



UNIVERSITY OF VIRGINIA
DRAMA DEPARTMENT
SCENE SHOP SAFETY HANDOUT

Welcome to the Scene Shop

In this reading you will find some of the important safety guidelines to be followed that help ensure a continued safe working environment for all. The management of the University Virginia Department of Drama scene shop recognizes that written safe work procedures are extremely important to ensure a safe work environment and form an essential part of the overall Occupational Health and Safety Program.

These guidelines provide information necessary to assist all students, assistants and work study employees as well as faculty and staff in performing their various tasks safely. These guidelines also assist in the training and orientation of new employees/students in job hazards, as well as providing them with the rules and procedures necessary to ensure that they can perform their work in a safe and hazard free manner.

ALL faculty, staff and students are expected to familiarize themselves with these requirements. Everyone is expected to follow these general rules when engaged in any activity in the UVA scene shop.

Theater work, by nature, is physical, and dangerous. However, if you use common sense and follow these safety procedures, Working in the shop and on stage will be fun and safe for you and your fellow workers.

Please feel free to ask questions at any time.

Remember our guiding principles are:

1. Safety, 2. Education, and 3. Completing the productions

Again, welcome. We hope you enjoy your experience in the shop.

PROPER ATTIRE:

Safety demands that proper clothing be worn for work in the shop. The shop does not provide aprons or overalls, and we will not be responsible for clothing damaged in any way. Failure to wear proper clothing is a safety hazard and is not an excuse to miss work.

- ✓ No loose, long or baggy clothing. It can get caught in moving parts and machinery or snagged on splinters etc.
- ✓ Wear shoes with good, non-slippery soles that cover the whole foot; no: sandals, open toed shoes, high heels, flip flops, or dress shoes.
- ✓ No gloves while using power tools. (Again, these can get caught in moving parts of machines.)
- ✓ No shorts or skirts (jeans are best). Wear clothes that will protect you from dust, etc.
- ✓ No long or large jewelry. It can get caught on things and may get ruined.
- ✓ You will get dirty and stained. Bring work clothes that can get dirty and possibly ruined.
- ✓ Long hair must be put up or tied back and put down your shirt. A cap is a good way to keep your hair up also.
- ✓ Long sleeves are required for welding. You don't want to get burned.

SAFETY RULES

GENERAL SAFETY RULES:

The following general safety rules have been developed to provide a safe and healthy working environment for all UVA Drama employees and students. These apply to all work activities. The most obvious safety rule is to be careful. Pay attention to what you are doing, what is going on around you, and do not rush. Repetitious jobs are more likely to cause inattention. Try to avoid monotony and boredom.

Being careful means being careful all the time. You can be careful for years and then get hurt in two seconds of inattention. Working with the power tools and equipment in the shop and stage demands 100% of your attention. This is entirely under your own control. Being careful is your best defense against injury. Having a healthy fear and respect for the tools will help ensure you use them safely.

Avoid danger by using common sense. Some people accept a greater risk of danger in order to work faster, more conveniently, etc. Do not hurry and cut corners on safety. Some people take greater risks because they have a strange notion of invulnerability, or as a show of bravado. This will gain no respect for you in our shop.

GENERAL SAFETY BULLETS:

- ✓ Report to work well rested and physically fit to be able to give full attention to your job.
- ✓ No person shall be permitted to remain on the premises while their ability to work is so affected by alcohol, drugs (prescription or non-prescription) or other substance, so as to endanger their health or safety or that of any other person.
- ✓ Persons are not permitted to work alone. A qualified supervisor must be present any time work is to be performed in the scene shop.
- ✓ Inappropriate behavior, such as horseplay, fighting and practical jokes are extremely dangerous and will not be tolerated.
- ✓ Any unsafe conditions, which are encountered, shall be corrected or reported to your Supervisor and/or the Occupational Health and Safety Department.
- ✓ Do not operate any machinery or equipment if it is known to be in an unsafe condition. Any damaged equipment or missing machine guards must be reported to your Supervisor.
- ✓ Machinery and equipment, including vehicles, are only to be operated by qualified persons and then only when adequately trained in the use of the equipment and authorized to operate it.
- ✓ Unsafe Acts shall be reported to your Supervisor and/or the Occupational Health and Safety Department.
- ✓ Smoking is prohibited within UVA premises and vehicles at all times. Smoking is only permitted outside buildings. Where "NO SMOKING" signs are posted, (i.e. near flammable storage), persons shall observe those signs.
- ✓ Avoid parking, even temporarily, in designated fire lanes.
- ✓ Employees/students are responsible for reporting to their Supervisor and First Aid (Health Services) whenever they become sick or injured at work. All injuries, no matter how minor, must be reported immediately.
- ✓ All warning signs, signals and alarms shall be obeyed.
- ✓ Employees/students shall not use unfamiliar tools or equipment without proper instruction and permission from their immediate Supervisor. Always use the correct tool for the job.
- ✓ Do not dispose of any hazardous materials or flammable liquids by pouring them down a sewer or drain. Guidance in proper disposal of hazardous materials is available from the Occupational Health and Safety Department.
- ✓ Compressed gas cylinders should be stored in an upright position and chained or otherwise secured. Where not connected to a service line or manifold system, the protective caps for these cylinders shall be in place.
- ✓ Flashback arrestors or reverse gas flow check valves must be in place on all oxy-acetylene fuel cutting equipment.
- ✓ Compressed air shall not be used for cleaning clothing or to blow dust from your body.
- ✓ Do not attempt to repair defective wiring or other electrical equipment. Report defective electrical equipment to your Supervisor. Electrical equipment can only be repaired or serviced by a qualified electrician.
- ✓ If something looks unsafe it probably is ... IF YOU ARE IN DOUBT ... ASK !

HOUSE KEEPING BULLETS: (A CLEAN SHOP IS A SAFE SHOP)

- ✓ Clean up your work area at the end of your work shift. Which means clean up all sawdust and debris, put away unused materials and return all tools and equipment to their proper place.
- ✓ Do not leave tools and supplies out unnecessarily.
- ✓ Do not let your work area become too cluttered; this can lead to trip hazards. Clean as you go.
- ✓ Remove nails in all reused lumber. Flatten nails in lumber that is trash.
- ✓ Do not leave long sticks in trash barrels. They can poke others in the eyes.
- ✓ Do not block fire extinguishers, doors, or marked tool-safety areas.
- ✓ Keep pathways to fire exits and for crossing the shop clear. It can be dangerous having to carry large items while walking over lumber and trash.

PERSONAL SAFETY

PERSONAL PROTECTION EQUIPMENT (PPE):

The shop will provide you with safety equipment. If you have any questions or doubts, ask the Technical Director or Scene Shop Manger. Your safety is our concern. We will never knowingly put you in a position to be over exposed to hazardous materials. We welcome questions if you have any. We will attempt to explain things to you. Feel free to request safety equipment. We are human; we might forget and it is always better to be safe than sorry. Our goal is to make you safe and comfortable when performing duties in the shop.

HANDS:

Hands are the most susceptible to injury. Be sure to use the appropriate protective equipment or glove for the task you are performing. If you have any questions about what type of glove to use please ask. Watch the cutting edge of any tool, especially the power tools and be aware of where your hands are in relation to it. Pay attention and do not get distracted. There is a dangerous temptation to hold parts together with one hand while shooting pneumatic tools with the other. Sometimes staples and nails turn inside the wood and poke out where you do not expect them. Use clamps or other devices to keep hands away from dangerous actions. This would seem elementary, but the number of bad cuts from matte knives is incredible. Chisels fall into this category also. The simple rule is to keep both hands behind the direction in which the sharp edge is going and never pull a blade towards your body.

EARS:

Hearing loss is a normal part of the aging process. Throughout our lives we are exposed to loud noises and physical conditions that add up to gradual loss of hearing. Hearing loss is generally gradual, cumulative, and irreversible. The tools in shop generate noise that exceeds safe levels over extended periods of time (Generally more than 4 hours). We therefore suggest you where hearing protection while you are working in the shop. We have earmuffs and earplugs for your protection. See packaging or ask the Technical Director or the Scene Shop Manger for assistance in their use.

EYES:

Eye protection is required whenever an employee is using or is around power tool usage. You must wear eye protection any time a tool plugs in, (electrical, air, water) creates debris, or poses a splash hazard. You may not be using a power tool or a chemical but someone else might be. You can be struck by flying debris and splashing solvents or paints. (Plus they are fashionably correct.)

EYE SAFETY BULLETS:

- ✓ Be alert to eye hazards in your workspace.
- ✓ Wear the appropriate protective eyewear for the specific hazards to your eyes and face. If you are not sure which eyewear to wear ask the staff for assistance.
- ✓ Regular glasses do not count as protective eyewear.
- ✓ Make sure that your protective eyewear fits properly and is in clean and good condition.

DUST MASKS:

Comfort masks are available for Employees. These are for use for comfort from dust. They will do nothing to protect from fumes and vapors and other assorted toxins. They will reduce the amount of large particulates that can enter your respiratory system. Read the box for instructions on how and when to use these.

LIFTING:

When lifting, have a secure footing, bend your knees, keep your back straight, take a firm hold of the object being lifted and slowly straighten your legs. If you must turn with a load, turn your feet and whole body. DO NOT twist yourself. Avoid reaching while lifting or putting the object down. If you are carrying the object you have lifted ensure that the path you are using is clear of debris and safe to move through. Look where you are going and communicate with the others carrying the object. If you are losing your grip or if something is too heavy, tell the person you are carrying it with and take a rest and get a better grip, this is much better than dropping it and having someone suddenly bear the entire weight at once. Be aware of the back end of the object and what's behind you. When carrying tall objects like a flat or ladder, lift with one hand high and one hand low. That is, lift with one hand, which carries the weight and the other hand extended to help balance the object. Be aware of the top of tall objects and things that it might hit like the ceiling, tops of doors, other scenery or lighting equipment. If the object is too heavy for you, get assistance. Avoid manual lifting of materials, articles or objects that are too heavy. Machismo will only get you hurt. Wherever possible, use mechanical lifting devices to move heavy objects. Such devices include: carts or dollies, hand trucks, pallet jacks, and chain hoists. It is all too common to set heavy platforms or walls down on one's toes. Awareness and communication with fellow co-workers are the only prevention. When you lean scenery or materials against a wall, be sure that the object is a sufficient distance between its base and the wall, so it will not fall back by itself.

RESPIRATORS:

Before an employee can be issued a respirator at the University of Virginia, said employee must undergo a series of physicals and fit tests provided by the office of Environmental Health and Safety. Please contact the Scenery Shop Manager for more details regarding respirator policies at the University of Virginia.

HEALTH HAZARDS:

Ventilation is poor in the shop. We are continuously striving to make improvements with our equipment (within our budgets) and creating procedures for safe and alternate methods. Because this is mainly a wood working shop, the use of dust masks may help prevent some dust particles from getting in the nose. Note; these are not for lung protection from vapors and fumes.

Paint solvents, adhesives, and welding produce toxic fumes. Do not spray paint in the shop. Go outside (and use brown paper to prevent over spray). For contact adhesive, we have a latex product that is water-soluble. Spray adhesive and spray shoe dye are especially bad.

Welding is done with only the necessary people in the shop. Doors must be opened and the large exhaust fan on. If possible, a welding fume respirator should be used. The bright glare from welding is an eye hazard. A brief glance will not hurt, but do not stare at it.

LADDERS/GENIES™:

Working on ladders and scaffolds presents a potential for a fall. If you must use a ladder, always have someone there to foot and hold the bottom for you. Do not stand on the top or any steps the safety labels indicate. Before you get on a ladder, make sure that all four legs are firmly on the floor. Remember not to leave tools and hardware or anything heavy on top of a ladder. This will lead to the next person who moves the ladder getting hit in the head by a falling object. When you are working above on a ladder you must take extra precautions. You need to be aware of overhead scenery and lighting instruments and the electrical cable. Do not have loose items in pockets that may fall and whenever possible, tools should be attached to you. If you can't attach tools, extra precautions must be made to keep people below aware of you and your work. You must be certified to use the Genie™ Personnel lifts.

FIRE SAFETY:

- ✓ Most of the materials in the shop are combustible.
- ✓ Paint solvents etc. are highly flammable and must be kept in a special cabinet.
- ✓ Welding and grinding produce sparks. Paper, sawdust, oil, and all flammable items must be moved away from the work area during these procedures.
- ✓ Know where the Fire Exits are in the shop.
- ✓ Know where the fire extinguishers are and what types we have in the shop.
- ✓ No smoking!!!!

WORKING IN THE THEATER SPACE

WORKING WITH THE FLY SYSTEM AND ROPES.

When you are the person responsible for raising and lowering scenery or equipment it is your responsibility to make sure that people are out of the way, that all hazards are cleared and that everyone on stage knows that you are about to move something in or out (down or up) on stage. This should be a loud verbal warning so all can hear you over all other work going on at the time. This goes for lifting a bucket up to a scaffold to moving a half-ton wall on a hydraulic batten. Yes, you must watch the rope you are pulling or the button you are pressing and the object that it is moving at the same time.

Natural fiber ropes age and wear, so do not trust them completely.

Do not use any rope or hardware or cable that is worn or in questionable condition to fly anything that is heavy or could lead to a hazardous situation. We do not want to endanger the lives of anyone. If you have a question always ask someone who knows.

WORKING ABOVE

Whenever you are to work on the grid loading deck or any other overhead platform, all tools must be secured so they can't fall. Loose change and items in your pockets can cause serious injury if dropped from thirty feet. They should be removed before you ascend. You are responsible to make sure the people working beneath you know you are above them, and whenever possible they should be cleared from the area. If by chance an accident occurs and you do drop something, you should yell:

"HEADS !!!!!"

Do this clear and loud so people know where the warning is coming from and can scatter out of the way of danger. If you are below and hear "heads" yelled, get out of the freaking way. Do not let curiosity get the best of you and look up to see what is falling. This may lead to your face getting up close and personal with a stage weight and could cause serious injury or death.

If you need to work above in an area that does not provide railings and there is a possibility of a fall that could cause injury, you must wear proper fall protection equipment. You should also be trained in the correct use of this equipment.

STAGE ELEVATOR LIFTS

Stage lifts (elevators) are found in Culbreth Theatre. This is a large and dangerous piece of equipment. They have the capability of snapping a large piece of a set in half and could easily shear off a foot or crush someone to death. Trained individuals should only operate these lifts. You should obey all written and verbal instructions from them. When operating the elevator you must make sure there are no large objects on the lift. When lowering the lift you must make sure there is nothing sticking off of the platform. A person must ride down on the lift must to be able to stop it if there is a problem.

SET STRIKE/CHANGEOVER

This is where a lot of dangerous work goes on in a short amount of time. Make sure you are aware of all the things going on around you. The fast work pace and the extra enthusiasm you will find does not change the need to pay attention and follow all the rules for working in the theater and with power tools. Pay extra attention to nails in wood and debris on the floor.

IN CASE OF AN ACCIDENT

Report all accidents to the Technical Director or Scene Shop Manager immediately.

Call Public Safety at 911 (Charlottesville E-911 Center)

There are phones in the Tech office and in the Green Room.

POWER TOOLS:

Each power tool has its own set of safety rules. They are safe when properly used, but they can cause serious accidents when misused. You will be trained on each power tool before you use it. In general, power tools have rotating parts that can wind you in like a fishing reel if they catch on clothes, hair, or jewelry. Power tools can throw debris at you, so eye or face protection is necessary. Ear protection from loud noise is also often necessary. Make sure the work surface and floors are clear, and get EVERYTHING ready before you hit the ON switch.

Employees may NEVER operate unguarded power tools.

Sometimes there is a strong temptation to remove safety guards when they seem to complicate the work. If you think you need to do something without the standard blade guard, stop and ask the staff. In cases where a guard must be removed, a jig will be put in its place to allow for safe operation of the saw and still provide adequate protection to the user.

Pneumatic tools are power tools also. You must learn each one before use. They also have safety guards, with the exception of the smaller stapler. Do not ever defeat the safety or use the tools in a manner they were not made for. (I.e., It is not a target gun!)

Table Saw:

Only operators trained in the safe operation of a table saw are allowed to use the saw.

- Operator must wear safety glasses. If the material chips severely, a face shield should be used in addition to safety glasses. If the cutting operation is dusty, wear a dust mask. Operators using the saw for extended periods should wear hearing protection.
- Prior to using table saw the blade should be checked for tightness.
- Check the hood guard and anti-kickback devices for proper operation.
- Verify location of off switch and/or emergency power disconnect.
- If used, check to ensure the fence is set properly and tight.
- Ensure that the table is clear of materials, tools, and debris.
- The table saw must have a hood guard, splitter, and anti-kickback device installed. One or more of these devices may be removed ONLY if absolutely necessary to perform a specific cut (e.g. dado or rabbet) and only with the approval of a shop supervisor. These safety devices must be re-installed immediately after completing the cut(s).
- The fence and miter gauge should never be used together. Use the fence for ripping and the miter gauge for cross-cutting. Use a stop block when you crosscut short lengths.
- When making a rip cut to bevel an edge, always work WITH gravity by positioning your rip fence on the down side of the saw blade and NEVER above it.
- When making a crosscut to bevel an edge, always place your miter gauge on the down side of the saw blade and NEVER above it.
- Always stand firmly on the floor and avoid any awkward operations. This is to avoid falling into the blade by slipping or losing your balance.
- Do not carry on a conversation while cutting. Pay attention to the work being performed.

- Do not reach behind or over the blade unless it has stopped turning.
- Do not leave the saw until the blade has come to a complete stop.
- Make sure that the blade has stopped turning before you adjust the table saw. After any adjustment, make sure that the blade is free before you turn on the power. When changing the blade or servicing the saw, the power disconnect must be locked in the "off" position. For saws with a cord and plug, the saw must be unplugged. The saw must be tested after disconnecting power and before beginning service.
- Ensure that the guides are positioned properly and that the tabletop is smooth and polished. An unclean or rough table requires you to use more force to push the stock through the blade. The more force that you are required to use the more chance that you may slip or lose your balance.
- Check that the stock has no nails, knots screw, stones etc. in it prior to cutting into the wood. These items can become projectiles and cause injury.
- Push sticks, feather boards, hold-downs, etc. must be used whenever an operation is performed that would require the operator's hands to pass within 6 inches of the saw blade.
- When boards over 3 feet in any dimension are cut, a helper should be used to assist in supporting the work.
- When ripping large or cumbersome workpieces alone, use a roller stand or support table to support your workpiece on the outboard side of the main saw table. If you're not using such a support device and your stock begins to fall after the cut, it's safer to release it and let it do so. You can always pick it up later after you've turned off your machine.
- Never allow your saw blade to project more than 1/8" to 3/8" above the surface of your workpiece during a cut. It just stands to reason that the less the blade is exposed, the less likely you are to come in contact with it...and if you do, the less serious your injury will be.
- The operator should stand to the side of the wood while it is being fed through the saw. Position your body so that it is NOT in line with the blade. This is to avoid being injured by flying sawdust, woodchips or the work.
- Keep your saw blades clean and sharp. A dull blade or one coated in pitch or gum can create a dangerous situation.
- After completing work, the saw blade should be lowered below the table.
- A two-foot perimeter around the saw should be kept clear of debris and sawdust.

Radial Arm Saw:

The principal sources of injury to persons using radial arm saws include cuts or amputation to arms or hands by the blade, flying wood chips and handling of materials. It is therefore necessary that no person operate this equipment until its use has been thoroughly demonstrated and understood.

Pre-Operation

- A radial arm saw requires many adjustments prior to use. Ensure that the saw is locked out before making these adjustments.
- Safety glasses or goggles must be worn. A face shield may also be required and it should be used in conjunction with proper eye protection.
- Read and understand the operating manual prior to use.
- Choose the proper blade for the job and ensure that it is installed correctly.
- Ensure that the blade guards are securely installed. The upper half of the blade must always be guarded, including the arbor end. The lower half of the saw should have an articulating guard for 90-degree crosscut operations.
- The tabletop should be large enough to cover the blade in any direction (miter, bevel or rip). The saw should never be operated with the blade in a position where it protrudes or extends beyond the table.
- The slots of the back fence should not be deeper than 6mm. The fence must be replaced if the slots are deeper than this or if pieces are missing.

Operation (all cuts)

- Do not stand in a direct line with the blade.
- Never carry on a conversation or interrupt a person operating a radial arm saw.
- Allow the saw to reach full speed before starting the cut.
- Hold the stock firmly against the tabletop and the rear fence.
- A push stick should be used when ripping. The push stick should be longer than the blade's diameter.
- Keep proper footing and balance at all times.
- Never leave the radial arm saw unattended while the blade is running. Wait until the blade has come to a full stop before leaving the area.
- Always remove scrap material from the table with a stick.

Crosscutting

- Radial arm saws used for crosscutting are pulled across the cutting area by means of a handle located to one side of the blade. The operator should stand, if possible, on the handle's side and pull the cutting head with the hand nearest the handle. The product being cut should be maneuvered with the other hand.
- The blade should never be pulled beyond the point necessary to make the cut as the back of the blade could lift the work piece and throw it over the fence.
- Place the material to be cut against the fence or a special jig, never cut freehand.
- Never remove short pieces from the table until the saw has returned to its normal position at the rear of the table. Always use a stick, not your hands, to remove scrap from the table.

Woodworking Band Saw Safety Procedures:

- Only operators trained in the safe operation of a band saw are allowed to use the saw.
- The operator should check the following points before operating the band saw:

- Operator must wear safety glasses
- If the material chips severely, a face shield should be used **in addition to** safety glasses
- Blade should be checked for tightness
- Verify location of off switch and/or emergency power disconnect
- Ensure that the table is clear of materials, tools, and debris
- All portions of the saw blade must be enclosed or guarded except the portion between the bottom of the guide rolls and the table.
- The blade guard should be kept adjusted as close as possible to the table without interfering with movement of the stock.
- The down travel guard from the upper wheel to the guide rolls shall be so adjusted that the blade will travel within the angle or channel.
- The wheels of the band saw (upper and lower) must be fully enclosed.
- A blade tension control device with an indicator must be present on all band saws.
- Band saws must not be run at speeds in excess of the manufacturer's recommended speed.
- When changing the blade or servicing the saw, the power disconnect must be locked in the "off" position. For saws with a cord and plug, the saw must be unplugged. The saw must be tested after disconnecting power and before beginning service.

CHOP SAW SAFETY:

1. For operation of the chop saw, a full-face shield and safety glasses are required. Operators should always wear safety glasses under a full-face shield.
2. Gloves, loose clothing, jewelry, or any dangling objects including long hair should not be worn as they may catch in the rotating parts of the saw.
3. All guards must be in place and operating. If a guard seems slow to return to its normal position or hangs up, adjust it or repair it immediately. Unplug or lockout power when making repairs.
4. Hands and fingers must be kept clear of the path in which the blade travels.
5. Clean the lower guard frequently to help visibility and movement. Unplug before adjusting or cleaning.
6. Use only the recommended RPM and sizes of blades.
7. Regularly check and tighten the blade and the blade-attachment mechanism.
8. Prior to installing or changing a blade, be sure to lockout or unplug equipment. Ensure that the blade and its related washers and fasteners are correctly positioned and secured on the saw's arbor.
9. To avoid losing control or placing hands in the blade path, hold or clamp all material securely against the fence when cutting. Do not perform operations freehand.
10. Never re-cut small pieces. Long material should be supported at the same height as the saw table.
11. Never place hands or fingers in the path of the blade or reach in back of the fence.
12. Use the brake if one is provided. To avoid contact with a coasting blade, do not reach into the cutting area until the blade comes to a full stop.
13. After completing a cut, release the trigger switch and allow the blade to come to a complete stop, then raise the blade from the work piece. If the blade stays in the cutting area after the cutting is complete, injury can result from accidental contact.

DRILL PRESS SAFETY:

- ✓ Make sure that the belt guard is in place.
- ✓ Be sure that the table and head of the drill press are secure.
- ✓ Select the proper drill bits (avoid dull drill bits). Make sure that the correct speed is used for the bit selected. If uncertain, check with the instructor.
- ✓ REMOVE THE CHUCK KEY BEFORE THE POWER IS TURNED ON! If the chuck key is not removed it will be thrown from the chuck at tremendous speed when the power is turned on.
- ✓ Use the drill press vice or clamps whenever necessary to firmly secure the work.
- ✓ USE A BASE BLOCK UNDER THE WORK AT ALL TIMES! Set the stop so that the bit will never go through the base block.
- ✓ Make sure that no one but you are within the safety zone.
- ✓ Keep your hands away from the revolving spindle once the power is on.
- ✓ Operate the feed handle so that the drill cuts evenly into the work.
- ✓ Ease up on the pressure as the drill begins to break through.
- ✓ Back out the drill as soon as the hole is drilled.
- ✓ When boring to depth, use the lock nut on depth adjustment.
- ✓ Stop the drill press before attempting to remove work.
- ✓ Keep the floor clean around the drill press .
- ✓ If the work comes loose and is seized by the drill press , shut off the power immediately if possible without endangering yourself. If impossible to shut the machine off, move away from the machine and move others away.
- ✓ The drill bit should be backed out occasionally to clear shavings and cool the bit.
- ✓ Obtain approval of instructor for any special setups on the drill press before beginning the operation.
- ✓ ALWAYS WEAR YOUR SAFETY GLASSES!!!!!!

HAND DRILL SAFETY:

How do you select the proper bit or attachment?

- ✓ Follow manufacturers' instructions when selecting and using a bit or attachment, especially with unfamiliar drills or work.
- ✓ Select the bit or attachment suitable for the size of the drill and the work being done.
- ✓ Ensure that the bit or attachments are properly seated and tightened in the chuck.
- ✓ Use only bits and attachments that turn true.
- ✓ Use the auxiliary (second) handle for larger work or continuous operation.

What should you do when working with powered hand drills?

- ✓ Wear safety glasses or a face shield.

- ✓ Keep drill air vents clear to maintain adequate ventilation.
- ✓ Keep drill bits sharp always.
- ✓ Keep all cords clear of the cutting area during use. Inspect for frays or damage before each use.
- ✓ Disconnect power supply before changing or adjusting bit or attachments.
- ✓ Tighten the chuck securely. Remove chuck key before starting drill.
- ✓ Secure work-piece being drilled to prevent movement.
- ✓ Slow the rate of feed just before breaking through the surface.
- ✓ Drill a small "pilot" hole before drilling large holes.

What should you do when working with small pieces?

- ✓ Clamp stock so work will not twist or spin.
- ✓ Do not drill with one hand while holding the material with the other.

What should you avoid when working with powered hand drills?

- ✓ Do not use a bent drill bit.
- ✓ Do not exceed the manufacturer's recommended maximum drilling capacities.
- ✓ Do not use a hole-saw cutter without the pilot drill.
- ✓ Do not use high-speed steel (HSS) bits without cooling or using lubrication.
- ✓ Do not attempt to free a jammed bit by starting and stopping the drill. Unplug the drill and then remove the bit from the work-piece.
- ✓ Do not reach under or around stock being drilled.
- ✓ Do not overreach. Always keep proper footing and balance.
- ✓ Do not raise or lower the drill by its power cord.

SABRE, JIG, & RECIPROCATING SAW SAFETY:

What should you do before start cutting with powered handsaws?

- ✓ Wear safety glasses or a face shield.
- ✓ Disconnect power supply before changing or adjusting blades.
- ✓ Use lubricants when cutting metals.
- ✓ Keep all cords clear of cutting area.
- ✓ Position the saw beside the material before cutting and avoid entering the cut with a moving blade.
- ✓ Make sure guards, if present, are installed and are working properly.

What should you do to work with powered handsaws safely?

- ✓ Remember sabre saws cut on the up stroke.
- ✓ Secure and support stock as close as possible to the cutting line to avoid vibration.
- ✓ Keep the base or shoe of the saw in firm contact with the stock being cut.
- ✓ Select the correct blade for the material being cut and allow it to cut steadily. Do not force it. Clean and sharp blades operate best.
- ✓ Set the blade to go no further than 0.32 to 0.64 cm (1/8 to 1/4 inch) deeper than the material being cut.
- ✓ Do not start cutting until the saw reaches its full power.
- ✓ Do not force a saw along or around a curve. Allow the machine to turn with ease.
- ✓ Do not insert a blade into or withdraw a blade from a cut or lead hole while the blade is moving.
- ✓ Do not put down a saw until the motor has stopped.
- ✓ Do not reach under or around the stock being cut.
- ✓ Maintain control of the saw always. Avoid cutting above shoulder height.

How should you start an external cut?

- ✓ Place the front of the shoe on the stock.
- ✓ Make sure that the blade is not in contact with the material or the saw will stall when the motor starts.
- ✓ Hold the saw firmly down against the material and switch the saw on.
- ✓ Feed the blade slowly into the stock maintaining an even forward pressure.

How should you start an inside cut?

- ✓ Drill a lead hole slightly larger than the saw blade. With the saw switched off, insert the blade in the hole until the shoe rests firmly on the stock.
- ✓ Do not let the blade touch the stock until the saw has been switched on.

Jig Saw Safety:

- ✓ Always wear safety glasses.
- ✓ Make sure the blade is secure.
- ✓ Clamp down your work-piece.
- ✓ Do not cut small pieces of wood, such as anything smaller than your hand.
- ✓ Make sure there is nothing underneath the board you are cutting such as your HAND!, LEG!, CLOTHING!, vise, or anything else.
- ✓ Be aware of where the blade is going and what may be underneath the wood in that direction such as your HAND! or anything else.
- ✓ Hold the tool firmly.
- ✓ Keep hands away from moving parts.
- ✓ Keep constant pressure when cutting, but do not twist or force the blade.
- ✓ Let the blade come to a complete stop before taking it out of a cut and do not try to insert a moving blade into a cut.
- ✓ Do not touch the blade after use because it will burn you.

PORTABLE CIRCULAR SAW SAFETY:

- ✓ Many portable circular saws have grounded plugs. If a plug has three prongs, make sure each prong is in good working condition and not broken off or loose.
- ✓ Make sure that the lower guard revolves up into the upper guard assembly without sticking or binding, and rotates freely back, covering the circular blade, at the completion of the cut.
- ✓ Make sure you check the blade for the proper cutting application for the job. Ask the instructor for assistance for special cutting operations.
- ✓ Before starting a cutting operation, you should set the proper cutting depth at 1/8 inch below the thickness of the stock you are cutting.
- ✓ All stock must be supported so that the rotating guard will not bind and will move freely during the complete cutting operation.
- ✓ Place the saw on the stock to be cut with the blade clear of the stock and lined up with the cut line on the stock, before the power is turned on.
- ✓ The portable circular saw is designed to cut only straight lines, which can be square or beveled from the top surface of the stock to be cut.
- ✓ When using portable electric power equipment, always check to see that you have ample length of power cord to complete the job.
- ✓ Before starting your cutting operation, make sure the electric power cord will not come in contact with the moving blade.
- ✓ If the cutoff piece of stock is unsupported, caution must be used so that when it falls, the stock does not cause injury to the operator, other students, or damage to the cut stock.
- ✓ Make sure the switch is in the off position before plugging the saw into the power source.
- ✓ The saw must be unplugged from the power source when changing the blade, adjusting the depth of cut, or doing any adjustments in the cutting operation.
- ✓ Every student must obtain permission from the instructor prior to using the portable circular saw. The instructor will assist in selecting the proper blade and provide strict supervision in the cutting operation.
- ✓ If you are apprehensive about using this machine, have the instructor assist you.
- ✓ Always wear approved eye protection while operating this machine.

PNEUMATIC TOOLS

What are pneumatic tools?

- ✓ Pneumatic tools are powered by compressed air. Common types of these air-powered hand tools that are used in industry include buffers, nailing and stapling guns, grinders, drills, jack hammers, chipping hammers, riveting guns, sanders and wrenches.

How do you use pneumatic tools safely?

- ✓ Review the manufacturer's instruction before using a tool.
- ✓ Wear safety glasses or a face shield and, where necessary, safety shoes or boots and hearing protection.

- ✓ Post warning signs where pneumatic tools are used. Set up screens or shields in areas where nearby workers may be exposed to flying fragments, chips, dust, and excessive noise.
- ✓ Ensure that the compressed air supplied to the tool is clean and dry. Dust, moisture, and corrosive fumes can damage a tool. An in-line regulator filter and lubricator increases tool life.
- ✓ Keep tools clean and lubricated, and maintain them according to the manufacturers' instructions.
- ✓ Use only the attachments that the manufacturer recommends for the tools you are using.
- ✓ Be careful to prevent hands, feet, or body from injury in case the machine slips or the tool breaks.
- ✓ Reduce physical fatigue by supporting heavy tools with a counter-balance wherever possible.

How should you handle air hoses?

- ✓ Use the proper hose and fittings of the correct diameter.
- ✓ Use hoses specifically designed to resist abrasion, cutting, crushing and failure from continuous flexing.
- ✓ Check hoses regularly for cuts, bulges and abrasions. Tag and replace, if defective.
- ✓ Blow out the air line before connecting a tool. Hold hose firmly and blow away from yourself and others.
- ✓ Make sure that hose connections fit properly and are equipped with a mechanical means of securing the connection (e.g., chain, wire, or positive locking device).
- ✓ Install quick disconnects of a pressure-release type rather than a disengagement type. Attach the male end of the connector to the tool, NOT the hose.
- ✓ Do not operate the tool at a pressure above the manufacturer's rating.
- ✓ Turn off the air pressure to hose when not in use or when changing power tools.
- ✓ Do not carry a pneumatic tool by its hose.
- ✓ Avoid creating trip hazards caused by hoses laid across walkways or curled underfoot.
- ✓ Do not use compressed air to blow debris or to clean dirt from clothes.

What should you avoid with a compressed air?

- ✓ Cleaning with compressed air is dangerous. Compressed air may be used only if no alternate method of cleaning is available. The nozzle pressure MUST remain below 30 psi. Personal protective equipment and effective chip guarding techniques must be used.

What general safety principles should you follow when using pneumatic nailing and stapling tools?

- ✓ Permit only experienced and trained persons to operate pneumatic nailing and stapling tools.
- ✓ Wear safety glasses or face a shield and, where necessary, use hearing protection.
- ✓ Inspect a tool before connecting it to air supply: -Check tool safety mechanisms if applicable. -Tighten securely all screws and cylinder caps.

- ✓ Check correct air supply and pressure before connecting a tool.
- ✓ Check that the tool is correctly and securely connected to the air supply hose and that is in good working order, with the safety mechanism operative, before using.
- ✓ Always handle a tool as if it loaded with fasteners (nails, staples, etc.)
- ✓ Equip tools with a work-contacting element that limits the contact area to one that is as small as practical.
- ✓ Make sure that the mechanical linkage between work-contacting element and trigger is enclosed.
- ✓ Disconnect a tool from air supply when the tool is unattended and during cleaning or adjustment. Before clearing a blockage, be sure that depressing the trigger exhausts all air from the tool.
- ✓ Use only fasteners recommended by the manufacturer.
- ✓ Permit only properly trained people to carry out tool maintenance.

What should you avoid when using pneumatic nailing and stapling tools?

- ✓ Do not point the tool toward yourself or anyone else whether it contains fasteners or not.
- ✓ Do not operate at a pressure above the manufacturers' rating.
- ✓ Do not depress the trigger unless the nose-piece of tool is directed onto a safe work surface.
- ✓ Do not carry a tool with the trigger depressed.
- ✓ Do not load a tool with fasteners while the trigger is depressed.
- ✓ Do not overreach. Keep proper footing and balance.

Do not use compressed air to blow debris or to clean dirt from clothes.