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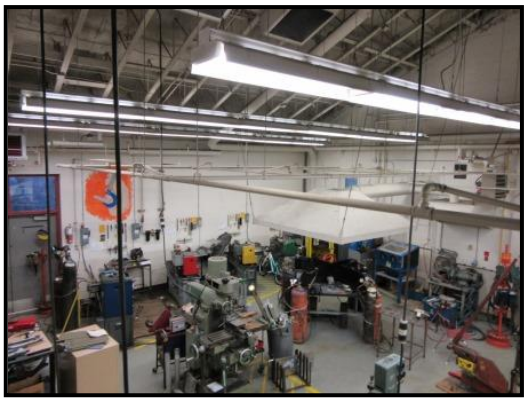
IA TECHNOLOGY SHOPS SAFETY MANUAL

RESOURCE MANUAL



Prepared By: Noratek Solutions Inc.

Alan Kavanaugh, CRM, Member of NFPA
Director of Loss Control & Risk Management

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Section 1

School IA Technology Shop Safety Program

The purpose of a safety program is to insure a safe environment exists in all IA technology classrooms and shops. The safety program is designed to prevent injuries to students and teachers.

The teacher is responsible for the training of safe practices in their IA technology classrooms and shops.

Subsequently, if a student is not trained on specific IA technology classrooms and shops equipment or is thought to be a safety concern for others, then a student should not be allowed to operate in an IA technology classrooms and shops.

The safety program consists of more than lecturing and posting of safety rules and regulations. It includes active instruction that involves the student in learning and choosing behaviours that promote the safe use of equipment located in IA technology classrooms and shops.

The following factors are a short list of injury prevention criteria:

1. Ample space is provided for machines and equipment.
2. Permanently placed machines are fastened to the floor or bench.
3. Safety zones are clearly marked around each piece of equipment.
4. Approved PPE (Personal Protection Equipment) is worn when required.
5. Standard emergency stations are provided.
6. Machine guards are utilized at all times.
7. All safety procedures are followed at all times.
8. Full safety training is provided on all equipment before first use.
9. Enforcement policies are provided which allow teachers to remove students from the IA technology classrooms and shops if they are thought to be a danger to the teacher or other students.

Section 2

Source Materials, Standards, Codes and Recommended Practices

- The purpose of this manual is to discuss the safe and recommended practices for IA technology classrooms and shops design and safety. The information in this manual includes various source materials in regard to IA technology classrooms and shops.
- National and Provincial Building Code
- National and Provincial Fire Code
- 1952 BC School Building Manual
- 1986 – 1992 BC School Building Manual
- School Protection Program – “Heads up for Safety”
- School Safety – Alberta
- School Safety - Manitoba
- Work Safe & OH&S – BC, Alberta and Saskatchewan
- Other related standards, regulations and documentation

Section 3

Responsibilities of District, Staff and Students

The designed responsibilities for every level of operation within the School District in regard to safety in and around IA technology classrooms and shops follows the basic idea and recommended practice as discussed in various Provincial Work Safe recommended practices.

The District/maintenance department is responsible to ensure they provide a safe work place for the staff/teachers.

The teachers are responsible to provide training, direction and supervision to the students to help mitigate potential injuries to the students.

The students are required to follow all the rules and regulations within the IA technology classrooms and shops and to ask questions if they have any concerns in regard to safety or operations.

Expanded responsibilities are discussed further, based on the following:

- Employer/District/Maintenance
- Staff/Teacher/Supervisor
- Student/Employee

GENERAL

- Educators have a responsibility to both students and their parents to provide a safe learning environment in which the risk of personal injury is low. For technology educators, however, this responsibility is compounded by the fact that students generally have little or no experience working in hazardous environments where the knowledge of risks and the need for safe work practices are crucial.
- Safety in the IA technology classrooms and shops is everyone's business.
- Below is a list of responsibilities as adapted from the Workers' Compensation Board in their Work Safe Online document entitled "Safety on the Job is Everyone's Business".

  (http://www.Work Safe.com/publications/Health_and_Safety_Information/by_industry/assets/pdf/safetyonthejob.pdf)

EMPLOYER (SCHOOL DISTRICT)

- To provide a safe environment;
- Take action immediately when the worker or supervisor tells you about a potentially hazardous situation;
- Initiate an immediate investigation into accidents;
- Report serious staff accidents to WCB; report student accidents to the school division office and the Schools Protection Program;
- Provide adequate first aid facilities and services; and
- Provide personal protective equipment where required.

SUPERVISOR (IA TECHNOLOGY SHOPS TEACHER)

- Instruct new students in safe work procedures;
- Train students for all tasks assigned to them and check their progress;
- Ensure that only authorized, adequately trained students operate tools and equipment;
- Enforce safety regulations;
- Correct unsafe acts and conditions;
- Identify students with problems such as drugs or alcohol that could affect their safety and the safety of others; follow up with interviews and referrals where necessary;
- Formulate safety rules and inspect for hazards in your own area;
- Keep accurate safety and training records; and
- Complete a School Incident Report each time an accident occurs.

EMPLOYEE (STUDENT)

- Know and follow safety and health procedures affecting your work;
- If you don't know, ask for training before you begin work;
- Work safely and encourage your classmates to do the same;
- Correct or immediately report any unsafe conditions to your teacher; and
- Take the initiative – make suggestions for improved safety conditions.

Section 4

Setting Up and Maintaining a Safe IA Technology Shop Facility

ACHIEVING A SAFE FACILITY

The intent of this section is to help the teacher achieve and maintain a safe facility.

Topics of this section include

- Safety and health inspections; and
- Hazard analysis.

PURPOSE OF SAFETY AND HEALTH INSPECTIONS

To provide the teacher with the understanding of the inspection process and give them the ability to carry out an effective safety and health inspection. The following introduces the teacher on:

- Purpose of inspections;
- Types of inspections;
- Persons involved in the inspection process;
- Techniques; and
- Methods of recording.

INTRODUCTION

Safety and health inspections are an important part of the hazard control process. Regular inspections are important to providing a safe environment for our students.

MANDATORY INSPECTIONS

Every school facility and each of its processes and operations contain potential hazards which come about through normal use or through changes and additions of new equipment. One way of keeping aware of hazards is through continuous inspections.

PURPOSE OF INSPECTION

- To spot potential hazards before an incident occurs;
- To assess the hazard;
- To find improvements and corrections to improve overall operations and increase effectiveness;
- Do all of the above every day.

INSPECTIONS MAY BE CLASSIFIED AS PERIODIC OR CONTINUOUS

Periodic Inspection

A safety and health inspection is thorough and systematic. These inspections can be conducted monthly or bi-monthly. This type of inspection covers all areas (e.g. operations, equipment, etc.).

Continuous Inspection
Continuous inspections should be conducted by students, teachers, department heads or supervisors as part of their instructional, supervisory, or assigned duties. Continuous inspections provide an immediate chance to examine, and if necessary, to correct or report any unsafe situations (if correction is not possible).

WHO SHOULD PERFORM THE INSPECTIONS?

Teachers
Teachers must make continuous inspections and be aware of changing conditions, operations and work methods. These inspections may have to be made several times a day (i.e. at the beginning of each day, and for certain equipment, at the beginning of each class).

Students
Student inspections allow students to take a major role in their shop/lab/facility, thus giving them a sense of ownership of their shop/lab/facility.

Department Head or Supervisors
A school that has a department head or supervisor for applied arts has a further advantage in safety and health inspections. The department head or supervisor may record any unsafe conditions and practices and forward the information to the teacher and/or maintenance personnel if required.

INSPECTION PROCEDURES
An inspection program requires that those conducting the inspections:

- Have a sound knowledge of the facility;
- Have systematic inspection process for the facility; and
- Have a method of reporting, evaluating and using the data gathered.

USING A HEALTH AND SAFETY CHECKLIST
There are many different types of checklists available for use in safety and health inspections, varying from listing thousands of items to listing just a few. Each type has its place, and when properly used, can be a benefit to that particular facility.

BE THOROUGH
Any checklist for use in safety and health inspections is only as good as the method in which it is completed. The checklist is to be used as an aid in the inspection process, keeping in mind other items may have to be recorded. Any observed hazard must be recorded (even though it may not be on the list).

WHAT SHOULD BE INSPECTED
When inspecting, the following should be considered:

- **Materials and Substances:** Inspect those materials and substances that may cause injury, illness, fire, or other hazards.
- **Machinery, Equipment and Tools:** Ensure that they are free of defects and other hazards. Make sure guards, grounding (electrical) and exhaust systems are in place.

- **Personal Protective and Safety Equipment:** Ensure that there is adequate protection for all students involved and that the equipment is in good shape (i.e., safety glasses/shields are free from scratches; leather welding gloves are free from holes).
- **Working and Walking Areas:** Areas must be clean and functioning safely.
- **Environmental Factors:** Ensure lighting, ventilation and noise control devices are up to standards.
- **Housekeeping:** Material storage, waste disposal, floor and counters should be neat and tidy.
- **First Aid Kit and Eyewash Station:** Ensure the first aid kit is stocked with adequate supplies and the eyewash station is functioning properly.
- **Electrical:** Switches, breakers, fuses, cords and plugs must be in compliance with regulations.

CHEMICAL STORAGE, HANDLING AND USE

Ensure that material such as paints are stored properly (i.e., five gallons of paint or more must be stored in an approved flame proof cabinet). Specific protective clothing should be available for the chemical requirements. Adequate exhaust ventilation must be in place where stated by chemical requirements.

FIRE PROTECTION AND EXTINGUISHING SYSTEMS

Fire blanket, fire extinguishers, fire exit doors and exit signs, etc. must all be in good order and in clear working condition.

PREVENTATIVE MAINTENANCE

The teachers should provide consistent preventative maintenance in the lab/facility and tools that will help ensure incident prevention and student safety.

HAZARD ANALYSIS

The benefit of hazard analysis is to increase the awareness of potential hazards.

Results of Hazard Analysis

Hazard analysis should help to:

- Improve instructional quality;
- Assist in the selection of processes and tasks;
- Create awareness of possible incidents;
- Establish control measures (special procedures, guarding, PPE);

- Set up equipment and machinery so that students or the teacher will not be exposed to unnecessary hazards;
- Identify situational hazards in facilities (equipment, tools, materials);
- Identify human factors responsible for incidents (student capabilities, activities and imitations);
- Identify exposure factors that contribute to injury and illness (contact with hazardous substances and materials); and
- Determine safe inspection methods and maintenance standards.

Who Should Participate in Hazard Analysis
The teacher may initiate the analysis of the processes, operations and tasks; however, others may also give assistance (i.e. department heads, maintenance personnel, colleagues, manufacturing representatives and students).

Note: Remember to review specific equipment manuals for proper procedures.

What to Analyze
There are many processes, operations and tasks conducted that have potential hazards.

Consideration should be given to:

- General housekeeping;
- Inappropriate use of tools and equipment;
- Faulty tools and equipment;
- New or altered processes;
- Potential for injury;
- Severity of injury; and
- Frequency of incidents.

The Process of Hazard Control
The four processes in hazard control are:

1. Spot the hazard;
2. Assess the risk;
3. Find a safer way; and
4. Practice all of the above every day.

Hazardous Equipment
In the process of inspection, various actions or corrections may have to take place. When a broken or damaged tool is found, the teacher should immediately take it out of service. Large equipment, however, may have to be properly tagged. The teacher may also need to perform an electrical lockout

by placing a mini padlock through one of the tines of the power cord plug to prevent unauthorized use of the tool.

SUMMARY

Acting on the information gathered from an inspection is as important as conducting the inspection in the first place. It is necessary that the inspection team brings problems and recommendations for corrective action to the attention of those involved (i.e. teacher, principal, designated person or Workplace Safety and Health). Based on problems uncovered and recommendations received, they must then determine the best course of action.

Information from inspections should never be seen as a fault-finding or criticism, but rather as fact-finding with emphasis on locating potential hazards that may have an adverse effect on the safety of the operation. The information is simply the basis for establishing priorities and implementing programs that will improve conditions to provide a safe environment for our students.

Section 5

General Safety - Personal Protection Equipment ("PPE")

PPE does not take the place of such engineering controls as substitution, isolation and ventilation. PPE includes such items as helmets, glasses, goggles, face shields, special footwear, respirators and other items that protect the student against hazards such as flying particles, noise, chemicals and electric shock.

Sometimes the only practical way to reduce illness and injuries is to use personal protective equipment. The first method is to control the problem at its source; the second is to control it along the path. PPE is regarded as the last line of defense.

SELECTING PERSONAL PROTECTIVE EQUIPMENT (PPE)

- The extent of the hazard's potential to cause harm must be determined;
- The degree of desired protection is in direct proportion to the seriousness of the hazard;
- The equipment's ability to protect must be considered along with its potential to interfere with the students' work;
- Protective equipment, particularly for eyes and face, must be approved by the Canadian Standards Association (CSA); and
- Quality is an important factor to consider. Good protective equipment may not be inexpensive, but may last considerably longer than lower grade PPE.

PPE FIT

The PPE must fit the student. Poorly fitted protective equipment discourages students' acceptance and may hinder their work and safety.

EDUCATION

Unless students are educated in the use and care of PPE, it may do little to fulfill its intended purpose.

PPE REQUIREMENTS

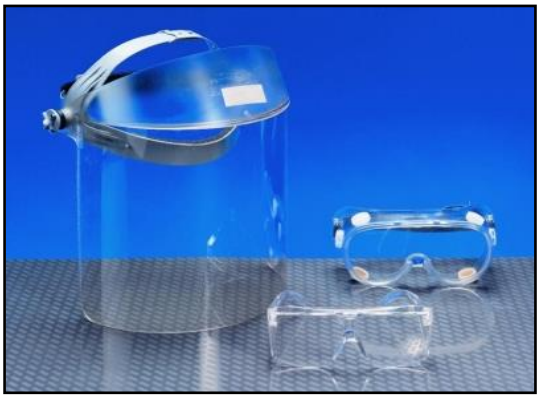
Head Protection (CSA Z94.1 – Protective Headwear)

There is always a danger of hair becoming entangled in moving parts. Students with long hair should have their hair tied back, secured or tucked underneath their clothing.

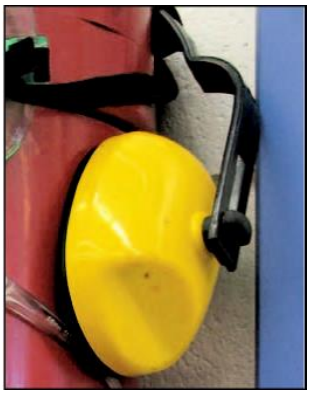
Helmets are the best means for protecting students against impact blows from falling objects.

Eye and Face Protection (CSA Z94.3 – Eye & Face Protection)
In school technology education shops, students' eyes can be exposed to a variety of hazards (i.e. flying objects, splashes of corrosive liquids or molten metal, dust and harmful radiation). Work Safe requires that eye and face protection be designed to meet standards.

The type of face shields and safety glasses used must meet their intended purpose. A variety of types and sizes of safety glasses give the student an opportunity to select his or her own "style". Glasses that are damaged by pitting or scratching must be replaced. A weekly check of their condition is essential.



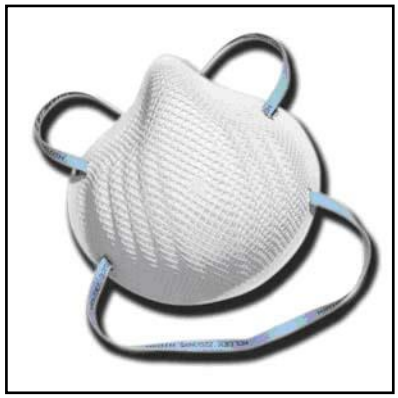
Hearing Protection (CSA Z94.2 – Hearing Protection Devices)
The need for hearing protection arises when source control and/or path control are not present, when source and/or path control do not lower noises to safe levels or when a person in the facility cannot avoid direct exposure to noisy equipment and tools.



Many types of personal hearing protection devices are available, ranging from ear plugs to cup-type hearing protectors. Selection of a protective device is governed by individual preference. Important factors to consider are effectiveness, comfort, and cost.

Respiratory Protection (CSA Z94.4 – Selection, Use and Care of Respirators)

The human respiratory system presents the quickest and the most direct avenue of entry of hazardous materials because it is connected with the circulatory system and the need to oxygenate tissue cells. Air may be contaminated with dusts, fumes and sprays. The most important objective is to prevent atmospheric contamination. This should be accomplished by engineering control measures (i.e. enclosure or confinement of operation, general and local ventilation, and substitution of less toxic material). When effective engineering controls are not feasible, appropriate respirators must be used.



Hand Protection (Based on Potential Exposures)

Statistics indicate injuries to the arms, hands, and fingers account for more than a quarter of all disabling mishaps. The hazards in the industrial arts teaching facilities are similar to those in industrial workplaces (i.e. molten metal, heat, sharp objects and corrosives).

Many industrial incidents are the result of operating machinery, using tools, or handling materials. PPE can do little to prevent incidents in the first of these areas (i.e. gloves can snag in revolving parts and pull the hand into machinery).

Gloves supplement good work practices to prevent hand injuries during the handling of tools and materials. There are many types of gloves that are suitable for abrasions, cuts, oils, chemicals, radiation, heat and flame.

Body, Foot and Leg Protection (Based on Potential Exposures)
Students require protection from the hazards of molten metal, sparks, splashing liquids, heat and cutting.

Welders need aprons made of fire-resistant fabric or leather. Personal protective footwear can protect feet against injuries such as those from falling objects, accidental contact with sheet metal, and sparks from welding and cutting operations.

Although safety shoes may present the ideal protection for feet, this may be impractical in certain situations. Some alternatives that may better fit particular situations could be foot guards which protect the toes and instep against falling objects or a combination foot and skin guard which protects both against flying particles and sparks from cutting/welding.



Machine Guarding (CSA Z432 – Safeguarding of Machinery)
It is estimated that nearly 20 percent of all permanent partial disabilities result from injuries associated with machinery. Poorly designed, improperly guarded or unguarded machinery are detriments to the educational system.

Machine guarding is of the utmost importance in protecting students in the industrial arts facility. Machine guarding is not optional; it is required. Guarding is a means of effectively preventing students from coming into contact with those moving parts of machinery and equipment which could lead to physical harm.

SOURCES TO BE GUARDED AGAINST
Sources of injury that guarding can protect:

- Direct contact with the moving parts of a machine;
- Contact with work in progress;
- Mechanical failure;
- Electrical failure; and
- Human failure or error.

HAZARDOUS AREAS
Typical hazardous mechanisms that need to be safeguarded are:

- Rotating mechanisms;
- Cutting and shearing mechanisms;
- Belts, drives, clutches, fly wheels;
- Gears, sprockets;
- Screw or worm mechanisms; and
- Points of operation – saw blades sanders, planers, jointers, lathes, etc.

THE ACCEPTABLE GUARD
The following are requirements for an acceptable guard:

- It should protector the operator;
- It should protect others nearby;
- It should be an integral part of the machine;
- It should be convenient to the operator;
- It should prevent access to the danger zone; and
- It should not create a hazard in itself.

For more information on guarding, see CSA Z432 – Safeguarding of Machinery or log onto the Work Safe website (Work Safe.com), under OH&S Regulation, Section 12 – Tools, Machinery and Equipment.

SAFETY STATION REQUIREMENTS

This information in regard to minimum recommended practices for station safety was taken from various OH&S sources, Work Safe sources and others:

- Eyewash station (ANSI Z358.1 – Emergency Eyewash and Showers);
- Electrical emergency cut-off switch located at eye level. Two other cut-off switches should be located in strategic places elsewhere in each shop;
- Gas cut-off switch (normally in metal shop area);
- Fire extinguisher (ABC);
- Fire blankets;
- First aid kit;
- Spill/clean-up kits;
- List of emergency response procedures; and
- Intercom/communication to general office.

Section 6

Machine Equipment Requirements

MACHINE EQUIPMENT REQUIREMENTS

The document produced for the BC School Protection Program entitled **"Heads Up for Safety"** can be used when discussing safe practices with machinery and hand tools in the applied arts classrooms and shop area.

The information discussed in this section can be utilized to enhance the "Heads Up for Safety" document if required.

Here is what we will cover in this section of the manual:

- Recommended safe operating procedures – additional information only; the "Heads Up for Safety" guidelines should be utilized first;
- Recommended layouts and distances between equipment; and
- Recommended designated safe work zones.

RECOMMENDED SAFE OPERATING PROCEDURES (OUTLINED BELOW)

1. Band Saw
2. Buffer
3. Drill Press
4. Grinder
5. Horizontal Band Saw
6. Horizontal Belt Sander
7. Jointer
8. Lathe
9. Mitre Saw
10. Radial Arm Saw
11. Scroll Saw
12. Spindle Sander
13. Squaring Shear
14. Table Saw
15. Thickness Planer

1. Band Saw

a. You must get your instructor's permission before using the band saw.

b. You must always use eye protection.

c. Remove jewellery and loose clothing.

d. Tie back long hair.

e. Make sure all guards are in place.

f. Start the machine only when the blade is free of the material.

g. Keep both hands at the sides of the stock; never on top.

h. Protect hands from excess heat.

i. Use a push stick whenever possible.

j. The saw cuts at a very slow speed; do not use excess force to increase cutting speed.

k. Reduce the feed rate at the end of the cut to avoid sudden break through.

l. If you hear a loud ticking or clicking sound **turn the machine off immediately**; it is a sign that the blade may be about to break.

m. Stop the saw as soon as the cut is completed.

n. Do not remove any stock until the machine has stopped moving.

o. CAUTION: the stock may be very hot.

p. Remove debris on the table and the case with a brush.

2. Buffer

a. Wear safety glasses or a face shield when using the buffer.

b. Keep loose clothing and long hair away from the turning wheels.

c. Always buff using the bottom half of the wheel (below center).

d. Use extra care around openings, corners, or other areas where the wheel can grab and throw the work.

e. Exercise caution to avoid overheating and burns on the hands.

f. Avoid allowing the work to become cramped between the wheel and the machine, the wall, or some other object. Freedom of movement is essential to avoid catching.

g. Make sure the wheel diameter is appropriate for the job.

h. Never use a rag because the work heats up and rags can catch in revolving doors.

i. Always stand to one side of the wheel when applying compound.

3. Drill Press

a. You must get your instructor's permission before using the drill press.
b. You must always use eye protection.
c. Remove jewellery and loose clothing.
d. Tie back long hair.
e. Make sure all guards are in place.
f. Do not touch the revolving chuck.
g. Feed with even and moderate pressure.
h. Reduce pressure as the drill breaks through the bottom.
i. Use lubrication on thick stock and deep holes.
j. If the material becomes caught by the bit, step back and turn off the machine.
k. Turn power off immediately after work is complete.
l. Remove chips with a brush.

4. Grinder

a. Secure all loose clothing especially sleeves and draw strings.
b. Wear a face shield to protect your entire face from sparks and flying material.
c. Allow the wheel to reach full speed before feeding the stock.
d. Check for excess vibration or movement in the wheel.
e. Keep the stock on the tool rest.
f. Use only the face of the wheel.
g. Cool the stock frequently in the water bowl.
h. Keep stock moving across the face of the wheel.
i. Do not continue grinding after the power has been shut off.
j. Do not leave a grinder running.
k. The grinding wheel does not stop turning immediately after the power has been turned off; keep hands and materials away from the wheel until it has stopped completely.
l. Make no adjustments when the wheel is moving.
m. Never wear gloves.

5. Horizontal Band Saw

a. Secure loose clothing.
b. Wear eye protection when using this machine.
c. Start the machine only when the blade is free of the material; never touching.
d. Open feed valve slowly to allow the blade to start the cut without a jerk.
e. Once the cut has started the feed valve may be opened fully to apply full weight.
f. Adjust the coolant feed to allow fluid to reach the bottom of the blade.
g. Stop the machine before removing the material from the machine.
h. Remove unused stock to the rack.
i. Brush off the vice area and soak up any coolant spills.

6. Horizontal Belt Sander

a. Put on safety glasses; tuck in or remove loose clothing.
b. Tie back long hair; remove jewellery.
c. Never wear gloves.
d. Ensure the work area is clean from debris and clutter.
e. Make sure all guards and safety devices are in place and correctly adjusted.
f. Inspect the wood and set up the machine according to the above instructions.
g. Position yourself to the right of the belt, out of the way of any possible kickback.
h. Turn on dust extraction.
i. Turn on machine.
j. Place the wood in the center of the belt.
k. Hold the wood by the edges and remove your hands from the board when it starts to feed into the machine.
l. Never hold your wood with your fingers underneath, as they will get pinched.
m. Never look into the machine. If there is a problem, turn the machine off immediately and get the instructor.
n. After the first pass the table is raised no more than 1 mm (1/8 of a turn).
o. Once you are finished, turn off the machine and clean the area.

7. Jointer

a. Eye protection must be worn.

b. Remove jewellery, eliminate loose clothing and confine long hair.

c. Operate only with guards in place.

d. Make all adjustments with the power off.

e. Joint faces and edges only.

f. Do not joint wood less than 12" long.

g. Use a hold-down push block for jointing surfaces.

8. Lathes

a. Eye protection must be worn at all times.

b. Ask for permission before using the lathe.

c. Remove all jewellery and restrain loose hair and clothing.

d. Understand the operation of the machine and the procedure being performed – do not hesitate to ask questions!

e. Carefully plan and check each job before starting the work and give your full attention to the job.

f. Understand the relative motions of the various parts of the lathe and the stock.

g. Do not run the machine above its proper cutting or feeding speed.

h. Check that the stock is tight in the chuck and that all locks are tight.

i. All filing on the lathe must be done left handed to prevent you slipping into the chuck.

j. Tighten all locks, spin the chuck by hand and have your instructor check you set-up before starting the machine.

k. No not leave the chuck key in the chuck.

l. Do not leave a running machine unattended.

m. Keep hands away from moving parts.

n. Use a brush for removing chips. Do not use bare hands, as the cuttings are very sharp.

o. Never make adjustments to the tool bit or the gears while the machine is running.

p. The chuck should be turned by hand before turning on the lathe.

q. When using the automatic feed, keep your hand on the clutch so you can stop the feed at a moment's notice.

9. Mitre Saw

a. Always use eye protection when using a compound mitre saw.

b. Do not wear loose clothing or jewellery that may get caught and tie back long hair.

c. Never place your hands in the path of the blade.

d. Secure work with a clamp wherever possible.

e. Be sure all guards are in place and are in good working order.

f. Make sure your work is held securely against the fence.

g. Never cut pieces of wood shorter than 6".

h. Support long material at the same height as the mitre saw table.

i. Saw blades coast after the saw has been shut off; never reach toward a spinning blade. After completing a cut, allow the blade to come to a complete stop before raising the blade from your work piece.

<u>Safe Cutting Procedures</u>

a. Check wood for possible safety hazards; loose knots, screws, nails, large cracks, etc. may damage the blade of the saw and can be a safety hazard to the operator.

b. Check PPE: eye protection must be worn; hearing protection is strongly recommended.

c. Secure your work to the saw's table. Larger pieces may be secured by hand if the operator's hands are never within 6" of the blade.

d. The compound mitre saw is much safer if you orient your work so that your dominant hand is on the handle, while your non-dominant hand secures the piece.

e. When your work piece is properly aligned, slowly squeeze the on/off switch, draw the blade down and slowly pull the blade through the wood towards yourself.

f. At the completion of the cut, release the on/off switch, wait until the blade has come to a complete stop, then raise the handle.

g. Remove your work, clean off the table, deposit any trim ends in the designated receptacle.

10. Radial Arm Saw

a. Do not stand in a direct line with the blade.

b. Never carry on a conversation or interrupt a person operating a radial arm saw.

c. Allow the saw to reach full speed before starting the cut.

d. Hold the stock firmly against the tabletop and the rear fence.

e. A push stick longer than the blade's diameter should be used when ripping.

f. Keep proper footing and balance at all times.

g. Never leave the radial arm saw unattended until the blade has come to a full stop.

h. Always remove scrap material from the table with a stick.

11. Scroll Saw

a. Always ask permission before using any machine.

b. Always wear safety glasses.

c. Never wear clothes or other articles that dangle and could catch on the saw.

d. Be sure to perform only operations you know how to do safely.

e. Check the saw to make sure it is in good working order.

f. Make all adjustments with the saw turned off and unplugged (locked out) in cases where the blade is or could be touched.

g. Make sure the hole down is contacting the work before beginning.

h. Make sure that the table is locked in the desired angle before starting.

i. Check the stock for foreign objects and never saw stock containing loose knots.

j. Turn off the saw to clear any materials that are near the blade.

k. Avoid distractions; never look away during a cut and do not allow others to crowd you.

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

m. Never let go of stock during a cut.

n. Do not saw stock that rocks on the table.

o. Do not force stock; let the blade cut the material (or you could break the blade).

12. Spindle Sander

a. Eye protection must be worn.

b. Remove jewellery, eliminate loose clothing and confine long hair.

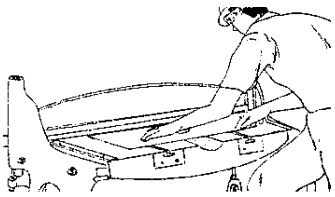
c. Feed wood in the direction opposite to the direction that the spindle turns.

d. Use the smallest table insert that can surround the spindle.

e. Press wood lightly against the spindle.

f. Keep wood tight against the tabletop.

13. Squaring Shear



a. Do not place a foot under the treadle.

b. Only the operator may touch the treadle.

c. Operate the machine from the treadle side only.

d. Keep your fingers away from the hold-down guard and blade.

e. Place all cuttings in the metal waste container.

14. Table Saw

a. Eye protection must be worn.
b. Remove jewellery, eliminate loose clothing and confine long hair.
c. Operate only with guards in place.
d. Always use a fence or mitre guide.
e. Never stand directly in line with the saw blade.

15. Thickness Planer

a. Eye protection must be worn.
b. Remove jewellery, eliminate loose clothing and confine long hair.
c. Operate only with guards in place.
d. Do not plane wood less than 12" long.
e. If wood gets stuck, turn off power then lower the table.
f. Check wood for loose knots and foreign materials before planning.

RECOMMENDED LAYOUTS AND DISTANCES BETWEEN EQUIPMENT

- The information utilized in developing the recommended practices for distances between school technology education shop equipment was taken from several sources, including the recommended safety dimensions of machine tools discussed and located in the 1952 and 1986/1992 BC School Building Manuals and "Safe Working Areas in Schools Workshops" from the Department of Education in Australia.

- The safety distances in these two documents are considered to be entire total of safety dimensions around equipment, so the dimensions discussed were actually divided in half, with one half being provided to each side of the equipment (e.g. recommended distance for a pedestal grinder is 1.4 m x 800 mm; divided in half would be 700 mm x 400 mm for safety dimensions beyond the device itself).

- All distances are typically measured from edge of equipment to edge of equipment. Also as an added consideration, the distances between equipment can be affected depending on the location and size of designated "safety zones" which we will discuss further in the next section of this manual.

- **NOTE: In most cases, designated distances between equipment should not be shared.**

Recommended Safety Dimensions Between Equipment – Wood Technology Shop

Equipment	Recommended Spacing		
	Front	Back	Side
Mitre Box Saw	36”	8”	36”
Radial Arm Saw	36”	8”	36”
Disc Sander	36”	8”	12”
Router Shaper	36”	8”	12” to 36”
Jointer	36”	8”	36”
Thickness Planer	36”	36”	12”
Spindle Sander	36”	8”	24”
Table Saw	36”	36”	24”
Band Saw	36”	36”	12”
Drill Press	36”	8”	12”
Wood Lathes	36”	36”	24”
Bench Grinder	36”	8”	12”

Recommended Safety Dimensions Between Equipment – Metal Technology Shop

Equipment	Recommended Spacing		
	Front	Back	Side
Bench Grinder	36”	8”	12”
Grinder / Finisher	36”	8”	12”
Drill Press	36”	8”	12”
Drilling Machine	36”	8”	12”
Band Saws	36”	36”	12”
Universal Bender	Review	Review	Review
Forge Furnace	36”	8”	36”
Metal Melter	36”	8”	36”
Metal Lathes	36”	36”	24”
Milling Machine	36”	8”	12”
Squaring Shear	36’	36”	12”
Plasma Cutter / Welder	Designated Area	Designated Area	Designated Area

Recommended Safety Dimensions Between Equipment – Auto Technology Shop

Equipment	Recommended Spacing		
	Front	Back	Side
Bench Grinder	36”	8”	12”
Hydraulic Press	36”	36”	12”
Tire Changer	36”	8”	36”
Parts Washer	36”	8”	12”
Drill Press	36”	8”	12”
Brake Service Unit	36”	8”	24”
Pedestal Grinder	36”	8”	12”
Lathe	36”	36”	24”

NOTE: Recommended safety dimensions between lathes was determined to be 36” between each lathe and 24” to 36” between lathes and other equipment.

The recommended safety dimensions were taken from the 1952 and 1986 / 1992 BC School Building Manual – IA shop section and from the “Safe Working Areas in Schools Workshops” from the Department of Education in Australia.

RECOMMENDED DESIGNATED SAFE WORK ZONES

The safety zone is basically a three dimensional space noted where it is painted on the floor and exists up to the ceiling of the school technology education shop area.

The zone exists when the machine is “in use”, and is not to be entered by any person except the operator (student) or the instructor (teacher) when giving instruction.

Some considerations for the design of the safety zone around each piece of equipment will be somewhat unique for each machine. As a general rule, the safety zone markings should reflect the work area where the operator will be located while operating the machinery.

The area designated as the safety zone should be painted a bright yellow and should be surfaced to reduce the possibility of slips and falls.

The designated safety zone should take into account the following:

1. Potential kick back of materials;

2. Projectile debris;

3. Waste accumulation;

4. Noise level;

5. In feed space;

6. Out feed space;

7. User interference – individuals should not be able to reach out and touch machinery while in operation by another individual; and

8. Designated working area (i.e. a scroll saw may only require a designated safety zone of 2 ft. x 2 ft., while a table saw, lathe or other device will require a much larger designated safety zone area).

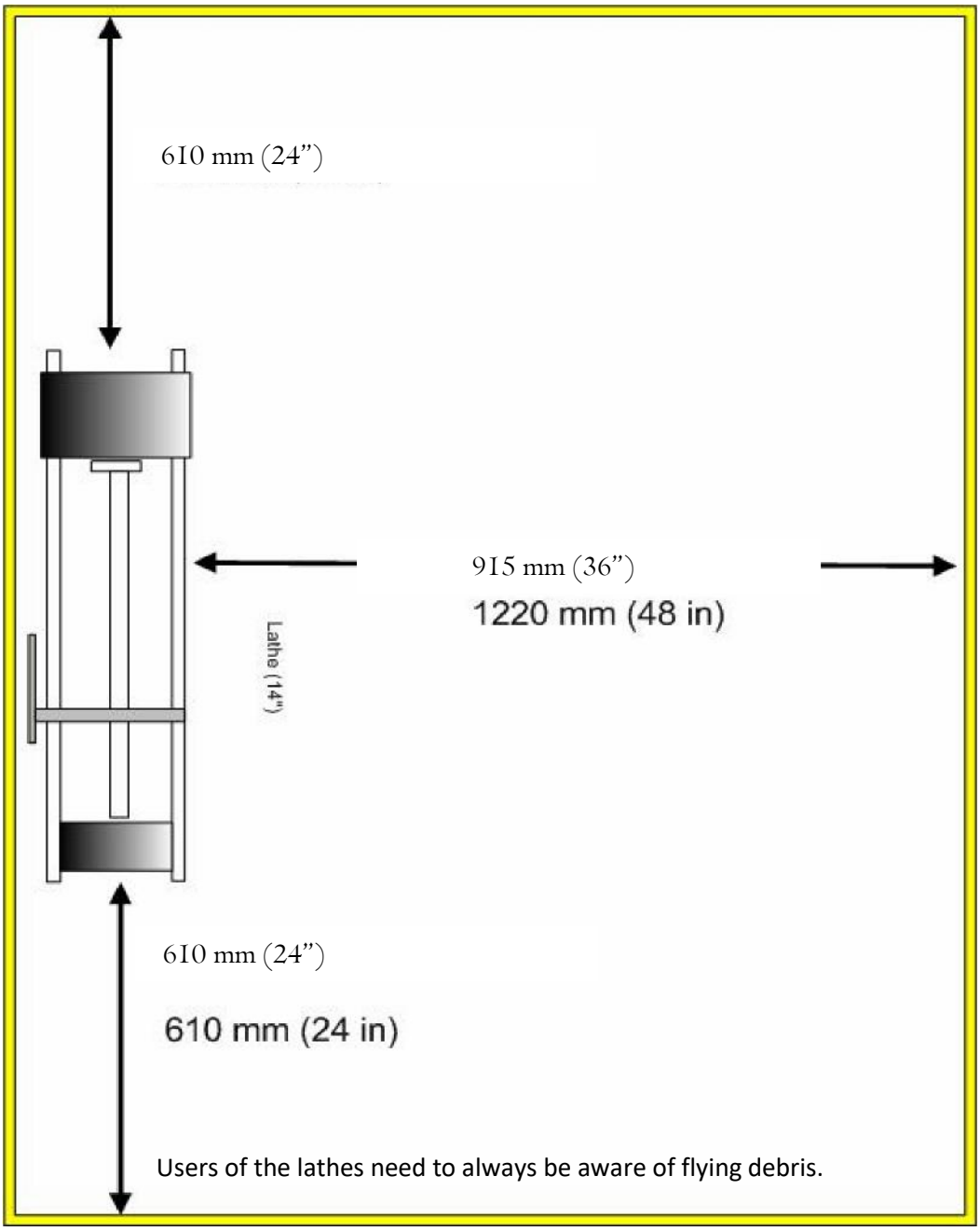
Safety Zone Overlap

Due to shop designs and designated layouts, there will be situations where safety zones may overlap. In these situations, there may be a need to develop a policy whereby overlapping equipment cannot be used at the same time if the safety zone areas will be compromised. In all cases, a full review should be provided to determine potential risks and hazards before the policy is developed.

Examples

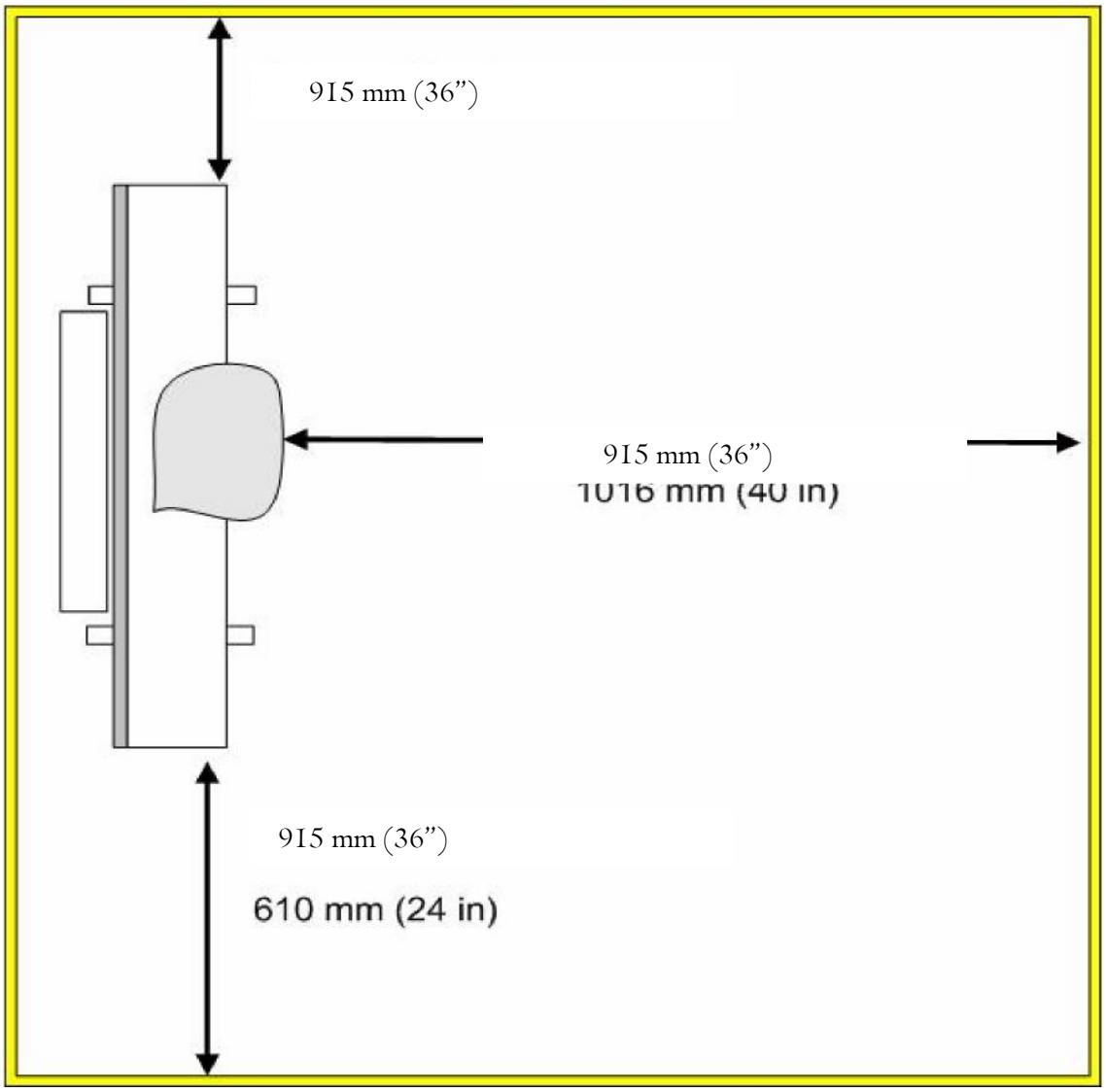
The examples included in this manual are for general descriptions of Safety Zones only. As part of an ongoing program, all Safety Zones should be reviewed and determined based on the use of the machinery before they are fixed on the work floor area.

Lathe

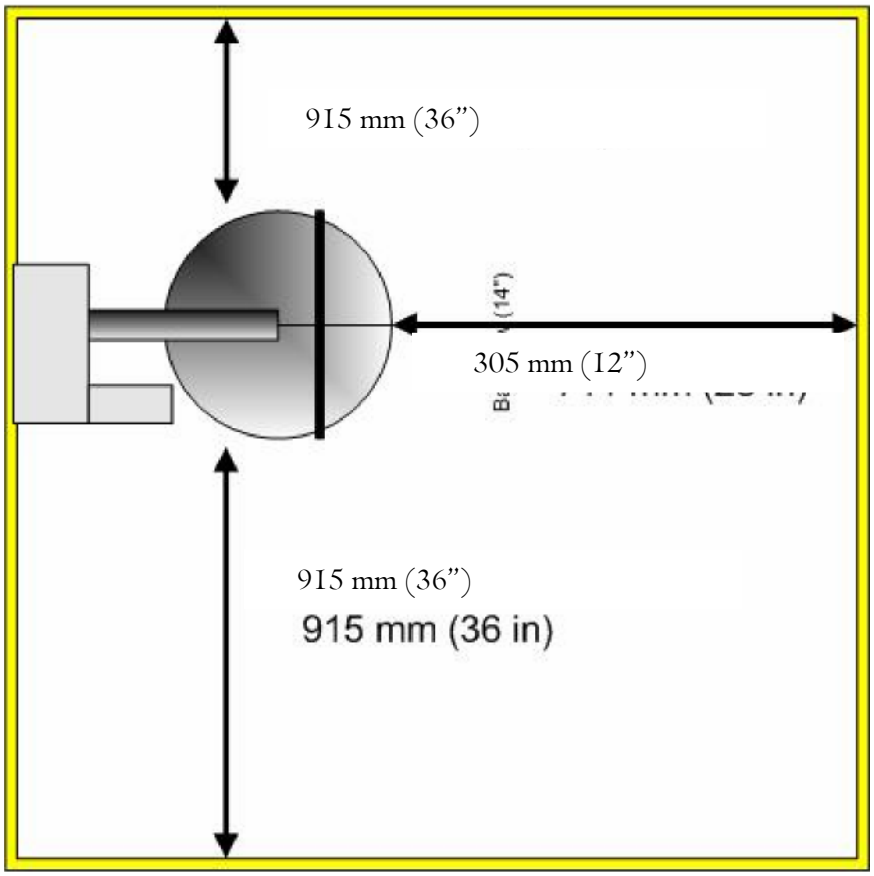


Users of the lathes need to always be aware of flying debris.

Jointer

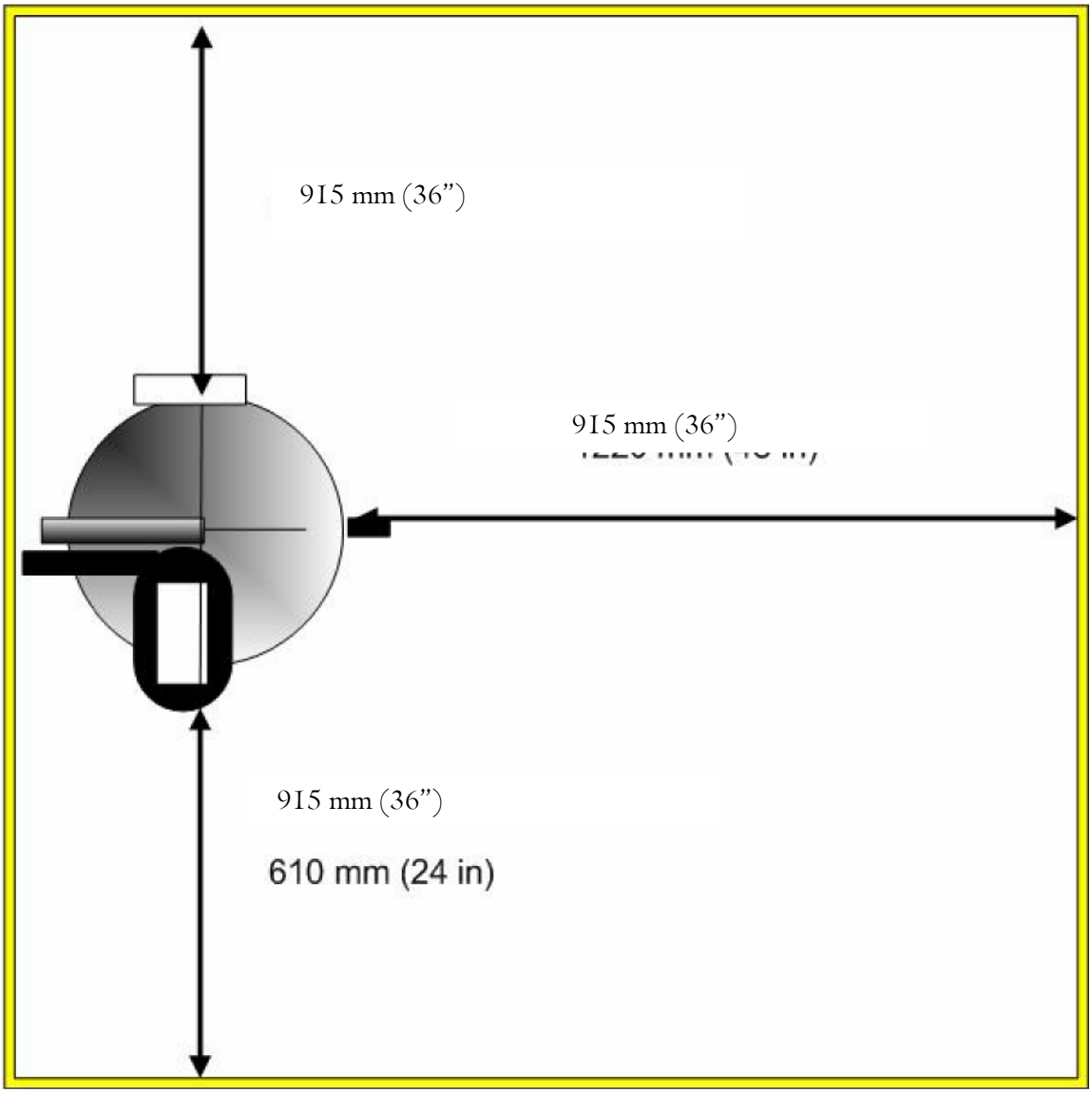


Band Saw



The band saw, having one sided operation, should be mounted against a wall; or two may be mounted back to back. The wheel diameter of the tool limits the width of the stock, but not the length, therefore attention must be paid to the stock length. Longer stock items will require an extension of the safety zone at the infeed and outfeed locations. Also, longer stock will require a helper or a tool aid (such as a roller stand).

Compound Mitre Saw



The compound mitre saw is often used mounted on a mobile stand. Keep in mind that the safety zone may be constantly changing as the stand is moved throughout the school technology shop area. The areas to the sides will also have to be modified to accompany the changing lengths of stock to the crosscut.

Table Saw

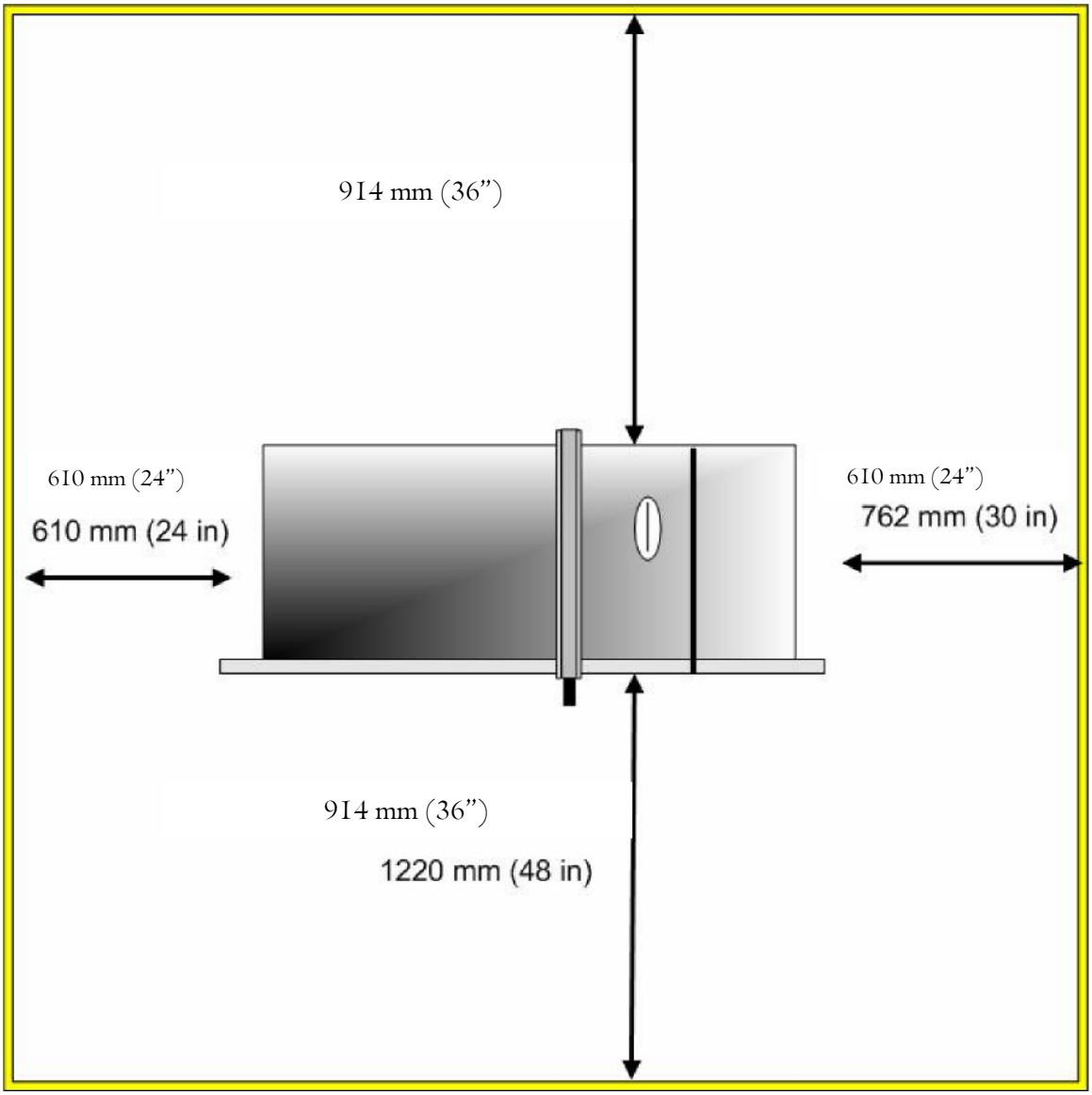


Table saw placement should be such that kick-back hazard is accounted for. Dimensions include spacing for large stock, but when stock in excess of those dimensions is used, the safety zone should be expanded accordingly.

NOTE: Large stock should not be cut with students present. In addition, when a dimension is expanded to allow for larger stock, be sure that an expansion beyond the size of the stock is included.

SUMMARY – GENERAL SAFETY AND RECOMMENDED PRACTICES

Working and learning in a school industrial arts shop can potentially be dangerous if you do not follow some basic safety procedures. In order for you to feel comfortable and work safely amongst your peers, some basic rules must be followed. Below is a list of general rules for students working in an applied arts classrooms and shop environment.

General Safety

1. Always use a tool only for its intended use.
2. Do not rush or take chances. Observe all safety rules.
3. Do not work in the shop if you are excessively tired or fatigued.
4. Do not work under the influence of any substance that impairs your ability to think and work safely (NOTE: some cold remedies may cause drowsiness).
5. Never fool around in the shop or distract another person.
6. Avoid walking behind a person operating a machine; you may bump or startle the operator, causing an accident.
7. Be aware of other people in the room. Make sure your work does not pose a safety risk to those around you.
8. Set up your work area so that it is well organized, well lit and adequately ventilated.
9. Always make sure your area is clean when you are finished.
10. Place all scrap pieces in the correct containers.
11. Store projects in a way that they are not tripping hazards.
12. Never use compressed air to clean your clothes or any machine.
13. Get help for handling large materials or machine pieces.

Machine Safety

1. Never operate a machine without your instructor's permission.
2. Do not set up or operate any machine unless an instructor is in the shop.
3. Work only with properly guarded and safe equipment.
4. Where applicable, use dust extraction devices.
5. Before starting, always ensure the tool/machine you intend to use is clean and working.
6. Only the student operating a machine should be in the painted safety zone around a machine.

Hand Tools Safety

1. Wear safety glasses and goggles at all times.
2. Ensure that you are properly trained in the safe use of hand tools.
3. Select the right tool for the right job.
4. Maintain tools carefully.
5. Keep tools in good condition at all times.
6. Inspect tools for defects before each use.
7. Replace or repair defective tools.
8. Keep cutting tools sharp.
9. Replace cracked and broken handles on files, hammers, screwdrivers, etc.
10. Replace worn wrenches, pipe tools and pliers.
11. Redress burred or mushroomed heads of striking tools.
12. Keep the work area clean at all times.

Safety Equipment and First Aid

1. Always use appropriate eye and hearing protection whenever there is any chance of injury or irritation to your eyes or ears.
2. Know the locations of emergency stop buttons and only use them in case of an emergency.
3. Know the location of the first aid kit and eyewash station. In the event of an accident, seek first aid immediately.
4. Know the locations of fire extinguishers and fire exits.
5. Always be properly dressed for the job you are working on and never wear loose clothing that may be caught by a machine.
6. Always wear appropriate footwear. No open-toed shoes or sandals.
7. Immediately report all accidents or unsafe situations to your instructor, so they may be properly dealt with.

SPECIFIC REGULATIONS (OUTLINED BELOW)

- Finishing Rooms
- Flammable and Combustible Liquid Storage
- Compressed Gases
- Cutting and Welding
- Plasma Cutting
- Heat Producing Devices
- Dust Collection Systems
- Auto Lifts

FINISHING ROOMS – FLAMMABLE LIQUID FINISHING ROOMS, SPRAY BOOTHS AND OTHERS (NOTE: APPLIES TO FLAMMABLE LIQUIDS/VAPOURS ONLY)

The information in regard to minimum recommended practices for finishing rooms was taken from various OH&S sources, Work Safe sources, and the National & Provincial Building and Fire Codes, which reference NFPA 33 and NFPA 30 (see below).

Minimum Recommended Design Requirements

- One hour fire separation with ULC listed door (self-closing), wired glass windows that comply with provincial fire regulations, BC Fire Code, NFPA 33 (spray applications) and NFPA 30 (flammable and combustible liquids code).

- Electrical and Lighting – vapour-proof sealed and interconnected with extraction fan (Class 1, Group D, Division 2). This applies to all electrical equipment in the enclosure including, but not limited to light fixtures, motors, fans, switches, wiring, conduit, heat detectors, etc.

- Class 1 – areas where flammable vapours are present.

- Group D – acetones, lacquers, solvents, etc.

- Division 2 – where a hazard may occasionally be communicated.

- Ventilation – extraction fan (non-ferrous blade) to outside wall, operated by interconnected light switch.

- Standard recommended exhaust fan for flammable and combustible vapours is a minimum of 100 cubic feet per minute.

FLAMMABLE AND COMBUSTIBLE LIQUID STORAGE

- The information in regard to minimum recommended practices for storage of flammable and combustible liquids is taken from several standard and regulations including National and Provincial Fire Codes, NFPA 33 (spray applications) and NFPA 30 (storage of flammable and combustible liquids).

- These codes and standards dictate the minimum precautions to take in regard to storage, handling, transportation, ventilation and general housekeeping.

- All flammable liquids (when not in use) should be stored in a ULC listed cabinet or ULC listed container.

- Standard ventilation should be provided in all areas where cabinets are located or being stored.

- Standard housekeeping practices should be maintained for all cabinets.

- A documented list should be maintained, detailing all materials located in the cabinets with references to SDS sheets and WHIMS standards.

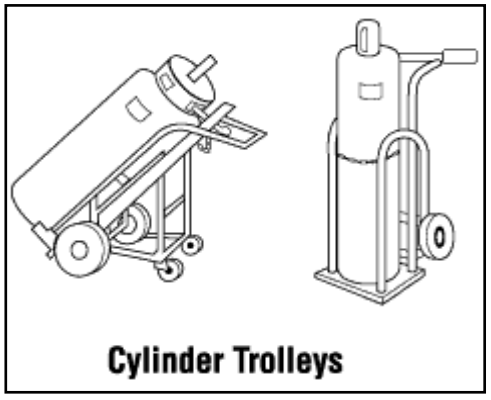
- All cabinets should be inventoried a minimum of once per year. All materials not being used or past due dates should be disposed of accordingly.

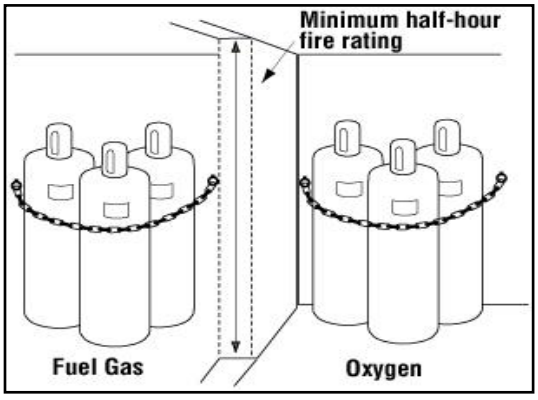
COMPRESSED GASES

There are different types of compressed gases that are utilized and stored within schools and in outside storage areas. Information regarding this can be found under CSA W117.2 – "Safety in Welding, Cutting and Allied Processes" and NFPA 51 – "Design and Installation of Oxygen-Fuel Gas Systems for Cutting, Welding and Allied Processes".

The following recommended practices are taken from various OH&S standards and apply to all schools and other areas that may utilize or store compressed gases:

- Check your fire code for guidelines regarding the storage of flammable gas cylinders.
- Store containers in a clearly identified, dry, well-ventilated storage area away from doorways, aisles, elevators and stairs.
- Post "no smoking" signs in the area.
- Store cylinders in the upright position and secure with an insulated chain or non-conductive belt.
- Secure the protective caps.
- Ensure that the area is well ventilated. With outside storage, place on a fireproof surface and enclose in a tamper-proof enclosure.
- Protect cylinders from contact with ground, ice, snow, water, corrosion and high temperatures.
- Store oxygen and fuel gases separately. Indoors, separate oxygen from fuel gas cylinders by at least 6 m (20 ft.) or by a wall at least 1.5 m (5 ft.) high, with a minimum half-hour fire resistance. (From CSA W117.2-06 – "Safety in Welding, Cutting and Allied Processes". Local jurisdiction requirements may vary.)
- All cylinders should be secured by chains, tied down or by other means, to help prevent accidental knocking over or falls.
- **Propane should not be stored within buildings. It should be stored in a secure, well-ventilated area outside the building when not being used.**





CUTTING AND WELDING

The information in regard to minimum recommended practices for cutting and welding is taken from various OH&S sources and Work Safe sources, including CSA W117.2 – "Safety in Welding, Cutting and Allied Processes" and NFPA 51 – "Design and Installation of Oxygen-Fuel Gas Systems for Cutting, Welding and Allied Processes".

The "Welding, Cutting and Allied Processes" guideline discusses regulations, standards, maintenance, inspection and testing procedures for all cutting and welding procedures. (There are specialized industrial requirements for plasma cutters.)

Welding – Safety Procedures

Personal Protective Equipment

1. Wear leather gloves for handling metals.
2. Use pliers or vise-grips when handling hot materials.
3. Safety glasses and face shields must be worn when chipping, grinding, drilling, punching, chiselling, spot welding, or wire brushing.
4. Frayed and greasy clothing can catch fire easily during welding, cutting or grinding operations; proper clothing must be worn (denim and leather are recommended). Avoid materials such as nylon.
5. Lighters or matches are never allowed in any welding area.
6. Wear appropriate eye, face, body, leg and foot protection, as specified by the teacher.

Housekeeping

1. Sheet metal and other sharp edged materials must be stored in protected-style storage areas and handled with care.
2. Always sweep the weld area before welding and ensure all flammable materials are removed.
3. Keep the welding area free of metal chips and weld splatter.
4. Welding and cutting operations must not be allowed in the vicinity of vehicle fuel tanks or fuel lines.

Gas Welding

1. Gas welding must be done in a place that provides for adequate ventilation which removes fumes, dust and gases from the air.
2. Welding galvanized materials can release toxic gases (which we want to avoid). If in doubt regarding the material, ask your teacher.
3. Know where the fire blanket is located.
4. Lighters and matches must never be allowed in the welding area.
5. Oil or grease on cylinder fittings may cause an explosion. Avoid these materials around the area.
6. Follow the proper lighting and extinguishing techniques for the welding torch as specified by the teacher.
7. Gas cylinders must be fitted with safety caps when in storage or transit.
8. Gas cylinders must be chained securely in the vertical position.
9. Use a striker to light the oxygen/acetylene flame.
10. 1 – 1½ turns on the acetylene cylinder valve will allow full flow from the cylinder, yet also allow fast shut-down in an emergency.
11. Acetylene must be set at pressure less than 15 PSI.

Electric Welding and Arc Welding

1. Always keep welding stations and clothing dry to avoid electric shock.
2. Keep electric arc away from flammable materials.
3. Lighters and matches are never allowed in the welding area.
4. The welding arc produces ultraviolet rays that destroy skin cells. All exposed skin areas must be covered.
5. Welders must be protected by an approved welding helmet and heat/spark resistant clothing (leather preferred).
6. All people in the room must be protected from the rays of electric welding (protective curtains must be fully drawn).
7. Only strike an arc when you and others are ready and suitably protected.

PLASMA CUTTING

Plasma cutting areas are being adopted more and more in various welding shops to enhance the present teaching methods and curriculum development.

The safety factors for plasma cutting are very similar to those listed in regard to electrical and compressed gas welding and cutting.

See below for recommended practices in regard to safety, isolation and ventilation for plasma cutting areas.

General Safety

CSA W117.2 – "Safety in Welding, Cutting and Allied Processes" and NFPA 51 – "Design and Installation of Oxygen-Fuel Gas Systems for Cutting, Welding and Allied Processes" referenced.

- Hot metal and sparks blow out from the cutting arc. The flying sparks and hot metal can cause fires and burns. Check and be sure the area is safe before doing any cutting.
- Remove all flammables within 35 ft. (10.7 m) of the cutting arc. If this is not possible, tightly cover them with approved covers.
- Do not cut where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot material.
- Be alert that sparks and hot materials from cutting can easily go through small cracks and openings to adjacent areas.
- Watch for fire and keep a fire extinguisher nearby.
- Be aware that cutting on a ceiling, floor, bulkhead or partition can cause fire on the hidden side.
- Do not cut on closed containers such as tanks or drums.
- Connect work cable to the work as close to the cutting area as practical to prevent cutting current from traveling long, possibly unknown paths and potentially causing electric shock, sparks and fire hazards.
- Do not use a plasma cutter to thaw frozen pipes.
- Never cut containers with potentially flammable materials inside; they must be emptied and properly cleaned first.
- Do not cut in atmospheres containing explosive dust or vapours.
- Do not cut pressurized cylinders, pipes or vessels.
- Do not cut containers that have held combustibles.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap.
- Do not position unit on or over combustible services.

- Remove any combustibles (e.g. butane lighters or matches, etc.) from your person before doing any cutting.
- Follow requirements on OSHA 1910.252 (a)(2)(iv) and NFPA 51 B for hot work and have a fire watcher and extinguisher nearby.

Eye and Face Protection (ANSI Z94.3 – Eye and Face Protection)

Arc rays from the cutting process produce intense visible and invisible (ultra violet and infrared) rays that can burn the eyes and skin.

- Wear face protection (helmet or shield) with a proper shade of filter lenses to protect your face and eyes when cutting or watching. ANSI Z49.1 Safety Standards suggests a No. 9 shade (with No. 8 as minimum) for all cutting currents less than 300 amperes. Z49.1 adds that lighter filter shades may be used when the arc is hidden by the work piece. As this is normally is the case with low current cutting, there are shades suggested in the ANSI Z49.1 – "Table 1 Guide for Shade Numbers" for an operator's convenience.
- Wear approved safety glasses with side shields under your helmet or shield.
- Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton or wool) and foot protection.

Isolation, Ventilation, etc.

Cutting produces fumes and gases; breathing these in can be hazardous to your health.

- Keep your head out of the fumes and do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove cutting fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Safety Data Sheets (SDS) and the manufacturer's instructions for metals to be cut, coatings and cleaners.
- Work in a confined space only if it is well ventilated or while wearing an air-supplied respirator. Fumes from cutting and oxygen depletion can alter air quality, possibly causing injury or death; be sure the breathing air is safe.
- Do not cut in locations near degreasing, cleaning or spraying operations. The heat and rays of the arc can react with vapours to form highly toxic and irritating gases.
- Do not cut on coated metals such as galvanized lead or cadmium plated steel unless the coating is removed from the cutting area and the area is well ventilated, and only while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes when cut.
- Do not cut containers with toxic or reactive materials inside or ones that have previously held toxic or reactive materials; they must be emptied and properly cleaned first.

HEAT PRODUCING DEVICES

For the purposes of this manual, this section will discuss various types of heat producing devices that may be used in IA technology shops.

These devices include primarily forges, metal melting equipment and soldering equipment.

This equipment can be found and used in areas like metal casting, metal work, jewellery making and electronics courses.

Forges and Metal Melting Equipment

- Forges and metal melting equipment are utilized to melt metals at high temperatures for molding, jewellery making and other metal related processes.
- The obvious dangers inherent with forges are the high temperatures of operation, as well as potential for splashing and burns when pouring or mixing heated metals.
- It is advisable that all forges and metal melting equipment be located in a separate area of a technology shop with standard isolation, ventilation and safety features provided.
- Most metal forges and metal melting equipment is natural gas fired; thus, standard shut-offs should be provided (including emergency shut-offs and gas line lockouts).
- Protective equipment should be utilized when working with forges and metal meting equipment in order to protect the eyes, hands and body.
- Standard safety rules and procedures should be developed, posted and followed at all times.

Soldering Iron

A soldering iron is a hand tool most commonly used for soldering. It supplies heat to melt the solder so that it can flow into the joint between two work pieces.

A soldering iron is composed of a heated metal tip and an insulated handle. Heating is often achieved electrically by passing an electric current (supplied through an electrical cord or battery cables) through the resistive material of a heating element.

Soldering irons are used in jewellery making classes, etching and other related activities.

- Soldering irons produce heat so there is always the potential for burns or related injuries.
- Because soldering involves the melting of materials, standard ventilation should be provided.
- Protective equipment which should be utilized when working with soldering irons and other related equipment should protect the eyes, face, hands and body.
- Standard safety rules and procedures should be developed, posted and followed at all times.

<u>Safe Operating Procedures</u>

1. Wear eye protection when soldering.
2. Check the power cord for damage before plugging it in.
3. Do not flick excess soldering off the tip; wipe it on a moist sponge or a towel.
4. Handle hot objects with extreme care and report any burns to your teacher.
5. Wash your hands with soap and water when finished soldering.
6. Avoid breathing in soldering fumes.
7. Always replace the soldering iron in the stand when you are finished using the iron.

DUST COLLECTION SYSTEMS

The information in regard to minimum recommended practices for dust collection systems was taken from various National and Provincial Fire Codes and NFPA 664 – "Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities".

Minimum Recommended Design Requirements

- Adjacent to shop; access to outside only (isolated).
- Minimum of 1 hour fire-resistive construction.
- Electrical equipment must meet or exceed all provincial electrical code requirements for combustible dust laden occupancies (Class 2, Group G, or Group E, Division 1). This applies to all electrical equipment in an enclosure including, but not limited to light fixtures, motors, fans, switches, wiring, conduits, etc.
- Class 2 – Areas where combustible dusts are present.
- Group G – Areas that include non-conducting dusts, etc. (i.e. wood shops)
- Group E – Areas where metal dusts are present, etc. (i.e. metal shops)
- Division 1 – Where hazard exists continually.
- If a "return air duct" is provided, then a ULC listed fire damper needs to be installed.

Recommended Velocities Based on Type of Dust to be Extracted

Type of Dust	Velocity in Branches (FPM)	Velocity in Main (FPM)
Metalworking Dust	5000	4500
Woodworking Dust	4500	4000
Plastic/Other Light Dust	4500	4000

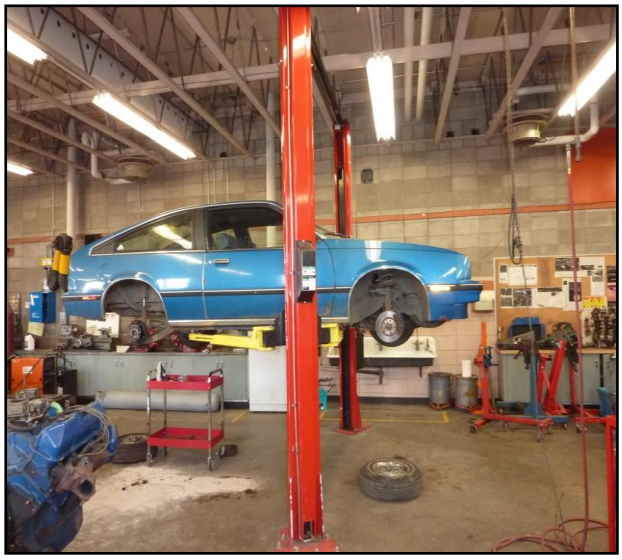
AUTO LIFTS

The information in regard to minimum recommended practices for auto lifts is taken from various OH&S sources, Work Safe sources and ANSI/ALI ALCTV-2006, "American National Standard for Automotive Lifts – Safety Requirements for Construction, Testing and Validation".

The "Automotive Lifts and Other Vehicle Supports" guideline discusses regulations, standards, maintenance, inspection and testing procedures for all automotive lifts.

Safe Operating Procedures

1. Must be inspected and tested a minimum of once every month; more if required by manufacturer.
2. Rated capacity of the lift must be marked on each auto lift.
3. Manual wheel chocks must be used as the primary means to restrain the vehicle from movement, and automatic or fixed stops (or a combination of them) must be provided and used as a secondary means, to prevent the vehicle from inadvertently rolling off either end of the runway.
4. The employer (school) must keep a maintenance, inspection and modification and repair record for each automotive lift.
5. Full safe operating procedures must be provided to all students before they use an auto lift.
6. All shop hoists need to have an annual inspection provided by a certified inspector.
7. Monthly documented safety inspections should be provided for all shop hoists.



POTTERY AND ARTS ROOMS

The information in regard to minimum recommended practices for pottery and arts rooms is taken from various OH&S sources and Work Safe sources.

The "Pottery and Arts Rooms" guideline discusses regulations, standards, maintenance, inspection and operational procedures for all pottery and arts room areas.

Safe Operating Procedures

1. All exposed pottery wheel belts, motors, pulleys, and other related items should be provided with standard contact guards.
2. Documented inventories of all materials used in pottery and arts rooms should be maintained.
3. Arts and crafts materials may cause adverse health effects; MSDS sheets should be provided and maintained on all materials used in an arts and crafts room.
4. Spraying operations should be maintained in a standard ventilated hood setting with standard PPE being provided.
5. All materials should be stored according to type.
6. Flammable materials should be stored and distributed in ULC listed cabinets and/or containers only.

POTTERY KILNS

The information in regard to minimum recommended practices for pottery kilns is taken from various OH&S sources, CSA standards, loss prevention practices and Work Safe sources.

The "Pottery Kilns" guideline discusses regulations, standards, maintenance, inspection and operational procedures for all pottery and kiln areas.

Safe Operating Procedures

1. Operating instructions should be readily available with emergency instructions clearly displayed on or near to each kiln.
2. Anyone who operates a kiln should have knowledge of the position, function and setting of all controls and safety devices, and be able to recognize faults and cope with abnormal or emergency situations.
3. The kiln's electrical installation should be regularly inspected. Electrical installation should be periodically (annually) tested to ensure that the grounding, insulation and connections are maintained in a safe and efficient condition.
4. When purchasing kiln bats (shelves), they must always allow airflow around them during firing; therefore, they need to be 50mm smaller than the muffle size (internal dimension) of the kiln (i.e. if the muffle size is 300mm x 300mm, then the shelf must be 250mm, unless manufacturer's instructions state otherwise). When packing a kiln, props must always be placed directly above one another; this avoids damage and the collapse of kiln bats.
5. Kiln bats are protected during glaze firing with a covering of kiln placing sand. The making and use of bat wash using silica is not accepted and is dangerous to your health.
6. Regular light maintenance of kilns is recommended: kiln element runs can be lightly swept or vacuumed to maintain optimum performance; and regular visual checks on the condition of the kiln interior. A suitable respirator and eye protection must be worn, and where a vacuum cleaner is used this must be fitted with a minimum 4-micron filter.
7. The changing of kiln elements must always be carried out by a qualified electrician.
8. Suitable proprietary kiln gloves should be used if a hot kiln must be unloaded.
9. There is now no longer a need to look into a kiln during firing. The only exceptions are where staff needs to test a kiln firing using cones; or where concerns regarding a kiln's operation are being checked. In these circumstances, dark shaded glasses must be used when looking into a hot kiln through the spy hole.
10. Staff who are pregnant, or suspect that they are pregnant, should not be involved in the loading or firing of kilns, or work in a room where a kiln is located and regularly fired.

Choosing and Installing Kilns

1. Kilns should be situated with due regard to ventilation and heating, mechanical hazards, means of access, lighting, and any impact of their operational noise on teaching spaces.
2. Kilns should be situated within a short distance of the ceramics/pottery teaching and storage area to avoid transportation of work from classrooms and storage. Schools may wish to consider that the placement and use of a kiln will also require regular transport of bulky and heavy materials such as clay to the teaching areas. If kilns are installed in inaccessible areas or where access only by stairs is provided, then costs will increase.
3. Kilns may be situated in a classroom or in a kiln bay, only when they are protected by an adequate cage providing safe access for qualified staff, where ventilation arrangements are suitable and the placement and use of the kiln does not restrict or disrupt teaching and learning within the room. Kilns are better placed within a separate room set aside for this purpose, such as a storeroom. A kiln room will need to be sufficiently large to provide adequate space for access to the kiln for loading and any necessary repairs.
4. Adequate ventilation is necessary; particularly in rooms with low ceilings or in classrooms, a canopy to carry heat and fumes from the kiln to outside is required, as most fires involving ceramic kilns occur at night due to overheating of the wood forming part of the construction of roofs/ceilings/floors around kilns. If flammable vapours are being extracted, then specific requirements per the Provincial Building and Fire Code need to be adhered to, as well as the applicable NFPA standard.
5. If extracting just for heat, then the hood / ventilation system should be designed to extract all heat and resultant vapour.
6. Adequate clearance should be maintained between hot surfaces and flue pipes and any part of the building structure. Kiln should be isolated on all sides from combustible materials, as well as the floor. See the “Pottery Kiln Shielding” section below.
7. A standard, non-combustible pad should be provided; ensure pad is installed correctly to prevent movement of heat combustible materials by conduction.
8. Standard non-combustible finishes should be provided on all exposed sides of the pottery kiln. Again, the same rules apply as above: these should be designed to prevent movement of heat through conduction to combustible materials.
9. Kilns cannot be located in boiler rooms, mechanical rooms, storage rooms or other mixed-storage areas.
10. Front loading kilns are preferred. Top loading kilns are more cost effective, but the loading of such kilns can exacerbate back problems for staff. The fitting of suitable local exhaust equipment and hood can also make the use of such kilns more difficult.
11. Combustible equipment, teaching, and cleaning materials, should not be stored close to any kiln (these should be a minimum of 4 feet away) and never inside a kiln cage.
12. If a kiln has been installed or moved, the Fire Safety Plan (FSP) may need to be revised.
13. An appropriate fire extinguisher **(minimum of 1-ULC listed 1040BC)** should be immediately accessible outside the kiln room or cage **(within 20 feet of the kiln)**.
14. All kiln installations must meet or exceed the requirements of the provincial electrical code.

15. Bulkhead warning lights are normally situated above the kiln, but are more usefully placed above the kiln room door (to give clear warning of a kiln firing). These lights should be fitted with two red bulbs (so that if one fails, the other still gives clear indication of a firing in progress). Bulkhead warning lights must be wired into the kiln circuitry to indicate when the kiln is powered on.
16. A protective barrier (i.e. a metal cage) is required for any kiln not situated in a separate room, such as those in a classroom or kiln bay. The kiln cage will need to stand far enough away from the front of the kiln to allow kiln doors to be opened; or alternatively, be fitted with sets of gates to allow kiln doors to be opened and allow access to the kiln for packing and firing. The kiln cage should be constructed as a frame (preferably metal) and covered with a mesh of a sufficiently small gauge to prevent students from reaching through the cage. Access to the kiln via gate is for suitably experienced staff only.
17. The gates or system of access to a kiln cage, kiln bay or kiln room should be fitted with a lock to prevent student access. Students must not be able to access a kiln during firing.
18. Sufficient space should be provided around kilns to provide access for repairs and maintenance. A minimum of 4 feet clearance at the front of the kiln is required. For the back and sides, see the "Pottery Kiln Shielding" section below.
19. Storage within the kiln cage area should be limited to essential kiln 'furniture', stored in such a way that it will not prevent safe access around the kiln, and the storage of students' clay work on appropriate racks.
20. Most modern kilns have refractory ceramic fiber as part of their construction. This should be treated with care, as inhalation of the fiber dust and contact with the skin should be avoided. The use of personal protective equipment (i.e. dust respirators) may be necessary (if cleaning work is being carried out on the kiln or where excessive dust is evident when loading or unloading the kiln).
21. Older kilns may be insulated with asbestos materials. Specialist advice should be obtained if any work on a kiln which would expose or disturb asbestos is planned, or may occur accidentally.
22. Kiln controllers should not be accessible from outside the kiln cage area, but should be positioned to provide ease of access for staff from within the kiln cage. Kiln controllers should be fitted away from the front of the cage, on a solid wall to one side and in front of the kiln. Easy and safe access is needed in case of emergency to switch off the kiln.

<u>Kiln Safety Devices</u>

A heat fuse or temperature cut off device should be installed for safety purposes and to prevent damage to the kiln in the event of over-firing.

<u>Decommissioning Kilns</u>

The disconnection and removal of any kiln will need to be carried out with care and only by suitably qualified electricians or kiln specialists.

Older kilns are often constructed with an outer or inner lining of asbestos, and should **<u>never</u>** be dismantled. After electrical disconnection, all kilns should be wrapped in polythene and removed. Kilns should **<u>never</u>** be abandoned on school sites, or left outside a classroom.

Pottery Kiln Shielding

Be sure to maintain **clear spaces from combustibles of at least 48" on all sides** of the pottery kiln.

Distances can be reduced to the back and sides of the unit, **but not the front**, by utilizing the following recommended shielding chart:

REDUCING CLEARANCES WITH SHIELDING		
Type of Protection (shield)	**Sides and Rear %**	**Top %**
Sheet metal, a minimum of 29 gauge in thickness spaced out at least 21mm (7/8 in.) by non-combustible spacers.	67 %	50 %
Ceramic tiles, or equivalent non-combustible materials on non-combustible supports, spaced out at least 21mm (7/8 in.) by non-combustible spacers.	50 %	33 %
Ceramic tiles, or equivalent non-combustible materials on non-combustible supports, with a minimum of 29 gauge sheet metal backing, spaced out at least 21mm (7/8 in.) by non-combustible spacers.	67 %	50 %
Brick, spaced out at least 21mm (7/8 in.) by non-combustible spacers.	50 %	N/A
Brick, with a minimum of 29 gauge sheet metal backing, spaced out at least 21mm (7/8 in.) by non-combustible spacers.	67 %	N/A
NOTE: A minimum of a 1" to 3" clearance should be maintained between the bottom of the shield and the floor, and the top of the shield and ceiling (if so installed), to allow for free air flow behind the shield.		

COSMETOLOGY – HAIRDRESSERS AND ESTHETICS

The information in regard to minimum recommended practices for cosmetology is taken from various OH&S sources and Work Safe sources.

The "Cosmetology – Hairdressers and Esthetics" guideline discusses regulations, standards, maintenance, inspection and operational procedures for all cosmetology rooms and areas.

Health and Safety for Hairdressers – Safe Operating Procedures

1. Sanitize implements prior to each service to remove all visible debris and dirt by cleansing with antibacterial soap, warm water and a scrub brush; dry with a disposable towel.
2. Compressed air is an effective method for removal of residual hair from clippers and electrical appliances.
3. Use an ultrasonic unit or solvent on metal bits.
4. Disinfect implements (e.g. combs, brushes, scissors, etc.) by completely immersing them in a disinfectant solution (or 10% bleach solution) for the time specified on the product label.
5. To disinfect fine cutting implements or electrical appliances, rub surface with a cotton pad dampened with 70% ethyl alcohol or 99% isopropyl alcohol.
6. Place all disinfected tools in a dry container, UV sanitizer or dry sanitizer, when not in use.
7. Sanitize and disinfect all bowls and multi-use equipment immediately after using, dry with a disposable towel and store properly.
8. Use disposable neck strips between the client's neck and cape or gown; never allow the client's skin to touch the cape or gown.
9. Sterilize reusable straight razors by using either a steam autoclave, or 100% undiluted bleach for 30 minutes.
10. Use antiseptic and disposable gauze to treat minor cuts and abrasions.
11. Powder or liquid forms of antiseptics are acceptable; use a disposable applicator to remove product from its container if contact with the skin is required.
12. Always wear protective, vinyl gloves when applying chemical product.
13. Always use a protective barrier cream on the client's hairline before applying perm solution, change the cotton batting around the hairline often, and never allow damp cotton to remain on the client's skin.
14. If dripping of any chemical product occurs, immediately wash skin with warm soapy water.
15. Discard any unused product that has been removed from its container.

Health and Safety for Esthetics – Safe Operating Procedures

Skin Care and Facials

1. Wear protective, vinyl gloves if you are performing a service that exposes you to a client's blood or bodily fluids.
2. Keep fingernails short and smooth to avoid scratching a client.
3. Place clean linen or a single use, disposable sheet on the bed for each new client.
4. Provide a new loofah or sponge for each client; never reuse.
5. Change water in facial steamers daily.
6. Remove product from containers using pumps, squeeze bottles with dispenser caps or disposable spatulas.

7. Discard any unused product that has been removed from its container.
8. Always check the integrity of the packaging of any item stored in sterile packaging.
9. Any object that is exposed to blood or bodily fluids must be discarded, properly autoclaved or sterilized.
10. Discard disposable items, porous implements and sponges, immediately following service.
11. Sanitize and disinfect all non-porous tools (e.g. brushes, tweezers, and comedone extractors) immediately after use. Rinse and dry tools with a disposable towel and store in a covered container, UV sanitizer or dry sanitizer.
12. Sanitize and disinfect all bowls and multi-use equipment immediately after use, dry with a disposable towel and store properly.
13. Discard gloves, disposable items and porous implements immediately after each client.
14. Dispose used materials as biomedical waste; contact your local waste management authorities for proper disposal direction.
15. Safely discard lancets, sharps and needles into a clearly identified “biological hazard” puncture-proof container, immediately after use.

Waxing and Hair Removal

1. Wear protective, vinyl gloves if you are performing a service that may expose you to a client's blood or bodily fluids.
2. Place clean linen or a single use, disposable sheet on the waxing table for each client.
3. Examine your client's skin prior to waxing: if skin is irritated, infected or broken, do not proceed with service.
4. Always test the temperature of the heated wax on your forearm before applying the wax to a client's skin.

5. Sanitize the client's skin prior to a service by using an antiseptic (e.g. witch hazel, toner, astringent).
6. Use powder or cornstarch to buffer the skin before applying the hot wax.
7. Use a new spatula or applicator stick for each client and discard after use.
8. DO NOT double dip unless you are disposing of the wax pot after treating that particular client.
9. Use a new spatula or applicator stick every time you dip into the wax pot.
10. Never reuse wax.
11. After waxing treatment, apply wax remover on the client's skin to remove residual wax.
12. Apply a soothing lotion to calm the client's skin.
13. Clean the wax machine after each use; cover and turn off the heat at the end of each day.
14. Any object that is exposed to blood or bodily fluids must be discarded, autoclaved or sterilized.
15. Discard any unused product, gloves, disposable items and porous implements immediately after each client.

Makeup

1. Keep fingernails short and smooth to avoid scratching a client.
2. Use a sanitized headband or hair clip on a client during the procedure.
3. Launder all linens that touch the client after each use.
4. Only use brushes and implements that have been properly sanitized and disinfected after each use.
5. Use a disposable spatula to remove product from its container.
6. Eyeliner and lip liner pencils must be sharpened after each client and cleaned properly at the end of each day.
7. Use an antiseptic on tweezed areas of the brow and face to avoid infection.

Nail Care – Nail Technician and Manicurist

1. Wear protective, vinyl gloves if you are performing a service that may expose you to a client's blood or bodily fluids.
2. Sanitize all reusable implements after use by rinsing away all traces of visible debris, scrub with antibacterial soap and warm water and dry with a disposable towel.
3. Follow this by completely immersing non-disposable, multi-use tools (i.e. cuticle nippers, pushers) in a chemical disinfectant, 70% ethyl alcohol or 99% isopropyl alcohol.
4. Always follow the manufacturer's recommendations and time specified on the label.
5. Sanitize and disinfect finger bowls and other reusable items, dry with a disposable towel and store properly.
6. Always use brand new porous implements (i.e. nail files, buffers, orange wood sticks) on each client. NEVER reuse.
7. Clients must wash his/her hands thoroughly prior to service.

8. Thoroughly assess each client's nails prior to each service; look for unhealthy conditions such as fungus or infection.
9. If the conditions are deemed unhealthy, do not perform the service.
10. If the client displays any signs of nail fungus, redness, pus, itching or bacterial infections, do not perform the service; advise the client to see a physician for appropriate treatment.
11. When applying nail product (i.e. acrylic, gel) never double dip brush in the product's container.
12. Remove product into a disposable container using a disposable spatula.
13. Discard gloves, disposable items and porous implements immediately after each client.
14. Rinse with warm water, dry with a disposable towel, and store all implements in a clean container, UV sanitizer, or dry sanitizer.

Nail Care – Pedicurist

1. After each use, all equipment that holds water for pedicures must be thoroughly sanitized by cleaning all areas (including surfaces and walls) of the foot spa or basin with a chelating detergent and scrub brush. Rinse with hot water, dry with a disposable towel.
2. Clean and disinfect the scrub brush.
3. Follow with a liquid disinfectant; if a whirlpool spa, circulate water and disinfectant well.
4. Drain and rinse with hot water, dry with a disposable towel.
5. At the end of each day, allow the foot spa to completely dry overnight.
6. At the end of each week, leave the disinfectant solution in foot spa overnight. Drain, rinse with hot water, and dry thoroughly with a disposable towel.
7. Always follow manufacturer's recommendations and time specified on the product label.

HOME ECONOMICS (HOME EC.) – FOOD OPERATIONS

The information in regard to minimum recommended practices for home economics food operations is taken from various sources, including Occupational Health & Safety (OH&S) and Work Safe sources.

The "Home Economics (Home Ec.) – Food Operations" guideline discusses regulations, standards, maintenance, inspection and operational procedures for all home ec. food operations and areas.

Health and Safety – Home Ec. Food Operations

1. Review all layouts to allow for smooth operations within the home ec. classroom and prevent unnecessary congestion.
2. Worktables and moveable equipment should be positioned in a manner to allow sufficient movement for all students.
3. Electrical equipment should be located away from water supplies whenever possible.
4. Work surfaces should be suitable and easy to clean. There should be no cracks or open joints, damaged counter surfaces or other areas that might act as dirt traps.
5. The floor surfaces should be of a non-slip variety and free from risks of tripping.
6. The main switches for electricity, gas and water supplies should be within easy reach and clearly labelled.
7. Pilot lights should be considered for all electrical outlets.

Storage – Equipment

1. The storage of materials, tools and equipment should be carefully arranged for safe, effective work. Heavy article storage should be in the lower levels of the cupboards.
2. Knives, sharp items and cutlery should be safely stored in drawers or cupboards to help reduce the potential for injury.
3. Glasses, cups, plates and other related items should be secured in cupboards to prevent accidental knocking over or damage.

Storage – Food Items

1. Food items should be stored based on recommended practices, taking into account refrigerated items, frozen items, canned goods, dry goods, spices, etc.
2. Keep all fresh foods covered.
3. Store raw foods and cooked foods separately in refrigerator to avoid cross-contamination.
4. Do not use foods that have an unusual color, appearance, texture or odour.

5. Maintain recommended temperatures in all refrigerators and freezers.
6. For dry and canned goods, put opened packs in airtight containers.
7. All food items should be labelled.
8. Use food in rotation; oldest items always used first.
9. Empty canned foods if not all used all at once into a non-metallic container, cover and refrigerate.
10. Discard any rusted, blown cans.

11. All precautions should be taken to help minimize exposure to contamination.

Home Ec. – Equipment Use and Safety

1. Equipment in a home ec. classroom should be operated only under full supervision from the instructor.
2. Ensure all operational and safety features of a piece of equipment is fully taught and/or explained to the student before use.
3. Students who have not received operation and safety training on a piece of equipment should not be allowed to use it.
4. All equipment should be operated on a flat stable surface.
5. Inspect all electrical cords, connections, prongs, etc. before each use.
6. Electrical equipment with loose cords, frayed wiring or damaged connections should not be used.
7. Inspect all cooking equipment, including but not limited to pots, pans, utensils, containers, etc. before each use. Damaged items should not be used.

Home Ec. – Health and Safety

1. Protective, vinyl gloves are required if you are washing dishes or cleaning equipment and/or countertops.
2. When performing food preparation, hair should be controlled, tied back or covered, to help prevent contamination.
3. Handle cleaning agents, detergents, disinfectants, bleaches and other materials carefully to avoid contamination or potential injury.
4. All cleaning agents, detergents, disinfectants, bleaches and other materials should be securely stored and only used under full supervision of the instructor.
5. Follow all directions when using any cleaning or disinfection products.
6. A standard emergency eyewash station should be provided in the classroom:

a. **<u>Emergency Eyewash Station</u>:**

In addition to having students and staff wear personal protective equipment, students and staff involved in the handling and using of corrosive chemicals such as **bleach, cleaning products, degreaser etc.** need to have provisions for flushing their eyes in case of eye exposure. Depending on the chemical used, a cooking operation may be required to have an emergency eyewash station. Staff / teachers need to refer to the material safety data sheet (MSDS) of the chemical in use for specific requirements.

When eyewash is required, teachers need to make sure that the classroom has a properly functioning emergency eyewash that meets ANSI Z-358.1 requirements (it should be labeled as such). Having an emergency eyewash also helps students whose eyes may have accidently come in contact with materials such as **hot oils, peppers, etc.**

7. A standard 3A10BC multi-purpose fire extinguisher should be provided in the classroom.
8. A first aid kit should also be provided in the classroom.

<u>Home Ec. Food Operations – Safety Rules</u>

1. Always cut with an appropriate knife and away from your body.
2. Always use potholders when handling hot containers.
3. Immediately wipe up spills. Inform the instructor of any large spills and restrict area until it is cleaned up.
4. Do not operate or connect electrical equipment if hands are wet or you are standing on a wet floor.
5. Know the location of the fire extinguisher, emergency eyewash, first aid kit and other equipment.
6. Always turn pan handles to the back or side of the range to prevent spills when cooking.
7. Never leave an operating stove unattended.
8. Do not place flammable materials on or near stovetops.
9. Disconnect appliances by pulling out the plug properly.

HOME ECONOMICS (HOME EC.) – FABRICS (SEWING AND TEXTILES)

The information in regard to minimum recommended practices for sewing and textiles operations is taken from various OH&S sources and Work Safe sources.

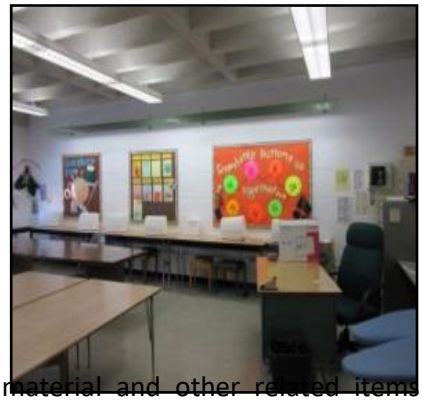
The "Home Economics (Home Ec.) – Fabrics (Sewing and Textiles)" guideline discusses regulations, standards, maintenance, inspection and operational procedures for all sewing and textiles operations and areas.

Health and Safety – Sewing and Textiles Operations

1. Review all layouts to allow for smooth operations within the sewing and textiles operations classroom to prevent unnecessary congestion.
2. Worktables and moveable equipment should be positioned in a manner to allow sufficient movement for all students.
3. Electrical equipment should be located away from water supplies whenever possible.
4. Work surfaces should be suitable and easy to clean.
5. The floor surfaces should be of a non-slip variety and free from risks of tripping.
6. The main switches for electricity should be within easy reach and clearly labelled.
7. Pilot lights should be considered for all electrical outlets.

Storage – Equipment

1. The storage of materials, tools and equipment should be carefully arranged for safe, effective work. Storing of heavy articles should be in the lower levels of cupboards.
2. Scissors, sharp items and textile / material cutting equipment should be safely stored in drawers or cupboards to help prevent potential injury.
3. All sewing machines should be stored in cases when not in use.



Storage – Sewing and Textiles Items

1. Store fabric scraps in bins or secure containers that have lids.
2. Keep needles, pins and related items in containers.
3. All stored items should be labelled.
4. All sewing equipment, fabrics, sewing machines, sergers, material and other related items should be securely stored at all times.
5. Irons should be stored and secured to prevent accidental knock over.

6. Ensure ironing boards are stable, properly maintained and securely fixed, to guard against collapse during use.

Sewing and Textiles – Equipment Use and Safety

1. Equipment in a sewing and textiles operation should be operated only under full supervision from the instructor.
2. Ensure all operational and safety features of a piece of equipment are fully taught / explained to the student before use.
3. Students who have not received operation and safety training on a piece of equipment should not be allowed to use it.
4. All equipment should be operated on a flat stable surface.
5. Inspect all electrical cords, connections, prongs, etc. before each use.
6. Electrical equipment with loose cords, frayed wiring or damaged connections should not be used.
7. Inspect all equipment, including but not limited to irons, sewing machines, sergers, etc. before each use. If they are found to be damaged, these items should not be used.

Sewing and Textiles – Health and Safety

1. Follow all safety procedures when using equipment.
2. Stand irons on their ends on a suitable heatproof surface during use.
3. Never test the heat of an iron with your hand.
4. Do not add water to a plugged in steam iron.
5. Allow the iron to cool before putting it away.
6. Never leave irons unattended.
7. Consider purchasing automatic shut-off irons.
8. Train students to use electrical sewing equipment.
9. Ensure sewing machines are installed with finger guides and needle guards.
10. Hair should be tied back when operating any machines.
11. Sewing machines should be inspected and serviced as required.
12. A standard safety eyewash station should be provided in the classroom.
13. A standard 3A10BC multi-purpose fire extinguisher should be provided in the classroom.
14. A first aid kit should also be provided in the classroom.

Sewing and Textiles – Safety Rules

1. Do not talk or distract others when operating a sewing machines.
2. Always turn off the irons after use.
3. Only iron on a flame resistive board cover.

4. Know the location of the fire extinguisher, emergency eyewash, first aid kit and other equipment.
5. Never leave an operating iron unattended.
6. Do not place flammables materials on or near an iron.
7. Disconnect appliances by pulling out the plug properly.

Alan Kavanaugh
Director of Loss Control & Risk Management, CRM, CCPI, Member of NFPA

#200 1840 3rd Ave, Prince George, BC, V2M 1G4
akavanaugh@noratek.com | 250.564.2236; C:250.961.8186
www.noratek.com | www.cityinspectionsoftware.com