

## SAMPLE SHOP AGREEMENTS

### "SUGGESTED EXAMPLE"

#### SHOP SAFETY AGREEMENT

As a student in this shop, there are a few safety rules you must observe. Rules will be kept to a minimum, but those we do keep are kept for a definite reason. Know the reason for each rule and it should be a lot easier to remember and to observe that rule.

1. Students must never enter the shop unless a teacher is present.
2. Power equipment must never be operated unless a teacher is in the shop.
3. Do not run in the shop.
4. "Horseplay" will not be tolerated in the shop.
5. Use care and common sense when using any sharp tool. For instance, always keep hands and fingers behind the tool's cutting edge.
6. Protective equipment, such as safety goggles **MUST** be worn when using any power tools or machines.
7. Long hair, loose clothing and jewellery must be restrained or removed.
8. Never use any machine until you personally have been given instruction by the teacher about the use of that machine. This means that if you are absent when instruction is given about the safe operation of a machine, you must then check personally with your teacher for this information when you return.
9. Report to the teacher any damaged or defective tools.
10. If you cut or scratch your finger, even slightly, report it to the teacher and receive treatment. A cut left untreated can be dangerous.
11. Keep the benches and the floor clean. Replace all tools as soon as YOU finish using them. Place all scraps in the scrap bins or cans.
12. When you finish using an oil or paint soaked rag, place it in the special oily rag can.
13. In the event of a school fire drill or an actual fire in the shop, the students' only responsibility is to WALK out quickly and silently.
14. Welding goggles and leather aprons must be worn when doing any welding or forging process.
15. Only one operator per machine is permissible.
16. Use compressed air with caution. Wear eye protection. Direct air away from eyes, skin and any opening in the body. Beware of flying particles.

I, \_\_\_\_ have read this shop safety agreement at least twice. I understand and will obey these rules.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



**"SUGGESTED EXAMPLE"**

**SHOP PRACTICE AGREEMENT**

Shop students are reminded that a shop program is more closely related to the workplace than any other school subject. Shop work is intended to train students not only in the knowledge and care of tools and machines and in the skills of their use, but also in forming desirable work habits which will assist them in many types of work. In other words, how you do your work is as important as the product. How you work and conduct yourself is called "shop practice". It includes the following topics:

1. Tool Care - handling tools carefully, keeping them properly adjusted avoiding such practices as dropping them or laying them down carelessly; using machinery carefully and safely.
2. Technique - neatness and accuracy, avoiding awkward and careless methods of working.
3. Effort - nothing but your best is good enough; loafing and unnecessary conversations do not go unnoticed.
4. Cooperation - sharing tools and machines, taking your turn; planning your activities, assisting shop economy by avoiding waste, promptness in arriving for class and in cleaning up when signal is given.
5. Dependability - being reliable in carrying out shop duties assigned to you; checking your bench tools and equipment, reporting to the teacher any damaged or defective tools, breakages and errors in your work.
6. Safety Practices - keeping in mind safe practices and rules, a healthy respect for power machinery and respect for other students' safety.
7. Resourcefulness - leaning to think for yourself, following instructions and avoiding unnecessary questions.
8. Deportment - being attentive during lessons and working quietly at your job; horseplay, loud talk, whistling and noisy conversations have no place in the shop.
9. Courtesy - politeness and good manners go a long way in getting along with people.
10. Attitude - make the best of every job and be cheerful and pleasant about it.
11. Health Problems - inform the teacher of any specific medical problems that may be aggravated by the shop environment.

I HAVE READ THIS SHOP PRACTICE AGREEMENT.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



## GUIDELINES FOR TECHNICAL DIRECTORS

Have available The Lakehead Board of Education Technological Studies Safety Guidelines that includes general and specific safety requirements for each of the different subject areas in the department and ensure that the document is followed.

Discuss these safety requirements with all members of the technical department and ensure that they understand and implement them to the best of their ability.

Inform the principal of the safety program for the technical areas in the school.

Inform the principal when the number of students, physical arrangement of room or attitude of students is inappropriate to safe instruction.

Inform the principal, where in the Technical Teacher's opinion, a student's dress, grooming and/or attitude does not conform to the particular safety requirements and is constituting a hazard to himself or others.

Inform the principal (and/or any safety committee), in writing, of any known or potential safety hazard.

Incorporate some form of Student Safety Awareness Program for all technical students as part of their technical program, i.e. - I.A.P.A.

Develop, implement and post a standard accident emergency procedure in each technical area.

Inform all occasional teachers of the standard accident and emergency

Ensure that each technical area has a floor plan posted in a strategic place to show the locations of items such as:

- \* fire extinguishers
- \* fire blankets
- \* emergency power "stop" buttons
- \* first aid kit
- \* eye wash station(s)
- \* emergency exits
- \* special shut-off valves (gas, etc.)
- \* nearest fire-pull station

Ensure that a first aid kit is available in each technical area.

Encourage the use of safety posters, literature and audio-visual aids.



Advise all members of the technological studies staff that all student projects must be able to be completed with all designed safety guards in place.

Ensure that each student is instructed in the use of personal safety equipment.

Direct technical staff that any equipment deemed not to be safe must be taken out of service immediately, tagged, locked out and reported to the technical director.

Advise the technological studies staff that, unless otherwise authorized by you, only book work shall take place during their absence or when an occasional teacher is in class.

Recommend that a qualified occasional technological studies teacher for a specific subject area assign book work until he/she has had an opportunity to provide a safe working environment.

Implement or incorporate other safety procedures or equipment as may be deemed necessary by the principal, technical director and/or teacher.

Encourage the technological staff to receive instruction in approved first aid training.

Ensure that all incidents, whether serious injury and/or property damage resulted or not, are recorded and reported on an OSBIE Incident Report Form.

Conduct a follow-up analysis of all incidents, whether serious injury and/or property damage resulted or not.



## GUIDELINES FOR TEACHERS OF TECHNOLOGICAL STUDIES

Teach and develop a safe, positive working attitude in the technical environment throughout any technological studies course.

Ensure that safety instruction is an integral part of the course of study and that students keep up-to-date notes on these lessons.

Observe the safe handling and proper disposal of hazardous chemicals and other water materials which are used in the technical area.

Ensure that any undisciplined and/or unsafe behaviour in the technical area is not permitted.

Ensure that all safety equipment and signs are clearly visible and identified within each technical area. Some examples are:

- \* fire extinguishers
- \* fire blankets
- \* emergency power "stop" buttons
- \* first aid kit
- \* eye wash station(s)
- \* emergency exits
- \* special shut-off valves (gas, etc.)
- \* nearest fire-pull stations
- \* fire exit routes

Discuss and use appropriate safety posters or pictures at strategic points around the room and to change them regularly to avoid complacency on the part of the students.

Discuss the importance of safety awareness in industry and around the home as well as at school. Refer to current I.A.P.A. student information.

Ensure that students have sufficient time for complete clean-up before the end of the period(s).

Set a good example by observing all safety rules.



Report any defective lighting that may occur in the shop area.

Broken glass should be packaged and identified before disposing in the garbage in order to prevent injury to the custodial staff and any other person.

Supply each student with a set of student safety requirements relevant to the specific shop and to review and ensure that each student understands these requirements and signs a Student Safety Record Sheet.

Arrange that, during a technical teacher's absence, only activities authorized by the technical director occur.

Complete accurate records (OSBIE Incident Report Form) of all incidents whether serious injury and/or property damage resulted or not.

Keep accurate records of first aid treatment administered in the technical area with a copy supplied to the Technical Director in conjunction with school policy.

Label prominently, mark and secure all hazardous chemicals and equipment as per W.H.M.I.S regulations.

At the beginning of the year/semester to become aware of any student medical condition which could become a safety problem, e.g., by consulting with the student, the nurse or Student Services.

Arrange furniture and/or equipment to maximize ease of movement and safety.

Ensure that students are not permitted to work unsupervised in a technical area at any time.

Ensure that all student projects must be able to be completed with all designed safety guards in place and in working order.

Ensure that all tools are in proper working condition and that the correct tool is used for each job.

Report any defects in technical equipment to the technical director and to have any equipment deemed unsafe taken out of service immediately, tagged, locked out and reported to the Technical Director.

Instruct students to report to the technological studies teacher any tool or equipment that is unsafe or damaged.



Instruct the students that long hair and loose clothing must be adjusted or contained and jewellery removed when working in a technical area.

Ensure that appropriate protective apparel is available and worn, where applicable, while working in the technical environment.

Instruct students in recognition and understanding of hazardous products, safety symbols and frames.

Ensure that ventilation is adequate to provide a safe working environment and that all ventilation controls are easily visible.

Ensure good housekeeping practices are observed by keeping all areas clean, dry and uncluttered and to encourage students to develop neat, orderly work habits.

Alert visitors to any situation that could produce a hazard if proper protection is not worn.

Ensure that hazardous materials are stored in a designated and secure place. (VVHMIS Material Safety Data Sheet Binder)

Ensure that approved protective hearing equipment is worn whenever noise exceeds the recommended levels. (See Occupational Health and Safety Act - O.H.S.A.)

Post specific machine regulations on or near that machine where possible.

Be alert for and discuss unsafe practices and habits with all concerned individuals such as students, teachers, the Technical Director and School Administration.

Advise students that butane lighters are not allowed in the shops.

During school evacuations (i.e. fire drill) all technical teachers must shut off all power, direct class to proper exit, lock classroom doors, accompany students outside to designated area and account for all students.



## **SAFETY PROCEDURES**

Safety procedures for specific equipment, materials or shop areas are described in this part of the document. The intent is to focus on safety issues and facilities rather than specific shops.

It is important that students be instructed in the safety procedures outlined in the following sections. In general, individual or group instruction is more effective.

The following pages include information that is relevant to the various areas of Technological Studies. Teachers are encouraged to use the information that is applicable to their particular curriculum.

It is suggested that students be instructed in all aspects of safety that apply to their areas of study.



## HAND TOOLS: SAFETY PROCEDURES

Remove all rings, watches and jewellery where conditions are warranted.

Maintain correct posture to reduce the possibility of back injury.

When using hand tools, balance your weight equally on both feet. Proper stance will help prevent accidents.

Have a proper storage location for 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.

Hand tools, when damaged, worn or in an unsafe condition, must be repaired or discarded. These conditions must be reported to the teacher.

Use tools only for their designed purpose.

Wipe oil or grease from tools before and after use.

Blunt cutting tools are the cause of many accidents. Use chisels, knives, blades, etc., which are sharp and ready for use.

Carry all sharp and pointed tools or objects with the sharp point toward the floor.

Wear eye protection whenever using a hammer, nails, cold chisel, etc.

Hammers must be fitted with clean, sound and secure handles. When heads become loose, repair by inserting new wedges or fitting new handles.

Hammer faces must never be struck against hardened surfaces, e.g. another hammer, anvils, etc.

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 hammer head.

Consider other people, especially when chipping or cutting off rivet heads or burrs. Cover the part so that it cannot fly and cause damage.

When striking, the end of a chisel becomes mushroomed from the impact of the hammer. Bring the end back to its normal shape as particles of the mushroom will chip off and could injure your eye or face.

When loosening or tightening nuts and bolts, be careful that the wrench does not slip or give suddenly. This can be very dangerous to knuckles and fingers.

Use pressure on the solid jaw only of an adjustable wrench.



Tools such as wrenches are designed to produce the correct leverage for their length. Do not run the risk of breakage and injury by using extensions such as a pipe.

Wrenches, which due to wear do not fit well, should be turned in to the instructor to avoid hand injury.

When cutting off material with a hand hack-saw, care must be taken to avoid injury to your hand on the final stroke.

Always cut away from your body and keep hands behind cutting edge.

Screw drivers 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 screw driver.

Files should not be used as pry bars - they are extremely brittle and when breaking with release fragments which could injure or blind you.

Always use a file with a proper fitting handle to protect your hand from serious injury.

Do not leave vices open when not in use.

Do not put tools on ledges or ladders.

When working above floor level, keep tools contained and do not lower by dropping.



## PORTABLE POWER TOOLS: SAFETY PROCEDURES

Before operating any machine for the first time, ask the teacher to explain the function of the guards and to demonstrate them in operation.

Before starting the machine, make sure that both the work and the cutting tool are secured.

Do not touch handles or levers of machines or equipment until you have received instruction, and then only with permission of the teacher.

Remove all rings, watches and jewellery.

Power must be turned off when machines are not in use.

Read the safety rules and instructions regarding each machine tool.

Electrical equipment and portable tools must be properly grounded. Ensure that ground wires are not missing, broken or improperly connected.

Never work alone in a hazardous situation or location.

Keep floors clean and well swept.

Never leave hand tools or work on the table of any machine, even if it is not in motion.

Always keep tools and equipment away from all moving parts.

Power tools must not be operated in the vicinity of flammable materials.

Avoid loose power cords on floor.

Operate power equipment well within its capability - replace a fuse only by a fuse of the same value. Do not overload circuits.

Never use damaged or defective power tools.

Use all guards that will add to the safety of the operator.

Power tools with loose or poorly secured guards must not be operated until guards have been properly adjusted.

if power tool has been repaired, or set up recently, recheck the guards and their performance.



Appropriate safety apparel such as goggles and hearing protection should be worn,

If the job you are doing requires that you work with another student, only one student should operate the power tool.

Remove all wrenches, chuck keys, etc., from the power tool after completing the set up.

Do not have ragged sleeves, loose clothing, ties, long hair, etc., near the revolving parts.

Do not stand directly in line with fast-moving discs, such as saws, grinders, wheels, etc.

Allow power tools to reach proper working speed before commencing work.

Any form of distraction, such as talking, standing close, waving, etc., is a dangerous practice to anyone who is operating and near power equipment. Wait for an opportune moment if you must interrupt the operator.

Wait until the power tool has come to a complete stop before setting down.

Unplug the power tool before changing blades, bits, etc.

Remove the plug from the receptacle by grasping the plug and not the cord.

Be sure to clean up the area when finished and to place all scrap items in the scrap boxes.

Good housekeeping promotes safety.

Disconnect power tools when not in use or when transporting.

Inspect power tool cords periodically and, if damaged, have them repaired or replaced immediately.

Power tools must be switched off, unplugged or locked out before doing any cleaning, oiling or adjusting.

Do not touch the switch of a power tool until you are ready to turn it on or off.

Never use your hands or body to slow down or stop a power tool.

Guide power tools - do not force them.

Keep pressure constant when cutting. Do not force the cut.

Use two hands on the power tool when required.



When using power tools, balance your weight equally on both feet. Proper stance will help prevent accidents. Do not over-reach. Make sure you are secure from falling, should the tool stall or kick back.

Be certain that any material to be worked on is properly clamped.

### ELECTRICAL CORDS

Electrical portable tools must be properly grounded. Ensure that ground wires are not missing, broken or improperly connected.

Periodically run a current leakage check on portable power tools and check for proper grounding to make sure they are safe to use.

Never carry a power tool by the cord or yank it to disconnect it from a receptacle.

Keep electrical cords from heat, oil, moisture or sharp edges.

Avoid contacting or cutting power cords during use of power tools.

Always use power tools in a dry condition and a safe environment if the surrounding area is wet.

Do not wind the cord of power tool tightly around the equipment.

When coiling and uncoiling extension cords, care should be taken to prevent twisting or kinking of the cord. Do not coil cord around arm but coil on the floor, allowing for natural lay. The longer the cord, the larger the circumference.

Extension cords should be of an approved 3-wire type and inspected regularly. They should be kept clean and, if damaged, be repaired or replaced immediately.

Avoid the use of temporary electrical connections.

Avoid loose extension cords on floors.



## **ELECTRICAL/ELECTRONICS: SAFETY PROCEDURES**

### ELECTRICAL CIRCUITS

Use extreme care when working in wet or damp areas.

Handle electrical circuits with dry hands.

Do not touch circuit components or make changes to a circuit unless the switch is open.

Always have a newly-constructed circuit checked before closing the switch.

Do not make any changes to a circuit after the teacher has checked it and given permission to turn it on.

Use only proper instruments for testing circuits. Never use any part of your body for testing circuits.

Grasp probes of electrical testing equipment by the insulating portion only.

When working on sensitive equipment, always ground the tools to prevent static build-up damage to the circuit.

Understand the colour code for conductors of both alternating and direct current circuits.

Check service outlets for polarity and proper grounding.

Never short circuit sources of electrical energy.

Do not replace a fuse or reset a circuit breaker unless the cause of trouble has been rectified or isolated.

Always replace a fuse with one of the correct rating.

Switches, circuit breakers and other control devices must be marked so that their open and closed positions are quickly recognized and the circuits they control can be easily determined.

Never work on electrical circuits unless you have made sure that the power supply is turned off and locked out.

When working within a panel box, ensure the power supply to the box has been turned off, locked out and tagged.

When a switch is opened so that you may work on a conductor, or equipment repair, make sure that the switch is off, tagged and locked out. Failing this, a clear warning label must be affixed to the switch (or the fuses removed).



Don't tap into live wires. Find the switch or circuit breaker and open the circuit before doing any work.

If it is not possible to remove the source of supply, do not touch the wiring until you know the correct procedures and safety precautions.

Transformer experiments must be energized with as low a voltage as possible.

Induction coils must be clearly marked for the low voltage and high voltage connections.

When cutting flexible cable, BX, or Greenfield cable with a hacksaw, hold the cable against a solid support - not against your knee.

Keep ends of wire under control to avoid injury to yourself and others.

If you drill into a live conductor/circuit you can be seriously injured or killed. Therefore ensure the power to any live conductors that could be drilled into are turned off .

Do not make holes with a knock-out punch or remove knock-outs in panels containing live conductors.

Avoid cutting into welds with knock-out punches; these welds could contain hard spots that might shatter the punch.

Do not try to make knock-outs in heavier gauge metal than that for which the manufacturer has designed the punch.

## **SOLDERING**

A soldering iron stand must be provided for each iron.

All soldering irons must be considered hot and, therefore, they must only be picked up by the handles.

Keep hands away from mouth and eyes when soldering.

Wash hands thoroughly after using solder.

Use a vacuum de-soldering tool to eliminate excess solder.

## **APPLIANCES**

Always disconnect appliances and equipment from electrical outlets before attempting repairs.

When servicing AC/DC appliances, use an isolation transformer.



Never leave makeshift wiring to be finished later. Do the job right and prevent accidents.

When appliance repairs are complete:

1. plug into a dead receptacle;
2. clear people from the area;
3. energize receptacle with the circuit breaker.

Whenever testing appliances and equipment which remain connected, stand on an insulated surface and wear appropriate gloves.

## ELECTRONICS

Discharge capacitors and high voltage points after they are disconnected and before they are serviced.

When connecting the leads of test equipment, the common or neutral lead must be connected first.

Do not use test equipment from different test benches. A hazardous situation could exist.

To eliminate possible hazards, oscilloscopes should not be removed from the case.

Students must be aware of the possibility of dangerous exposure to radio frequency radiation from defective or poorly adjusted television or video display devices.

When etching printed circuit boards using an arc light or other ultra-violet device, never look directly at the source.

Do not use etchants stronger than ferric chloride or ammonium persulfate. Follow instructions on label.

Etching must be done in a closely controlled area.

Air agitated power etchers must be operated in a well ventilated area.

Etchants will stain skin, clothes and equipment. Wash involved areas with a cleaner that is safe and non-contaminating. Use proper protective clothing and equipment.

Tongs must be used to handle printed circuit boards until etched and rinsed.

Used etchant should be disposed of in an approved manner.

Extra caution should be observed when working around the neck of a Cathode Ray Tube.

Dispose of Cathode Ray Tube's in the proper manner.



Dangerous exposure to radio frequency radiation from video display devices must be avoided. Provide proper ventilation and ensure equipment is properly adjusted and free of defects.

## BATTERIES

When mixing acid and water, always add acid to water, never add to concentrated acid.

Rubber gloves, a rubber apron and cup-type eye protection should be worn when servicing automotive batteries.

Any form of ignition should not be allowed in battery charging areas ( designated or occasional).

Sulphuric battery acid can be injurious to eyes and skin. Flush any acid splash immediately with large quantities of clean water to prevent injury. Flush eyes for at least 15 minutes. See a doctor.

Acid spills on upholstery or clothing can be neutralized by applying a solution of baking soda and water.

Adequate ventilation is required wherever batteries are being charged. Battery caps should be loosened or removed whenever possible to prevent build-up of flammable gases.

Do not set tools on top of the battery at any time.

To prevent explosion of battery packs, test equipment and some electronic equipment, proper polarity and voltage must be used.

Do not attempt to charge a dry cell battery unless it is a nickel/cadmium battery; charge only with an approved nickel/cadmium charger.

## COMPRESSED AIR

Proper signs must be posted near compressed air outlets.

Never use the air hose to clean out wheel brake units. A shop vacuum will clean more safely.

Spinning bearings with the air hose is a dangerous practice. The bearings can disintegrate at high speed causing injury and damage.

The spark plug cleaner uses high pressure air and powder abrasive. If the blast is triggered without a spark plug in the cleaning port, serious eye injury is probable. Disconnect when not in use.

Do not use the air hoses to clean yourself. The high pressure blast can drive dirt, grease or air under the skin or into the blood causing injury or death.



## **BENCH AND PEDESTAL GRINDERS: SAFETY PROCEDURES**

Check grinding wheel for damage before each use.

Never use a grinding wheel that is loose on the shaft.

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 turning.

When mounting or replacing any grinding wheel, always ensure that it passes the ring test before you secure it to the spindle.

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. Do not over tighten.

When starting up any grinding wheel, stand to one side out of line with the wheel, especially if it is a new one.

Always ensure that the wheel spins at the recommended number of revolutions per minute. Excessive speed can cause the wheel to shatter.

Use the face of the wheel only and use the entire face to avoid grooving the wheel.

Always feed the work to the wheel gradually. Too much pressure or striking the wheel suddenly may cause it to fracture.

Shut off power immediately if the wheel begins to chatter or vibrate.

Never use tools or hands to stop any grinder.

Flammable materials, batteries, etc., should not be in the vicinity of grinding operations.



## **GENERAL EQUIPMENT: SAFETY PROCEDURES**

Remove all rings, watches, necklaces and jewellery when using equipment.

Power must be turned off when machines are not in use.

Read the safety rules and instructions regarding each machine.

Never work alone in a hazardous situation or location.

Keep floors clean and well swept.

Never leave hand tools or work on the table of any machine even if it is not in motion.

Always keep tools and equipment away from all moving parts.

Before operating any machine for the first time, ask the teacher to demonstrate and explain the function of the machine.

Before starting the machine, make sure that both the work and the cutting tool are secured.

Do not touch handles or levers of machines or equipment until you have received instruction.

Operate power equipment well within its capability - replace a fuse only by a fuse of the same value. Do not overload circuits.

Never use damaged or defective machines.

Use all guards and hold-down devices on the machine that will add to the safety of the operator.

Machines with loose or poorly secured guards must not be operated until guards have been properly adjusted.

Always check the machine guards to make sure they are in place, operating and not damaged before using machine. Inform the teacher of any problem.

If a machine has been repaired, or set up recently, recheck the guards and their performance.

Wear proper eye protection.

Wear proper hearing protection.



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. This operation must be supervised by the teacher. Always replace the guard and check its performance before using the machine.

Unguarded rotating parts, such as mower blades, snowblowers, tillers, outboard propellers, chain saws, open crankshafts, etc., must be treated with extreme caution and worked on in an isolated location.

Certain types of guards are adjustable. Make sure that the guards are adjusted to give the maximum protection.

If the job you are doing requires that you work with another student, only one should operate the machine and the power switches.

Always remove all tools from the machine after completing set up.

Stand clear whenever power machines are being started. Do not have ragged sleeves, loose clothing, ties, long hair, etc., near the revolving parts.

Keep fingers as far away from the machine as the size of the work permits, and never any closer than 125mm (5 inches). Use push sticks.

Do not stand directly in line with fast-moving discs, such as saws, grinders, wheels, etc.

Allow machines to reach proper working speed before commencing work.

Any form of distraction, such as talking, standing close, waving, etc., is a dangerous practice to anyone who is operating and near power equipment. Wait for an opportune moment if you must interrupt the operator.

Always keep your hands away from the work when the machine is running.

Never reach over a revolving cutter, saw or shaft.



## DRILL PRESSES: SAFETY PROCEDURES

Eye protection must be worn by everyone in the vicinity of an operating drill press.

Select drills carefully as to good condition and suitability for the job.

Use drills correctly sharpened to cut clockwise and see that they are running true.

Make sure that chuck wrenches have been removed from the drill chuck before starting the machine.

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.

Make sure that drills are fed by the operator at the proper drilling rate. forcing or trying to drill too quickly can cause drills to break or splinter with the chance of serious injuries.

Do not use bits with screw feeds.

If the work should slip from the clamp, never attempt to stop it with the hands.

Never reach around or in back of any rotating drill.

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.

If the drill sticks in the work, stop the motor and rotate the drill by hand to free it from the work.

File, scrape or countersink all burrs from drilled holes and be sure that the file is fitted with proper handle.

Always clear away chips and curls with a hand brush - not with hands.

Loose clothing, neckties, jewellery, etc., must not be work when operating drill presses.

Long hair must be contained so that it does not constitute a hazard.



## PROTECTIVE CLOTHING: SAFETY FEATURES

Be sure to wear approved safety glasses or the appropriate type of face shield before you start working on any machine or operation even when a permanent shield is present.

Wear an approved respirator when a relevant environmental hazard exists.

Wear approved hearing protection when the noise level conditions warrant.

Wear the proper protective clothing when appropriate for the job, e.g. hard hats, welding gloves, chaps, gaiters, etc.

Oily coveralls can cause skin irritation. Change overalls when necessary.

Shoe laces must be tied with no long ends.

Wear clothing that is appropriate for the specific shop.

Do not use flammable liquids for cleaning clothing.

Do not use an air hose to clean or dry personal clothing.

Do not wear conductive hard hats in the vicinity of electrical equipment.

Approved hard hats must never be painted or have holes drilled in them.

The suspensions of hard hats must be changed once a year or more frequently if required. The hard hats must be replaced every five years.

In order to maintain hard hats properly, there must be minimum exposure to sunlight, extreme heat or cold, chemicals, etc.



## **HAZARDOUS PRODUCTS: SAFETY PROCEDURES**

**Adequate first aid provisions and appropriate fire extinguishers must be available when working with hazardous products.**

**All containers must be labelled as to their contents. Safety data sheets dealing with the hazard, the safe handling, the proper use, the first aid treatment and the method of disposal must be readily available for all hazardous products. (See WHMIS info).**

**Appropriate protective clothing must be worn depending on the nature of the hazard.**

**Adequate ventilation is required whenever a possible explosive or toxic environment exists.**

**Smoking or others forms of ignition must not be allowed in hazardous locations such as battery charging and gasoline handling areas.**

**If corrosive or explosive liquids or oils are spilled, they must be neutralized first and cleaned up immediately. Ask the teacher for clean-up procedure.**

**Know the symbols for hazardous products. (See WHMIS info).**

**Do not use own air pressure to blow out possible hazardous areas of dust, particles, etc. Use a special vacuum or lightly brush the dust into a container for disposal.**

**There are many new chemical processes on the market. Obey the instructions packaged with the product, avoiding contact with the skin and the breathing of fumes present.**

**Always add acid to water, never add water acid.**

**Bases (alkaline liquids) and acids have violent reactions - always use caution when operating with these products.**

**Reacting chemicals must be stored in separate areas away from each other.**

**Etchants, such as ferric chloride or ammonium persulfate, must be used with extreme caution. Follow instructions on the label.**

**Never store flammable liquids in glass containers. If broken, they create a serious potential hazard, such as an explosive atmosphere.**

**Before transferring combustible liquids from one container to another, the containers must be bonded and grounded to prevent static ignition.**



Open containers must never be used to contain flammable liquids at any time.

Varsol-style parts cleaning tanks must have thermal lid supports and require adequate ventilation.

Students must be warned not to immerse their hands in varsol or other petro-chemical solvents or cleaners. Suitable gloves must be used.

Students handling varsol, other cleaners, must wear eye protection (cup type).

Never use cleaning solvents on clothes in the shops.

Cleaning solvents and paint must be stored away from the work area in a secure place with a fire-resistant door. All containers must be labelled.

Do not store highly flammable liquids near electrical equipment because vapour can be ignited by an arc, spark, etc.

Gasoline must be stored in an approved fire-resistant container in a secure area with a fire-resistant door. Both container and area must be clearly marked Gasoline Storage.

Gasoline must not be syphoned by mouth from tanks or vehicles. Ingestion or inhalation of gasoline can cause injury or death.

Paints, solvents and other volatile material must be stored in approved containers in fireproof cupboards.

Butane lighters must not be allowed in shops.

Priming an engine with raw gasoline must be avoided because it can cause fire, injury or death.

Never use gasoline as a cleaning solvent for hands, clothes or equipment.

Never allow any form of ignition in a gasoline handling area or wherever gasoline vapours are present.

Refueling vehicles from portable metal gasoline containers requires the use of a bonding cable to prevent static ignition. Static can also be prevented by pressing the nozzle of the container against the filler neck of the vehicle.

Welding and cutting operations must not be allowed in the vicinity of the vehicle fuel tank or supply lines.



Propane powered vehicles are not allowed in the shop.

Extension lamps and power tools must be kept away from leaking gas lines, tanks or spills.

The varsol (parts) cleaning tank must be used with adequate ventilation, face protection and rubber gloves.

The lid of the varsol tank must be kept closed when not in use and must be fitted with a thermal-type lid closure.

Use extreme care when handling penetrating oil because it causes intense eye and skin irritations.

Penetrating fluid and brake fluid react with paints, plastics, synthetics and upholstery. Treat with caution and wipe up spills immediately.

The carburetor degreaser/cleaner is a strong caustic solution and is as dangerous as acid. Keep cleaning fluids away from battery acids and any form of heat. Acids and alkali solutions react violently with each other and heated carburetor cleaners produce toxic gases.



## **HOIST & LIFTING DEVICES: SAFETY PROCEDURES**

**The teacher should supervise the hoisting. Proper supervision when hoisting a vehicle would not be left or delegated so that one student is supervising another.**

**When lifting a vehicle, there must be an observer positioned to the side of and well away from the vehicle to assist the hoist operator in raising the vehicle at an even level.**

**To prevent damage to the vehicle, the hoist must be fully lowered before the vehicle is moved.**

**Hoist posts and/or pads must be correctly positioned to the individual before a lift is attempted.**

**Vehicles must be properly positioned on the hoist before a lift is attempted.**

**Students must not work under vehicles which are not in a full lift position without safety locks engaged.**

**Operators must always face the lift vehicle while the lift is underway.**

**Hoists must be inspected for proper operation and safe condition by competent personnel in intervals of no more than 1 year. Permanent record should be signed by inspecting personnel and kept on file by the shop teacher.**

**Before working under a vehicle, it must be supported securely on approved stands placed at strategic lift points.**

**Keep jack handles secure, out of the way or removed to prevent damage and injury should they fall.**

**Do not exceed the rated capacity of any lifting crane.**

**Do not stand under any operating crane.**

**Use cranes only for vertical lifts.**

**Never jack up a vehicle when anyone is working underneath the vehicle. The jack might slip and allow the vehicle to drop.**

**Jacks must be used within their rated capacity. The lift must be vertical - never on an angle. Lift in line with the vehicle center line to prevent toppling.**

**Engine slings must be securely fastened to the engine before lifting. Fasteners must be of correct size for the lifting weight and fully tightened to secure sling lugs.**

**Overhead shop doors should be operated only when doorway is clear of people and obstructions.**



## WELDING SAFETY PROCEDURES

### PERSONAL PROTECTIVE EQUIPMENT

Wear leather gloves or use hand pads for handling scrap, sheet metal or material.

Wear appropriate hand protection when handling hot materials.

Safety glasses must be worn when chipping, grinding, drilling, punching, chiselling, spot welding or wire brushing.

Greasy clothing or coveralls can catch fire easily during welding or grinding operations. The grease also causes skin irritations and dermatitis.

Do not use compressed air to remove dust from clothing or hair. The high pressure blast can drive dirt, grease or air under the skin or into the blood causing injury or death.

Never use oxygen as a substitute for compressed air.

Cuffless pants must be worn, all laces fastened, and all loose clothing contained. Keep sleeves rolled down and collars buttoned.

When working with oxy/acetylene, eye protection with a minimum #5 eye filter must be worn.

### HOUSEKEEPING

Sheet metal and other sharp-edged materials must be stored in protected-style storage areas and handled with care.

Always sweep the weld area before welding and remove all combustible materials. If this is not possible, the materials must be covered with a metal or fire-resistant guard.

Always keep welding stations free of metal chips and weld spatter. As well as a skid hazard, these chips can cut or burn through the soles of footwear.

Do not throw electrode stubs on the floor. They create a slipping hazard.

Keep a safe, clean area around the welding station to protect others from spatter and hot metal.

Welding and cutting operations must not be allowed in the vicinity of the vehicle fuel tank or supply lines.

Fuel tanks should be protected or removed when welding in the vicinity (i.e. when installing or welding a trailer hitch onto a vehicle).



## GAS WELDING

Adequate ventilation must be provided to remove fumes, dust and gases from affected areas.

Do not apply welding heat to galvanized materials as this will release, toxic gases. Proper ventilation procedures must be taken.

An approved fire blanket must be in a prominent place and easily accessible to all students.

An approved fire extinguisher must be in a prominent place and easily accessible to all students.

Lighters and matches must never be allowed in the welding area.

Never use oil or grease as a lubricant for cylinder fittings. High pressure oxygen can cause the lubricant to degrade into carbon and hydrogen, causing a flash fire.

Always leak test, using soap and water solution, after fitting hoses, regulators and tanks. Never force hose connections.

If a gas build-up of acetylene occurs; evacuate the area.

Leaking acetylene cylinders must be moved immediately and carefully outdoors and allowed to discharge in a safe open area. It is illegal to transport a leaking cylinder of any type.

Exercise caution when lighting or extinguishing the welding torch.

Avoid overheating brazed areas. Zinc oxides are produced which cause irritation on the lungs, eyes and nose.

Quenching hot metal in oil can cause a fire. Use a vented hood area and extra caution.

Quenching hot metal in a water bath can cause eruptions of hot water or steam. Use caution.

Always seek advice and use caution if it is absolutely necessary to cut and weld castings or containers. -These might contain toxic or flammable materials which react adversely to the welding heat.

Always seek advice, and use caution if it is absolutely necessary to cut and weld casting or equipment which have been degreased. The degreasing fluids release deadly phosgene gas at welding heat.

Call all flammable gases by their correct name, e.g., acetylene, propane, butane, natural gas, etc. Never use the group name gases. They all have different properties.



Leaking acetylene cylinders must be moved immediately and carefully outdoors and allowed to discharge in a safe, open area. It is illegal to transport a leaking cylinder of any type. If gas build up has occurred, evacuate the area.

Never tamper with the safety devices or markings on a gas cylinder.

Gas cylinders must be fitted with safety caps when in storage or transit.

Gas cylinders must be chained securely in the vertical position.

All flammable gas cylinders which are winter heated must be kept well away from the heat sources.

Should the outlet of an acetylene cylinder become iced-up, defrost with warm water - not boiling water or open flame.

Do not use the recessed top of a flammable gas cylinder to hold tools or equipment.

Never attempt to repair or remove a cylinder valve.

Where flammable gas cylinders have a removable main valve handle, the handle must always be in place whenever welding is in progress.

Each cylinder must have an approved regulator for that particular use.

Never use a hammer or wrench to open a cylinder valve.

Always ensure that the regulator is backed out before opening the main valve. The sudden or extreme increase in pressure could blow out the adjusting screw or damage the gauges.

Never repair a damaged hose. Replace it immediately.

Always purge hoses before starting up - especially after fitting fresh tanks. Purge at the rate of ten seconds per hundred feet of hose.

Acetylene can degrade at fairly moderate pressures. Never use acetylene at pressures higher than 15 PSIG (100 KPa).

One to one and one-half turns on the acetylene cylinder valve allows a full flow from the cylinder yet allows fast shut-down in an emergency.

Never hang the torch on the cylinder valve or regulators.

Use a striker to light the oxy/acetylene flame.



Keep flames and electric arc away from flammable gas and oxygen cylinders.

Welding metal must be cooled before disposal.

When cutting with an oxy/acetylene torch, never direct hot slag onto wood or concrete floors. Make sure that the torch hoses are not exposed to the slag that is removed.

Exhaust fans must be on when welding.

### ELECTRIC WELDING

Always keep welding stations and clothing dry to avoid electric shock. Avoid damp or wet welding stations.

Keep flames and electric arc away from flammable gas and oxygen cylinders.

Lighters and machines should never be allowed into the welding area.

Most sources of electrical energy are dangerous. If the electrical source doesn't kill, it can produce serious and lasting injury. Always use extreme caution.

The welding arc produces ultra-violet rays which destroy skin cells. Since ultra-violet rays are 'cool' rays, the arc welder may have no sense of radiation heat. All exposed skin areas must be appropriately covered.

Arc welders must be protected by an approved welding helmet with a #10 or #12 eye filter and heat resistant clothing (leather preferred). Leather gloves should be in good condition with no holes. Observers must be at a safe distance and using similar eye and face protection.

Never wrap the arc welding cables around the welder's body. Insulation failure or short-circuit heat can cause injury or death. The cables could also cause tripping or prevent emergency exit.

Never strike an arc until you, and any observers, are aware and suitably protected.

Most sources of electrical energy are dangerous. If the electrical energy doesn't kill, it can produce serious and lasting injury. Always use extreme caution.

Always remove the electrode before leaving the work station. This may prevent eye-flash if the arc welder is inadvertently turned on.

