Safe Activity Foundations in Education Document (SAFEdoc)

CONSTRUCTION TECHNOLOGY
MANUFACTURING TECHNOLOGY
TECHNOLOGICAL DESIGN
(FAB)

Revision July 2003

Table of Contents

SECTION 1: **General**

Disclaimer

This material was designed to help teachers implement the new Grade 12 secondary school curriculum, but is fully adaptable to any Science and Technology and Technological Education subject or course. This material was created by members of the Ontario Council for Technology Education (OCTE) subject association and is intended as working guides 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 to 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.

All materials within these safety related documents 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.

Safe Activity Foundation in Education: Design and Fabrication Technology

This ***SAFEdoc*** was designed to provide safety data sheets, posters, safety passports, and safety resources for all technology educators. While developed as a resource for the **Grade 12 Course Profiles,** and as an additional resource for the **Grade 11 Activity Resource Documents (ARMdocs)**, it is available for any grade level or any technology education environment. Each Grade 11 ARMdoc lists specific safety sheets that should accompany the project notes for that activity.

The ***SAFEdoc*** is divided into five separate disciplines:

1. Communications, Computer Engineering and Computer and Information Science (COM)
2. Construction, Manufacturing and Technological Design (FAB)
3. Health and Personal Services (HPS)
4. Hospitality and Tourism (HOST)
5. Transportation (TRANS)

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 data sheets. For example, a Transportation Technology teacher may need to utilize wood shop equipment, therefore may need to refer to the FAB **SAFEdoc**. Teachers are encouraged to download ALL ***SAFEdocs***.

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

This document is a practical safety resource that compliments and elaborates on other recommended resources for technical teachers. See the appendix for linking information such as **Live Safe! Work Smart!,** the **Young Worker's Awareness Program**, and 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.

See Appendix A for related safety resources, such as Live Safe, Work Smart; the Young Workers Awareness Program, the Ministry of Labour and other organizations dedicated to safe practices.

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.

NOTE:
FOR ALL SHOP OPERATIONS

Do not attempt any operations that generate dust without proper dust collection and removal equipment. Make sure you have a regular inspection and maintenance schedule to ensure the proper operation of dust collectors.

Do not attempt any operation that generates fumes without proper operational fume removal equipment. Make sure you have a regular inspection and maintenance schedule to ensure the proper operation of fume hoods. Example operations that this applies to are welding, soldering, plastics welding, plastic casting, and using solvents for cleaning.

Responsibilities for Safety

[from the Ontario Ministry of Education Technological Education, The Ontario Curriculum, Grades 11 and 12, 2000, page 200]
Health and safety are of paramount importance in technological education programs. As part of every course, students must be made aware that health and safety are everyone's responsibility – at home, at school, and in the workplace. Before using equipment, students must be able to demonstrate knowledge of the equipment being used and the procedures necessary for its safe use. Personal protective gear should be worn as appropriate.

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

- the Workplace Safety and Insurance Act
- the Workplace Hazardous Materials Information System (WHMIS)
- the Food and Drug Act
- the Health Protection and Promotion Act
- the Ontario Building Code
- the Occupational Health and Safety Act
- local by-laws

Teachers must make use of a wide range of available and relevant resources to make students sufficiently aware of the importance of health and safety. These can include materials from the following:

- Workplace Safety and Insurance Board (WSIB)
- Industrial Accident Prevention Association (IAPA)
- Ontario Ministry of Labour (MOL)
- Canadian Centre for Occupational Health and Safety (CCOHS)
- appropriate safe workplace associations (SWAs), such as the Construction Safety Association of Ontario (CSAO), the Ontario Service Safety Alliance (OSSA), the Transportation Safety Association of Ontario (TSAO), the Electrical Utilities Safety Association (EUSA), and the Workers' Health and Safety Centre (WHSC), and clinics, such as the Occupational Health Clinics for Ontario Workers.

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.gov.on.ca/LAB/english/hs/ohsaguide/index.html

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 ,Live Safe! Work Smart!*
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

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.

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 also your Board, school and relevant municipal policies for local safety rules and procedures.

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

Communication

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

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

Safety Expectations

The following are safety related expectations from Technological Education, The Ontario Curriculum 2000, for:
Grade 12 TCJ4C Construction (College) and TCJ4E Construction (Workplace)
Grade 12 TMJ4C Manufacturing (College) and TMJ4E Manufacturing (Workplace)
Grade 12 TDJ4M Technological Design (University/College) and TDJ4E Technological Design (Workplace)

Construction Technology, Grade 12, College Preparation, TCJ4C

Impact and Consequences

Overall Expectations

ICV.03 · apply health and safety legislation; general shop and site safety rules; and rules specific to the safe use of materials, tools, and equipment;

Specific Expectations

Health and Safety
IC2.01 – identify hazards related to the materials, processes, and equipment used in a construction work environment;
IC2.02 – demonstrate safe shop practices when using hand and power tools, materials, and equipment;
IC2.03 – describe the basic health and safety needs of workers on construction sites;
IC2.04 – explain the need for, and apply where appropriate, health and safety laws and regulations;
IC2.05 – identify safety codes, regulations, and standards applicable to construction projects and the workplace;
IC2.06 – explain health and safety legislation and practices related to the construction industry such as the Workplace Hazardous Materials Information System (WHMIS), the Worker's Compensation Act, the Ontario Building Code, and local by-laws;
IC2.07 – handle hazardous materials in accordance with the Workplace Hazardous Materials Information Systems (WHMIS) guidelines.

Construction Technology, Grade 12, Workplace Preparation, TCJ4E

Impact and Consequences

Overall Expectations

ICV.02 · apply appropriate health and safety legislation; general shop and site safety rules; and rules specific to the use of materials, tools, and equipment;

Specific Expectations

Health and Safety

IC2.01 – identify hazards related to materials, processes, and equipment used in a construction work environment;
IC2.02 – demonstrate safe shop and construction site practices for the use of hand and power tools, materials, and equipment;
IC2.03 – describe the basic health and safety needs of workers on construction sites;
IC2.04 – explain the need for, and apply where appropriate, health and safety codes, standards, and regulations applicable to construction projects and the workplace;
IC2.05 – explain health and safety legislation and practices related to the construction industry such as the Workplace Hazardous Materials Information System (WHMIS), the Worker's Compensation Act, the Ontario Building Code, and local by-laws;
IC2.06 – explain how to handle hazardous materials in accordance with the Workplace Hazardous Materials Information Systems (WHMIS) guidelines.

Manufacturing Engineering Technology, Grade 12, College Preparation, TMJ4C

Impact and Consequences

Overall Expectations

ICV.02 · evaluate and implement safe work practices in performing manufacturing-related tasks;
ICV.03 · identify the role of health and safety legislation in manufacturing technology programs in schools and in the manufacturing sector;

Specific Expectations

Safety and Legislation

IC2.01 – use safe work practices and model the most appropriate method for a particular operation;
IC2.02 – develop and conduct safety audits and inspections of the school manufacturing facility and implement a plan to address any deficiencies;
IC2.03 – develop an effective emergency action plan for the school manufacturing facility;
IC2.04 – analyse the Occupational Health and Safety Act (OHSA) and implement the parts of it

that relate specifically to the school manufacturing facility;
IC2.05 – identify the issues addressed in the Workplace Hazardous Materials Information System (WHMIS).

Manufacturing Technology, Grade 12, Workplace Preparation, TMJ4E

Impact and Consequences

Overall Expectations

ICV.02 · develop and conduct safety audits and inspections of the school manufacturing facility and implement a plan to address any deficiencies;
ICV.03 · describe the Occupational Health and Safety Act (OHSA) and identify its implications for the school manufacturing facility and for their workplace;

Specific Expectations

Safety and Legislation
IC2.01 – use safe work practices in the manufacturing program;
IC2.02 – demonstrate good housekeeping practices in the work environment by cleaning up spills and leaks, keeping areas clean and clear of obstructions, and sorting tools and equipment so that the potential for an accident or injury is minimized;
IC2.03 – develop comprehensive safety checklists for machine tools and operations;
IC2.04 – use all required protective clothing and gear (e.g., eye, ear, hand, head, foot, and respiratory protectors);
IC2.05 – identify components of the Occupational Health and Safety Act (OHSA) that relate to specific machine tools and operations used in the school manufacturing facility.

Technological Design, Grade 12, University/College Preparation, TDJ4M

Skills and Processes

Overall Expectations

SPV.03 · perform structural and material tests correctly;

Specific Expectations

Planning
SP1.02 – include appropriate health and safety codes in project documentation;

Impact and Consequences

Overall Expectations

ICV.02 · handle materials and tools safely;

ICV.03 · assess project solutions in terms of safety, efficiency, ergonomics, and the environment;

Specific Expectations
Environmental and Safety Issues
IC2.01 – handle tools and materials safely;
IC2.02 – analyse the consequences of a product's features in terms of safety, efficiency, ergonomics, and the environment;
IC2.03 – describe how well-designed project solutions can minimize negative environmental impact.

Technological Design, Grade 12, Workplace Preparation, TDJ4E

Impact and Consequences

Overall Expectations
ICV.01 · describe safety features and ethical issues that must be addressed in technological design;
ICV.03 · handle the tools and equipment used in technological design safely;
ICV.04 · identify career opportunities in design-related businesses;

Specific Expectations
Design Impacts
Environmental and Safety Issues
IC2.01 – handle tools and materials safely;
IC2.02 – explain how project solutions affect the environment;
IC2.03 – evaluate the procedures used in processing materials, taking into consideration safety issues and environmental concerns;
IC2.04 – identify the environmental concerns related to a product's life

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.

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.

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 heavy and long loads 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.

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 MSDS 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

I, _____ agree to:

Ensure a safe workplace

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

Prescribed and Non-prescribed Medications

1. Report any use of prescription medications and will inform teachers of any possible side effects of the medication [e.g. penicillin, phenobarbital etc.]
2. Report any use of non-prescription medication and any possible side effects of the medication [e.g. Reactine, Benadril, any cough syrups etc.]
3. Never enter a shop or lab carrying, or under the influence of illegal substances

Consequences for Improper Action

I understand that failure to comply with this agreement may result in injury to myself or others, and that failing to comply with safety procedures may result in my temporary removal from the class or shop.
Note: Teachers must ensure that the ***Consequences for Improper Action*** aligns with school and board policies.

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

Student signature: _____

Parents signature _____

Date: _____

SECTION 2: SAFETY DATA SHEETS

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 sheets for inclusion in Course Profiles or Activity Resource Management (ARMdoc) documents.

Safety Data Sheets contain information specific to various common workshop tools and procedures. Before using them, ensure they accurately describe your own particular facilities and equipment. Make sure equipment specific information aligns with manufacturers' safety precautions.

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.

Air Compressor

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate.
2. Do not operate machines and equipment without the instructor's permission.
3. Know the purpose of each tool you use, and use each for the specific task it was designed to do.
4. Never use any tool - hand or power tool unless you are trained to do so and are familiar with its use.
5. Always use the carrying handle to transport the compressor
6. Always leave sufficient space (at least 5 meters) between the compressor and the work area in particular when using tools for spraying of liquids
7. The compressor must be placed on a stable surface
8. Never clean the machine with liquids or solvents when cleaning. Disconnect the machine from the electricity supply by removing the plug and use a damp cloth only.
9. The compressor is designed for air compression only and must never be used for any other type of gas.
10. Never direct the jet of air towards persons or animals or your body.
11. When using compressed air, you must know and comply with the safety precautions to be adopted for the single applications (inflating, pneumatic tools, painting, washing with water based detergents only, etc.)

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Air Nailer

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate. Do not wear loose clothing or jewelry when operating power tools. Long hair must be tied back.

2. Do no operate the air nailer without the instructor's permission.

3. Before operating the equipment notify the teacher you are ready to begin.
4. Follow the manufacturer's instructions for lubricating and changing tool accessories.

5. **Keep your finger off the trigger when carrying the tool and at any time you are not nailing.**

6. Use proper nails for the job, set nailer to proper pressure for wood strength and thickness.

7. Never nail towards yourself or others.

8. Be aware of what is behind the piece you are going to nail. Watch for catches along the air line and clear the area before working.

9. Make adjustments to the nailer only when air is disconnected.

10. Fire the nailer only when you are applying even pressure and have a firm grip of the handle.

11. Make sure you use only the proper connectors on the hoses.

12. Never step on hoses. This prevents wear and reduces tripping hazards.

13. Never operate a nailer at pressure higher than it was designed for.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Arbor Press

1. Wear **EYE PROTECTION AND OTHER PERSONAL PROTECTIVE EQUIPMENT** when using a press.
2. Mount all work to be pressed squarely.
3. Choose the appropriate opening for the shaft size to slide through.
4. Apply pressure in a steady manner; do not hammer down with the handle.
5. Oil the shaft and bearing while applying pressure.
6. Maintain pressure until the bearing is seated or disengages.
7. If you are pressing out a bearing you should be aware that the shaft may fall to the floor, so watch where your feet are placed.
8. If the bearing doesn't move make the teacher aware of the problem. Heat may be applied to the bearing under supervision.
9. 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, SEE YOUR INSTRUCTOR

Arc Welding

1. **PROTECT YOUR SKIN** by wearing safety footwear and leather or flame resistant canvas coat and gloves.
2. **PROTECT YOUR HEAD AND EYES** by wearing an approved welding helmet equipped with a minimum shade 10 lens and protective cover glass. Observers must also wear approved **EYE PROTECTION**.
3. **STUDENTS WEARING CONTACT LENSES MUST NOT USE AN ARC WELDER** or be exposed to its arc.
4. Always place a suitable barrier around the work area to protect others from arc radiation. Use shaded screens (shade 8 minimum) when possible.
5. Be aware of others at all times when welding. Notify others that you are about to weld especially if you are not in a protected welding booth.
6. When welding, the area and equipment must be free of water and your footwear dry.
7. Ensure all connectors are fastened .
8. Ensure the ventilation system is turned on and working.
9. Check for flammable substances before beginning to weld.
10. Always ground to your work piece and be aware of any bearings installed on the work piece.
11. Take breaks to help relieve arm fatigue.
12. Always pick up hot pieces using tongs or pliers.
13. Ensure eye protection is in place when chipping “slag” or grinding a weld.
14. Always ensure the teacher is aware of any equipment problems.

AT ALL TIMES – IF IN DOUBT, SEE 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 its arc.

3. All welding equipment must be in good operating condition. Never use damaged equipment.

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. When welding the area must be free of water and your footwear dry.

7. Ensure all connectors are fastened securely.

8. Ensure the ventilation system is turned on and working.

9. Check for flammable substances before beginning to weld.

10. Always clamp ground cable to your work piece. Be aware of any bearings installed on the work piece.

11. Take breaks to help relieve arm fatigue.

12. Always pick up hot pieces using tongs or pliers.

13. All welding equipment must be in good operating condition, never use damaged equipment. Always ensure the teacher is aware of any equipment problems.

Band Saw

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate.
2. No loose clothing, long hair or jewelry is allowed in the shop.
3. Do not operate the band saw without the instructor's permission.
4. Follow the manufacturer's instructions for changing tool accessories.
5. Be aware of the position of the on/off switches and emergency **STOP** button.
6. Make all adjustments with the power off.
7. Use both hands and keep fingers at least 10cm (4") from the blade at all times; adjust guard prior to turning the saw on.
8. Keep upper guide less than 5mm (1/4") from the material being cut.
9. Plan your cuts carefully. Saw curves gradually. Sudden twists may cause the blade to bind or break. Use relief cuts if necessary.
10. If the blade breaks, turn the power off immediately and step back. Inform the instructor immediately.
11. Always make short cuts first. Avoid backing out of cuts with the power on. Backing out of a cut may cause the blade to come off of the drive wheel.
12. Do not cut cylindrical stock without the use of a V block clamp.
13. Remove scrap pieces from the table only after the blade has stopped.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Band Saw (cont.)

14. Always operate the saw from the front never from the side.
15. Do not leave the band saw until the blade has stopped.
16. Ensure that the blade is running at full speed before starting a cut.
17. Cut on the waste side of your line, leaving the pattern line on the work.
18. Keep your hands beside or behind the blade. Never in front. Use a push stick on small pieces.
19. Make sure all guards are in place and properly adjusted. Ensure all band wheels are enclosed.
20. Ensure the blade is tracking correctly and runs freely in the upper and lower guide rollers. Ensure the blade is under proper tension. See your instructor for guidance.
21. Use band saw blades that are sharp, properly set and otherwise suitable for the job (e.g., the right tooth pitch; tooth form; blade width).
22. Hold stock firmly and flat on the table to prevent the stock from turning and drawing your fingers against the blade.
23. Use a push stick when you remove cut pieces from between the fence and saw blade or when your hands are close to the blade. Keep your hands on either side of the blade - not in line with the cutting line and the blade.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Belt and Disk Sander

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate.
2. No loose clothing, long hair or jewelry is allowed in the shop.
3. Do not operate the belt and disc sander without the instructor's permission.
4. Be aware of the position of the on/off switches and emergency **STOP** button.
5. Remove all the sawdust around the belt/disc sander.
6. Do not operate if the abrasive paper is loose or torn.
7. Ensure that power is off when changing the belt.
8. Sand only on the rotating-*down side surface* of the disc-sander.
9. Sand only on dry wood.
10. The stock must be positioned against the table at all times.
11. Belt sander roll end and side guards should be properly adjusted and in good condition.
12. Do not apply excessive force toward the belt or disc. Let the machine do the work.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Drill Press

1. Make sure that your **FACE SHIELD OR SAFETY GLASSES** 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** 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 attempt to stop it with your hands. Never reach around or in back of any rotating drill. Use a V-block for round stock.
8. Always ensure that the machine has come to a **COMPLETE STOP** and has been switched off before you attempt to change 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. Always clear away chips and curls with a **HAND BRUSH** – not your hands.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Facility Emergency Procedures

1. Make sure you know the location of all fire alarms, emergency exits, and emergency power stop buttons

2. EMERGENCY PROCEDURES AND EVACUATION ROUTES must be clear at all times, and occupants must know and understand these procedures and routes.

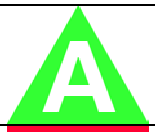
Location of Emergency Exits and Fire Alarms:

Locations of Emergency Stops:

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Fire Extinguishers

1. If you see a fire, call for attention; get everyone out, pull fire alarm.
2. Stay calm.
3. If using a Fire Extinguisher:
   - **PULL THE PIN, AIM LOW AT BASE OF FIRE**
   - **SQUEEZE HANDLE, SWEEP SLOWLY AT BASE OF FIRE**
   - **STAY LOW TO AVOID HEAT AND SMOKE**
4. Have the fire department check to make sure the fire is out.
5. Ventilate when fire is completely out.

CLASS A **water**		**Ordinary Combustibles**: paper, cloth, wood, rubber, many plastics.
CLASS B **CO2**		**Flammable Liquids:** oil, grease, gasoline, some paints, solvents etc.
CLASS C **dry chemical**		**Electrical:** wiring, fuse boxes, electrical equipment etc.
CLASS D **special liquid or powder**		**Combustible Metals:** magnesium, sodium.

First Aid Kits

ALL INJURIES MUST BE REPORTED TO MAIN OFFICE
REPORT ANY USE OF FIRST AID KIT TO TEACHER TO ENSURE THAT ANY SUPPLIES THAT ARE USED ARE REPLACED

Suggested list (add items specific to your needs) See WSIB Regulation 1101, Required first aid kit items (at http://www.wsib.on.ca/wsib/wsibsite.nsf/Public/PreventionYHSRR)

DATE CHECKED:
CHECKED BY:

ITEM	Number
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	

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

General Housekeeping

1. Everything has a proper storage location.
   If you don't know where it is, please ask.
   If you do know, put it back.

2. If it is broken, report it.
   If it doesn't work, report it.
   If it's broken or doesn't work, don't use it.

3. Dirt, dust, debris are harmful to your safety and health. Even if you didn't put it there, pick it up, clean it up, or move it aside.

4. If you spill or drop any fluid on the floor, clean it, or use absorbent materials. You are responsible for prevention of injuries.

5. Never block fire exits, fire pull alarms, doorways, aisles, and electrical breakers of machine switches for any reason at any time.

6. Oil, gas, and other vehicle fluids all have proper storage containers.
   Make sure you use them.
   Never mix chemicals.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Bench Grinder

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate. No loose clothing, long hair or jewelry is allowed in the shop.
2. Do not operate any grinder without the instructor's permission.
3. Be aware of the position of the on/off switches and emergency **STOP** button.
4. Always check the clearance of the tool rest before starting work. Clearance should never be more than 3mm (1/8 inch). Always set the tool rest clearance when the wheel is not turning.
5. When mounting or replacing any grinding wheel, always ensure that it fits properly on the spindle. Never use a grinding wheel that is loose on the shaft.
6. In securing the wheel to the spindle be sure that the blotters are affixed to both sides of the wheel and that washers and nuts are of the correct size.
7. When starting up any grinding wheel, stand to one side out of line with the wheel especially if it is a new one.
8. Only replace a grinding wheel with one that has the same speed rating. Excessive speed on lower speed rated grinding wheels can cause the wheel to shatter.
9. Only grind on the face of the wheel, Use the entire face to avoid grooving the wheel.
10. Always feed the work into the wheel gradually. Too much pressure or striking the wheel suddenly may cause it to fracture.
11. Shut off machine immediately if it begins to chatter or vibrate. Never use tools or hands to stop any grinder. Report chattering and vibration to the teacher.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Hand Grinders

1. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING GLOVES AND FACE SHIELD OR GLASSES** when using a grinder.
2. Check the grinder disk for any flaws before using.
3. Ensure that the grinder disk is secured and seated properly on the arbor.
4. Check the immediate area for any fire hazards such as flammable materials, liquids or batteries.
5. Make sure you are at least 6 metres (20 feet) away from other workers.
6. Start the grinder off the work.
7. Grip the grinder solidly with two hands (beware of the torque). Also make sure you have a solid stance before starting to grind.
8. im the sparks towards the floor and away from others.
9. When you have finished grinding raise the grinder off the work and allow it to stop on its own.
10. If the grinder is dropped during use it should be thoroughly inspected by the teacher before being used again.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Hand Tools

Hand tools in poor condition are responsible for a vast number of injuries.

1. Wear **EYE PROTECTION** whenever using hand tools.
2. Have a proper storage location for your tools to protect them from loss or damage. After use, clean and **RETURN THEM TO THEIR PROPER PLACE** so they are always ready when you need them.
3. Never leave tools on floor, hanging over edges, on ramps or hoists where they could be forgotten or cause a tripping hazard.
4. When tools become worn or damaged, they should be repaired or replaced immediately. Show your instructor.
5. Use chisels, knives, blades that are sharp. Do not use blunt tools.
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. Files should not be used as pry bars – they are extremely brittle and when breaking will release fragments which could injure or blind you.
8. **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.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Machinery Guards

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 give 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.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Metal Cut Off (Chop) Saw

1. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING GLOVES AND FACE SHIELD OR GLASSES** when using a metal chop saw.
2. All jewelry must be removed, and long hair tied back securely.
3. Stand to the side of the disc assembly when operating the saw.
4. Students who are left-handed should use their right hand for cutting operations.
5. Clamp material firmly and ensure you are aware of the blade path before you make your cut.
6. Prior to using the saw check the condition of the cord and the abrasive cutting disc.
7. Long stock pieces should be supported safely.
8. Ensure the guard is functioning correctly during operations.
9. When making angle cuts ensure the cutting disc has adequate clearances.
10. Start the saw off the metal and gradually make the cut with even force on the abrasive disc.
11. Pieces of metal that have just been cut will have **SHARP EDGES AND WILL BE HOT** to touch.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Metal Lathe

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate. No loose clothing, long hair or jewelry is allowed in the shop.
2. Do not operate the lathe without the instructor's permission.
3. Be aware of the position of the on/off switches and emergency **STOP** button.
4. Make sure headstock, tailstock and tool rests are tight before operating.
5. Ensure your material is secure before starting motor.
6. Ensure all tool bits are sharp and without nicks. Show your instructor any problems with the tooling.
7. Do not operate lathe till you have established proper speeds, stops, tool heights and angles.
8. Make sure you have proper speeds and feeds for the type of material and tool bits, type of operation, and diameter of material. When in doubt, ask.
9. Assume a solid position with your body to the side of the tool. Be sure to have firm footing when operating the lathe.
10. Remove cut off material with a brush. Never use your hand.
11. Turn the lathe off immediately if it does not sound right or if there is excessive vibration.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Mitre Saw

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate. No loose clothing, long hair or jewelry is allowed in the shop.
2. Do not operate the mitre saw without the instructor's permission.
3. Follow the manufacturer's instructions for changing tool accessories.
4. Clamp all material firmly and properly.
5. Ensure you are aware of the blade path before you make your cut.
6. When you cut short pieces make sure your left hand is clear of the blade path.
7. Watch for kick back when cutting short pieces.
8. Long stock pieces should be supported safely.
9. Students who are left handed must use their right hand for cutting operations.
10. When making angle cuts ensure the blade has adequate clearances.
11. Your body position should always be left of the blade assembly when operating this saw.
12. When using a sliding mitre saw, ensure the blade clears stock sizes before cutting operations.
13. Make sure all guards are in place and properly adjusted.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Oxy-Acetylene Welding (1)

1. **PROTECT YOUR HEAD AND EYES** by wearing welding goggles or shield equipped with a minimum shade 5 level of protection. Observers must wear **EYE PROTECTION**.
2. Cylinders must be secured and upright at all times and stored in a well-ventilated area.
3. Full and empty cylinders must be stored separately. Mark all empty cylinders appropriately.
4. Gas cylinders must have **PROTECTIVE CAPS** in place for transporting and storing.
5. Ensure that all regulators, hoses, and torches are in good condition, leak-free, and the hoses are equipped with approved **FLASHBACK ARRESTORS**.
6. Perform leak tests as part of a preventive maintenance procedure.
7. Use only approved pressure-reducing regulators with each gas cylinder.
8. **OXYGEN COMBINES WITH OIL AND GREASE** to cause violent fires. Do not use oxygen to blow dust off clothing.
9. Keep equipment free of oil or grease
10. Make certain a fire extinguisher is readily available.
11. **PROTECT YOUR SKIN** by wearing safety footwear and leather or flame resistant canvas coat and gloves.
12. Do not carry a Butane lighter or other flammables in your pockets
13. Only use a proper striker to ignite torches
14. Check for flammable substances in the vicinity before beginning to weld.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Oxy-Acetylene Welding (2)

START UP

1. Open oxygen cylinder valve slowly ½ turn to prevent damage to regulator. Then open all the way.
2. Open acetylene cylinder valve 3/4 turn only.
3. Adjust hose pressures using the T-handles on the regulator gauges.
4. Purge acetylene and the oxygen lines individually before lighting torch.
5. Open the acetylene torch valve 1/3 turn and light the acetylene gas using a striker (before opening the oxygen torch valve).
6. Open the oxygen valve slowly until a neutral flame is achieved.

SHUTDOWN

1. Close the torch acetylene gas valve to extinguish the flame. **(A before O).**
2. Close the torch oxygen valve.
3. Close the acetylene gas cylinder valve.
4. Close the oxygen cylinder valve.
5. Drain the acetylene gas line by opening the torch acetylene gas valve. Release the acetylene gas regulator knob (T-handle) on the gauge.
6. Close the torch acetylene gas valve.
7. Drain the oxygen lines by opening the torch oxygen valve. Release oxygen regulator knob (T-handle) on the gauge.
8. Close the torch oxygen valve. Oxygen and acetylene gauges for both tank and hose pressures should read zero.
9. Neatly wrap hoses on holder, and place torch handle and tip in a position that will prevent damage to them.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Pedestal Grinder

1. **WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING AN APPROVED SAFETY SHIELD AND/OR SAFETY GLASSES** when using a grinder, even if the grinder is equipped with protective glass shields. Ensure participants or observers are wearing personal protective equipment.

2. Make certain your work area is clean and clear of debris.

3. 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.

4. Always ensure a new grinding wheel has the **CORRECT RPM RATING** for the grinder it is being installed on.

5. When mounting or replacing any grinding wheel, always ensure that it fits properly on the shaft.

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. When starting up any grinding wheel, **STAND TO ONE SIDE** out of line with the wheel.

8. Only grind on the face of the wheel, Use the entire face to avoid grooving the wheel.

9. Always **FEED THE WORK TO THE WHEEL GRADUALLY**. Too much pressure or striking the wheel suddenly may cause it to fracture.

10. **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, SEE YOUR INSTRUCTOR

Power Tools (1)

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate.
2. Do not operate power tools without the instructor's permission.
3. Do not wear loose clothing or jewelry when operating power tools. Long hair must be tied back.
4. Follow the manufacturer's instructions for lubricating and changing tool accessories.
5. Keep guards in place and follow lockout/tag-out procedures.
6. Know the purpose of each tool you use, and use each for the specific task it was designed to do.
7. Always use two hands on the tool when operating. Clamp work piece to a solid surface; do not attempt to hold work piece with hand or foot.
8. Unless it's designed for it, never use a portable electric tool where there are flammable vapors or gases present.
9. Electrical cords must be in good condition; report any broken, damaged or bare cords. Keep cords away from heat, oil, and sharp edges
10. All power tools must be effectively grounded and/or be of the double insulated type.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Power Tools (2)

11. If the tool is equipped with a three-prong plug, it should be plugged into a three-hold electrical receptacle. Never remove the third prong.

12. Never use power tools in damp or wet locations or if the worker is perspiring. Moisture helps electricity flows more easily through the body.

13. Rubber gloves and footwear are recommended when working outdoors in damp conditions.

14. Never carry a tool by its cord, or pull the cord to disconnect it from a receptacle Never carry a plug-in tool with your finger on the switch.

15. Unplug tools before replacing any broken, dull or damaged bits or blades.

16. Be careful not to overreach. Keep your balance and proper footing when working with power tools.

17. When you have completed an operation with a power tool, switch it off and lay the tool down in a safe manner after it stops. Keep the rotating blade or bit away from your legs and body.

18. Keep floor around work area clean.

19. Be sure the power switch for a portable tool is “off” before plugging it in.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Radial Arm Saw

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate.
2. No loose clothing, long hair or jewelry is allowed in the shop. Do not operate the radial arm saw without the instructor's permission.
3. Follow the manufacturer's instructions for changing tool accessories.
4. Be aware of the position of the on/off switches and emergency **STOP** button.
5. Make sure the floor is clear in the work area.
6. Check the blade for flaws (replace if damaged, worn, or dull). Make sure power is off and the blade has stopped before making any adjustments.
7. Wear a dust mask when cutting treated wood or when there is a fine dust hazard.
8. Stand clear of possible kickback and keep your hands clear of the blade path.
9. Before cutting, inspect the stock for loose knots, metal, or any other hazards.
10. Stock must be held firmly on the table and against the fence for all crosscutting operations.
11. The ends of long boards must be supported level with the table.
12. Use table extensions or hold down clamps to control long stock.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Radial Arm Saw (cont.)

13. Never cut more than one piece of stock at a time (don't stack).
14. Never cut stock that is shorter than the blade diameter or stock that doesn't lay flat on the table.
15. Make sure all guards are in place and function properly. Secure the fence position before beginning.
16. Keep the guard and anti-kickback device in position. Do not remove them without your instructor's permission.
17. Keep your hands a safe distance away from the path of the saw blade. Always return the saw to the rear of the table after completing a crosscut or mitre cut. Never remove stock from the table until the saw has been returned.
18. Shut off the motor and wait for the blade to stop before making any adjustments. Be sure the blade has stopped before you leave the machine.
19. The table should be kept clear of scrap pieces and large amounts of saw dust.
20. Never use the radial arm saw for making rip cuts.
21. Turn off the saw to clear any materials from near the blade.
22. Change blade if you notice smoking, burning, or wavering during cut. Turn off saw if you encounter any unusual problems or sounds.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Router

Power tools in poor condition are responsible for a vast number of injuries.

1. Wear **EYE PROTECTION** whenever using hand power tools.
2. Routers operate at high speeds and torque. Ensure all parts are tight and bits are sharp. Use tool shields and face shields at all times. Keep a solid two-handed grip at all times. Make sure your stance is solid.
3. Routers turn clockwise (when seen from top). Always feed from left to right, otherwise you will 'walk' the bit. Cut with the grain of the wood whenever possible.
4. You control the feed speed…do not force tool (listen to sound of motor) or move too slowly (when you are burning material) **LOOK, LISTEN AND SMELL!**
5. Ensure you are using proper depth of cut. Test cuts on scrap material. Make multiple passes if necessary.
6. When bits become worn or damaged, they should be repaired or replaced immediately. Show your instructor.
7. Use bits that are sharp, do not use blunt tools.
8. Make sure material to be routed is clamped solidly to the work bench

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Scroll Saw

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate. No loose clothing, long hair or jewelry is allowed in the shop.
2. Do not operate the Scroll Saw without the instructor's permission.
3. Follow the manufacturer's instructions for changing tool accessories.
4. Be aware of the position of the on/off switches and emergency **STOP** button.
5. Ensure that the correct blade is being used for the type and size of material. Use the correct speeds for the material being cut (variable speed machines).
6. When pushing the work through do not force the piece. Keep fingers clear of the blade path. Use both hands and keep fingers at least 10 cm. (4 in.) from the blade at all times.
7. Never pull or force a jammed piece through the equipment. Shut the power off and then carefully dislodge the piece.
8. If the blade is dull change it. (Make sure the machine is locked out). Make all adjustments with the power off.
9. Make sure the hold down is resting on the work piece.
10. Plan your cuts carefully. Saw curves gradually. Sudden twists will cause the blade to bind or break. Use relief cuts if necessary. Always make a short cut first. Avoid backing out of cuts with the power on. Backing out of a cut may cause the blade to bind
11. If the blade breaks, turn the power off immediately and step back. Inform the instructor immediately.
12. Remove scrap pieces from the table only after the blade has stopped.
13. Always operate the saw from the front never from the side. Keep your hands beside or behind the blade; never in front. Do not leave the scroll saw until the blade has stopped.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Surface Planer

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, hearing protection as appropriate. No loose clothing, long hair or jewelry is allowed in the shop.
2. Do not operate the Surface Planer without the instructor's permission.
3. Be aware of the position of the on/off switches and emergency **STOP** button.
4. Check the blades for flaws (replace if damaged, worn, or dull). Replace or set only when power is off. Follow the manufacturer's instructions for changing tool accessories.
5. Be sure stock is free of foreign materials, nails, other hardware, grit, dirt, loose knots.
6. Before investigating any jammed pieces shut the power off and lock it out. Never reach into the planer.
7. Use a push stick when necessary.
8. Keep fingers from under the stock while feeding or retrieving. This will prevent being pinched between planer bed and stock.
9. Wear a dust mask when cutting treated wood or when there is a fine dust hazard.
10. Stand clear of possible kickback.
11. When working with a partner ensure you have clear communication.
12. Make successive passes removing shallow amounts. Do not plane two pieces of stock at the same time. Do not plane stock shorter than the distance between front and back rollers.
13. Use a backer board when planning stock thinner than 1/2" (12.7mm)

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Table Saw

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate. No loose clothing, long hair or jewelry is allowed in the shop.
2. Do not operate the table saw without the instructor's permission. Follow the manufacturer's instructions for changing tool accessories.
3. Be aware of the position of the on/off switches and emergency **STOP** button.
4. Make sure the floor is clear in the work area.
5. Check the blade for flaws (replace if damaged, worn, or dull) Make sure auto kick-back is in place. Secure the fence position before beginning. Always keep the work firmly down on the table while pushing it past the blade.
6. Always "lock-out" the table saw before changing blades.
7. Never reach over the blade.
8. Always use a push stick when the fence is set under 3" to the blade.
9. Ask for assistance when working with large pieces.
10. Wear a dust mask when cutting treated wood or when there is a fine dust hazard.
11. Stand clear of possible kickback. Keep your hands clear of the blade path.
12. When working with a partner ensure you have clear communication. The second person should stand behind and to the left of the blade.
13. Do not feed the material faster than the saw will accept.
14. Use a fence when making a rip cut and a mitre gauge to make cross-cuts. Never cut a piece of material free-hand. Keep the work against the fence throughout the operation.
15. Report all unguarded and inadequately guarded equipment promptly to your instructor.
16. Always check the machine guards to make sure they are in place and operating, before using the machine.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Vertical Mill

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate. No loose clothing, long hair or jewelry is allowed in the shop.
2. Do not operate the mill without the instructor's permission.
3. Be aware of the position of the on/off switches and emergency **STOP** button.
4. Make sure spindle, beds and control handles are working properly before operating.
5. Ensure all tool bits are sharp and without nicks. Show your instructor any problems with the tooling.
6. Ensure your workpiece is clamped secure before starting motor.
7. Do not operate mill till you have established proper speeds, stops, tool depths.
8. Make sure you have proper speeds and feeds for the type of material and tool bits, and type of operation. When in doubt, ask.
9. Be sure to have firm footing when operating the mill.
10. Remove cut off material with a brush. Never use your hand.
11. Turn the mill off immediately if it does not sound right or if there is excessive vibration.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Wood Jointer

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate. No loose clothing, long hair or jewelry is allowed in the shop.

2. Do not operate the wood jointer without the instructor's permission.

3. Be aware of the position of the on/off switches and emergency **STOP** button.

4. Check the cutter head to make sure it is in good working order. Make all adjustments with the jointer turned off, and locked out where the blade could be touched.

5. Before investigating any jammed pieces shut the power off and lock it out.

6. Check the stock for foreign objects. Never joint stock containing loose or unsound knots.

7. Ensure the guard is installed and working properly. Adjust the fence to slightly larger than material size. Set cutting depth to 3mm (1/8 in.) or less. Never make "free hand" cuts on the jointer. Always use the fence. Ask for assistance when working with large pieces.

8. Wear a dust mask when cutting treated wood or when there is a fine dust hazard.

9. Stand clear of possible kickback. Be sure to have firm footing when operating the jointer.

10. Never reach directly over the moving blade to remove stock. Use a push stick for thin work. Never let a finger come with in 10 cm (4") of blade when running. Always push the work well beyond the blade when finishing a cut. Never let go of the stock during the cut.

11. Make sure stock is at least 25cm (10") long. Make sure stock is no narrower than 1" (25.4mm) when edge jointing and 1/2" (12.7mm) when face jointing.

12. Turn the jointer off immediately if it does not sound right or if slivers of wood catch between the blade and table.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Wood Lathe

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate. No loose clothing, long hair or jewelry is allowed in the shop.
2. Do not operate the wood lathe without the instructor's permission.
3. Be aware of the position of the on/off switches and emergency **STOP** button.
4. Make sure headstock, tailstock and tool rests are working properly and are tight before operating.
5. Ensure your material is secure before starting motor.
6. Ensure all chisels are sharp and without nicks. Show your instructor any problems with the tooling.
7. Keep a firm but not too tight grip on the chisel. Do not strain your hand or arm, and take your time. Ease tool into material, take your time and listen for motor strain, or look for burning material. Ensure you have a good grip, particularly when you are approaching the headstock or tailstock.
8. Wear a dust mask when working with treated wood or when there is a fine dust hazard.
9. Stand clear of possible kickback. Be sure to have firm footing when operating the lathe.
10. Do not attempt thin and long materials without proper setup. If in doubt, ask your instructor.
11. Turn the lathe off immediately if it does not sound right or if there is excessive vibration.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Wood Shaper

1. Wear Personal Protective Equipment (PPE) such as safety glasses, safety goggles, face shields, gloves and proper clothing as appropriate.
2. No loose clothing, long hair or jewelry is allowed in the shop.
3. Do not operate the wood shaper without the instructor's permission.
4. Be aware of the position of the on/off switches and emergency **STOP** button.
5. Do not use damaged cutters or cutterheads.
6. Keep cutters sharp. Do not try to force your work against a dull cutter.
7. Be sure power is off before installing cutters in the cutterhead. Be certain that the cutters are inserted fully.
8. Keep guards and other safety devices in place and in good condition.
9. Do not try to cut too deep in a single pass. Several shallow cuts are safer.
10. Never try to cut "freehand" with your shaper system. Use a fence at all times.
11. Use a right-angle fixture to mill end grain, especially on narrow material.
12. Feed against the rotation of the cutterhead.
13. Use hold-downs wherever possible, and always use a push stick when milling narrow stock.
14. Avoid working with small pieces.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

Welding Equipment (General)

1. **PROTECT YOUR SKIN** by wearing leather or flame resistant canvas coat and gloves.

2. **PROTECT YOUR HEAD AND EYES** by wearing a welding helmet equipped with approved lens and cover glass. Observers must wear **EYE PROTECTION**.

3. **NEVER START A TORCH OR STRIKE AN ARC** unless you and any observers have protective lenses in place.

4. Always place a suitable barrier around the work area to protect others from arc radiation.

5. **REMOVE COMBUSIBLE MATERIAL** and sweep the area before welding. Any immovable combustibles must be covered with metal or fire resistant guards.

6. Make sure that clothing you are wearing has no cuffs or loose folds exposed.

7. Ensure that **VENTILATION** will remove smoke and fumes.

8. **KEEP OPERABLE FIRE EXTINGUISHERS CLOSE AT HAND** and ready for an emergency. Know where the nearest fire alarm is located

9. When the job is complete, check the area for any hot or smoldering material. Ensure that it is extinguished.

10. **OXYGEN COMBINES WITH OIL AND GREASE** to cause violent fires. Do not use oxygen to blow dust off clothing.

11. Use only approved pressure-reducing regulators with each gas cylinder.

12. Gas cylinders must have **PROTECTIVE CAPS** secured in position for transporting and storing. Oxygen and acetylene tanks must be kept upright at all times.

AT ALL TIMES – IF IN DOUBT, SEE YOUR INSTRUCTOR

SECTION 3: SAFETY ASSIGNMENTS AND TESTS

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.

Note: These tests and assignments are not correlated with the Safety data Sheets. 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.

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. Show the work zones around major equipment. 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	
Chemicals/paints/solvents storage	
Consumable supplies storage	
Drill press	
Sink	
Pedestal grinder	
Saws	
Jointer/planers	
Lathes	
Grinders	
Sanders	
Arc welding area	
Oxy-acetylene welding area	
Dust collector fan control	
Material storage areas	
Cleaning supplies (brooms, dust pans, 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 technological environment.

- Group 1 Arc/MIG/TIG welding
- Group 2 Oxy-acetylene welding and cutting
- Group 3 Cutting Operations
- Group 4 Jointer/Planer
- Group 5 Grinding
- Group 6 Vehicle hoist
- Group 7 Drilling
- Group 8 Gluing
- Group 9 Sanding/Finishing
- 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 technological education 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 WELDING TEST QUESTIONS

(See Answer Sheets after the test listings)

WELDING HAZARDS TEST

1. What are the ten major hazards in welding operations?
2. What four types of radiant energy should the welder guard against?
3. What effects can metal fumes have?
4. How can sparks and slag be a hazard?
5. What two main hazards may result from the use of electricity?
6. What chemical sources can the welder be exposed to?
7. What are four welding heat sources that may cause fires?
8. What four causes of explosions must the welder guard against?

WELDING SAFETY TEST

1. Name the three natural clothing materials that are recommended for welders.
2. What laundry product reduces the ability of clothing to repel sparks?
3. Why are synthetic materials not recommended for welders?
4. Give two requirements regarding the fit of welding goggles.
5. What device should be used to prevent fumes from accumulating in a poorly ventilated area?
6. What are two functions of earmuffs and earplugs in welding?
7. Name three things that can affect the seal of a full-face respirator.

WELDING FIRES AND EXPLOSIONS TEST

1. How do air ducts and shafts increase fire hazards?
2. What danger is posed by excessive oxygen in the atmosphere?
3. What must flammable gases, vapours, liquids or dusts be mixed with to create an explosive atmosphere?
4. Why should gas cylinders, hoses and torches be kept outside a confined space where welding is being done?

WELDING FUMES AND GASES TEST

1. To reduce the danger of fumes, what is the first, simplest, and most basic precaution?
2. What product, used to treat metal surfaces, will produce phosphine gas?
3. What gas may be produced by degreasing fluids?
4. What plastic material should be stripped or removed from the weld area before welding or cutting?
5. What vapours change into a dangerous gas when acted upon by ultraviolet light?
6. What causes negative pressure in some respirator face pieces?
7. Which is best, a negative or a positive pressure face piece?
8. If the cartridge or canister of an air-purifying respirator becomes hot, what does this signify?
9. Name four factors, other than clothing, that can interfere with the fit of a respirator face piece.

CONTAINERS AND WELDING TEST

1. If it is not known what substance a container has held, what should you assume?
2. Name four substances whose dusts are flammable.
3. What gas may be produced when an acid reacts with a metal container?
4. Name three methods of cleaning a container.
5. Name the five major steps that must be taken before welding or cutting on a container.
6. How does purging a vessel differ from cleaning?
7. What does it mean to "isolate" a container?
8. At the same voltages, why is ac more dangerous than dc?

ANSWERS TO THE WELDING HAZARDS TEST

1. Ten welding hazards:
    a. radiant energy
    b. temperature extremes
    c. fumes and gases
    d. noise
    e. sparks and slag
    f. electrical shock
    g. chemicals
    h. fires
    i. explosions
    j. tripping hazards

2. Four types of radiant energy:
    a. visible light
    b. ultraviolet light
    c. infrared rays
    d. x-rays and gamma rays

3. Metal fumes can damage the lining of the lungs. Prolonged exposure can damage other organs, or cause death.

4. Sparks and slag can cause fires, burn exposed parts of the body, damage hearing, and cause eye injuries.

5. Two electrical hazards are: shock and burns.

6. Among the chemical sources the welder may be exposed to are fluxes, anti-spatter compounds, glues, rust inhibitors, paints, degreasers, and plastics.

7. Some welding heat sources which cause fires:
    a. the torch flame;
    b. sparks from welding, cutting and grinding;
    c. used welding rods and electrode stubs;
    d. the weld deposit;
    e. the base metal;
    f. slag.

8. Some causes of explosions in welding operations:
    a. using equipment incorrectly;
    b. using damaged equipment or containers;
    c. welding on a pressurized container;

d. welding in the presence of explosive materials.

ANSWERS TO WELDING SAFETY TEST

1. Cotton, wool and leather are recommended for clothes.
2. Fabric softeners decrease clothes ability to repel sparks.
3. Synthetics may melt where sparks land. Note: some specialized synthetic materials can provide a short-term flame barrier.
4. Welding goggles should fit over safety glasses or spectacles, and should make full-face contact.
5. A portable exhaust fan helps vent an area.
6. Earmuffs and plugs help to exclude noise and sparks.
7. Facial hair, clothing, goggles and spectacles can affect the seal.

ANSWERS TO WELDING FIRES AND EXPLOSIONS HAZARDS TEST

1. Air ducts and shafts carry sparks to distant areas.
2. Excess oxygen causes materials to burn, which are not normally combustible, or causes them to burn more fiercely.
3. Oxygen, (or the oxygen in air) must mix with substances to make them combustible.
4. Because they may leak, allow gases to accumulate in the atmosphere.

ANSWERS TO WELDING FUMES AND GASES TEST

1. Staying to one side of the welding plume is the first defense.
2. Rust inhibitors produce phosphine gas.
3. Phosgene may be produced by degreasers.

4. Teflon-type plastics should be stripped or removed from the weld area.

5. The vapours of chlorinated hydrocarbon degreasers become a dangerous gas.

6. The wearer inhaling causes negative pressure.

7. A positive pressure face piece is best.

8. That a high concentration of gas or vapour is being encountered when a cartridge or canister becomes hot.

9. Sideburns, beard, moustache, eyeglasses and goggles interfere with a respirator's fit.

ANSWERS TO CONTAINERS AND WELDING TEST

1. Assume that the container has held a flammable substance if you are unsure about the contents.

2. Sugar, wheat, coal and wood have flammable dusts.

3. Hydrogen is produced.

4. Three ways to clean a container:
    a. wash with water
    b. low pressure steam
    c. chemical plus low pressure steam

5. Prior to welding or cutting:
    a. identify contents
    b. determine internal combustion
    c. clean
    d. purge
    e. isolate

6. Cleaning is intended to remove the bulk of liquids, solids and vapours. Purging is intended to displace any remaining vapours and to exclude air.

7. To isolate a container is to disconnect or blank off any pipes leading into it which carry dangerous substances.

8. Alternating current can cause spasms that tighten the grip on a conductor; DC has the power to throw a person away from the conductor.

Sample Safety Quizzes

GENERAL SAFETY QUIZ

Name:_____

Date:_____

The following are True or False questions. Write T for true or F for False for each question.

1. If you are uncertain about something in the shop, it is okay to ask a peer.
2. All injuries must be reported to the teacher immediately.
3. Shop equipment needs to be cleaned only at the end of the period each day.
4. It is okay to bring a drink into the shop as long as none of the equipment is running
5. Carrying a tool in your pocket is okay as long as you don't remove it from the class.
6. It is okay to talk to a person while they are using a piece of equipment, as long as you do not distract them.
7. It is okay to use a flat screwdriver to scrape some old paint off of a piece of wood.
8. The first aid kit can be stored in the school main office so no one steals the contents.
9. A class "D" fire extinguisher is a must in a construction shop.
10. Once you've received your equipment passport you may use the equipment any time without permission
11. Minor injuries need not be reported.

12. If a machine does not work, report it to the instructor.
13. At all times, if you are in doubt of how to use equipment, ask someone who is licensed (passport).
14. All guards must be in place and properly working before using the equipment.
15. As long as no one is using the equipment after you, leave it running until you need it again.
16. Safety equipment is necessary only when power is on.
17. A safety zone is an area where shop rules do not apply.
18. Long hair must be tied back before using any power tool.
19. Before working in a construction shop you should know where the emergency exits are.
20. Any adjustments to a machine must be made with the power off.

Answer Key

1. F	2. T	3. F	4. F	5. F
6. F	7. F	8. F	9. F	10. F
11. T	12. T	13. F	14. T	15. F
16. F	17. F	18. T	19. T	20. T

GENERAL SAFETY RULES QUIZ

Name:_____

Date:_____

Write the rule that relates to the following statements:

1. Using the proper tool for the job.
2. How to carry tools.
3. Electrical chords and plugs.
4. Portable tools when not in use.
5. Securing your work.
6. Safety guards.
7. Moving parts on equipment.
8. How many persons operate machines at one time, what do partners do.
9. Make sure it is completely stopped before leaving.
10. Broken or damaged tools.

HAND TOOLS QUIZ

Name:_____

Date:_____

1. Hand tools in _____condition are responsible for many injuries.
2. After use, _____and return the tool to its proper place.
3. All _____should be removed before beginning work.
4. _____ are the cause of many accidents. Use only sharp tools that are in good condition.
5. Always push a wood chisel _____from yourself.
6. Keep_____hands on the chisel, unless striking it with a mallet.
7. Use the_____tool for the job.
8. Always use a file with a _____. Protect your hand from serious injury.
9. Wear _____whenever you use striking tools.
10. Never _____behind a person swinging a hammer.

WORD BANK:
eye protection, both, blunt cutting tools, handle, stand, poor, clean, away, jewellery, proper

AIR NAILERS QUIZ

Name:_____

Date:_____

1. Always wear _____ goggles or a face shield.
2. Use _____ nails for the job.
3. Set the compressor to the proper _____.
4. Never nail _____ yourself or anyone else.
5. Be aware of what is _____ the piece you are nailing.
6. _____ the nailer when it is disconnected.
7. Watch for _____ along the air line .
8 .Remove all _____ and restrain long _____.
9. Use the proper _____ on the hoses.
10. Fire the nailer only when you are applying even _____ and have a firm _____ on the handle.

WORD BANK:
pressure, grip, load, hang ups, behind, safety, proper, pressure, towards, jewellery, hair, connectors

TABLE SAW QUIZ

Name:_____

Date:_____

1. Wear _____ goggles or a face shield.

2. Secure _____ position before beginning cutting procedures .

3. Check the _____ of the blade.

4. Check _____ clearance and adjust accordingly.

5. Use a _____ stick.

6. Get _____ when working on large pieces.

7. Wear a _____ mask when cutting treated wood.

8. Stand _____ of the path of a kickback.

9. Remove _____ and tie back _____ hair.

10. Never use the _____ when crosscutting.

11. Use a _____ gauge when crosscutting.

12. Never cut _____.

WORD BANK:
freehand, safety, mitre, fence, fence, condition, jewellery, long, guard, assistance, push, dust, clear

BAND SAW QUIZ

Name:_____

Date:_____

1. When using the band saw, _____are required when making curved cuts.
2. You should adjust the _____ above the work before beginning to cut.
3. Narrow blades are best suited for cutting _____.
4. When cutting with the band saw, the blade should cut on the _____ side of the work piece.
5. When using the band saw, plan your cuts carefully. Saw curves gradually. Sudden twists will cause the blade to _____ or _____.
6. When using the band saw, keep your hands _____ or _____ the blade. Never in front.
7. Inspect all _____ before using any saw.
8. Always support _____ pieces.
9. Use _____ sticks on small pieces.
10. Use the _____ when changing blades.

WORD BANK:
relief cuts, upper guide, tight, waste, bind, break, beside, behind, guards, round, push, lock-out

MITRE SAW QUIZ

Name:_____

Date:_____

1. Secure the mitre saw to the work surface with _____ or bolts.
2. Remove all _____ and tie back _____ hair.
3. Your body should be _____ of blade assembly.
4. Ensure the blade clears the _____ before cutting.
5. Always use your _____ hand to operate the trigger.
6. Ensure the _____ is functioning correctly before operating the saw .
7. When making _____ cuts ensure the blade has adequate clearances.
8. _____ pieces should be supported.
9. Watch for _____ when cutting small pieces.
10. Keep your _____ clear of the blade path when cutting short piece that can not be clamped down.

WORD BANK:
kickbacks, long, left hand, clamps, jewellery, left, right, guard, angular, stock ,left

SCROLL SAW QUIZ

Name:_____

Date:_____

1. Wear _____ goggles or a face shield.

2. Allow _____ for the work piece.

3. Ensure the correct _____ is being used for the material being cut.

4.Never _____ the work into the blade.

5. Keep your fingers out of the _____ of the blade.

6. Never _____ or force a jammed piece through the equipment. Shut the _____off and dislodge the piece.

WORD BANK:

machine, safety, pull, clearance, path, blade, force

SURFACE PLANER QUIZ

Name:_____

Date:_____

1. Check the floor for any _____.

2. Replace _____ when worn or dull.

3. Make adjustments only when the _____ is off and the off switch is _____.

4. Check hood and make sure the _____ is on.

5. Use a _____ stick when necessary.

7. Wear a dust _____ where planing treated wood.

8. Assume a position with your body _____ of a possible kickback.

9. Remove all _____ and tie back _____ hair.

10. Before investigating any jammed pieces _____ the power off and _____ it out.

WORD BANK:

shut, lock, mask, blades, clear, vacuum, push, power, locked, debris, Jewellery, long

JOINTER QUIZ

Name:_____

Date:_____

1. Wear _____ goggles or a face shield.
2. Secure the_____ position before beginning cutting procedures.
3. Check the _____ of the blade. Set it at one-eighth of an inch or less.
4. Check the _____. Make sure it returns to cover the blades.
5. Use a _____ stick .
6. Get _____ when working on large pieces .
7. Wear a _____ mask when cutting treated wood .Put the vacuum on.
8. Stand _____ of the path of a kickback.
9. Remove _____ and tie back _____ hair.

WORD BANK:

safety, fence, depth, jewellery, long, guard, assistance, push, dust, clear

DRILL PRESS QUIZ

Name:_____

Date:_____

1. When using the drill press, a _____is required when cutting cylindrical stock.
2. Always operate the drill press from the _____, never from the _____.
3. Make sure your _____ or safety glasses are on before you start the machine.
4. Make all _____ clothes and long _____ is restrained.
5. Choose a drill bit that is _____ and in good condition.
6. Remove the _____ from the chuck before starting the machine.
7. Check for the proper _____ for the drill size and material you are working on.
8. ._____ the work securely before drilling.
9. Never attempt to _____ a piece of work if it slips from the clamp.
10. Always make sure the drill press has _____ before attempting to change speeds.
11. If the drill sticks in the work piece, _____ the motor and rotate the chuck _____ by hand to free it up.
12. Always clear away _____ and curls with a _____-not by your bare hands.

WORD BANK:
sharp, hair, face shield, chips, brush, stopped, shut off, hand, loose, chuck key, speed, clamp, grab

GRINDER QUIZ

Name:_____

Date:_____

1. Always use a _____ or goggles when grinding.
2. Inspect the _____ wheel before starting the machine.
3. Check the _____ of the tool rest. It should not exceed _____of an inch.
4. When starting up the grinder always _____ to one side, not directly in front of the wheel.
5. Check the _____ of wheel. Excessive revolutions could cause the wheel to shatter.
6. Only use the _____ of the wheel.
7. Feed the work into the wheel _____.
8. Shut off the machine immediately if the wheel begins to _____ or vibrate.
9. Never use _____ or hands to stop any grinder.

WORD BANK: Stand, clearance, one-eighth, speed, face mask, condition, face, tools, gradually, chatter

BELT AND DISK SANDER QUIZ

Name:_____

Date:_____

1. Wear _____ goggles or a face shield.

2. Secure the_____ position before beginning sanding procedures.

3. Check the _____ of the disk. Work on the downward side of the motion.

4. Wear a _____ mask when sanding treated wood .Put the vacuum on.

5. Only one person _____ the machine at a time .

6. Remove _____ and tie back _____ hair.

7. Let the work _____ on the table and do not force it into the disk or the belt.

8. Keep your _____ away from the edge that contacts the sandpaper.

WORD BANK:
safety, jewellery, long, dust, table, rest, fingers, rotation, operates

SECTION 3: SAFETY PASSPORTS

This section contains Safety Passports, which provide a means to track individual student safety knowledge and skills. These Safety Passports insure 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 may 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 safety passport addresses board and school safety policies.

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

Safety Passport: Form 1: single sheet for individual student and machine, has signature area and note area to be used in student notebook

Safety Passport Form 2: sheets for individual students listing machines, for teacher record book

Safety Passport Form 3: 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.

Sample Student Safety Record Card

Student Information	**Levels Chart**
Name: **Student #:** **Grade:** **Course/Section:**	**Rating 1:** May set-up equipment only, Instructor must do the work. **Rating 2:** Use only with an Instructor's assistance. **Rating 3:** Full use with an Instructor standing by to supervise. **Rating 4:** Full use of machine with an Instructor's permission. (**Note:** Lower levels can be upgraded to higher levels with further instruction, practice and proof of competence. **All students** must have Instructor's permission before using any equipment.)

Manufacturing Equipment				**Construction Equipment**			
Equipment	**Rate**	**Sign**	**Date**	**Equipment**	**Rate**	**Sign**	**Date**
Arbor Press				Band saw			
Arc Welder				Table saw			
Beverly Shear				Radial arm saw			
Metal Lathe				Jointer			
Compressed Air				Planer			
Drill Press				Shaper			
Metal Chop Saw				Drill press			
MIG Welder				Scroll saw			
Oxy-Acetylene Welder				Belt and disc sander			
Pedestal Grinder				Hand sanders			
Milling Machine				Hand Drill			
Tube bender				Hand Grinder			
Soldering Iron				Router			
				Shop Hand & Power Tools			
				Air Nailer			
				Wood lathe			

Technology Lab Safety Passport

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

The general process is as follows:

1. Lesson: When the teacher introduces a new piece of equipment (e.g. lathe), 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 of the machine and personal protective equipment (e.g. eye protection, secure loose hair, remove jewelery, protective clothing, etc.),After the demonstration, students write a note 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 of the machine tool, outlining all safety features that must be observed. The individual machine tests are designed to compliment any general facility safety rules. Upon satisfactory completion of the test the student dates the "tested" column and teacher initials this as complete. **IMPORTANT NOTE: A copy of the test should be kept by the teacher.**

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

4. Once the student has completed #1, 2 and 3, the teacher signs the final column of student's safety passport indicating that they have permission to use that equipment. Students must be able to provide the teacher with their signed passport for that equipment each time they wish to use that equipment.

Note: Three forms are provided, Form 1 can be used as a student notebook form for each machine; Form 2 can be used for signing several machines per student. With the 2nd form, students keep safety notes on separate paper. The third form requires one sheet per tool per student, and may be used in the student notebook or kept on file by the teacher (or both).

Form 1

Student Name: _____ Course/class: _____

Equipment: _____

Attended Teacher Safety Instruction and Demonstration (notes recorded)		Passed Written or Oral Testing		Demonstrated Safe Setup and Operation of Equipment to Teacher		Granted Permission to use Equipment by Teacher	
Date of Lesson	Teacher Initial	Date Tested	Teacher Initial	Date of Demo.	Teacher Initial	Date	Teacher Initial

NOTES:

Form 2
Student Name: ______________________ **Course/Class:**

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

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

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

FORM 3: Equipment Passport

[EQUIPMENT TYPE]

General Conditions

Personal Protective Equipment

Possible Risk Factor

- 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 _____

AIR NAILERS PASSPORT

General Conditions

Students must be trained on the safe and proper use of an **Air Nailer** before they may begin using it. The student must demonstrate safe and proficient use prior to using the Air Nailer.

Personal Protective Equipment

Safety Glasses
Safety footwear
Safety Harness (when on a roof)
Safety Cable (for nailer)
Gloves

Possible Risk Factor

Slips and falls [working on roofs]
Impalement
Eye injuries
Injury to others
Back injuries [fatigue]

- 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 _____

ARBOUR PRESS PASSPORT

General Conditions

Students must be trained on the safe use of an **Arbor Press** before they may begin using it. The student must demonstrate to the teacher proficiency and the safe work procedures that must be followed before usage.

Personal Protective Equipment

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

Possible Risk Factor

- Small projectiles
- Slips and falls
- Strain injuries
- Impact injuries [parts breakage]

- 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 _____

ARC WELDING PASSPORT

General Conditions

Students must be trained on the safe use of the **Arc Welding** before they may begin using it. The student must demonstrate to the teacher proficiency and safe work procedures, which must be followed before usage.

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]

- 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 _____

BAND SAWS PASSPORT

General Conditions

Students must be trained on the safe and proper use of the **Band Saw** before they may begin using it. The student must demonstrate safe and proficient procedures.

Personal Protective Equipment
Safety Glasses
Coveralls
Safety footwear
Gloves [material handling]

Possible Risk Factor

Entanglement [hands and hair]
Cutting fluid fumes
Small projectiles [chips]
Hand injuries
Cuts and Abrasions
Eye 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 _____

Teachers signature _____

Date of training _____

BELT/ DISC SANDER PASSPORT

General Conditions

Students must be trained on the safe and proper use of a **Belt/ Disc Sander** before they may begin using it. The student must demonstrate the ability to use the equipment safely and proficiently.

Personal Protective Equipment

Safety Glasses
Safety footwear
Dust mask [breathing protection]

Possible Risk Factor
Small projectiles [wood pieces]
Slips and falls [wood dust]
Fine dust Hazard
Entanglement of hair, clothing and jewelry
Burns and abrasions to hands and fingers
Crushing of fingers

- 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 _____

BEVERLY SHEAR PASSPORT

General Conditions

Students must be trained on the safe use of a **Beverly Shear** before they may begin using it. The student must demonstrate to the teacher proficiency and the safe work procedures that must be followed before usage.

Personal Protective Equipment

- Safety glasses
- Coveralls or apron
- Safety footwear
- Work gloves

Possible Risk Factor

- Small projectiles
- Slips and falls
- Strain injuries
- 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 _____

Teachers signature _____

Date of training _____

COMPRESSED AIR PASSPORT

General Conditions
Students must be trained on the safe and proper use of **Compressed Air** before they may begin using it. The student must demonstrate to the teacher, proficiency and the safe work procedures that must be followed before usage. All connections must be secure and hoses must be in good condition before usage of compressed air systems. **Never direct Compressed Air towards yourself or others**.

Personal Protective Equipment

Safety Glasses
Appropriate Footwear [work boots]
Work Gloves
Hearing protection

Possible Risk Factor

Eye injuries
Hearing loss
Loss of Life
Impact (hoses disconnecting from tools or each other)

- 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 _____

DRILL PRESS PASSPORT

General Conditions

Students must be trained on the safe and proper use of the **Drill Press** before they may begin using it. The student must demonstrate the ability to use the equipment safely and proficiently.

Personal Protective Equipment

Safety Glasses
Appropriate Footwear [work boots]
Work Gloves

Possible Risk Factor
Eye injuries
Hand Injuries
Entanglement of clothing and hair
Slipping

- 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 _____

GLUES AND RESINS PASSPORT

General Conditions

Students must be trained on the safe and proper use of the various glues and resins before they may begin using them. The student must demonstrate the ability to use the equipment safely and proficiently.

Personal Protective Equipment

Safety Glasses
Coveralls when necessary
Safety footwear
Gloves [latex]

Possible Risk Factor

Entanglement [hands and hair]
Cutting fluid fumes
Small projectiles [chips]
Hand injuries
Cuts and Abrasions
Eye 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 _____

Teachers signature _____

Date of training _____

HAND DRILL (AIR or ELECTRIC)

General Conditions

Students must be trained on the safe use of **Hand Drills (air or electric)** before they may begin using them. The student must demonstrate to the teacher proficiency and the safe work procedures that must be followed before usage.

Personal Protective Equipment

- Safety glasses
- Coveralls
- Safety footwear
- Dry clothing

Possible Risk Factor

- Eye injuries
- Hand Injuries, cuts and abrasions
- Impalement
- Electric shock or electrocution
- Entanglement
- Projectile (Chuck key)
- 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 _____

Teachers signature _____

Date of training _____

HAND GRINDERS PASSPORT

General Conditions

Students must be trained on the safe use of various types of **4", 5", 7" Hand Grinders** before they may begin using them. The student must demonstrate to the teacher proficiency and the safe work procedures that must be followed before usage. Proper guards must be in place before this equipment is used.

Personal Protective Equipment

- Full face shield
- Safety glasses
- Industrial work gloves
- Coveralls or apron
- Safety footwear
- Hearing protection

Possible Risk Factor

- Small projectiles [Metal cuttings or debris]
- Entanglement
- Hearing loss [prolonged use without PPE]
- 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 _____

Teachers signature _____

Date of training _____

METAL CUT OFF (CHOP) SAW

General Conditions

Students must be trained on the safe use of the **Metal Cut Off (Chop) Saw** before they may begin using it. The student must demonstrate to the teacher proficiency and the safe work procedures that must be followed before usage.

Personal Protective Equipment

- Face shield
- Safety glasses
- Coveralls
- Safety footwear
- Gloves

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 _____

Teachers signature _____

Date of training _____

METAL LATHE PASSPORT

General Conditions

Students must be trained on the safe and proper use of the **Metal Lathe** before they may begin using it. The student must demonstrate the ability to use the equipment safely and proficiently.

Personal Protective Equipment

- Safety Glasses
- Appropriate Footwear [work boots]
- Coveralls

Possible Risk Factor

- Eye injuries
- Hand Injuries
- Entanglement of clothing and hair
- Slipping
- Cuts from sharp edges

- 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 _____

MIG WELDING PASSPORT

General Conditions

Students must be trained on the safe use of a **MIG Welding Machine** before they may begin using it. The student must demonstrate to the teacher proficiency and the safe work procedures that must be followed before usage.

Personal Protective Equipment

- Shade 10 or greater welding shield
- Safety Glasses
- Coveralls or leather apron
- Safety footwear
- Leather welding gloves

Possible Risk Factor

- U/V rays I/R rays
- Burns to hands
- Gas bottle upset
- Electric Shock
- Fumes

- 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 _____

MITRE SAW PASSPORT

General Conditions
Students must be trained on the safe and proper use of a **Mitre Saw** before they may begin using it. The student must demonstrate safe and proficient procedures.

Personal Protective Equipment

Safety Glasses
Breathing Protection [dust mask]
Coveralls
Hair net [long hair only]

Possible Risk Factor

Clothing or long hair [entanglement]
High Speed Sharp blade [severe cuts]
Fine dust
Fire Hazard
Small projectiles [wood splinters 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 _____

Teachers signature _____

Date of training _____

OXY-ACETYLENE WELDING AND CUTTING

General Conditions

Students must be trained on the safe use of **Oxy-Acetylene Welding and Cutting** equipment before they may begin using it. The student must demonstrate to the teacher proficiency and the safe work procedures that must be followed before usage.

Personal Protective Equipment

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

Possible Risk Factors

- Hot molten metal
- Eye burns [splatter]
- Welding fumes
- Small projectiles [chipped slag or debris]
- Hand injuries
- Cuts and Abrasions
- Explosion

- 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 _____

PEDESTAL GRINDER

General Conditions

Students must be trained on the safe use of a **Pedestal Grinder** before they may begin using it. The student must demonstrate to the teacher proficiency and the safe work procedures that must be followed before usage.

Personal Protective Equipment

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

Possible Risk Factors

- Hot metal
- Eye injury
- Small projectiles
- Hand injuries
- Cuts and Abrasions
- 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 _____

Teachers signature _____

Date of training _____

PNEUMATIC TOOLS PASSPORT

General Conditions

Students must be trained on the safe use of **Pneumatic Tools** before they may begin using them. The student must demonstrate to the teacher proficiency and the safe work procedures that must be followed before usage.

Personal Protective Equipment

- Full face shield and/or safety glasses
- Coveralls or apron
- Safety footwear

Possible Risk Factor

- Eye injuries
- Projectiles
- Impact injuries [parts breakage]
- Sharp metals/objects
- Cuts and abrasions
- Compressed air
- Air embolism in bloodstream

- 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 _____

RADIAL ARM SAW PASSPORT

General Conditions
Students must be trained on the safe and proper use of **Radial Arm Saws** before they may begin using it. The student must demonstrate the ability to use the equipment safely and proficiently. **All guards** and **safety devices** must be in place and **ventilation system** must be free and clear.

Personal Protective Equipment
Safety Glasses
Safety footwear
Dust Masks
Hearing Protection

Possible Risk Factor
Small projectiles [wood chips]
Slips and falls [wood dust]
Contact with moving blade
Eye injuries
Abrasions [wood slivers]
Hearing loss [High noise area] [unprotected ears]
Entanglement of clothing or long hair
Serious hand injuries
Fine Wood dust

- 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 _____

ROUTER PASSPORT

General Conditions

Students must be trained on the safe use with **Routers** before they may begin working with them. The student must demonstrate to the teacher proficiency and the safe work procedures that must be followed before usage.

Personal Protective Equipment

- Safety glasses or face shield
- Coveralls
- Safety footwear

Possible Risk Factors

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

- 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 _____

SCROLL SAW PASSPORT

General Conditions

Students must be trained on the safe and proper use of a **Scroll Saw** before they may begin using it. The student must demonstrate to the teacher, proficiency and the safe work procedures that must be followed before usage.

Personal Protective Equipment

Safety Glasses
Dust Masks
Coveralls
Hair nets [long hair]

Possible Risk Factor

Small Projectiles
Fine wood dust
Minor cuts and abrasions
Entanglement of Hair and clothing

- 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 _____

SHOP HAND and POWER TOOLS

General Conditions

Students must be trained on the safe use with **Shop Hand and Power Tools** before they may begin working with them. The student must demonstrate to the teacher proficiency and the safe work procedures that must be followed before usage.

Personal Protective Equipment

- Safety glasses
- Coveralls
- Safety footwear

Possible Risk Factors

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

- 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 _____

SOLDERING IRON

General Conditions

Students must be trained on the safe use of a **Soldering Iron** before they may begin using it. The student must demonstrate to the teacher proficiency and the safe work procedures that must be followed before usage.

Personal Protective Equipment

- Safety glasses
- Coveralls
- Safety footwear

Possible Risk Factor

- Burns
- Hand injuries
- Cuts and Abrasions
- Eye 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 _____

Teachers signature _____

Date of training _____

SURFACE PLANER PASSPORT

General Conditions

Students must be trained on the safe and proper use of a **Surface Planer [wood]** before they may begin using it. The student must demonstrate the ability to use the equipment safely and proficiently. All guards must be in place and ventilation system must be free and clear.

Personal Protective Equipment

Safety Glasses
Coveralls or apron
Safety footwear
Work Gloves
Hearing Protection

Possible Risk Factor
Small projectiles [wood chips]
Slips and falls [wood dust]
Strain injuries
Eye injuries
Abrasions [wood slivers]
Hearing loss [unprotected ears]

- 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 _____

TABLE SAW PASSPORT

General Conditions
Students must be trained on the safe and proper use of **Table Saws** before they may begin using it. The student must demonstrate to the teacher proficiency and the safe work procedures, which must be followed before usage. **All guards** must be in place and **ventilation system** must be free and clear. **Anti-kickback** devices must be in place and used. **Push sticks** must be used.

Personal Protective Equipment
Safety Glasses
Safety footwear
Dust Masks
Hearing Protection

Possible Risk Factor
Small projectiles [wood chips]
Slips and falls [wood dust]
Contact with moving blade
Eye injuries
Abrasions [wood slivers]
Hearing loss [High noise area] [unprotected ears]
Entanglement of clothing or long hair
Serious hand injuries
Wood trapping between blade and fence

- 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 _____

WOOD JOINTER PASSPORT

General Conditions

Students must be trained on the safe and proper use of a **Wood Jointer** before they may begin using it. The student must demonstrate the ability to use the equipment safely and proficiently. **All guards** and **safety devices** must be in place and **ventilation system** must be free and clear. **Push sticks** must be used.

Personal Protective Equipment

Safety Glasses
Breathing Protection
Safety footwear
Hearing Protection

Possible Risk Factor
Small and large projectiles [wood chips]
Slips and falls [wood dust]
Contact with moving blades
Eye injuries
Hearing loss [unprotected ears]
Serious hand injuries [Improper placement of hands]
Entanglement of clothing or hair

- 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 _____

WOOD LATHE PASSPORT

General Conditions

Students must be trained on the safe and proper use of the **Wood Lathe** before they may begin using it. The student must demonstrate the ability to use the equipment safely and proficiently.

Personal Protective Equipment

- Safety Glasses
- Appropriate Footwear [work boots]
- Coveralls

Possible Risk Factor

- Eye injuries
- Hand Injuries
- Entanglement of clothing and hair
- Slipping
- 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 _____

WOOD SHAPER PASSPORT

General Conditions

Students must be trained on the safe and proper use of a **Wood Shaper** before they may begin using it. The student must demonstrate the ability to use the equipment safely and proficiently.

Personal Protective Equipment

Safety Glasses
Safety footwear
Dust mask [breathing protection]

Possible Risk Factor

Small projectiles [wood pieces]
Slips and falls [wood dust]
Fine dust Hazard
Entanglement of hair, clothing and jewelry
Burns and abrasions to hands and fingers (burnt wood)
Cutting of fingers (contact with blades

- 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 _____

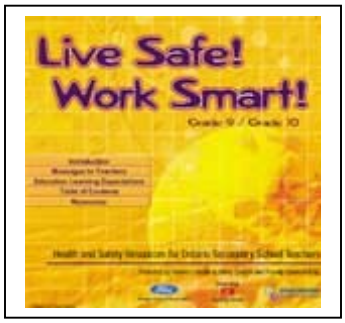
Teachers signature _____

Date of training _____

Appendix A: Health and Safety Resources
to Support Health and Safety Expectations in the Ontario Secondary School Curriculum

This resource list has been assembled by the *Live Safe! Work Smart!* project team to further support the lessons, overheads, exercises and examples in *Live Safe! Work Smart!* We've previewed most of the resources to ensure they are suitable for the age and experience level of your students, that they bring the workplace into your classroom and especially that they support the health and safety expectations in the Ontario secondary curriculum
Further resources can be found in Section 3 of each chapter of *Live Safe! Work Smart!* and in the Resources section at the back of each binder.

Live Safe! Work Smart! Grade 9/10 and Grade 11/12



Web address: http://www.livesafeworksmart.net
Written by health and safety professionals, produced by the Ministry of Labour in partnership with the Ministries of Education and Training, Colleges and Universities, *Live Safe! Work Smart!* provides the only comprehensive resource for Ontario teachers developed to match health and safety curriculum expectations from Grades 9 – 12. It has received top marks from the Ontario Curriculum Center. Reviews can be viewed on the OCC website: (*www.curriculum/occ/resources.org*). Within the two-volume set are lessons, overheads, handouts and exercises well suited to cooperative education and apprenticeship.

Binders and CDs have been distributed to all secondary schools in Ontario. If you can't locate either, check the website at *www.livesafeworksmart.net* for who to contact in your Board to get more information on your local resources, or to order a CD of your own. If you don't have access to the web, you can place an order by calling 1-800-268-8013.

Ontario Ministry of Labour
Web address: *http://www.gov.on.ca/lab*
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:

www.WorkSmartOntario.gov.on.ca (available early 2003)
This section of the Ministry of Labour 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.

Workplace Safety and Insurance Board
Web Address: http://www.wsib.on.ca
Summary: Contains information for both employers and employees about workplace safety. Includes advice on prevention, important news releases, policies and other work-related information.

Video: ***Launching a Safe Start*** **.. You have rights and responsibilities** (2001) cc
Produced by: Workplace Safety & Insurance Board (WSIB)
Cost: Free
Description: If you work in Ontario "You have rights and responsibilities" legislated under the *Occupational Health and Safety Act.* Workplace health and safety affects not only you and those around you, but your family and community as well. Keeping safe and healthy while at work in the best interests of everyone. One way to ensure that, is to work with your employer and participate in making your workplace safe.
This video is part of an orientation resource package designed to help make Ontario's workplace health and safe.
There are two booklets to accompany the video:
Launching a Safe Start – an Employer's Guide (5009A)
Launching a Safe Start – A Worker's Guide (5010A)

Ontario School Boards Insurance Exchange

Web Address: http://www.osbie.on.ca
Summary: 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.

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.

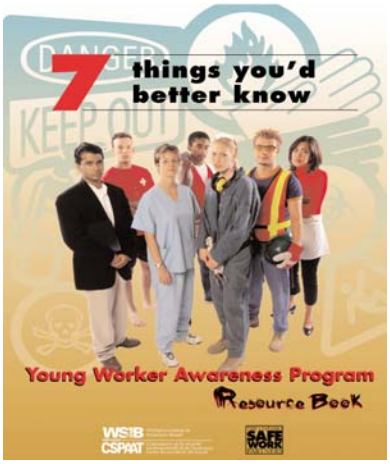
Young Worker Awareness program

Web Address: http://www.yworker.com
Summary: The Young Worker Awareness Program is designed to give students the information they need to protect their health and safety on the job. This complete website provides a lot of information for students – makes a great research site!

Student Resource Book

The student resource book, a 32-page, full colour publication called "*7 things you'd better know"* (pictured below) is available free of charge. The book is distributed during a young worker awareness program or can be obtained by contacting the WSIB at *Youth@wsib.on.ca* or call : 1-800-663-6639.

Student Resource Book



Young Worker Awareness Program

School presentations

For several years, Ontario schools have been welcoming persons from the community to deliver the Young Worker Awareness Program (YWAP). YWAP provides an excellent overview of the rights and responsibilities of workers and also provides useful information for students on work placements. Those who deliver the program are committed to preventing injuries among young workers. Bringing in a community representative to reinforce the lessons you've been teaching for cooperative education safety is a great idea!

Contact Toll-free:
IAPA – 1-800-406-IAPA (4272)
Workers' Centre – 1-888-869-7950
WSIB – 1-800-663-6639

Video: **Outreach Edition: Things You'd Better Know…To Work Smart, Work Safe *(2001)***
Length: 13 min.
Cost: FREE
Produced by: Workplace Safety & Insurance Board (WSIB)
Description: Created as part of the Young Worker Awareness Program, this video is narrated by Marisa Ellis, whose brother was killed after getting caught in an industrial mixer on the second day on the job at a bakery. It details the rights and responsibilities of young workers, and features the stories of:
-Marco, who lost his right hand trying to remove a piece of metal from a press
-Sandy, whose left hand was cut off by a fan
-Matt, who was paralyzed while employed as a camp counselor
-Isobel, who suffered from head and neck injuries after slipping and falling on the job
-Sean Kells, who died after a chemical explosion.
The program also has a companion student booklet (pictured on page 30) that provides students with a free, lasting reference to help them work safely.

www.oshforeveryone.ca is a health and safety website that provides a search engine and access to many organizations in Ontario who provide safety information. It's a great spot to research particular hazards or issues and get one-stop shopping in Ontario's health and safety system.

Video: Dying to Work

W-Five, CTV production 2001
20 minutes
Cost: varies by quantity
W-Five examines the perils of teen labour and discovers an astounding statistic — on average one young worker in Canada dies on the job each week and sixty thousand young workers are injured each year. *"The tragedy is that parents willingly send their children to work — not knowing that safety rules are la*x," says reporter Wei Chen, who investigates several tragedies across Canada. The most high-profile case is that of 18-year-old David Ellis, killed on his second day on the job at a Toronto-area bakery. He died while taking cookie dough from a mixer that suddenly turned on. The program follows Ellis' father as he campaigns for tougher safety rules and tries to make teenagers aware of the risks they can face. Parents and victims from Delta, B.C. and Edmonton, Alberta, recount the tragedies in their lives. Experts say these accidents were preventable. Why did it happen?

Produced by CTV Television Network
© 2001 • 20 min. • Gr. 9-Adult, Professional
VHS Price: PPR-$99 • Code # 859-31-1168VHS
MVCD Price: PPR-$109 • Code # 859-92-1168MVCD

Bulk Order Prices
· 10 or more copies: VHS Price: PPR-$50 each
· 25 or more copies: VHS Price: PPR-$35 each

Ask for the 2001 edition of this production:
Toll free: 1-800-263-1717
Email: video@magiclantern.ca
Internet site: www.magiclantern.ca

Canadian Centre for Occupational Health and Safety (CCOSH)

Web address: http://www.ccohs.ca
Another website has excellent general information and a special section called Young Workers' Zone. The Young Worker's Zone provides health and safety information on various types of workplaces – great for TAP and Career Studies exercises.

CanOSH – Canada's National Occupational Safety and Health Website – Young Workers

Web Address: http://www.canoshweb.org/en/young_workers.html
Summary: A list of links to a series of occupational safety and health (OSH) resources for young workers and/or individuals who are new to the workforce.

North American Occupational Safety and Health (NAOSH) Young Worker Links

Web Address: http://www.naosh.org/english/young_worker_links.html
Summary: Includes links to occupational safety and health related websites, as well as other youth resources.

Ontario School Boards Insurance Exchange

Web Address: http://www.osbie.on.ca
Summary: 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.

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.

The First Step…Student Safety Handbook

(2000) (Also available in French.)
Produced by: London Occupational Safety and Health Information Services
Contact Info: 424 Wellington Street, Suite 218, London, ON, N6A 3P3
Tel: (519) 433-4156 **Fax:** (519) 433-2887 **E-mail:** losh@execulink.com
Web: *www.losh.on.ca*
Description: A handbook for students, first-time workers, employers, unions, teachers, parents and health and safety professionals. This book may be used with other health and safety training programs, for example: WHMIS, the school curriculum, or the Young Worker Awareness Program.
Cost: 1 copy - $20 plus $5 for postage and handling.
100+ copies - $15 each plus postage and handling.

Take Our Kids to Work – Teacher's Guide; Workplace Guide

The Learning Partnership
Web Address: 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.

Hospitality and Tourism

Video: **Foodservice Safety – Video Orientation Kit**
Length: 23:30 min. in the four subject areas.
Cost: $44.95 plus $5 postage and handling.
Produced by: Ontario Service Safety Alliance
Contact Info: 4950 Yonge Street, Suite 1500, Toronto, ON, M2N 6K1
Toll Free: 1-888-478-6772 **Fax:** (416) 250-9500 **E-mail:** *info@ossa.com*
Web: *www.ossa.com*
Description: This four-module video and employee guide exposes the most common hazards and dangers in restaurant and foodservice workplaces. Subjects include: Burns and Scalds, Slips and Falls, Cuts and Lacerations, and Repetitive Strain Injuries.

Ontario Service Safety Alliance

Web address: http: www.ossa.com
The Ontario Service Safety Alliance provides health and safety resources to a wide spectrum of workplaces. Individual resources have not been reviewed.

Construction Technology

Construction Health and Safety Association of Ontario

Web Address: www.csao.org
This association has extensive resources customized to all aspects of the construction industry. The resources mentioned below have been selected because their appropriate for workers new to construction, but check out the website for additional sector or equipment-specific resources to suit the needs of students being placed in the industry.

Construction Health & Safety Manual (1998)
Produced by: Construction Safety Association of Ontario
Contact Info: 21 Voyager Court South, Etobicoke, ON, M9W 5M7
Tel: (416) 674-2726 **Toll Free:** 1-800-781-2726 **Fax:** (416) 674-8866
E-mail: *info@constructsafety.on.ca,* **Web:** *www.csao.org*
Description: The manual covers topics of interest in all trades. The subjects include responsibilities for workplace health and safety; personal protective equipment; first aid and emergency procedures; back care; housekeeping; and access equipment such as ladders, scaffolds, and elevating work platforms. Other topics include hand and power tools for construction trades and step-by-step guidelines for welding, cutting and formwork.
Cost: $22.95 plus GST & PST, postage and handling.

SPECIAL OFFER FOR ONTARIO TEACHERS: TEACHER RESOURCE KIT

The Construction Safety Association of Ontario has pulled together a resource kit, which includes some of their best publications that explain the construction industry (manual), and are geared to new construction workers (pamphlets, video).
The special price for teachers is: **$50.00**. It includes the components below, which can be ordered individually, plus 30 “Your New Construction Job” booklets and classroom

posters.

Package: **Construction Health & Safety Teachers' Kit**
Produced by: Construction Safety Association of Ontario
Contact Info: **Tel:** (416) 674-2726 **Toll Free:** 1-800-781-2726 **Fax:** (416) 674-8866
Package Includes: 1 copy of Construction Health & Safety Manual; 30 brochures "Your Construction Job"; 1 "New on the Job" video; 4 different posters "Danger Due To…"; 4 different posters including "Personal Protective Equipment"; "Joint Health & Safety Committee"; and "Help New Workers Start Right"
Cost: $50.00 plus GST & PST, postage and handling.

5 CD-ROM SET:
Titles: **Legislation, Personal Protective Equipment, Site Safety, Material Handling and Back Care, and WHIMS Review (Special Package)**
Produced by: Construction Safety Association of Ontario
Description: This program will be of use and benefit to all construction personnel. Upon completion of this program, participants will be able to recognize and identify the basic requirements for health and safety on construction sites, including both equipment and procedures. Program duration is a minimum of 16 hours. Generic Level 1 training is a component of most multi-level trade training programs. Modules include: Legislation, Personal conduct, Personal protective equipment, Access structures, Electrical hazards, and Back care and materials handling.
Cost: $50.00 plus GST & PST, postage and handling.

VIDEO: **New on the Job** (1997) *Length:* 10 min.
Produced by: Construction Safety Association of Ontario
Description: The video follows a new worker from his arrival on site through the various stages of his orientation to the moment when he's ready to start work. Live-action shots highlight personal protective equipment, safety responsibilities, and hazard awareness. The video also alerts workers to the four major causes of death on construction projects.
Cost: $29.95 plus GST & PST, includes postage and handling.

Manufacturing Technology

Industrial Accident Prevention Association
Web address: www.iapa.on.ca
Cost: $10 for each video including postage and handling.
The Industrial Accident Prevention Association (IAPA) has a well-developed resource library with topics related to the wide variety of safety issues found in manufacturing and

industrial workplaces. Training courses, booklets, videos, web learning are among the types of materials currently available.

Blowin' in the Wind: Machine Guarding Prevents Deaths *Length:* 12 min.
Contact Info: **Canadian Auto Workers Union: Health and Safety Department**:
(416) 495-6558 **Toll Free**: 1-800-268-5763
E-mail: *caw@caw.ca* **Web:** *www.caw.ca*
Description: Deficiencies and the minimal use of machine guarding and lockout have resulted in workplace injuries and fatalities. The video describes the importance of machine guarding in protecting the health and safety of workers.

Transportation Technology

Transportation Health and Safety Association of Ontario, the Ontario Trucking Association and the Ontario Safety League have tremendous expertise about the industry itself and health and safety elements that everyone working in the industry needs to know.

Transportation Health and Safety Association of Ontario
Web address: http://www.thsao.on.ca

Ontario Trucking Association
This association's free video(s), including "Career Highways – Safety" have been used and recommended by cooperative education teachers.
Web address: http://www.ontruck.org

Ontario Safety League
Web address: http://www.osl.org

Health and Personal Services

Health Care Health & Safety Association of Ontario
Web Address: http://www.hchsa.on.ca
Summary: HCHSA supports the prevention and reduction of workplace injuries and occupational diseases in the health care sector in Ontario by assisting health care sector organizations to adopt preventative best practices and approaches. Information

on the site includes: a variety of publications in print and electronic form; newsletters; legislative information; research updates; guidelines; reporting forms and program manuals; selected occupational health and safety training and certification; and relevant professional health and safety information.

Communications and Computer Technology

For computer courses, resources relating to Ergonomics are listed on pages 53 – 55 of *Live Safe! Work Smart!* Grade 11/12 edition.

NOTABLE RESOURCES

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