

Symbol in black circle

Material Safety Data Sheets ( MSDS )

- Must be updated every 3 years
- 9 sections

### WHMIS 2015

Hazardous products regulations

Hazardous products

30+ hazard classes, multiple categories

Label:

- Solid border
- Standardized phrases

Pictograms: symbol in a red square on its point ( Diamond )

Safety Data Sheets ( SDS )

Must be updated when new information is available

16 sections

## SECTION 3: SAFETY ASSIGNMENTS AND TESTS

### SECTION OVERVIEW

This section contains sample tests and assignments related to safety. They are designed as samples that can be used as written or edited for your purposes. They can be used for evaluation of the safety expectations of the course, or as tools to assess the student's knowledge and understanding of safety. It is recommended that all teachers keep a record of all test or assignment results and/or passports (next section) as verification of each student's understanding of safe concepts and practices.

The equipment and safety practices in individual facilities will determine how a teacher can best use these resources in the teaching of safe work practices. As well, with the safetyNET resources online at [www.octe.ca](http://www.octe.ca), there are additional resources always being updated, and available for download in .zip files.

### NOTE:

All materials within this document are to be considered as suggestions and recommendations only. These are not legal documents and are not to be considered as legal requirements or as official policy. OCTE or the individual contributors makes no claim to the accuracy or the completeness of the enclosed documents and accepts no responsibility for any damages pertaining to their use. Users of this document should not assume all warnings and precautionary measures are contained herein, that additional information or measures are not required, or that local by-laws, regulations or Board policies are explicitly included.

Please see specific equipment manuals for further safety information, as well as local, Board and school policies and regulations. Please review exemplar [TTJ safetyNET](#) resource documents for experienced teacher tips and customization options for your course projects.

## Evaluation and Assessment:

### OCTE Safety Rubric

**Use the following rubric to evaluate and assess students' ability levels when working with tools and/or shop equipment.**

**Rubric developed in accordance with The Ontario Curriculum,  
Technological Education - Grades 11 and 12, 2009.**

| <b>Skill Level 4:</b><br>(Proficiency)<br><b>(80%-100%)</b> | <b>Skill Level 3:</b><br>(Accomplished)<br><b>(70%-79%)</b> | <b>Skill Level 2:</b><br>(Development)<br><b>(60%-69%)</b> | <b>Skill Level 1:</b><br>(Beginner)<br><b>(50%-59%)</b> | <b>Skill Level R:</b><br>(Unacceptable)<br><b>(0%-49%)</b> |
|-------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------|------------------------------------------------------------|
|-------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------|------------------------------------------------------------|

#### APPLICATION

|                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                    |                                                                                                                                                                                                       |                                                                                                                                                                                                       |                                                                                                                                                                                                          |                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The student ...</p> <p>Overall Expectation:<br/>D1.<br/>Demonstrate the use of professional work practices and procedures and compliance with occupational health and safety regulations and standards.</p> <p>Specific Expectation:<br/>D1.3<br/>Use protective clothing and equipment (<i>e.g., eye protection, gloves, breathing mask</i>) as required to ensure their own and others' safety in the work environment;</p> | <p>Always uses protective clothing and equipment (e.g., eye protection, gloves, breathing mask, etc.) as required to ensure their own safety and the safety of others in the work environment.</p> | <p>Regularly uses protective clothing and equipment (e.g., eye protection, gloves, breathing mask, etc.) as required to ensure their own safety and the safety of others in the work environment.</p> | <p>Sometimes uses protective clothing and equipment (e.g., eye protection, gloves, breathing mask, etc.) as required to ensure their own safety and the safety of others in the work environment.</p> | <p>Occasionally uses protective clothing and equipment (e.g., eye protection, gloves, breathing mask, etc.) as required to ensure their own safety and the safety of others in the work environment.</p> | <p>Does not use protective clothing and equipment (e.g., eye protection, gloves, breathing mask, etc.) as required to ensure their own safety and the safety of others in the work environment.</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## COMMUNICATION

| The student ...                                                                                                                                                                                                                                                                                                                                                                                    | Always                                                                                                                           | Regularly                                                                                                                           | Sometimes                                                                                                                           | Occasionally                                                                                                                           | Is unable to                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <p>Overall Expectation:<br/>D1.<br/>Demonstrate the use of professional work practices and procedures and compliance with occupational health and safety regulations and standards.</p> <p>Specific Expectation:<br/>D1.5<br/>Describe and demonstrate the ability to follow appropriate safety precautions required for new technologies when working on vehicles, craft, or power equipment;</p> | Always describes and demonstrates the ability to follow appropriate safety precautions to ensure the safe use of shop equipment. | Regularly describes and demonstrates the ability to follow appropriate safety precautions to ensure the safe use of shop equipment. | Sometimes describes and demonstrates the ability to follow appropriate safety precautions to ensure the safe use of shop equipment. | Occasionally describes and demonstrates the ability to follow appropriate safety precautions to ensure the safe use of shop equipment. | Is unable to describe and demonstrate the ability to follow appropriate safety precautions to ensure the safe use of shop equipment. |

## THINKING

| The student ...                                                                                                                                                                                                                                                        | Always                                                                                                                                            | Regularly                                                                                                                                            | Sometimes                                                                                                                                            | Occasionally                                                                                                                                            | Is unable to                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Overall Expectation:<br/>D1.<br/>Demonstrate the use of professional work practices and procedures and compliance with occupational health and safety regulations and standards;</p> <p>Specific Expectation:<br/>D1.4<br/>Identify potential health risks when</p> | Always identifies potential health risks when servicing vehicles or craft, and demonstrates the use of safe procedures to mitigate these hazards. | Regularly identifies potential health risks when servicing vehicles or craft, and demonstrates the use of safe procedures to mitigate these hazards. | Sometimes identifies potential health risks when servicing vehicles or craft, and demonstrates the use of safe procedures to mitigate these hazards. | Occasionally identifies potential health risks when servicing vehicles or craft, and demonstrates the use of safe procedures to mitigate these hazards. | Is unable to identify potential health risks when servicing vehicles or craft, or demonstrate the use of safe procedures to mitigate these hazards. |

|                                                                                                   |  |  |  |  |  |
|---------------------------------------------------------------------------------------------------|--|--|--|--|--|
| servicing vehicles or craft, and demonstrate the use of safe procedures to mitigate these hazards |  |  |  |  |  |
|---------------------------------------------------------------------------------------------------|--|--|--|--|--|

## KNOWLEDGE & UNDERSTANDING

|                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                 |                                                                                                                                                    |                                                                                                                                                    |                                                                                                                                                       |                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The student ...</p> <p><b>Overall Expectation: D1.</b></p> <p>Demonstrate the use of professional work practices and procedures and compliance with occupational health and safety regulations and standards;</p> <p><b>Specific Expectation: D1.6</b></p> <p>Demonstrate an understanding of professional responsibilities in the transportation industry with regard to personal and public safety</p> | Always demonstrates an understanding of professional responsibilities in the transportation industry with regard to personal and public safety. | Regularly demonstrates an understanding of professional responsibilities in the transportation industry with regard to personal and public safety. | Sometimes demonstrates an understanding of professional responsibilities in the transportation industry with regard to personal and public safety. | Occasionally demonstrates an understanding of professional responsibilities in the transportation industry with regard to personal and public safety. | Is unable to demonstrate an understanding of professional responsibilities in the transportation industry with regard to personal and public safety. |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|

## Safety Assignment # 1 – Room Inventory and Safety Identification

Use a ruler/straight edge to draw a neat floor plan of this shop and identify the location of the following. Check off each item to ensure you have covered everything:

|                                            |  |
|--------------------------------------------|--|
| Entrance/exit doors                        |  |
| Safety exit                                |  |
| Fire extinguishers                         |  |
| Fire alarm                                 |  |
| First aid kit                              |  |
| Eyewash station                            |  |
| Power shut-off or emergency “stop” buttons |  |
| Work benches                               |  |
| Tool storage                               |  |
| Project storage                            |  |
| Waste oil storage                          |  |
| Oily rag storage                           |  |
| Drill press                                |  |
| Parts cleaning area                        |  |
| Pedestal grinder                           |  |
| Tire machine                               |  |
| Wheel balancer                             |  |
| Brake lathe                                |  |
| Arc welding area                           |  |
| Oxy-acetylene welding area                 |  |
| Vehicle hoist(s) safety zones              |  |
| Flammable liquid storage                   |  |
| Exhaust ventilation fan control            |  |

|                                                           |  |
|-----------------------------------------------------------|--|
| Valve grinder                                             |  |
| Meter and test equipment storage                          |  |
| Consumable supplies storage                               |  |
| Cleaning supplies (brooms, dust pans,<br>floor-dry, etc.) |  |
| Safety glasses and face shields                           |  |

## Safety Assignment # 2 – General Safety

In groups of two, analyze the machine/equipment/issue you have been assigned and provide a detailed description of the safety for that system. Information may be found in a variety of places including textbooks, the Internet, equipment manuals, or from local suppliers. A 5 -10-minute group presentation will be made to the class in which your group will describe the topic and the importance of safety in a transportation environment.

- Group 1     Arc Welder
- Group 2     Oxy-Acetylene Torches
- Group 3     Bench Grinder
- Group 4     Tire Machine
- Group 5     Wheel Balancer
- Group 6     Vehicle Hoist
- Group 7     Hydraulic Floor Jacks and Safety Stands
- Group 8     Running Engines
- Group 9     Brake Lathe
- Group 10    Chemicals, Solvents, and Fluids

## Safety Assignment # 3 – Perform a Safety Audit

Once a month, a group of you will be assigned to perform a safety audit of the transportation shop/lab. To accomplish this task, the group must first design a safety checklist that will be used for the inspection. The checklist must include the headings of:

First aid kit content status

Status of safety equipment

Status of fire protection equipment

Status of cleaning supplies and equipment

Status of storage areas

Status of machines and tools

Status of housekeeping

Your teacher will give you information about safety standards. Prepare a checklist for a safety audit of the shop. When you have approval for your checklist, perform the initial audit and report back to your teacher.

Sample:

## Transportation Technology Health and Safety Inspection Checklist

Teacher Inspecting: \_\_\_\_\_

Student Inspecting: \_\_\_\_\_

Date of Inspection: \_\_\_\_\_

| AREA INSPECTED                                      | CONDITION | ACTIONS NEEDED | DATE RECTIFIED |
|-----------------------------------------------------|-----------|----------------|----------------|
| Safety Glasses / Goggles                            |           |                |                |
| First Aid Kit                                       |           |                |                |
| Eye Wash Station                                    |           |                |                |
| Emergency Power Switches / Breakers                 |           |                |                |
| Fire Extinguishers                                  |           |                |                |
|                                                     |           |                |                |
| Machines and Equipment                              |           |                |                |
| Exhaust Fans and Ventilation Systems                |           |                |                |
| Hand Tools                                          |           |                |                |
| Power / Air Tools                                   |           |                |                |
| Floors, Work Benches, and Sinks                     |           |                |                |
| Vehicle Hoists                                      |           |                |                |
| Flammable Cabinet and Chemical Storage and Labeling |           |                |                |
| Floor Jacks and Axle Stands                         |           |                |                |
|                                                     |           |                |                |



Sample:

## Transportation Technology Vehicle Safety Inspection Checklist

Student Inspecting: \_\_\_\_\_

Date of Inspection: \_\_\_\_\_

Vehicle Make / Model: \_\_\_\_\_

KM's: \_\_\_\_\_

| Component / System<br>INSPECTED | CONDITION | ACTIONS NEEDED | DATE RECTIFIED |
|---------------------------------|-----------|----------------|----------------|
|                                 |           |                |                |
| Lighting Systems                |           |                |                |
| Braking Systems                 |           |                |                |
| Exhaust Systems                 |           |                |                |
| Steering Systems                |           |                |                |
| Suspension Systems              |           |                |                |
| Fuel Systems                    |           |                |                |
| Drive line Systems              |           |                |                |
| Tires                           |           |                |                |
| Seatbelts                       |           |                |                |
| Windshield                      |           |                |                |
| Defrost / Cooling<br>System     |           |                |                |
| Body Panels / Mirrors           |           |                |                |
|                                 |           |                |                |

## Safety Assignment # 5 – Sample Student Log Sheet: Student Accountability

To provide students with a method of documenting daily shop and service repair work, and to assist in embedding literacy and numeracy into practical assignments.

### Technological Education - The Ontario Curriculum Grades 9 and 10 Specific Expectations:

#### A4. Technological and Mathematical Literacy

By the end of this course, students will:

**A4.2** report on work in progress (*e.g., complete a work order, parts list, and/or journal*) using appropriate documentation;

**A4.3** apply appropriate mathematical and/or scientific principles, procedures, and terms and symbols when conducting and/or reporting on work on vehicles and/or craft;

< Your School Name >

< Program Name >

< Course Code > ~ < Teacher Name >

## Log Sheet



|               |
|---------------|
| Student Name: |
| Week Of:      |

#### Log Sheet Instructions:

- Students must complete and hand in Log Sheets every week.
- This is the student's opportunity to gain credit for practical shop work that has been completed during the shop portion of the Transportation Technology program.
- Completed Log Sheets will be used to calculate a portion of the student's final grade.

| Date      | Time In | Time Out | Estimated Labour Time | Project Description | Instructor Evaluation |
|-----------|---------|----------|-----------------------|---------------------|-----------------------|
| Monday    |         |          |                       |                     | /5                    |
| Tuesday   |         |          |                       |                     | /5                    |
| Wednesday |         |          |                       |                     | /5                    |
| Thursday  |         |          |                       |                     | /5                    |
| Friday    |         |          |                       |                     | /5                    |

|            |  |
|------------|--|
| Week Total |  |
|------------|--|

|            |     |
|------------|-----|
| Week Total | /25 |
|------------|-----|

#### Notes:

All fields must be completed in order to achieve full credit for practical shop work.  
Project Description fields should be completed using sufficient detail to accurately describe what the student was working on throughout the in-shop portion of the Transportation Technology class.

#### Comments:

## SAFETY QUIZ – Shop Press

1. What is the load rating of the shop press?

\_\_\_\_\_

2. If the bearing/shaft doesn't move, you should stop applying pressure & notify the teacher.

**TRUE or FALSE**

3. When using the shop press, you should apply pressure in a steady manner.

**TRUE or FALSE**

4. When using the shop press you should

- A. Ensure that you are wearing proper safety equipment
- B. Use the correct size adaptors
- C. Properly support/mount the part that you are working on
- D. All of the above

5. Before using the shop press, you should ensure that

- A. The guard is functional
- B. The shop press is mounted securely to the floor
- C. The hydraulic cylinder is not leaking
- D. All of the above

### ANSWER KEY

1. Evaluate individually
2. TRUE
3. TRUE
4. D5. D

## Safety Quiz – Arc/MIG/TIG Welding

1. To prepare yourself for welding operations, you should
  - A. Get someone to watch you
  - B. Wear eye, face, hand, and breathing protection
  - C. Keep rags nearby for wiping down the tool
  - D. Learn first aid
2. Adequate ventilation is very important because
  - A. You need an adequate supply of air
  - B. Welding materials have an mild odor
  - C. Welding materials may give off toxic fumes
  - D. The air gets stale and doesn't move
3. You notice a defect with the welding equipment. You should
  - A. Set it in the storage area
  - B. Report it to your supervisor
  - C. Ask your buddy about it
  - D. Clear the workbench
4. Proper welding helmet lens minimum shade level should be
  - A. Level 5
  - B. Level 10
  - C. Level 3
  - D. Level 8
5. Prior to welding, you should inspect the work area for
  - A. Flammable liquids
  - B. Oily rags
  - C. Suitable welding barrier
  - D. All of the above

### ANSWER KEY

- 1.B
- 2.C
- 3.B
- 4.B
- 5.D

## **Safety Quiz – Battery Charging**

1. What personal protective equipment must be worn when charging a battery?

- A. Safety glasses
- B. Safety shoes
- C. Chemical resistant apron & safety glasses
- D. Respirator

2. Batteries can cause severe chemical burns.

**TRUE or FALSE**

3. Vapors generated from battery while charging can cause an explosion.

**TRUE or FALSE**

4. Before attaching the battery charger, you should ensure that

- A. The battery is not frozen
- B. The battery is full of distilled water
- C. The battery is located in a well-vented area
- D. All of the above

5. The battery charger must be connected to a power outlet before attaching to the battery.

**TRUE or FALSE**

6. A fully charged battery has

- A. 13.5 volts
- B. 12.0 volts
- C. 12.6 volts
- D. 13.0 volts

7. When removing a battery from a vehicle, you should always

- A. Remove positive cable first
- B. Remove negative cable first
- C. Doesn't matter which cable is removed first
- D. Remove both at the same time

### **ANSWER KEY**

- 1.C
- 2.TRUE
- 3.TRUE
- 4.D
- 5.FALSE
- 6.C
- 7.B

## Safety Quiz – Brake Lathe

1. Before machining a brake rotor/drum, you should check
  - A. The rotor/drum for cracks
  - B. The brake lathe cutter bit for damage
  - C. To ensure the brake rotor/drum is mounted correctly
  - D. All of the above
2. When operating the brake lathe, you should
  - A. Wear proper safety glasses
  - B. Ensure all loose clothing/jewelry is secure
  - C. Leave brake lathe unattended
  - D. Only A & B
3. The purpose of the silencer belt is to
  - A. Reduce the amount of noise & provide a smooth cut
  - B. Reduce the amount of noise
  - C. Protect the brake rotor/drum
  - D. Prevent damage to the brake lathe
4. If the minimum brake rotor thickness specification is 24.7MM & the actual brake rotor thickness measurement after machining is 23.9MM, you should
  - A. Reinstall the brake rotor on the vehicle
  - B. Replace the brake rotor with a new one
  - C. Continue to resurface the brake rotor
  - D. None of the above
5. The maximum amount that can be removed on the brake rotor per cut is
  - A. .006in or .15mm
  - B. .06in or 1.5mm
  - C. .02in or .50mm
  - D. .040in or 1.01mm
6. The maximum brake drum diameter specification is 235.00mm & the actual brake drum measurement after machining is 225mm
  - A. Reinstall the brake drum on the vehicle
  - B. Replace the brake drum with a new one
  - C. Continue to resurface the brake drum
  - D. None of the above
7. If the brake rotor finish is rough after machining you should
  - A. Check condition of cutting bit
  - B. Check silencer belt
  - C. Check brake rotor mounting
  - D. All of the above

## **ANSWER KEY**

1. D
2. D
3. A
4. B
5. A
6. A
7. D

## Safety Quiz – Coil Spring Compressor

1. Why must you use extreme caution when using the coil spring compressor?
  - A. You could damage the coil spring
  - B. You could damage the strut assembly
  - C. A compressed coil spring has a tremendous amount of stored energy
  - D. You could damage the coil spring compressor
2. Before compressing a coil spring, you must ensure that
  - A. The coil spring is seated properly in the compressor
  - B. The piston rod retaining nut is removed
  - C. The teacher has inspected the set-up of the coil spring compressor
  - D. Both A & C
3. While compressing the coil spring, you notice that it is not compressing evenly, you should
  - A. Tap the coil spring with a hammer
  - B. Release compressor tension, re-adjust the coil spring & notify teacher
  - C. Continue to compress the coil spring
  - D. None of the above
4. When using the coil spring compressor
  - A. Always wear safety glasses
  - B. Be aware of other students in the work area
  - C. Keep hands/fingers free and clear
  - D. All of the above
5. When replacing coil springs you should replace them as a pair (both sides).  
**TRUE or FALSE**
6. When replacing a strut assembly, you should
  - A. Check strut bearings for damage
  - B. Check dust boots for damage
  - C. Check rubber spring Insulators for damage
  - D. All of the above
7. Before you remove a strut from the coil spring compressor, you should
  - A. Ensure that the coil spring is seated properly on the strut
  - B. Ensure that the piston rod nut is fully installed
  - C. All of the above
  - D. None of the above

**ANSWER KEY**

1. C
2. D
3. B
4. D
5. TRUE
6. D
7. C

## Safety Quiz – Drill Press

1. Before using the drill press, you should
  - A. Ensure that the workpiece is clamped securely
  - B. Wear the proper safety equipment & safety glasses/face shield
  - C. Ensure that the drill bit is in good condition & the proper size
  - D. All of the above
2. It is important to ensure that long hair & loose clothing are tied back & secure because it could get caught in the rotating drill bit.

### TRUE or FALSE

3. When drilling a hole in round pipe, you must
  - A. Use a center punch to mark location of the hole to be drilled
  - B. Hold the work piece with your hand
  - C. Clamp work piece securely in V-BLOCK
  - D. Both A & C
4. While drilling a hole, the work piece becomes loose in the clamp, you should
  - A. Grasp the work piece with your free hand
  - B. Hit the stop button on the drill press & step back from drill press
  - C. Ask someone to hold the work piece
  - D. None of the above
5. After drilling a hole in a work piece, you should
  - A. File burrs from the hole
  - B. Remove drill bit
  - C. Remove chuck key
  - D. All of the above
6. When drilling a large hole in a piece of metal, you should
  - A. Start with a small drill bit & gradually use larger drill bit until desired size
  - B. Use a large bit & drill the hole
  - C. Apply light steady pressure & use cutting fluid
  - D. Both A & C
7. If the drill bit gets stuck in the workpiece you should
  - A. Stop the drill & rotate the drill by hand to free it from the work
  - B. Stop the drill & then re-start the drill to try and free it from the workpiece
  - C. Continue drilling until the bit works free
  - D. None of the above

**ANSWER KEY**

1. D
2. TRUE
3. D
4. B
5. D
6. D
7. A

### ***Safety Assignment – Facility Emergency Procedures***

Have students draw a sketch of the entire Transportation Technology shop & label the following items on the sketch:

- Fire alarms
- First aids kits
- Emergency shut-off switches
- Fire extinguishers
- Exhaust ventilations switches
- Emergency exits

Have students describe the following emergency procedures for your school:

- Fire alarm exit route
- Tornado procedures
- Emergency lock-down procedures

### **ANSWER KEY**

Evaluate individually

## *Safety Quiz – Fire Extinguishers*

1. Class “A” fire consists of
  - A. Oil/Grease
  - B. Electrical panel/wiring
  - C. Magnesium
  - D. Wood, paper & cloth
2. A grease fire is an example of
  - A. Class A fire
  - B. Class B fire
  - C. Class C fire
  - D. Class D fire
3. How does a Class “B” fire extinguisher put out a fire
  - A. Spraying water at the fire
  - B. Smothering the fire with dry power chemical
  - C. Spraying CO<sub>2</sub> at the fire and removing all the oxygen near the fire
  - D. Coating the fire with special foam
4. An example of Class “C” fire is
  - A. Battery pack of an electric vehicle
  - B. Oil fire
  - C. Metal transmission case
  - D. Upholstery of a vehicle
5. You should never use a Class “A” fire extinguisher on an electrical panel fire because
  - A. It will not extinguish the fire
  - B. It could enflame the fire
  - C. The chemical foam will not extinguish the fire
  - D. The water in the Class “A” fire extinguisher could cause electrical shock
6. A car that is on fire is an example of
  - A. Class “A” fire
  - B. Class “B” fire
  - C. Class “D” fire
  - D. All of the above
7. What type of fire extinguisher would you use for a Combustible metal fire
  - A. Class “A”
  - B. Class “B”
  - C. Class “C”
  - D. Class “D”

**ANSWER KEY**

1. D
2. B
3. C
4. A
5. D
6. D
7. D

## Safety Quiz – Flammable Liquid Handling / Storage

1. Gasoline should be stored in
  - A. An approved storage container
  - B. A flammable-proof storage cabinet
  - C. Away from direct sunlight & any ignition source
  - D. All of the above
2. Fuel container should never be filled to the top because you need to leave room for the fuel to expand during warmer temperatures.

### TRUE or FALSE

3. When adding fuel to a lawnmower, you should
  - A. Allow the engine to cool for 10 minutes prior to adding fuel
  - B. Wear safety glasses
  - C. Add fuel in a well-ventilated area
  - D. All of the above
4. If you spill flammable liquid on your clothes, you should
  - A. Avoid ignition source
  - B. Shower as soon as possible with soap & water
  - C. Wash clothes as soon as possible with lots of water
  - D. All of the above
5. When storing small engines, you should
  - A. Fill the fuel tank
  - B. Remove all fuel from the fuel tank
  - C. Store in a well-ventilated area
  - D. None of the above
6. When replacing a fuel filter on a fuel injected vehicle, you should
  - A. Work in a well-ventilated area
  - B. Notify co-workers that you are opening the fuel system
  - C. Relieve fuel system pressure prior to removing the fuel filter
  - D. All of the above
7. Fuel pressure in some fuel injected vehicles may have system pressure as high as
  - A. 5000 PSI
  - B. 20 PSI
  - C. 60 PSI
  - D. Both A and C

**ANSWER KEY**

1. D
2. TRUE
3. D
4. D
5. B
6. D
7. D

## Safety Quiz – WHMIS 2015 and SDS Quiz

### Section 1: Written Response

Define WHMIS?

Define SDS?

What is the responsibility of the employer in regards to WHMIS according to the Occupational Health and Safety Act of Ontario?

### Section 2: Multiple Choice

1. If a hazardous material has more than 100 milliliters in one container, the label must have additional information, which includes:
  - a) The company's chemist
  - b) Risk time factor
  - c) b and d
  - d) Precautionary measures while exposed to the product
2. Workplace labels must contain a material identifier or product name, reference to a SDS, precautionary steps, and:
  - a) An emergency phone number
  - b) The hospitals phone number
  - c) First aid measures
  - d) The company's phone number
3. In Canada a suppliers WHMIS label must be written in:
  - a) French
  - b) English
  - b) Chinese
  - d) both Official Languages
4. A supplier when selling a hazardous material product must include:
  - a) A rebate
  - b) SDS
  - b) WHMIS
  - d) OH&S
5. A Safety Data Sheet should be:
  - a) Kept on file forever
  - b) Read and then thrown out
  - c) Photo copied for all workers
  - d) Placed in a binder and kept for 30 years
6. How often should an SDS sheet be updated under the 2015 WHMIS regulations?
  - a) Whenever new information is available
  - b) 4 years
  - c) 5 years
  - d) 3 years

**Answer Key:**

**Section 1: Written Response**

1. Workplace Hazardous Material Information System
2. Safety Data Sheets
3. To inform employees of hazardous materials.

**Section 2: Multiple Choice:** 1. C 2. C 3.D 4. B 5. D 6. A

## Safety Quiz – First Aid and Chemical Handling

### Section 1: Written Response

Why should you always wear PPE (Personal Protective Equipment) when handling chemicals?

Who should administer First Aid treatment when necessary?

What is the necessary safety precaution required when a chemical is spilled?

### Section 2: Multiple Choice

1. All injuries must be reported to the teacher immediately.
  - a) Always
  - b) Sometimes
  - c) Never
  - d) Maybe
2. What fire extinguisher classification is a must in a Transportation Technology shop?
  - a) A
  - b) B
  - c) C
  - d) Multi-purpose
3. Minor injuries need not be reported.
  - a) Always report
  - b) Sometimes report
  - c) Never report
  - d) Maybe report
4. Safety equipment is necessary only when power is on.
  - a) True
  - b) False
  - b) Maybe
  - d) Sometimes
5. Long hair must be tied back before using any power tool.
  - a) Always
  - b) Sometimes
  - c) Never
  - d) Maybe

### Answer Key:

#### Section 1: Written Response

1. Risk of Spills, explosions, accidents, etc
2. Only qualified First Aid People
3. Inform Teacher, Dispose correctly, wear PPE, etc

Section 2: Multiple Choice: 1. A 2. D 3.A 4. B 5. A

## Safety Quiz – First Aid Kits

### Section 1: Written Response

Record the location of the **FIRST AID KIT**(s) in your Transportation Technology classroom and shop areas:

In the event of a minor accident in the Transportation Technology shop, what should your course of action be?

### Section 2: First Aid Kit Contents Audit

Locate one of your classroom's first aid kits and inspect the contents. Use the **CHECKLIST** below to inventory the contents, make suggestions for additions, and to make note of any missing items.

| Item                                 | Qty. | Suggested Additions |
|--------------------------------------|------|---------------------|
| St John's Ambulance First Aid Manual |      |                     |
| Masks                                |      |                     |
| Disposable Latex Gloves              |      |                     |
| Pair of Scissors                     |      |                     |
| Wooden Splints                       |      |                     |
| Roll of Splint Padding               |      |                     |
| Adhesive Strip Bandages              |      |                     |
| 3"x3" Sterile Gauze Pads             |      |                     |
| 4" Compress Bandages                 |      |                     |
| 6" Tensor Bandages                   |      |                     |
| Triangular Bandages                  |      |                     |
| Safety Pins                          |      |                     |
| Sterile Gauze Bandages               |      |                     |
| Sterile Gauze Field Dressing         |      |                     |
| 1 ½" Width Roll Adhesive Tape        |      |                     |
| Antiseptic Swabs                     |      | Missing Items       |
| Burn Cream                           |      |                     |
| Instant Cold Packs                   |      |                     |

### Answer Key:

#### Section 1: Written Response

1. First Aid Kit locations specific to your facility.
2. All accidents, no matter how minor, must be reported to the instructor.

## Safety Quiz – Hydraulic Floor Jacks

### Section 1: Written Response

Why is it important to apply the vehicle's emergency brake **AND** block the wheels **BEFORE** attempting to raise the vehicle with a floor jack?

Why is it important to perform an **UNDERBODY INSPECTION** before attempting to raise the vehicle with a floor jack?

Why must safety stands **ALWAYS** be used when raising and performing a service on a vehicle using a floor jack?

### Section 2: Multiple Choice

1. Where would you look to find the information that explains where the vehicle's lift points are located?
  - a. On the floor jack
  - b. In the vehicle's owner's manual
  - c. On the vehicle's door stamp
  - d. All of the above
2. Which of the following conditions must be met before attempting to raise a vehicle using a floor jack?
  - a. Vehicle doors closed
  - b. Emergency brake applied
  - c. Wheels blocked
  - d. All of the above
3. Where would you look to find the rated **LIFTING CAPACITY** of a floor jack?
  - a. On the floor jack
  - b. In the vehicle's owner's manual
  - c. On the vehicle's door stamp
  - d. All of the above
4. Which of the following workplace accidents may be the direct result of the improper use of a floor jack?
  - a. Mechanical damage to vehicle
  - b. Personal injury
  - c. Death
  - d. All of the above

**Answer Key:**

Section 1: Written Response

1. It is important to apply the emergency brake and block the wheels to prevent the vehicle from rolling while being raised.
2. An underbody inspection must be performed to ensure that the vehicle's frame is structurally sound.
3. Safety stands must always be used so that there is no chance the vehicle can drop while working on it.

Section 2: Multiple Choice: 1. b. 2. d. 3. a. 4. d.

## Safety Quiz – General Housekeeping

### Section 1: Written Response

Why is general housekeeping important in the Transportation Technology shop?

Why is it important to return a tool or piece of equipment to its proper storage location promptly after completing a task?

Describe the condition that a student's workspace should be left in, after completing his or her task:

### Section 2: Multiple Choice

1. Which of the following individuals is responsible for maintaining a safe and organized working environment in the Transportation Technology classroom?
  - a. The Principal
  - b. The students
  - c. The instructor
  - d. All of the above
2. How much time will be set aside at the end of each class, to be dedicated to general housekeeping duties?
  - a. 45 minutes
  - b. 20 minutes
  - c. 10 minutes
  - d. 15 minutes
3. What should be done in the event of an accidental fluid spill?
  - a. Inform others working nearby
  - b. Report it to the instructor
  - c. Apply absorbent material
  - d. All of the above
4. What should be done if a tool is accidentally damaged while completing a task in the Transportation shop?
  - a. Select another tool
  - b. Report it to the instructor
  - c. Return it to storage
  - d. All of the above

### Answer Key:

Section 1: Written Response

1. Keeping an organized workspace is essential to maintaining a safe, productive and professional working environment.
2. Tools and equipment should be returned promptly so that they are available for other students to use.
3. A student's workspace should be left in the same condition that they would expect to find it.

Section 2: Multiple Choice: 1. b. 2. c. 3. d. 4. b.

## Safety Quiz – Angle Grinders

### Section 1: Written Response

What are the 3 important inspections that must be carried out **BEFORE** starting to use the angle grinder?

What is the most common cause of injury to persons who improperly use angle grinders?

What measures can be taken to help ensure that the potentially dangerous condition known as **KICKBACK** is prevented?

### Section 2: Multiple Choice

1. Which of the following pieces of personal protective equipment must be used when working with the angle grinder?
  - a. Safety glasses
  - b. Protective gloves
  - c. Full face shield
  - d. All of the above
2. Using an angle grinder on a metal surface will produce which of the following?
  - a. Friction
  - b. Sparks
  - c. Heat
  - d. All of the above
3. What is the recommended distance that a worker using an angle grinder should keep away from other workers?
  - a. 6 meters (20 feet)
  - b. 3 meters (10 feet)
  - c. 12 meters (40 feet)
  - d. 1 meter (3 feet)
4. Which of the following items could create a potential fire hazard if exposed to the heat and sparks that are generated by the use of an angle grinder?
  - a. Wood and paper
  - b. Automotive batteries
  - c. Flammable liquids
  - d. All of the above

**Answer Key:**

Section 1: Written Response

1. Check the condition of the grinding disk, check that the disk is properly installed on the arbor, and check that the safety guard is in place and properly installed.
2. The most common cause of injury to persons who improperly use an angle grinder are lacerations from attachments (Abrasives) that break and become projectiles.
3. Kickback can be prevented by not forcing the grinding disc into the work where it can become pinched or jammed.

Section 2: Multiple Choice: 1. d. 2. d. 3. a. 4. d

## Safety Quiz – Impact Wrench

### Section 1: Written Response

How would you determine if a socket or accessory is safe for use with an air-powered impact wrench?

Why is it important to carefully inspect each socket and/or accessory before using it on an impact wrench?

### Section 2: Multiple Choice

1. What mandatory piece of safety equipment **MUST** be worn at all times when using an impact wrench?
  - a. Safety footwear
  - b. Safety glasses
  - c. Full face shield
  - d. All of the above
2. An air-powered impact wrench is capable of generating approximately what level of decibel output?
  - a. 45 dB
  - b. 75 dB
  - c. 105 dB
  - d. 155 dB
3. What should you do if you notice a fine crack in the wall of an impact socket?
  - a. Use it anyway
  - b. Report it to the instructor
  - c. Advise your classmates
  - d. Throw it in the garbage
4. While using the impact wrench, you develop a tingling sensation in your fingers and arms. What should you do?
  - a. Continue using the tool
  - b. Report it to the instructor
  - c. Hurry up and finish the job
  - d. All of the above
5. When installing an automotive fastener using an impact wrench, what accessory **MUST** be used?
  - a. A torque limiting device
  - b. A universal socket
  - c. An extension
  - d. All of the above

**Answer Key:**

Section 1: Written Response

1. Impact sockets are usually black in colour and have been approved and designated as safe for use with air-powered impact tools.
2. Damaged or cracked sockets and accessories can break and fly apart if used on an impact wrench, resulting in injury to the user or bystanders.

Section 2: Multiple Choice: 1. b. 2. c. 3. b. 4. b. 5. a.

## Safety Quiz – Fuel Handling

### Section 1: Written Response

In what type of container can fuel be safely stored?

Where are properly sealed fuel storage containers kept when not in use?

While filling the fuel tank on a lawnmower, you accidentally spill some of the gasoline. What should you do?

### Section 2: Multiple Choice

1. What mandatory piece of safety equipment **MUST** be worn at all times when handling gasoline?
  - a. Safety footwear
  - b. Safety glasses
  - c. Full face shield
  - d. All of the above
2. Which of the following should **NEVER** be used while working with or around gasoline?
  - a. A funnel
  - b. Siphon pump
  - c. Cell phone
  - d. All of the above
3. Prolonged exposure to gasoline vapours may cause which of the following conditions?
  - a. Dizziness
  - b. Confusion
  - c. Headache
  - d. All of the above
4. Which of the following could be a potential source of ignition for a gasoline spill?
  - a. Connecting booster cables
  - b. Starting an engine
  - c. Automotive ignition systems
  - d. All of the above

**Answer Key:**

Section 1: Written Response

1. Fuel must only be stored in approved, sealed containers.
2. Fuel containers must be stored inside the school's FLAMMABLE MATERIALS locker when not in use.
3. In the event of a fuel spill, I would use an appropriate method of spill control, notify the instructor immediately, and make sure the engine is not started until after the fuel spill has been cleaned up.

Section 2: Multiple Choice: 1. b. 2. c. 3. d. 4. d.

## Safety Quiz – Pneumatic Tools

### Section 1: Written Response

List 5 pneumatically powered tools that are commonly used in the Transportation Technology program:

Where should a pneumatically powered tool's exhaust air be directed during use?

### Section 2: Multiple Choice

1. What mandatory piece of safety equipment **MUST** be worn at all times when using any pneumatic tool?
  - a. Safety footwear
  - b. Full face shield
  - c. Safety glasses
  - d. All of the above
2. What must be visually inspected before connecting any pneumatically powered tool?
  - a. Air line hoses
  - b. Air line connections
  - c. Air line fittings
  - d. All of the above
3. When should air pressure be shut off to the air supply hose?
  - a. When changing tools
  - b. At the end of the class
  - c. When not in use
  - d. All of the above
4. Which of the following workplace accidents could be the result of leaving air hoses lying across walkways and curled up underfoot?
  - a. Personal injuries
  - b. Trips, slips and fall accidents
  - c. Injuries to other students
  - d. All of the above
5. Which of the following is an acceptable use of compressed air?
  - a. To blow dirt from bolt holes
  - b. To blow dirt from skin
  - c. To blow dirt from clothing
  - d. All of the above

**Answer Key:**

**Section 1: Written Response**

1. Air ratchet - Air Chisel - Air impact gun - Tire inflator - Die grinder - Blow gun -  
Air cut-off tool - Air drill
2. Exhaust air should always be directed away from the user.

**Section 2: Multiple Choice:** 1. c. 2. d. 3. d. 4. d. 5. d.

## Safety Quiz – Hand Tools

### Section 1: Written Response

List 5 hand tools that are commonly used in the Transportation Technology shop:

What safety rule is common to all of these hand tools?

### Section 2: Multiple Choice

1. While inspecting a hand tool before use, you notice it has been damaged. What should you do?
  - a. Use it anyway
  - b. Advise other students
  - c. Report it to the instructor
  - d. All of the above
2. What would be the risk associated with using a screwdriver as a pry bar?
  - a. Personal injury
  - b. Damage to the component
  - c. Damage to the screwdriver
  - d. All of the above
3. After using a tool, in what condition should it be put away?
  - a. Clean
  - b. Undamaged
  - c. In its proper location
  - d. All of the above
4. What would be the risk of using a “cheater wrench” to remove a rusty fastener?
  - a. Personal injury
  - b. Damage to the wrench
  - c. Injuries to other students
  - d. All of the above
5. Which of the following hand tools requires periodic dressing using a bench grinder, to prevent a dangerous condition called “mushrooming”?
  - a. Hacksaw blades
  - b. Punches and chisels
  - c. Wrenches
  - d. All of the above

**Answer Key:**

Section 1: Written Response

1. Ratchet wrench - Sockets - Hacksaw - Pliers - Hammer - Screwdriver
2. Safety glasses should always be worn when using any hand tool.

Section 2: Multiple Choice: 1. c. 2. d. 3. d. 4. d. 5. b.

## Safety Quiz – Vehicle Hoist

### Section 1: Written Response

Three potential injuries to persons who incorrectly use a vehicle hoist include:

What is the purpose of performing an **UNDERBODY INSPECTION** on a vehicle **BEFORE** attempting to lift it with a vehicle hoist?

What are the precautions taken when lifting an EV or Hybrid Vehicle?

### Section 2: Multiple Choice

1. Which of the following individuals are permitted to drive a vehicle into or out of the shop area?
  - a. Grade 12 students
  - b. Licensed and insured students
  - c. Teachers
  - d. All of the above
2. When determining whether or not you can safely lift a vehicle on a hoist, where would you expect to find the hoist's safe lifting capacity information?
  - a. In the service manual
  - b. On the hoist
  - c. On the vehicle's door stamp
  - d. All of the above
3. When determining whether or not you can safely lift a vehicle on a hoist, where would you expect to find the G.V.W.R. – Gross Vehicle Weight Rating for the vehicle?
  - a. In the service manual
  - b. On the hoist
  - c. On the vehicle's door stamp
  - d. All of the above
4. When preparing to lift a vehicle using a two-post vehicle hoist, where would you have to look to find the location of the vehicle manufacturer's recommended lifting points?
  - a. In the service manual
  - b. On the hoist
  - c. On the vehicle's door stamp
  - d. All of the above
5. When raising a vehicle on a two-post vehicle hoist, what is the name of the test that should be performed as soon as the vehicle's tires clear the ground?
  - a. The hoist test
  - b. The bounce test
  - c. The safety test
  - d. The vehicle test

**Answer Key:**

Section 1: Written Response

1. Three potential injuries to individuals who incorrectly use a vehicle hoist include everything up to and including death.
2. An underbody inspection must be performed to determine whether or not the vehicle's frame and/or body are structurally sound and in a safe condition for raising on a vehicle hoist.
3. Refer to manufacturers lifting instructions to prevent damage to electrical wires or battery.

Section 2: Multiple Choice: 1. c. 2. b. 3. c. 4. a. 5. b.

## Safety Quiz – Machinery Guards

### Section 1: Written Response

Describe the primary purpose of machinery guards:

What should you do if you need to use the shop bench grinder, but notice that its safety guard has been removed?

Before performing any service on a piece of machinery that requires that the safety guard must be removed, what **MUST** be done prior to removing any safety guard?

### Section 2: Multiple Choice

1. What piece of mandatory personal protective equipment **MUST** be worn anytime you are working with machines and machinery guards?
  - a. Safety boots
  - b. Safety glasses
  - c. Hearing protection
  - d. All of the above
2. Under which condition(s) does a machinery guard need to be serviced?
  - a. It has become loose
  - b. It is cracked
  - c. It is poorly secured
  - d. All of the above
3. The primary purpose of machinery guards is to prevent which of the following from becoming entangled with parts of the machine?
  - a. Long hair
  - b. Hands
  - c. Loose clothing
  - d. All of the above

**Answer Key:**

Section 1: Written Response

1. The purpose of guards on machinery is to keep the operator safe.
2. Machines without safety guards should never be used. Report it to your instructor immediately.
3. The machine must be securely “Locked Out” to prevent anyone else from using it until the guard has been reinstalled.

Section 2: Multiple Choice: 1. b. 2. d. 3. d.

## Safety Quiz – Metal Cut-Off Saw

### Section 1: Written Response

List the Personal Protective Equipment (P.P.E.) that **MUST** be used when operating the **Metal Cut-Off Saw**.

What is the recommended procedure if a left handed student is operating the **Metal Cut-Off Saw**?

### Section 2: Multiple Choice

1. Which of the following is a recommended safety precaution for an individual operating the Metal Cut-Off saw?
  - a. Long hair tied back
  - b. Loose clothing secured
  - c. Jewelry removed
  - d. All of the above
2. What is the recommended location for the operator to be standing while operating the metal cut-off saw?
  - a. To the side of the disc
  - b. In front of the disc
  - c. Behind the disc
  - d. All of the above
3. Using a metal cut-off saw to cut steel exhaust tubing will create which of the following?
  - a. High heat
  - b. Hot metal parts
  - c. Sparks
  - d. All of the above
4. Which of the following items commonly found in the Transportation Technology shop may pose a risk of fire, if left in close proximity to an operating metal cut-off saw?
  - a. Oil-soaked rags
  - b. Car batteries
  - c. Carburetor cleaner
  - d. All of the above
5. What should be done to the piece of material **BEFORE** starting the metal cut-off saw?
  - a. Material should be cleaned
  - b. Held in place by hand
  - c. Clamped in place
  - d. All of the above

**Answer Key:**

Section 1: Written Response

1. When using the metal cut-off saw, operators must wear a full-face shield, safety glasses, protective gloves and protective footwear.
2. If a left-handed student is using the metal cut-off saw, they should use their right hand for cutting operations.

Section 2: Multiple Choice: 1. d. 2. a. 3. d. 4. d. 5. c.

## Safety Quiz – Oxy-Acetylene Torches

### Section 1: Written Response

What personal protective equipment **MUST** be worn when operating the Oxy-Acetylene torches?

How must Oxygen and Acetylene cylinders be stored when not in use?

### Section 2: Multiple Choice

0. Due to the bright lights created when cutting metal, protective cutting goggles must be worn when operating the Oxy-Acetylene torches. What is the **MINIMUM** level of protection required?
  - a. Shade 2
  - b. Shade 8
  - c. Shade 5
  - d. Shade 10
3. What materials, if combined with Oxygen from the Oxy-Acetylene torches, have the potential to create violent fires?
  - a. Wood and paper
  - b. Oil and grease
  - c. Soap and water
  - d. All of the above
4. Which of the following items is an appropriate tool for lighting the Oxy-Acetylene torches?
  - a. A disposable lighter
  - b. A striker
  - c. A match
  - d. All of the above
5. When starting up the Oxy-Acetylene torches, which gas should be **IGNITED** first?
  - a. Oxygen
  - b. Both gases together
  - c. Acetylene
  - d. It doesn't matter
6. When shutting down the Oxy-Acetylene torches, which gas should be **EXTINGUISHED** first?
  - a. Oxygen
  - b. Both gases together
  - c. Acetylene
  - d. It doesn't matter

**Answer Key:**

Section 1: Written Response

1. When using the Oxy-Acetylene torches, operators must wear cutting goggles, protective gloves, protective clothing, and protective footwear.
2. Oxygen and Acetylene cylinders must be stored in an upright position, in a well-ventilated area, with their protective caps in place.

Section 2: Multiple Choice: 1. c. 2. b. 3. b. 4. c. 5. c.

## Safety Quiz – Bench Grinder

### Section 1: Written Response

What personal protective equipment **MUST** be worn when operating the bench grinder?

Why is it important to carefully inspect the grind wheel **BEFORE** turning on the bench grinder?

### Section 2: Multiple Choice

1. When starting up the bench grinder, where is the recommended location for the operator to be standing?
  - a. In front of the grind wheel
  - b. Off to one side of the grind wheel
  - c. Behind the grind wheel
  - d. All of the above
2. When adjusting the **TOOL REST** on the bench grinder, what is the recommended distance that the tool rest should be away from the surface of the grind wheel?
  - a. 1.5mm or 1/16 "
  - b. 6mm or 1/4 "
  - c. 3mm or 1/8 "
  - d. 12mm or 1/2 "
3. What part of the grind wheel is the recommended surface to be used for grinding?
  - a. The face
  - b. The left side
  - c. The right side
  - d. All of the above
4. When replacing a grind wheel on a bench grinder, what inspections should be confirmed before turning the machine on?
  - a. Correct RPM rating
  - b. Correct tool rest clearance
  - c. Correct fit on the shaft
  - d. All of the above
5. While using the bench grinder, it suddenly begins to chatter and vibrate violently. What should you do?
  - a. Try to stop it by hand
  - b. Turn off the power
  - c. Hurry up and finish the job
  - d. All of the above

**Answer Key:**

Section 1: Written Response

1. The personal protective equipment that must be worn while using the bench grinder is an approved safety shield and/or safety glasses, protective gloves, and protective footwear.
2. The grind wheel must be inspected for cracks, chips, or other visible defects that may compromise the structural integrity of the stone grind wheel.

Section 2: Multiple Choice: 1. b. 2. c. 3. a. 4. d. 5. b.

## ***Safety Quiz – Running Engines***

### **Section 1: Written Response**

Name three potential hazards that a running engine could cause?

Why are electric cooling fans so dangerous?

Why should you never remove a radiator cap from a running engine?

Why is long hair and loose clothing dangerous around running engines?

What does a running engine produce?

**Answer Key:**

Section 1: Written Response

1. Burns, cuts, etc.
2. Cuts, loss fingers, etc. They could turn on at any time.
3. Severe burns could occur
4. Caught in moving parts, etc.
5. Carbon Monoxide

## Safety Quiz – Tire Changing Machine

### Section 1: Written Response

What Personal Protective Equipment (PPE) must be worn while using a tire-changing machine?

List 3 “pinch points” that are capable of inflicting injury if the machine is used incorrectly.

### Section 2: Multiple Choice

1. It is necessary to use some sort of lubricant on the tire when removing / installing tires.
  - a) Always
  - b) Sometimes
  - c) Never
  - d) Maybe
2. If the bead of the tire does not seat to the rim upon max inflation pressure, you should:
  - a) Keep adding air
  - b) Stop, and call over the instructor immediately
  - c) Add more lubricant
  - d) Leave the air in it and set the wheel in the corner until it seats
3. What is the maximum inflation pressure for the tire you are working on when using the Tire Changing Machine?
  - a) 25 psi
  - b) 32 psi
  - c) 35 psi
  - d) Manufacturer's Specifications

**Answer Key:**

Section 1: Written Response

1. The personal protective equipment that must be worn while using the tire machine are approved safety glasses, protective gloves, and protective footwear, etc.
2. Tire to Rim, the bead breaker, rim clamps, demount head and tire iron. Helper arm.

Section 2: Multiple Choice: 1. a. 2. b. 3.d.

## Safety Quiz – Wheel Balancer Machine

### Section 1: Written Response

Where should you always stand when a Wheel Balancing Machine is spinning?

Will dirt, mud, or snow in the wheel affect the end result when balancing a wheel assembly?

### Section 2: Multiple Choice

1. Is it important to check the inflation of the tires air pressure before balancing it?  
a) Always                                      b) Sometimes  
c) Never                                        d) Maybe
2. Aluminum and steel rims take the same kind of wheel weights.  
a) Always                                      b) Sometimes  
c) Never                                        d) Maybe
3. A Wheel Balance Machine should be bolted to the floor.  
a) Always                                      b) Sometimes  
c) Never                                        d) Maybe
4. A Wheel Balance Machine will never have to be calibrated after its original purchase.  
a) True                                         b) False  
c) Never                                        d) Maybe
5. While hammering on the weights, wearing safety goggles and using pliers to hold the weights instead of your fingers on install are acceptable safety precautions.  
a) True                                         b) False  
c) Never                                        d) Maybe
6. The lead wheel weights are not harmful to your health and you do not need to wear gloves or wash hands after handling the lead weights.  
a) True                                         b) False  
c) Never                                        d) Maybe

**Answer Key:**

Section 1: Written Response

1. To the side
2. Yes, always make sure the wheels are clean

Section 2: Multiple Choice: 1.a. 2.c. 3.a. 4.b. 5.a. 6.b.

## Safety Quiz – Vehicle Movement

### Section 1: Written Response

1. Who must drive a vehicle into the shop?
2. After repairs are performed the vehicle should be test driven by?

**Answer Key:**

Section 1: Written Response

**NO STUDENT IS TO DRIVE A VEHICLE IN THE TRANSPORTATION TECHNOLOGY  
LAB!**

Section 2: Multiple Choice:

**NO STUDENT IS TO DRIVE A VEHICLE IN THE TRANSPORTATION TECHNOLOGY  
LAB!**

## Safety Quiz - Electricity

### True/False Questions

1. T /F \_\_\_\_ The amount of electricity used in automotive circuits (max voltage 14V) can cause a heart attack?
2. T /F \_\_\_\_ The function of a fuse or circuit breaker is to interrupt the flow of electricity if the circuit becomes "overloaded"?
3. T /F \_\_\_\_ The purpose of the "third wire" on a three-pronged plug is to "ground" leaking or stray electricity?
4. T /F \_\_\_\_ A person usually offers the most resistance to electricity?
5. T /F \_\_\_\_ When you unplug a tool, you should pull the electrical cord?
6. T /F \_\_\_\_ You should never leave a running machine unattended, however, you can leave powered test circuit unattended because there are no moving parts there?
7. T /F \_\_\_\_ You do not need to wear eye protection when using a powered test circuits.

### Multiple choice questions

8. Which of the following problems can faulty electrical equipment cause?
  - A. Shock.
  - B. Fire.
  - C. Explosion.
  - D. All of the above.
9. Which statement is TRUE about low voltage circuits (5 - 9 V)
  - A. At low voltages (5-9V), the major risk is the risk of burns from high current short circuits.
  - B. Electrical circuits with low voltages (5-9V) cannot cause short circuits, because the voltage is too low.
  - C. Even low voltages (5-9V) circuit can supply 20 amps of current, that is why there is a major risk for human to get heart attack or shock.
  - D. All of the above.
10. The ratings for four typical domestic appliance fuses are given below. Which is the **safest fuse** to use for an appliance with a normal **operating current of 2A**?

- A. 13A
- B. 3A
- C. 8A
- D. 5A

11. Which statement is **TRUE** about mains electricity in our classroom?

- A. The voltage is a little bigger than a battery
- B. Wet skin has a bigger resistance than dry skin
- C. The current flow is usually similar to triple batteries in a torch
- D. A fuse should melts if a significantly higher than normal current flows

12. Which of the following statements is **NOT** correct?

- A. Electricity always travels to ground.
- B. Electricity tries to travel to ground.
- C. Electricity takes the path of lease resistance.
- D. Electricity travels in a complete circuit.

13. A current even as low as \_\_\_\_\_ can be felt by the body.

- A. 1 Amp
- B. 6 Volts
- C. 1 mAmp
- D. 6 Ohms

14. Which part of the human body offers the most resistance to electricity?

- 1. Fingers
- 2. Toes
- 3. Wet skin
- 4. Thick and/or dry skin

15. The greater the body's resistance to electricity, the \_\_\_\_\_ amount of harm to the person.

- A. Less
- B. Greater
- C. Resistance has no effect on electricity
- D. Equal

16. Which of the following are electrical hazards?

- A. Flammable materials near electrical equipment and/or static electricity

- B. Damaged insulation on wires, broken plugs, and overheated appliances
- C. Overloaded circuits
- D. All of the above are electrical hazards.
- E. Only A and B are electrical hazards.
- F. Only B and C are electrical hazards.

Answer Key:

1. F 2. T 3.T 4.F 5.F 6.F 7.T 8.D 9.A 10.B 11.D 12.A 13.C 14.4 15.A 16. D

## Evaluation and Assessment:

### OCTE Safety Rubric

**Use the following rubric to evaluate and assess students' ability levels when working with tools and/or shop equipment.**

**Rubric developed in accordance with The Ontario Curriculum,  
Technological Education - Grades 11 and 12, 2009.**

| <b>Skill Level 4:</b><br>(Proficiency)<br><b>(80%-100%)</b> | <b>Skill Level 3:</b><br>(Accomplished)<br><b>(70%-79%)</b> | <b>Skill Level 2:</b><br>(Development)<br><b>(60%-69%)</b> | <b>Skill Level 1:</b><br>(Beginner)<br><b>(50%-59%)</b> | <b>Skill Level R:</b><br>(Unacceptable)<br><b>(0%-49%)</b> |
|-------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------|------------------------------------------------------------|
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#### APPLICATION

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| <p>The student ...</p> <p>Overall Expectation:<br/>D1.<br/>Demonstrate the use of professional work practices and procedures and compliance with occupational health and safety regulations and standards;</p> <p>Specific Expectation:<br/>D1.3<br/>Use protective clothing and equipment (<i>e.g., eye protection, gloves, breathing mask</i>) as required to ensure their own and others' safety in the work environment;</p> | <p>Always uses protective clothing and equipment (e.g., eye protection, gloves, breathing mask, etc.) as required to ensure their own safety and the safety of others in the work environment.</p> | <p>Regularly uses protective clothing and equipment (e.g., eye protection, gloves, breathing mask, etc.) as required to ensure their own safety and the safety of others in the work environment.</p> | <p>Sometimes uses protective clothing and equipment (e.g., eye protection, gloves, breathing mask, etc.) as required to ensure their own safety and the safety of others in the work environment.</p> | <p>Occasionally uses protective clothing and equipment (e.g., eye protection, gloves, breathing mask, etc.) as required to ensure their own safety and the safety of others in the work environment.</p> | <p>Does not use protective clothing and equipment (e.g., eye protection, gloves, breathing mask, etc.) as required to ensure their own safety and the safety of others in the work environment.</p> |
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## COMMUNICATION

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| <p>The student ...</p> <p><b>Overall Expectation:</b><br/>D1.<br/>Demonstrate the use of professional work practices and procedures and compliance with occupational health and safety regulations and standards;</p> <p><b>Specific Expectation:</b><br/>D1.5<br/>Describe and demonstrate the ability to follow appropriate safety precautions required for new technologies when working on vehicles, craft, or power equipment;</p> | <p>Always describes and demonstrates the ability to follow appropriate safety precautions to ensure the safe use of shop equipment.</p> | <p>Regularly describes and demonstrates the ability to follow appropriate safety precautions to ensure the safe use of shop equipment.</p> | <p>Sometimes describes and demonstrates the ability to follow appropriate safety precautions to ensure the safe use of shop equipment.</p> | <p>Occasionally describes and demonstrates the ability to follow appropriate safety precautions to ensure the safe use of shop equipment.</p> | <p>Is unable to describe and demonstrate the ability to follow appropriate safety precautions to ensure the safe use of shop equipment.</p> |
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## THINKING

|                                                                                                                                                                                                                                                                                                             |                                                                                                                                                          |                                                                                                                                                             |                                                                                                                                                             |                                                                                                                                                                |                                                                                                                                                            |
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| <p>The student ...</p> <p><b>Overall Expectation:</b><br/>D1.<br/>Demonstrate the use of professional work practices and procedures and compliance with occupational health and safety regulations and standards;</p> <p><b>Specific Expectation:</b><br/>D1.4<br/>Identify potential health risks when</p> | <p>Always identifies potential health risks when servicing vehicles or craft, and demonstrates the use of safe procedures to mitigate these hazards.</p> | <p>Regularly identifies potential health risks when servicing vehicles or craft, and demonstrates the use of safe procedures to mitigate these hazards.</p> | <p>Sometimes identifies potential health risks when servicing vehicles or craft, and demonstrates the use of safe procedures to mitigate these hazards.</p> | <p>Occasionally identifies potential health risks when servicing vehicles or craft, and demonstrates the use of safe procedures to mitigate these hazards.</p> | <p>Is unable to identify potential health risks when servicing vehicles or craft, or demonstrate the use of safe procedures to mitigate these hazards.</p> |
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| servicing vehicles or craft, and demonstrate the use of safe procedures to mitigate these hazards |  |  |  |  |  |
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## KNOWLEDGE & UNDERSTANDING

|                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                 |                                                                                                                                                    |                                                                                                                                                    |                                                                                                                                                       |                                                                                                                                                      |
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| <p>The student ...</p> <p><b>Overall Expectation: D1.</b><br/>Demonstrate the use of professional work practices and procedures and compliance with occupational health and safety regulations and standards;</p> <p><b>Specific Expectation: D1.6</b><br/>Demonstrate an understanding of professional responsibilities in the transportation industry with regard to personal and public safety</p> | Always demonstrates an understanding of professional responsibilities in the transportation industry with regard to personal and public safety. | Regularly demonstrates an understanding of professional responsibilities in the transportation industry with regard to personal and public safety. | Sometimes demonstrates an understanding of professional responsibilities in the transportation industry with regard to personal and public safety. | Occasionally demonstrates an understanding of professional responsibilities in the transportation industry with regard to personal and public safety. | Is unable to demonstrate an understanding of professional responsibilities in the transportation industry with regard to personal and public safety. |
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## SECTION 4: SAFETY PASSPORTS

### SECTION OVERVIEW

This section contains Safety Passports, which provide a means to track individual student safety knowledge and skills. These Safety Passports ensure that students have passed the required safety tests and understand the safety procedures and rules specific to the tools and equipment. It is recommended that all teachers keep records of signed passports at all times

Safety Passports must be signed by teachers, parents, and students before working on any workshop machine or tool. Signing signifies completion of safety training and testing. There are three variations; teachers may select the most appropriate method to suit their needs. Ensure that the selected passports meet board and school policies.

**Safety Record Card:** for individual student, records their proficiency rating for each machine on one sheet.

**Safety Passport Form 1:** sheets for individual students listing machines, for teacher record book

**Safety Passport Form 2:** individual machine for each individual student has line for parent signature to be used as a safety reinforcement or authorization, (see principal for permissions)

### NOTE:

All materials within this document are to be considered as suggestions and recommendations only. These are not legal documents and are not to be considered as legal requirements or as official policy. OCTE or the individual contributors makes no claim to the accuracy or the completeness of the enclosed documents and accepts no responsibility for any damages pertaining to their use. Users of this document should not assume all warnings and precautionary measures are contained herein, that additional information or measures are not required, or that local by-laws, regulations or Board policies are explicitly included.

Please see specific equipment manuals for further safety information, as well as local, Board and school policies and regulations.

The general process is as follows:

1. **Teacher Demonstration:** When the teacher introduces a new piece of equipment, the student records the date of the safety demonstration on their safety passport. This is to be initialed by the teacher (see sample below). 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.). Students prepare notes in their notebooks. This safety note is carefully recorded in each student's notebook along with the signed passport. 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 complement 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: The teacher should keep a copy of the test.**
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.

[illegible]

**Form 1: Student Name:** \_\_\_\_\_ **Course/Class:** \_\_\_\_\_

|                                                                        |                 |                                |                 |                                                   |                 |                               |                 |
|------------------------------------------------------------------------|-----------------|--------------------------------|-----------------|---------------------------------------------------|-----------------|-------------------------------|-----------------|
| <b>Equipment/Procedure:</b> _____                                      |                 |                                |                 |                                                   |                 |                               |                 |
| 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 |
|                                                                        |                 |                                |                 |                                                   |                 |                               |                 |

|                                                                        |                 |                                |                 |                                                   |                 |                               |                 |
|------------------------------------------------------------------------|-----------------|--------------------------------|-----------------|---------------------------------------------------|-----------------|-------------------------------|-----------------|
| <b>Equipment/Procedure:</b> _____                                      |                 |                                |                 |                                                   |                 |                               |                 |
| 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 |
|                                                                        |                 |                                |                 |                                                   |                 |                               |                 |

|                                                                        |                 |                                |                 |                                                   |                 |                               |                 |
|------------------------------------------------------------------------|-----------------|--------------------------------|-----------------|---------------------------------------------------|-----------------|-------------------------------|-----------------|
| <b>Equipment/Procedure:</b> _____                                      |                 |                                |                 |                                                   |                 |                               |                 |
| 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 |
|                                                                        |                 |                                |                 |                                                   |                 |                               |                 |

## FORM 3: Equipment / Procedure Passports

|                                                                                                                                                                                                                                                                                                                 |       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| <b>[EQUIPMENT/PROCEDURE]</b>                                                                                                                                                                                                                                                                                    |       |
| <b>General Conditions</b>                                                                                                                                                                                                                                                                                       |       |
|                                                                                                                                                                                                                                                                                                                 |       |
| <b>Personal Protective Equipment</b>                                                                                                                                                                                                                                                                            |       |
|                                                                                                                                                                                                                                                                                                                 |       |
| <b>Possible Risk Factor</b>                                                                                                                                                                                                                                                                                     |       |
|                                                                                                                                                                                                                                                                                                                 |       |
| <ul style="list-style-type: none"><li>▪ The student has been trained on this equipment and procedure.</li><li>▪ The student understands the required personal protective equipment to operate this equipment and perform this procedure.</li><li>▪ The student is aware of the possible risk factors.</li></ul> |       |
| <b>Student signature</b>                                                                                                                                                                                                                                                                                        | _____ |
| <b>Teacher's signature</b>                                                                                                                                                                                                                                                                                      | _____ |
| <b>Date of training</b>                                                                                                                                                                                                                                                                                         | _____ |

# SHOP PRESS PASSPORT

## General Conditions

Students must be trained on the safe use of a **Shop Press** before they may begin using it. The student must demonstrate safe and proficient use before using the Arbor Press.

## Personal Protective Equipment

- Full face shield
- Safety glasses
- Coveralls or apron
- Safety footwear
- Appropriate guarding

## Possible Risk Factor

- Small projectiles
- Strain injuries
- Impact injuries [parts breakage]
- Possible pinch points

- Student has been trained and understands the possible risk factors and the required personal protective equipment to operate a **Shop Press**.

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## ***ARC/MIG/TIG WELDING PASSPORT***

### **General Conditions**

Students must be trained on the safe use of the **Arc/MIG/TIG Welding** equipment before they may begin using it. The student must demonstrate safe and proficient use prior to using Arc Welding equipment.

### **Personal Protective Equipment**

- Shade 10 or greater welding helmet
- Safety glasses
- Leather welding gloves
- Coveralls or leather jacket/apron
- Safety footwear
- Welding screens

### **Possible Risk Factor**

- Hot molten metal
- Electrical shock
- Flash burns [ultra violet rays]
- Welding fumes
- Small projectiles [chipped slag or debris]
- Severe burns

- Student has been trained and understands the possible risk factors and the required personal protective equipment to operate **Arc/MIG/TIG** Welders.

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# **BATTERY HANDLING AND CHARGING METHODS PASSPORT**

## **General Conditions**

Students must be trained on the safe methods of **Battery Handling and Charging Methods** before they may work on them. The student must demonstrate safe and proficient use prior to handling, boosting or charging a battery.

## **Personal Protection**

- Safety glasses
- Safety footwear
- Work gloves [acid resistant]
- Coveralls
- Chemical resistant apron

## **Possible Risk Factor**

- Explosion
- Eye injuries
- Corrosive burns
- Electrical arcing
- Fumes and vapors
- Lower back strain

- Student has been trained and understands the possible risk factors and the required personal protective equipment and methods of **Battery Handling and Charging Methods**.

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## ***BRAKE LATHE PASSPORT***

### **General Conditions**

Students must be trained on the safe use of a **Brake Lathe** before they may begin using it. The student must demonstrate safe and proficient use prior to using the Brake Lathe.

### **Personal Protection**

- Safety glasses
- Safety footwear
- Dust control mask

### **Possible Risk Factor**

- Eye injuries
- Cuts and abrasions
- Burns
- Entanglement
- Pinching and crushing of fingers
- Student has been trained and understands the possible risk factors and the required personal protective equipment to operate a **Brake Lathe**.

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# COIL SPRING COMPRESSOR PASSPORT

## General Conditions

Students must be trained on the safe use of a **Coil Spring Compressor** before they may begin using it. The student must demonstrate safe and proficient use prior to using the Coil Spring Compressor.

## Personal Protection

- Safety glasses
- Safety footwear

## Possible Risk Factor

- Eye injuries
- Cuts and abrasions
- Pinching and crushing of fingers
- Impact injuries [parts breakage]
- Student has been trained and understands the possible risk factors and the required personal protective equipment to operate a **Coil Spring Compressor**.

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## ***DRILL PRESS PASSPORT***

### **General Conditions**

Students must be trained on the safe use of a **Drill Press** before they may begin using it. The student must demonstrate safe and proficient use prior to using the Drill Press.

### **Personal Protection**

- Safety glasses/face shield
- Safety footwear
- Work gloves

### **Possible Risk Factor**

- Eye injuries
- Hand Injuries
- Entanglement of clothing and hair
- Cuts and abrasions

- Student has been trained and understands the possible risk factors and the required personal protective equipment to operate a **Drill Press**.

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# ***FACILITY EMERGENCY PROCEDURES PASSPORT***

## **General Conditions**

Students must be trained on the proper **Facility Emergency Procedures** before they may begin working in the shop area. The student must demonstrate understanding of all Facility Emergency Procedures prior to working in the shop area.

## **Personal Protection**

- Safety glasses

## **Possible Risk Factor**

- Failure to understand proper Facility Emergency Procedures may result in injury to yourself or other students.
- Student has been trained and understands the Facility Emergency Procedures that required prior to working in the technology shop area.

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## ***FIRE EXTINGUISHERS PASSPORT***

### **General Conditions**

Students must be trained on the proper use of Fire Extinguishers before they may begin using the technical shop area. The student must demonstrate safe and proficient use prior to using the technical shop area.

### **Personal Protection**

- Safety glasses/Face shield

### **Possible Risk Factor**

- Eye injuries
- Burns
- Student has been trained and understands the proper use of a **fire extinguisher**.

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# ***FLAMMABLE LIQUID HANDLING/STORAGE PASSPORT***

## **General Conditions**

Students must be trained on the proper procedures for **Flammable Liquid Handling and Storage** before they may begin using it. The student must demonstrate understanding of the proper procedures for Flammable liquid handling and storage.

## **Personal Protection**

- Safety glasses/Face shield
- Work gloves
- Well ventilated areas

## **Possible Risk Factor**

- Eye injuries
- Skin irritation
- Respiratory concerns
- Burns

- Student has been trained and understands the possible risk factors and procedures for Flammable liquid handling/storage.

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# **HYDRAULIC FLOOR JACK PASSPORT**

## **General Conditions**

Students must be trained on the safe use of all types of **Hydraulic Floor Jacks and Safety Stands** used in the Transportation Technology shop **BEFORE** they may begin using them. The student must demonstrate safe and proficient tool use prior to using hydraulic floor jacks and/or safety stands.

## **Personal Protection**

- Safety glasses
- Coveralls
- Protective footwear

## **Possible Risk Factor**

- Pinching or crushing
  - Loss of life
  - Hand injuries
  - Cuts and abrasions
  - Muscle strain
  - Back injury
  - Battery or electrical cable damage to EV or Hybrid vehicles
- The student has been trained on this equipment.
  - The student understands the required personal protective equipment to operate this equipment.
  - The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# GENERAL HOUSEKEEPING PASSPORT

## General Conditions

Students must be trained on the **General Housekeeping** practices and policies used in the Transportation Technology shop **BEFORE** they may begin working in the shop.

## Personal Protection

- Safety glasses
- Coveralls
- Protective footwear

## Possible Risk Factor

- Eye injuries
- Hand Injuries
- Cuts and abrasions
- Chemical spills
- Muscle strain
- Back injury

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## ANGLE GRINDER PASSPORT

### General Conditions

Students must be trained on the safe use of various types of **4", 5", 7" Angle Grinders BEFORE** they may begin using them. Proper guards must be in place before this equipment is used. The student must demonstrate safe and proficient tool use prior to using an angle grinder.

### Personal Protection

- Full face shield
- Safety glasses
- Protective footwear
- Coveralls
- Hearing protection
- Protective gloves

### Possible Risk Factor

- Small projectiles (metal cuttings or debris)
- Entanglement
- Hearing loss (prolonged use without P.P.E.)
- Burns
- Cuts and abrasions

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## **IMPACT WRENCH PASSPORT**

### **General Conditions**

Students must be trained on the safe use of all types of **Impact Wrenches** used in the Transportation Technology shop **BEFORE** they may begin using them. The student must demonstrate safe and proficient tool use prior to using the **Impact Wrench**.

### **Personal Protection**

- Safety glasses
- Coveralls
- Protective footwear
- Mechanic's impact resistant gloves

### **Possible Risk Factor**

- Eye injuries
- Hand Injuries
- Hearing loss (prolonged use without P.P.E.)
- Cuts and abrasions
- Entanglement
- Projectiles
- Compressed air

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors.

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## **FUEL HANDLING PASSPORT**

### **General Conditions**

Students must be trained on the safe handling of all types of **Fuels** used in the Transportation Technology shop **BEFORE** they may begin working with them. The student must demonstrate safe and proficient work practices prior to working with **Fuel**.

### **Personal Protection**

- Safety glasses
- Coveralls
- Protective footwear

### **Possible Risk Factor**

- Fire
- Burns
- Eye injuries
- Hand injuries
- Chemical spills
- Muscle strain
- Back injury

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# PNEUMATIC TOOLS PASSPORT

## General Conditions

Students must be trained on the safe use of all types of **Pneumatic Tools** used in the Transportation Technology shop **BEFORE** they may begin using them. The student must demonstrate safe and proficient tool use prior to using any of the **Pneumatic Tools**.

## Personal Protection

- Safety glasses
- Coveralls
- Protective footwear
- Mechanic's impact resistant gloves

## Possible Risk Factor

- Eye injuries
- Hand injuries
- Hearing loss (prolonged use without P.P.E.)
- Cuts and abrasions
- Entanglement
- Projectiles
- Compressed air

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## ***HAND TOOLS PASSPORT***

### **General Conditions**

Students must be trained on the safe use of all types of **Hand Tools** used in the Transportation Technology shop **BEFORE** they may begin using them. The student must demonstrate safe and proficient tool use prior to using the shop **Hand Tools**.

### **Personal Protection**

- Safety glasses
- Coveralls
- Protective footwear

### **Possible Risk Factor**

- Eye injuries
- Hand injuries
- Cuts and abrasions
- Projectiles

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# VEHICLE HOIST PASSPORT

## General Conditions

Students must be trained on the safe use of all types of **Vehicle Hoists** used in the Transportation Technology shop **BEFORE** they may begin using them. The student must demonstrate safe and proficient equipment use prior to using any of the **Vehicle Hoists**.

## Personal Protection

- Safety glasses
- Coveralls
- Protective footwear

## Possible Risk Factor

- Pinching or crushing
- Loss of life
- Hand injuries
- Cuts and abrasions
- Muscle strain
- Back injury
- EV, Hybrid vehicle battery damage

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# ***MACHINERY GUARDS PASSPORT***

## **General Conditions**

Students must be trained on the safe use of all types of **Machinery Guards** used in the Transportation Technology shop **BEFORE** they may begin using the equipment associated with them. The student must demonstrate safe and proficient equipment use prior to using any of the pieces of equipment that are equipped with **Machinery Guards**.

## **Personal Protection**

- Safety glasses
- Coveralls
- Protective footwear

## **Possible Risk Factor**

- Eye injuries
- Hand injuries
- Cuts and abrasions
- Entanglement
- Projectiles

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# METAL CUT-OFF SAW PASSPORT

## General Conditions

Students must be trained on the safe use of the **Metal Cut-Off Saw** used in the Transportation Technology shop **BEFORE** they may begin using it. The student must demonstrate safe and proficient tool use prior to using the **Metal Cut-Off Saw**.

## Personal Protection

- Face shield
- Safety glasses
- Protective gloves
- Coveralls
- Protective footwear

## Possible Risk Factor

- Eye injuries
- Hand injuries
- Cuts and abrasions
- Small projectiles
- Fire

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# **OXY-ACETYLENE TORCH PASSPORT**

## **General Conditions**

Students must be trained on the safe use of the **Oxy-Acetylene Torches** used in the Transportation Technology shop **BEFORE** they may begin using them. The student must demonstrate safe and proficient tool use prior to using the **Oxy-Acetylene Torches**.

## **Personal Protection**

- Shade 5 cutting goggles
- Safety glasses
- Leather welding gloves
- Coveralls or leather jacket/apron
- Protective footwear

## **Possible Risk Factor**

- Fire
- Explosion
- Burns
- Hand injuries
- Eye injuries
- Cuts and abrasions
- Inhalation of welding fumes
- Small projectiles (chipped slag or debris)
- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## ***BENCH GRINDER PASSPORT***

### **General Conditions**

Students must be trained on the safe use of the **Bench Grinder** used in the Transportation Technology shop **BEFORE** they may begin using it. The student must demonstrate safe and proficient tool use prior to using the **Bench Grinder**.

### **Personal Protection**

- Face shield
- Safety glasses
- Leather welding gloves
- Coveralls or leather jacket/apron
- Protective footwear

### **Possible Risk Factor**

- Burns
- Hand injuries
- Eye injuries
- Cuts and abrasions
- Small projectiles
- Entanglement

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## ***RUNNING ENGINES PASSPORT***

### **General Conditions**

Students must be trained on the safe use involved in **Running Engines** before they may begin working on them. The student must demonstrate safe and proficient use prior to working on a running engine.

### **Personal Protection**

- Safety glasses
- Coveralls
- Safety footwear
- Breathing protection
- Shop exhaust system
- Hearing Protection

### **Possible Risk Factor**

- Asphyxiation
- Burns
- Eye injury
- Projectiles
- Hand injuries
- Cuts and abrasions
- Entanglement
- Carbon Monoxide Poisoning

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# ***TIRE CHANGING MACHINE PASSPORT***

## **General Conditions**

Students must be trained on the safe use of the **Tire Changing Machine** before they may begin using it. All connections must be secure and hoses must be in good condition. The student must demonstrate safe and proficient use prior to using the tire machine.

## **Personal Protection**

- Safety glasses
- Safety footwear [work boots]
- Work gloves
- Hearing protection
- Coveralls

## **Possible Risk Factor**

- Eye injuries
- Pinch points
- Impact (hoses disconnecting from tools or each other)
- Entanglement of clothing
- Strain injuries

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# **WHEEL BALANCER PASSPORT**

## **General Conditions**

Students must be trained on the safe use of the **Wheel Balancer** before they may begin using it. The student must demonstrate safe and proficient use prior to using the wheel balancer.

## **Personal Protection**

- Safety glasses
- Safety footwear [work boots]
- Work gloves

## **Possible Risk Factor**

- Eye injuries
- Back strain
- Slipping
- Hand injuries
- Projectiles

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## ***VEHICLE MOVEMENT PASSPORT***

### **General Conditions**

**NO STUDENT IS TO DRIVE A VEHICLE IN THE TRANSPORTATION  
TECHNOLOGY LAB!**

### **Personal Protection**

**NO STUDENT IS TO DRIVE A VEHICLE IN THE TRANSPORTATION  
TECHNOLOGY LAB!**

### **Possible Risk Factor**

**NO STUDENT IS TO DRIVE A VEHICLE IN THE TRANSPORTATION  
TECHNOLOGY LAB!**

**NO STUDENT IS TO DRIVE A VEHICLE IN THE TRANSPORTATION  
TECHNOLOGY LAB!**

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# INTERNET USE PASSPORT

**\*\*TO BE USED AS AN EXAMPLE ONLY – PLEASE SEE BOARD/SCHOOL POLICY\*\***  
The teacher/instructor must follow the guidelines/policy as established by their school board.

## General Conditions

Students must be trained on the safe and proper use of the Internet before they may begin using it. The student must demonstrate to the teacher, knowledge of safe and secure procedures as outlined in the Internet Use Policy Document.

## Personal Protection

- Knowledge of school and school board Internet Use Policy
- Never releasing personal information
- Avoidance of insecure and questionable sites
- Respect for self and others
- Awareness of security issues in communications technology

## Possible Risk Factor

- Threats to personal safety and/or security
- Loss of privacy
- Threats to emotional security
- Spread of damaging computer viruses
- Damage to computer operating and networking systems

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

# ***ELECTRICAL/ELECTRONICS PASSPORT***

## **General Conditions**

Students must be trained on the safe use of the **electrical/electronic** before touching any electronic circuits. The student must demonstrate safe and proficient use prior to servicing electronic circuits.

## **Personal Protection**

- Safety glasses
- Work gloves
- Grounding strap

## **Possible Risk Factor**

- Eye injuries
- Shock
- Cuts
- Electrical Arcing
- Trip Hazards
- Never perform any work on EV or Hybrid high voltage wiring

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## *Transportation Technology Shop Rules and Expectations*

**In order to function safely in a professional Transportation Technology Lab, the following rules must be adhered to:**

1. **Respect** for the teacher and fellow students is an absolute must! The lab operates on a “team” basis. We must get along and respect each other in order for the lab to function successfully. Therefore, bullying of any nature will be dealt with immediately and consequences will follow.
2. **“Horseplay”** will not be tolerated at any time in the Transportation Technology lab. This includes any disruptive behaviour that may be dangerous.
3. **Cell phones and electronic equipment of any kind (mp3’s, I-Pods, games, etc) are not permitted** in the Transportation Technology lab.
4. If you need to **leave the lab** for any reason you must ask permission to do so.
5. Coats, bags and purses belong in your locker. We cannot be responsible for any lost or stolen personal items that are not permitted in the Transportation Technology lab.
6. Proper dress is essential in the Transportation Technology lab. Students are not permitted to wear sandals due to safety reasons. Shoes should be closed-toe and rubber soled. Storage will be available to the students for any extra clothing.
7. Long hair **must** be tied back when in the Transportation Technology lab.

I, \_\_\_\_\_ have read these guidelines. I understand and will abide by them at all times while in the Transportation Technology lab.

**Student’s Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Parent’s Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## SECTION 5: EMPHASIS COURSE RESOURCES

### *Emphasis Course Resources: Agriculture Equipment*

Use the following links for more information on Agriculture Equipment Mechanics service and repair techniques.

#### **Agriculture Equipment**

Agriculture equipment mechanics repair, troubleshoot, adjust, overhaul and maintain Agriculture Equipment. They are employed by farm equipment dealers and service establishments.

#### **Ministry of Labour – Ontario**

Farm Equipment - Hazards

Web site describe the dangers of working with & repairing farm equipment

[http://www.labour.gov.on.ca/english/hs/pubs/farming/gl\\_equipment.php](http://www.labour.gov.on.ca/english/hs/pubs/farming/gl_equipment.php)

#### **John Deere**

Agricultural Equipment Safety, Maintenance & Operation - VIDEOS

<https://www.deere.com/en/parts-and-service/manuals-and-training/videos/>

## ***AGRICULTURE EQUIPMENT REPAIR***

1. Wear **EYE PROTECTION AND OTHER PERSONAL PROTECTIVE EQUIPMENT** when repairing/servicing farm equipment.
2. Turn off the machine and remove the key before making any repairs or adjustments.
3. Block raised hydraulic equipment using approved safety stands. Do not depend on hydraulic systems to keep the implement or attachment in a raised position.
4. Use extreme caution when working with hydraulic systems. Hydraulic systems may contain extremely high pressure and cause serious injuries. NEVER attempt to locate a leak by running your hand over the suspected area. Always use a piece of cardboard or paper.
5. Never allow hydraulic fluid to spill into the ground, down a drain, or into a body of water. All used hydraulic fluids must be disposed of in a safe and environmentally responsible manner.
6. Hydraulic systems may retain high pressures even if the hydraulic pump is not running. Be **ABSOLUTELY SURE** you have relieved the hydraulic system's pressure according to the equipment manufacturer's specifications, **PRIOR TO BEGINNING ANY SERVICE PROCEDURE.**
7. **LIFT WITH YOUR LEGS, NOT YOUR BACK!** Agriculture equipment components are generally built larger and heavier than parts designed for automotive applications. Use proper lifting equipment and use proper lifting procedures **AT ALL TIMES!**
8. Use caution when removing large components; removing large components may change center of gravity of the equipment, causing the load to shift.
9. Agriculture equipment may use large springs on various attachments. These large springs maybe under tremendous tension. Use extreme caution when working near springs.
10. Agriculture equipment may have pinch points & sharp cutter knives. Use extreme caution when working on agriculture equipment.
11. Use caution when working with the diesel injection system; diesel fuel injection system may contain high pressure and can cause serious injury.

**"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"**

### ***Safety Quiz – Agriculture equipment***

1. When working on agriculture equipment, you should always
  - A. Ensure the machine is off & key is removed
  - B. Blocked - raised hydraulic equipment attachments
  - C. Relieve hydraulic system pressure prior to any service procedures
  - D. All of the above
  
2. When removing a large/heavy component, you should.
  - A. Ensure that there is adequate space for the repair
  - B. Use proper lifting techniques & lifting devices
  - C. Proper support the equipment, because the centre of gravity may change
  - D. All of the above
  
3. When checking for hydraulic leaks, you should
  - A. Move your hands over hydraulic hoses to locate leak
  - B. Use a piece of cardboard or paper to locate hydraulic leak
  - C. Use an inspection mirror
  - D. None of the above
  
4. Some agriculture equipment use large springs. You should
  - A. Relieve spring tension properly.
  - B. Use extreme caution when removing springs
  - C. Remove spring attachments fasteners to leave spring pressure
  - D. Only A & B
  
5. Agriculture equipment may have special service procedures; you should check the appropriate service procedures  
TRUE or FALSE
  
6. What safety service procedures should be used when working on a diesel fuel injections system?
  - A. Ensure that the proper grade of diesel fuel is used.
  - B. Ensure that the fuel filter is clean.
  - C. Diesel fuel injection systems may have a large amount of pressure. Use caution when servicing.
  - D. All of the above
  
7. When repairing any type of agriculture equipment, you should
  - A. Always ensure that the proper guarding is re-installed
  - B. Ensure that all fasteners are tighten to the proper specification
  - C. Make everyone aware when you are going to start/operate the equipment
  - D. All of the above

|                                               |                      |
|-----------------------------------------------|----------------------|
| <b>ANSWER KEY</b><br>1.D<br>2.D<br>3.B<br>4.D | 5.TRUE<br>6.C<br>7.D |
|-----------------------------------------------|----------------------|

# AGRICULTURE EQUIPMENT REPAIR PASSPORT

## General Condition

Students must be trained on the safe work practices required to safely service **Agriculture Equipment** in the Transportation Technology shop **BEFORE** they may begin servicing them. The student must demonstrate safe and proficient work habits prior to servicing any piece of **Agriculture Equipment**.

## Personal Protection

- Safety glasses
- Coveralls
- Protective footwear
- Hearing protection
- Mechanic's impact resistant gloves

## Possible Risk Factor

- Eye injuries
- Hand Injuries
- Pinch point hazards
- Back injuries/muscle strain
- Cuts and abrasions
- Entanglement
- Projectiles
- Compressed air

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors.

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## Emphasis Course Resources: Aviation

Use the following links for more information on Aviation

### Aviation

*Aviation is relatively new in a highschool setting. However there are several highschools in Ontario now that have Aviation programs. Some of the related jobs might be: Pilot, Aircraft Mechanic, Structural mechanic, Ground Equipment Mechanic, Ground Crew, Air traffic Controller, Cabin Crew, Aircraft Engineer, Avionics Technician, etc. The Aircraft Maintenance Engineer or AME is the equivalent of an Aircraft Mechanic.*

*Here are a list of some Aviation related resources:*

Transport Canada

<https://tc.canada.ca/en/aviation>

Transport Canada AME Licensing

<https://tc.canada.ca/en/aviation/licensing-aircraft-maintenance-engineers-ame>

The Federal Aviation Association

<https://www.faa.gov/>

NAV Canada

<https://www.navcanada.ca/en/flight-planning/flight-planning-and-reporting.aspx>

Transportation Safety Board of Canada

<https://www.tsb.gc.ca/eng/aviation/index.html>

## Emphasis Course Resources: Heavy Equipment

Use the following links for more information on Heavy Equipment Mechanics service and repair techniques.

### Heavy Equipment

*Heavy Duty Equipment Mechanics work on industrial and construction vehicles, such as mining trucks and bulldozers; on heavy equipment used in construction, forestry, materials handling, landscaping, and land clearing; as well as on buses and large trucks. Heavy Duty Equipment Mechanic is a nationally designated trade under the Interprovincial Red Seal program. Heavy Duty Equipment Mechanics overhaul, repair and service equipment such as graders, loaders, shovels, tractors, trucks, forklifts, drills, and wheeled and tracked vehicles.*

Red Seal Program Heavy Duty Equipment Technician

<http://www.red-seal.ca/trades/hd.2t-eng.html>

Industry Training Authority of British Columbia

<https://www.itabc.ca/program/heavy-duty-equipment-technician>

Apprenticeship & Certification Study Guide Heavy Duty Equipment Technician

<https://www.gov.nl.ca/aesl/files/StudyGuide-HeavyDutyEquipmentTech.pdf>

## ***HEAVY EQUIPMENT TECHNICIAN***

The mechanical systems used in most pieces of heavy equipment are similar in design and operation to those used in the automotive industry but require specialized knowledge and training to ensure a safe working environment.

1. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING SAFETY GLASSES, and PROTECTIVE FOOTWEAR** when working around any piece of heavy equipment.
2. **LIFT WITH YOUR LEGS, NOT YOUR BACK!** Heavy Equipment mechanical components are generally built larger and heavier than parts designed for automotive applications. Use proper lifting procedures **AT ALL TIMES!**
3. Heavy equipment drive belts and drive chains may be under high tension. Serious injury may occur if released unexpectedly.
4. Before attempting to raise a piece of equipment for service or repair, make certain that the weight of the vehicle you are lifting does not exceed the lifting device's capacity rating and that the equipment cannot roll or move in any way.
5. Many wheels used on heavy equipment applications are often multi piece or "split-rim" design. **THESE WHEELS MUST ONLY BE SERVICED BY LICENSED PERSONNEL.** Explosive separation of tire and rim parts can cause serious injury or death.
6. Handle tires and wheel assemblies with care: some are extremely heavy and can crush your arms and legs if they slip or fall.
7. Always use a liquid-type pressure gauge when checking tires with liquid ballast.
8. Before attempting to remove the track(s) from a piece of track-bound heavy equipment, **MAKE SURE THE VEHICLE HAS BEEN PROPERLY IMMOBILIZED!** A track-bound piece of equipment with its tracks removed can roll unexpectedly.
9. **NEVER** hammer on hardened pins or bushings; they have a tendency to chip, causing potentially dangerous projectiles.

"AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR"

## Safety Quiz – Heavy Equipment TECHNICIANS

### Section 1: Written Response

Why is it important to be absolutely sure a piece of track-bound equipment has been safely and properly immobilized **BEFORE** attempting to remove it's track?

Why is it important to never hammer on hardened pins or bushings when servicing a piece of heavy equipment?

List two precautions you would take BEFORE attempting to lift a piece of heavy equipment to perform a service or repair procedure:

### Section 2: Multiple Choice

1. As compared to mechanical components designed for automotive applications, how are heavy equipment mechanical components built?

- |            |                     |
|------------|---------------------|
| A. Bulkier | C. Larger           |
| B. Heavier | D. All of the above |

2. When applying proper lifting techniques when working on a piece of heavy equipment, what should you lift with?

- |              |                     |
|--------------|---------------------|
| A. Your back | C. Your legs        |
| B. Your arms | D. All of the above |

3. If a multipiece or "split rim" wheel is disassembled by an untrained individual, which of the following may result?

- |                  |                     |
|------------------|---------------------|
| A. Explosion     | C. Death            |
| B. Severe injury | D. All of the above |

4. Which of the following heavy equipment mechanical components may be under high tension, and have the potential to cause serious injury if released unexpectedly?

- |                           |                     |
|---------------------------|---------------------|
| A. Tires and wheels       | C. Drive shafts     |
| B. Drive belts and chains | D. All of the above |

**Answer Key:**

Section 1: Written Response

1. A piece of track-bound equipment with its track(s) removed can roll unexpectedly.
2. Hardened pins or bushing have a tendency to chip, causing potentially dangerous projectiles.
3. To precautions that must be observed BEFORE attempting to raise a piece of heavy equipment for service or repair are:
  - a. Make sure the weight of the equipment does not exceed the lifting capacity of the lifting device.
  - b. Make absolutely sure the equipment has been properly immobilized.

Section 2: Multiple Choice: 1. d. 2. c. 3. d. 4. b.

# HEAVY EQUIPMENT PASSPORT

## General Conditions

Students must be trained on the safe work practices required to safely service **Heavy Equipment Mechanical Systems** in the Transportation Technology shop **BEFORE** they may begin servicing them. The student must demonstrate safe and proficient work habits prior to servicing any piece of **Heavy Equipment**.

## Personal Protection

- Safety glasses
- Coveralls
- Protective footwear
- Mechanic's impact resistant gloves

## Possible Risk Factor

- Eye injuries
- Hand Injuries
- Back injuries/muscle strain
- Cuts and abrasions
- Entanglement
- Projectiles
- Compressed air

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teacher's signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## Emphasis Course Resources: Hydraulics

Use the following links for more information on Hydraulic systems service and repair techniques.

### Hydraulics

*Many pieces of industrial equipment used in the construction, forestry, mining and farming industries rely heavily on hydraulically controlled components. In these applications, hydraulic systems are used for the generation, control, and transmission of power by the use of pressurized hydraulic fluids. Hydraulic fluid is virtually incompressible, so controlling the flow of fluid provides the operator with accurate control and motion.*

Gates Hydraulics 101: Introduction to Hydraulics

<https://assets.gates.com/content/dam/gates/home/resources/resource-library/training-materials/4287153-intro-to-hydraulics-101-manual.pdf>

Caterpillar Industrial Equipment: Hydraulic Solutions

<http://www.cat.com/cda/files/363204/7/HydraulicsSolutions.pdf>

## **HYDRAULICS**

**A huge amount of energy is stored inside a hydraulic system. Follow these safety precautions to ensure student safety when performing any service or repair procedure on a piece of hydraulically operated equipment.**

1. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING SAFETY GLASSES, and PROTECTIVE FOOTWEAR** when working around any piece of hydraulic equipment.
2. **CAUTION: NEVER** service or adjust hydraulic systems under pressure; escaping fluid under pressure can penetrate the skin and cause serious injury.
3. Small “pinhole” leaks in high pressure hydraulic lines are one of the most common safety hazards associated with hydraulics. These leaks are difficult to locate, and can easily penetrate skin due to the high pressure of the hydraulic fluid.
4. **NEVER** attempt to locate a leak by running your hand over the suspected area. Always use a piece of cardboard or paper.
5. Hydraulic systems may retain high pressures even if the hydraulic pump is not running. Be **ABSOLUTELY SURE** you have relieved the hydraulic system’s pressure according to the equipment manufacturer’s specifications, **PRIOR TO BEGINNING ANY SERVICE PROCEDURE.**
6. Use proper containers when draining or transferring hydraulic fluids.
7. Never allow hydraulic fluid to spill into the ground, down a drain, or into a body of water. All used hydraulic fluids must be disposed of in a safe and environmentally responsible manner.
8. **ALWAYS** use a funnel when transferring hydraulic fluid. Use an approved transfer pump if transferring hydraulic fluid from one container to another.
9. In the event of a hydraulic fluid spill, apply floor-dry absorbent material directly to the spill, advise other students of the hazard, and **NOTIFY YOUR INSTRUCTOR IMMEDIATELY.**

**“AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR”**

## Safety Quiz – Hydraulics

### Section 1: Written Response

List the MANDATORY personal protective equipment that must be worn when servicing any piece of hydraulic equipment:

What MUST be done to a hydraulic system before attempting to service, adjust or replace any component, hose, or fitting?

How should used hydraulic fluid be disposed of?

### Section 2: Multiple Choice

1. When attempting to diagnose a pinhole leak in a hydraulic hose, what should be used to help locate the leak?  
A. A flashlight  
B. Piece of cardboard  
C. Your hands  
D. An inspection mirror
2. What is the major risk of attempting to detect a leak in a hydraulic system using only your hands?  
A. Your hands will get oily  
B. Hydraulic fluid may penetrate skin  
C. Muscle strain  
D. All of the above
3. Under what condition(s) may a sealed hydraulic system still retain high fluid pressure?  
A. Engine running  
B. Hydraulic pump running  
C. Hydraulic pump NOT running  
D. All of the above
4. In the event of an accidental spill involving hydraulic fluid, which of the following precautions must be taken?  
A. Apply absorbent material  
B. Notify other students of the hazard  
C. Notify the instructor  
D. All of the above

**Answer Key:**

Section 1: Written Response

1. Wear personal protective equipment including safety glasses and protective footwear when working around any piece of hydraulic equipment.
2. Hydraulic system pressure must be relieved in accordance with the equipment manufacturer's specifications BEFORE beginning any service procedure.
3. All used hydraulic fluid must be disposed of in a safe and environmentally responsible manner.

Section 2: Multiple Choice: 1. B. 2. B. 3. D. 4. D.

## ***HYDRAULICS PASSPORT***

### **General Conditions**

Students must be trained on the safe work practices required to safely service **Hydraulic Systems** in the Transportation Technology shop **BEFORE** they may begin servicing them. The student must demonstrate safe and proficient work habits prior to servicing any piece of **Hydraulic Equipment**.

### **Personal Protection**

- Safety glasses
- Coveralls
- Protective footwear

### **Possible Risk Factor**

- Eye injuries
- Hand Injuries
- Back injuries/muscle strain
- Cuts and abrasions
- Entanglement
- Projectiles
- High pressure fluid skin penetration

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teachers signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## Emphasis Course Resources: Small Engines

Use the following links for more information on Small Engine service and repair techniques.

### Small Engines and Recreational Equipment

Small Engines and Recreational Equipment are important to people for both leisure and work. Many people require small engine-operated machines for cutting grass, tree trimming, blowing snow, or pressure washing. Small engines are also an integral part of many different recreational motive power machines. Snowmobiles, boats, ATVs are all good examples of where a small engine would be an integral part of the operational characteristics.

Tecumseh: Tecumseh Small Engines

<http://www.tecumsehpower.com>

Lawn Boy: Lawn Boy Small Engines

[http://www.lawnboy.ca/ca\\_en/index.html](http://www.lawnboy.ca/ca_en/index.html)

Briggs and Stratton: Briggs and Stratton Small Engines

<http://www.briggsandstratton.com/us/en/>

Parts Tree: Small engine parts look up supplier

<https://www.partstree.com/>

## ***SMALL ENGINES***

1. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING SAFETY GLASSES** when running a small engine. Ensure all participants or observers are wearing personal protection equipment. Make certain your work area is clean and clear of debris. Clean-up oil or water spills to remove the danger of accidental slipping or falls.
2. **THE EXHAUST FROM RUNNING SMALL ENGINES CONTAINS DEADLY CARBON MONOXIDE GAS.** Always connect an exhaust ventilation system to the exhaust of the small engine.
3. Ensure the fuel tank is an approved fuel container and the fuel lines are fastened tight and secured away from moving parts. **GASOLINE HAS A LOW FLASHPOINT AND DOES NOT NEED A SPARK TO IGNITE.** Know where the nearest fire extinguisher is available.
4. Make sure that the small engine is fastened securely to a **motor stand** when removed for repair.
5. Connect all meters or test equipment prior to starting the small engine. Secure all equipment and leads away from moving parts. **HAVE THE TEACHER CHECK YOUR SET-UP BEFORE PROCEEDING.**
6. **KEEP FINGERS AND HANDS AWAY FROM ALL MOVING PARTS, ESPECIALLY THE RE-COIL.** When the small engine starts, watch for leaks or loose components and listen for abnormal noises.
7. As the small engine warms up be cautious of the exhaust components. **CAUTION NEEDS TO BE EXERCISED AT ALL TIMES AS BURNS CAN OCCUR FROM TOUCHING HOT SMALL ENGINE PARTS, OR SCALDING MAY RESULT FROM THE HIGH TEMPERATURE OF THE ENGINE.**

“AT ALL TIMES-IF IN DOUBT, STOP! ASK YOUR INSTRUCTOR”

## Safety Quiz – Small Engines

### Section 1: Written Response

What is the difference between a four-stroke and two-stroke small engine?

If a lawn mower hits a rock, suddenly stops, and will not restart, what is the most common fault?

On what angle should you sharpen a lawnmower blade?

Why is it important to balance a lawnmower blade after sharpening?

### Section 2: Multiple Choice

1. Aluminum is used in small engines for what reason?

- A. Because it is light
- B. Aluminum transfers heat out of the engine efficiently
- C. Both A) and B)
- D. None of the above

2. Small engines can be cooled with\_\_\_\_\_.

- A. Air
- B. Water
- C. Oil
- D. All of the above

3. The minimum compression for a four-stroke lawnmower small engine is\_\_\_\_\_.

- A. 10 psi
- B. 50 psi
- C. 120 psi
- D. 240 psi

4. When storing a small engine you should\_\_\_\_\_.

- A. Drain gas out of the carburetor
- B. Remove plug and put a small amount of oil in the cylinder
- C. Cover with dust proof wrapping
- D. All the above

**Answer Key:**

**Section 1: Written Response**

1. Lighter material, and less moving parts between the two.
2. A bent crankshaft if a solid object (rock) is hit.
3. 30 degrees
4. To reduce engine wear and vibration

**Section 2: Multiple Choice:** 1. C. 2. D. 3. B. 4. D.

## SMALL ENGINES PASSPORT

### General Conditions

Students must be trained on the safe work practices required to safely service **Small Engines** in the Transportation Technology shop **BEFORE** they may begin servicing them. The student must demonstrate safe and proficient work habits prior to servicing any piece or part of a **Small Engine**.

### Personal Protection

- Safety glasses
- Coveralls
- Protective footwear

### Possible Risk Factor

- Eye injuries
- Hand Injuries
- Back injuries/muscle strain
- Cuts and abrasions
- Entanglement
- Projectiles

- The student has been trained on this equipment.
- The student understands the required personal protective equipment to operate this equipment.
- The student is aware of the possible risk factors

**Student signature** \_\_\_\_\_

**Teachers signature** \_\_\_\_\_

**Date of training** \_\_\_\_\_

## APPENDIX A: HEALTH AND SAFETY RESOURCES

### Young Workers Awareness Program

<https://www.labour.gov.on.ca/english/atwork/youngworkers.php>

<https://www.labour.gov.on.ca/>

Is the official website of the Ministry of Labour, Immigration, Training and Skills Development for young workers and new workers. Utilize this website to find out how to be safe at work. Find out how to be treated fairly! Includes key information on: My Health and Safety at Work, My Employment Standards and I've Got a Problem – What Do I Do Now?

Some web content related to employment standards and workplace health and safety may be temporarily unavailable as we move it to this website. If this is not the page you were expecting, please try again in a few days. Sorry for any inconvenience. July 27, 2022.

### Workplace Safety and Insurance Board

<http://www.wsib.ca>

Legislated by the Ontario government and responsible for administering the *Workplace Safety and Insurance Act* (WSIA). Governed by a Board of Directors made up of representatives of workers, employers and others.

Under the Resources tab, this website provides information on how WSIB make decisions, by reviewing the Operational policy manual, Employer Classification Manual, and Adjudication support documents. You'll also find useful forms and fact sheets on a variety of topics, including benefit payments, and rights and responsibilities.

- Fact Sheets are also available:
- Fact Sheets for Workers
- Fact Sheets for Prevention
- WSIB Fact Sheets

### Canadian Centre for Occupational Health and Safety

<https://www.ccohs.ca/products/>

The Free Resources section is a collection of websites, databases, and other online resources suggested and reviewed by CCOHS. Many of the websites are designed and maintained by CCOHS, while some of the resources are provided by external, third-party providers.

#### Purpose

- Promote the importance of workplace health and safety in Canada
- Identify current and reliable health and safety information
- Create and maintain an accessible, convenient, and easy-to-use resource to anyone who needs it
- Provide access to information from a variety of sources including federal, provincial, and territorial governments, agencies, and non-profit organizations

#### Target Audience

The Free Resources are useful to workers, employers, managers and supervisors, joint health and safety committees, workplace health and safety professionals, and students.

## HEALTH CANADA

<http://www.hc-sc.gc.ca>

Health Canada is the Federal department responsible for helping Canadians maintain and improve their health, while respecting individual choices and circumstances.

Health Canada administers many pieces of legislation and develops and enforces regulations under this legislation that have a direct impact on the health and safety of Canadians. The Department consults with the Canadian public, industry, non-governmental organizations (NGOs) and other interested parties in the development of these laws. Health Canada also prepares guidelines in order to help interpret and clarify legislation and regulations.

Of particular interest would be regulations such as the Hazardous Product Act, Controlled Products Regulations, Environmental and Workplace Health.

## Health and Safety Associations in Ontario

Ontario is already a great place to do business, live and work. Making our province, and indeed our country, the healthiest and safest place to work in the world is a prize worth winning.

Ontario's Prevention System is made up of the Ministry of Labour (MOL), Workplace Safety and Insurance Board (WSIB), Workers Health & Safety Centre, Occupational Health Clinics for Ontario Workers Inc. and 12 Health and Safety Associations (HSAs).

- [Workplace Safety & Prevention Services](#)
- [Public Services Health & Safety Association](#)
- [Workplace Safety North](#)
- [Infrastructure Health & Safety Association.](#)

## ONTARIO BUILDING CODE

<https://www.ontario.ca/page/ontarios-building-code>

The Ontario Building Code's website has information on qualification and registration, available training, dispute resolution, news on recent code developments and more. The Ontario Building Code is administered by the Building and Development Branch of the Ministry of Municipal Affairs and Housing.

## CANADIAN STANDARDS ASSOCIATION (CSA)

<http://www.csagroup.org>

Standards contribute to safer homes, workplaces and public spaces. They address issues related to sustainability and the environment. And they encourage the adoption of new technologies and best practices that enhance trade and help make industry more competitive in the global marketplace. Standards help advance today, while anticipating tomorrow.

## CANADIAN SOCIETY OF SAFETY ENGINEERING (CSSE)

<http://www.csse.org/>

The Canadian Society of Safety Engineering (CSSE) is the leading health, safety and environmental organization for professionals in Canada. They work with industry, governmental agencies, and other safety organizations to promote a greater awareness of health, safety, and environmental issues in workplaces and communities across the nation and around the world. Our vision is "An Advocate for Safety in Every Workplace".

CSSE's mission is to be the resource for professional development, knowledge and information exchange to our members, and the Canadian public.

### Professional Associations

Professional Associations can be a great health and safety resource relating to discipline specific occupational health and safety. The following Tech Design related associations provide resources on professional practice relating to health and safety.

Professional Engineers of Ontario (PEO) [www.peo.on.ca/](http://www.peo.on.ca/)

Architectural Association of Ontario (OAA) [www.oaa.on.ca/](http://www.oaa.on.ca/)

Ontario Certified Engineering Technicians and Technologists (OACETT) [www.oacett.org/](http://www.oacett.org/)

Association of Registered Interior Designers of Ontario (ARIDO) [www.arido.ca/](http://www.arido.ca/)

### Ministry of Labour, Immigration, Training and Skills Development

Web address: <https://www.ontario.ca/page/ministry-labour-immigration-training-skills-development>

For news and information about Ontario's health and safety and employment legislation, the Ministry of Labour's website is an excellent place to visit. It provides current information on both employment standards and health and safety legislation, recent fines, alerts, etc. and allows you to ask a question that will be answered by Ministry staff. To directly access information for students, use the web address:

This section of the Ministry of Labour, Immigration, Training and Skills Development website ensures that students are aware of their rights and obligations and their employer's rights and obligations under the *Occupational Health and Safety Act* and the *Employment Standards Act*. It includes: young worker safety education information; information for working students – know your rights and obligations; information for new workers and students working in Ontario; fact sheets for employees; your guide to the Employment Standards Act; and links to related websites.

### Ontario School Boards Insurance Exchange

<http://www.osbie.on.ca>

The primary goals of the Exchange are to insure member school boards against losses, and to promote safe school practices. The Ontario school "Risk Management at a Glance" material is intended to provide guidance and direction in the major risk management areas facing school administrators, principals, vice-principals, teachers and all other school staff on a daily basis.

<https://www.osbie.on.ca/riskapp/>

Although this reference material is not intended to replace school board policies and procedures, it is intended to supplement the risk management considerations, which should go into making the decisions on the most common day-to-day school activities. The design of this publication is to promote the display of this document in a calendar-

like format in every classroom to facilitate ready “Risk Management at a Glance”. Every employee who may be called upon to make a decision about the permitting of or the organizing of any activity listed can use this.

For any activities not listed in this material, it is recommended that you contact your board office, or refer to the policies and procedures as stated by your school board.

### **Take Our Kids to Work – Teacher’s Guide; Workplace Guide The Learning Partnership**

<http://www.tlp.on.ca>

These resources have been custom designed to help teachers and workplaces prepare for Take Your Kid to Work day. The new booklets have an excellent section on activities to help prepare the students for a safe learning day.

### **School Workers Health and Safety Guide Canadian Centre for Occupational Health and Safety**

This information-packed coil-bound pocket book covers school safety topics such as emergency preparedness, classroom safety, arts and crafts, industrial technology, maintenance and custodial practices, sanitation and infection control, sports and activities, work environment, ergonomics, personal protective equipment and health and safety legislation. There are good ideas and work practices that can add to your existing safety programs.

**Cost:** The price is reasonable and covers printing and distribution costs.

Check current cost and delivery information in the publications section of the web site.

**Web address:** <http://www.ccohs.ca>

[OCTE EV/Hybrid safety resources](#)

## APPENDIX B: TRANSPORTATION TECHNOLOGY RESOURCES

### Ontario Trucking Association

This association's free video(s), including "Career Highways – Safety" have been used and recommended by cooperative education teachers.

The Ontario Trucking Association has tremendous expertise about the industry itself and health and safety elements that everyone working in the industry needs to know.

<http://www.ontruck.org>

### Ontario Safety League

<https://ontariosafetyleague.com/>

The Ontario Safety League has tremendous expertise about the industry itself and health and safety elements that everyone working in the industry needs to know.

### Ministry of Labour, Immigration, Training and Skills Development– Ontario

<http://www.labour.gov.on.ca/english/hs/pubs/alerts/i28.php>

Alert – Tire machine

Guidelines for proper tire machine guarding & proper use

### Ministry of Labour, Immigration, Training and Skills Development– Ontario

<http://www.labour.gov.on.ca/english/hs/pubs/alerts/i34.php>

Alert: Asbestos Hazard in Vehicle Brake Repair

Asbestos in aftermarket replacement brake pads poses an increased risk of asbestos-related disease for auto brake mechanics.

### Ministry of Labour, Immigration, Training and Skills Development – Ontario

<http://www.labour.gov.on.ca/english/hs/pubs/alerts/i03.php>

Alert: Gasoline Tank Removal

Guidelines for proper procedures for gas tank removal

### Shell Canada

<http://www.shell.ca/en/products-services/in-the-home/fuel-safety.html>

The Basics of Fuel Safety

This web site provides information, rules and precautions you can follow for the safe handling of a variety of fuels.

### National Council for Occupational Safety and Health

<http://www.coshnetwork.org/node/358>

Diesel Hazards

## Diesel fuel and Diesel fumes health hazard information

### **Apprenticeship Search**

<https://www.apprenticesearch.com/>

What Does a Technician Do?

### **Virtual Vehicle MD**

Produced by: Car Quest

Contact Info:

**Toll Free:** 1-800-214-0289

[www.virtualvehicledmd.com](http://www.virtualvehicledmd.com)

Description: Virtual Vehicle MD is an online program for automotive service professionals. Simplified animations of vehicle parts and systems will allow service professionals to easily illustrate over 165 of the most common customer vehicle concerns.

Some examples are:

- Why a timing belt needs to be replaced
- What effect warped brake disks/rotors have
- Why fuel injectors need to be cleaned

### **CDX Automotive**

Produced by: Jones & Bartlett Learning

Contact Info:

**Toll Free:** 1-877-984-6371

[www.cdxauto.com](http://www.cdxauto.com)

Description: CDX Automotive is the world's leading provider of interactive and experiential automotive curriculum for light vehicle, medium/heavy truck, and bus technician training. More than 3,000 high schools, vocational schools, community colleges, commercial fleets, established auto shops, and corporations in over 50 countries have benefited from CDX Automotive's unique Know-See-Do-Prove instructional model.

### **Circuit Construction Interactive Simulations**

Produced by: University of Colorado Boulder

Contact Info: The PhET Project: c/o Oliver Nix, University of Colorado Boulder, CO

<http://phet.colorado.edu/en/simulation/circuit-construction-kit-dc>

## APPENDIX C: OCTE SAFETYNET BLANK TEMPLATE

### Overview

A sample of a blank safetyNET template provided by the Ontario Council for Technology Education as well as their Materials and Resources sheet has been provided here as an additional resource for computer technology teachers.

Completing it once for a risky project can take teachers through a pre-project planning process, a review of the materials in their shops, the suppliers and processes they use, and encourage documentation of their safety training for themselves, their students, and classrooms. It collects safety information in one place for their own use, and respects their experience, pedagogy, and professionalism. It's a crucial step in standardizing safety training in your technology program at your school, and can assist in collegial communication in your department.

Please note that the online updated version is available at [www.octelab.com](http://www.octelab.com), however any teacher that considers and documents their answers to the questions will have created an important document for their personal professional practice. It's also available in fillable .pdf format, and is also available in French from OCTE

### Establishing A Safety Binder

The goal is a safety binder that teachers keep in their rooms as evidence of due diligence taken towards safety in the classroom.

Assembled safety binders often include teacher/room/board specific:

- safetyNET Template
- Project Specific Safety Resources
- SDS Sheets
- Student Safety Training Tracking Sheets
- Permission Forms Copies
- Class Lists
- Equipment Maintenance/Manuals
- Training Quiz Samples
- Teacher Training Documentation Copies
- Emergency Procedures Docs
- Board Repair Contacts
- Room Safety / PPE Location Map

## Starting Your safetyNET

TTJ Subject Area: Tech department heads can provide leadership asking teachers to consider the following questions to choose a focus for completing their own safetyNET.

- What are the riskiest projects I do in my classroom? (List them here.)
- What ones of these use the riskiest materials?
- Which ones of these use the highest risk-associated equipment?
- Which ones of these include recycled, found, repurposed, or donated materials?
- Which one of these is the hardest to train and track the kids for safety on?
- Reflecting on this listing, which project do you think you may want to do a safetyNET on?
- What resources of mine would make it easier - instructive for another teacher to try this project?
- What would be the best “safety lens” advice I could give for another teacher from my experience?

Then try it out!

## safetyNET Lesson Plan

### safetyNET STEP 1: Tell Us About You

First Name: \_\_\_\_\_  
Last Name: \_\_\_\_\_  
E-mail Address: \_\_\_\_\_  
Ontario School Board: \_\_\_\_\_  
School: \_\_\_\_\_

Community

- ☐ Urban  
☐ Suburban  
☐ Rural

Number of Students:

Student Work is Completed (individually, pairs, groups, mixed methods)

☐

I agree to the Terms and Conditions and have read the Teacher Guidelines.

### safetyNET STEP 2: Describe Your Lesson

#### Classroom Management Pre-Planning

1. Provide a descriptive **title** for your learning activity.

2. Choose the **length** that best describes your lesson.

- ☐ Full semester  
☐ Multiple weeks  
☐ One week  
☐ One period

3. Choose the **Ontario course code (e.g.)**.

4. Provide **learning goals** of the activity.

Names of Resource Files Included: (Please format as .pdf where possible.)

5. Generally describe your **classroom lab setup** with main equipment and areas.

6. There is a link [here](#) to your subject area's **full** Overall and Specific required **Ministry Expectations**. Click [here](#) for **safety expectations summarized for each tech course code**. These will create a pop-up window for copying and pasting into the field below. Copy and paste some safety expectations your lesson will cover.

7. There may also be **local by-laws** or **staff guidelines** applicable to your school community in general that affect how you teach your subject area for health and safety. Being in an urban or rural environment can offer unique challenges to a technological education program. Your department or school may also have a health and safety manual you can attach as a file later. Include any details or best practices here on what you refer to.

8. Coming from industry and experience as a technological educator, there is **prior teacher knowledge** that you would recommend for your classroom, focused on health and safety. Include information on recommended certifications for your subject area.

9. Many teachers use these as a basis of training for **prior student knowledge**. Check off which ones you use currently. A pop-up window is available through these links.

- ☐ Passport to Safety
- ☐ Introduction to WHMIS

10. Prior to specific project work, describe your **general introductory unit on health and safety** in your classroom.

11. Check off what **Personal Protective Equipment** may be applicable in your classroom in general for health and safety.

- ☐ safety glasses (shatterproof - may need side guards)
- ☐ coveralls / lab coat / apron (protective clothing)
- ☐ gloves (latex and standard)
- ☐ gloves (chemical resistant)
- ☐ welding gloves and face shield
- ☐ dust mask (breathing protection)
- ☐ respirator (breathing protection)
- ☐ appropriate footwear (may imply steel-toed work boots or closed toe and heel shoes)
- ☐ hair net
- ☐ hair tied back
- ☐ hearing protection - ear plugs
- ☐ removing jewellery and fashion accessories
- ☐ hard hat

- ☐ safety harness
- ☐ reflective vest
- ☐ no electronic devices

12. Describe your student safety training assessment strategies. Click [here](#) for a pop-up to review the **Growing Success** document that defines assessment *for learning and as learning*.

13. Some technological classroom areas are more complex and need layout planning, maintenance, and special resources available, especially when sharing rooms. Detail **general housekeeping, organization standards** and student clean-up procedures from your experience.

14. Detail **safe storage facilities** in your classroom for course specific materials.

15. Explain any **special learning considerations** and best practices for your classroom focused on safety. Are there left-handed students in your class? You may naturally include accommodations and modifications. Showcase special approaches or methods you use for exceptional students, multiple-intelligences, differentiated instruction, ESL, gifted, or physically-challenged students.

16. Include information on your safety procedures for **disposal of waste materials**. This could include food scraps, hairstyling chemical, dust collection, combustible wipes, or waste oil.

17. **Company's coming!** Educational Assistants, volunteers, student teachers, and classroom guests with administrators are in your classroom. Provide your experience on elements of safety training that need to be communicated to these participants for your subject area such as wearing safety glasses, maintaining distance from machines, or how to communicate an emergency or issue to the teacher.

18. **Emergency procedures** to pre-plan in general for your technological education classroom depends on your subject area. There may be steps for students, steps for administration, for assisting teachers, or directions for emergency assistance arriving at school. Detail how you cover these in your classroom. Include fire exits, extinguishers, first aid station, eye wash station, and electrical shut-off switches (panic buttons). Possibly detail AED location (if available) and first aid trained staff member locations for your records.

19. Does your Board have a **technological project approval process**?

- ☐ Yes
- ☐ No
- ☐ Unknown

20. Select (all that apply) that complete **equipment inspections** in your board.

- ☐ Teacher
- ☐ Department Head
- ☐ Board Instructional / Subject Area Leader
- ☐ Board Facilities Teams
- ☐ Independent Contractors
- ☐ Ministry of Labour

21. Select **Federal and Provincial Safety Legislation and Policies, Government Departments, and Associations** which may be applicable to your subject area. Click on any of them to open up a pop-up window to reference their website. Consider adding any resources you find to your lesson.

- ☐ Health Canada
- ☐ Ministry of Labour
- ☐ Ontario Workplace Safety and Insurance Act
- ☐ Food Safety and Quality Act
- ☐ Ontario Health Protection and Promotion Act
- ☐ Ontario Highway Traffic Act
- ☐ Ontario Fire Code
- ☐ Ontario Building Code
- ☐ Workplace Hazardous Materials Information System (WHMIS)
- ☐ Workplace Safety and Insurance Board (WSIB)
- ☐ Occupational Health and Safety Act (OSHA)
- ☐ Apprenticeship and Certification Act (ACA)
- ☐ Canadian Standards Association (CSA)
- ☐ Canadian Society of Safety Engineering (CSSE)
- ☐ Ontario Service Safety Alliance (Hospitality and Tourism) (OSSA)
- ☐ Canadian Centre for Occupational Health and Safety (CCOSH)
- ☐ Construction Health and Safety Association of Ontario (CSAO)
- ☐ Ontario School Boards Insurance Exchange (OSBIE)
- ☐ Industrial Accident Prevention Association (IAPA)
- ☐ Transportation Health and Safety Association of Ontario (THSAO)
- ☐ Health Care Health & Safety Association of Ontario (HCHSA)

That's the end of general classroom management info. You can copy and paste the content from this section to any project you submit to the safetyNET.

**That's So Cool! When Do We Start?**

22. Check off **planning** tasks you complete for this lesson.

- ☐ examine materials list (new, used, recycled materials)
- ☐ review tool use plan (power and hand tools)
- ☐ consider special preparation of recycled materials for this project.
- ☐ review hazardous materials use - WHMIS, SDS (attach files later)
- ☐ safety check on specific equipment
- ☐ review chemical and fire safety procedures
- ☐ prepare tools
- ☐ count or measure materials, evaluate efficiencies
- ☐ check 'past due' dates on supplies
- ☐ check student-accessible material supply areas are safe
- ☐ re-do a safety demonstration
- ☐ confirm all students completed training diagnostic assessment
- ☐ confirm web resources and handouts are current
- ☐ reconsider assessment and evaluation strategies
- ☐ plan direct supervision time for difficult or high-risk production steps
- ☐ plan direct supervision for flammable / toxic / corrosive materials handling
- ☐ plan safe storage of in-progress student projects
- ☐ plan cut off times for lab cleanup to begin
- ☐ plan waste disposal, recycling
- ☐ plan debrief on safety risk experiences with students
- ☐ detail notes for teacher sharing classroom/lab

23. Detail **instructional strategies** and **assessment strategies** for focusing on safety during this learning activity. Consider any IEP considerations applicable in your classroom.

24. Define the **materials and equipment** used for this learning activity. You can use the blank form that's provided and save it to make it your own. The layout helps you collect details showing the materials and equipment. It also provides space for equipment maintenance schedules, disposal of waste materials, training tracking, shielding or guarding details.

24. Include any **best practices** or tips, tricks, and advice in your experience of completing this learning activity. Focus your answer on how you document safety training, and share information about your shop with other tech teachers. That's an OCTElab**SafetyNET!**

25. Provide a **short description** of your project that can go with a reference image for the database. (Max 256 characters.)

### safetyNET STEP 3: Add Files and Videos

Please attach a **project image** for us to display with your short description in the database. Please upload any **supporting documents** including safety components, lesson materials, assessment tools, digital resources, images, or videos. To bring your lesson to life, include **online videos URL link** files on the lesson plan page. Add as many as you like.

Do you have a **safety features map** of your classroom you can share? Attach it here!

Find the **Safety Data Sheet (SDS)** for any of your materials clicking and searching. Save it and add it to your digital resources to attach with your lesson.

### safetyNET STEP 4: Tag Your Lesson

Add your own descriptive tag(s) to help users search for content like yours. Print your lesson to document your safetyNET for your classroom. [Submit](#) your safetyNET lesson. Plan to update lesson content or add digital resources later with your user login. Think about adding another lesson! Remember, most of your general classroom info is already in. You can 'Save As' and 'Modify' to submit a new lesson with new resources!

## OCTElab SafetyNET – Materials, Physical Resources Planning Sheet

Teachers can copy and add rows to this blank form to address specific project needs and include it in their safety binder.

PROJECT / LEARNING ACTIVITY TITLE:

COURSE CODE AND TITLE:

VERSION PREPARED DATE:

SUBMITTED BY:

CONTACT:

### MATERIALS LIST

| MATERIAL | QUANTITY | DESCRIPTION | SOURCE                                                                                                                                                                                                                                                                                            | WHMIS<br>MSDS<br>ATTACHED                                | SAFE<br>STORAGE | WASTE<br>DISPOSAL |
|----------|----------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------|-------------------|
|          |          |             | <input type="checkbox"/> new, purchased<br><input type="checkbox"/> new, donated<br>from community,<br>industry<br><input type="checkbox"/> recycled from<br>inside school<br><input type="checkbox"/> recycled from<br>outside school<br><br>PREPARATION<br>REQUIRED FOR<br>USE:<br><br>DETAILS: | <input type="checkbox"/> Y<br><input type="checkbox"/> N |                 |                   |

**PHYSICAL RESOURCES USED**

| EQUIPMENT, TOOL, MACHINE                                                                                                                  | SUBJECT – SPECIFIC NEEDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | INSPECTED FOR SAFETY FEATURES                                                                                | STUDENT TRAINING PLAN IDENTIFIED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | MAINTENANCE SCHEDULE                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| NOTE: TEACHER EXPERIENCE AND SAFETY PROFICIENCY IS ASSUMED.<br><br>DETAIL EQUIPMENT:<br><br><br>MANUAL APPLICABLE / AVAILABLE (LOCATION): | MACHINE GUARDING AND SHIELDING APPLICABLE<br><br><input type="checkbox"/> YES<br><input type="checkbox"/> NO<br><input type="checkbox"/> N/A<br><br>EMERGENCY STOP / PANIC BUTTON APPLICABLE<br><br><input type="checkbox"/> YES<br><input type="checkbox"/> NO<br><input type="checkbox"/> N/A<br><br>LOCK-OUT TAG APPLICABLE<br><br><input type="checkbox"/> YES<br><input type="checkbox"/> NO<br><input type="checkbox"/> N/A<br><br>OTHER (SUBJECT-SPECIFIC)<br><br><input type="checkbox"/> YES<br><input type="checkbox"/> NO<br><input type="checkbox"/> N/A | <input type="checkbox"/> Teacher<br><br>DATE: _____<br><br><input type="checkbox"/> Board<br><br>DATE: _____ | DETAIL STEPS:<br><br>Student attended teacher safety instructions, lessons, demonstration (notes recorded)<br><br>Student passed oral or written assessment (test)<br><br>Student demonstrated safe setup and operation of equipment to teacher<br><br>Student prepared and delivered power point presentations on all class tools and machines<br><br>Student granted permission to use equipment<br><br>SIGNAGE:<br>safety sign posted<br><br>RESOURCES:<br>safety lesson<br>tool safety video<br>tool power point presentation<br>manual<br><br>FREQUENCY OF RETRAINING ADVISED:<br>Students should be re-trained every semester<br><br>Safety passports expire at the end of every semester | DAILY:<br><br>WEEKLY:<br><br>MONTHLY:<br><br>ANNUALLY:<br><br>CONTACT FOR REPAIR: |

The Ontario Council for Technology Education wishes to acknowledge the contribution of the individuals that

participated in the development and refinement of this SAFEdoc.

## References

21<sup>st</sup> Century Competencies: Foundation Document for Discussion. Phase 1: Towards Defining 21<sup>st</sup> Century Competencies for Ontario, Winter 2016 Edition, 2016

[http://www.edugains.ca/resources21CL/About21stCentury/21CL\\_21stCenturyCompetencies.pdf](http://www.edugains.ca/resources21CL/About21stCentury/21CL_21stCenturyCompetencies.pdf)

Skilled Trades Ontario <https://www.skilledtradesontario.ca>

Canadian Centre for Occupational Health and Safety

<https://www.ccohs.ca/products/>

Course Codes for Emphasis courses in the Revised Curriculum: Technological Education, Grades 11 and 12, 2009 <http://www.edu.gov.on.ca/eng/curriculum/secondary/techedemphiscourses.pdf>

Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools, First Edition, Covering Grades 1 to 12, 2010 [www.edu.gov.on.ca/eng/policyfunding/growSuccess.pdf](http://www.edu.gov.on.ca/eng/policyfunding/growSuccess.pdf)

### **John Deere**

Agricultural Equipment Safety, Maintenance & Operation - VIDEOS

<https://www.deere.com/en/parts-and-service/manuals-and-training/videos/>

Learning for All – A Guide to Effective Assessment and Instruction for All Students, Kindergarten to Grade 12, <https://www.dcp.edu.gov.on.ca/en/>

Ministry of Labour, Immigration, Training and Skills Development

<https://www.labour.gov.on.ca/>

Some web content related to employment standards and workplace health and safety may be temporarily unavailable as we move it to this website. This website is currently in the process of being updated as of July 27, 2022.

Ontario BuildingCode

<https://www.ontario.ca/page/ontarios-building-code>

Ontario School Boards Insurance Exchange

<http://www.osbie.on.ca>