3D PRINTER

1. Ask for instructor's permission before using the 3D printer.
2. Always wear sanitized safety glasses with ANSI Z87.1 markings while operating and observing the 3D printer, removing the model from the platform, and removing the support material.
3. Run the printer at the temperature specified by the manufacturer.
4. Make all adjustments with the power turned off.
5. DO NOT touch the print nozzle.
6. Select the correct scale and other settings to print your model.
7. Properly load the platform tray so it is level.
8. Doors of the printer must remain closed for the entire operation.
9. Once printer is completely finished, remove the platform (may still be HOT and require heat insulated gloves), and carefully remove the model using a putty knife.
10. Remove all support material from the printing platform to ensure a smooth surface for the next print.
11. Some printers allow the removal of support material by carefully using chisels, pliers, and wire cutters.
12. Some support material must be removed using hazardous chemicals. Refer to the manufacturer instructions provided with these chemicals. To avoid contact with skin, some removal chemicals require the use of neoprene gloves, sanitized chemical splash goggles with ANSI Z87.1 markings, and steel or plastic (not aluminum) tongs.
13. If chemical manufacturer specifies, have a source of fresh water nearby to rinse chemical solutions from your skin or the model.
14. Chemical removal should not be conducted in an explosive atmosphere.
15. Only use the printer in a well-ventilated area which can accommodate potentially hazardous vapors and fumes!
16. Follow all safety precautions provided by the manufacturer.

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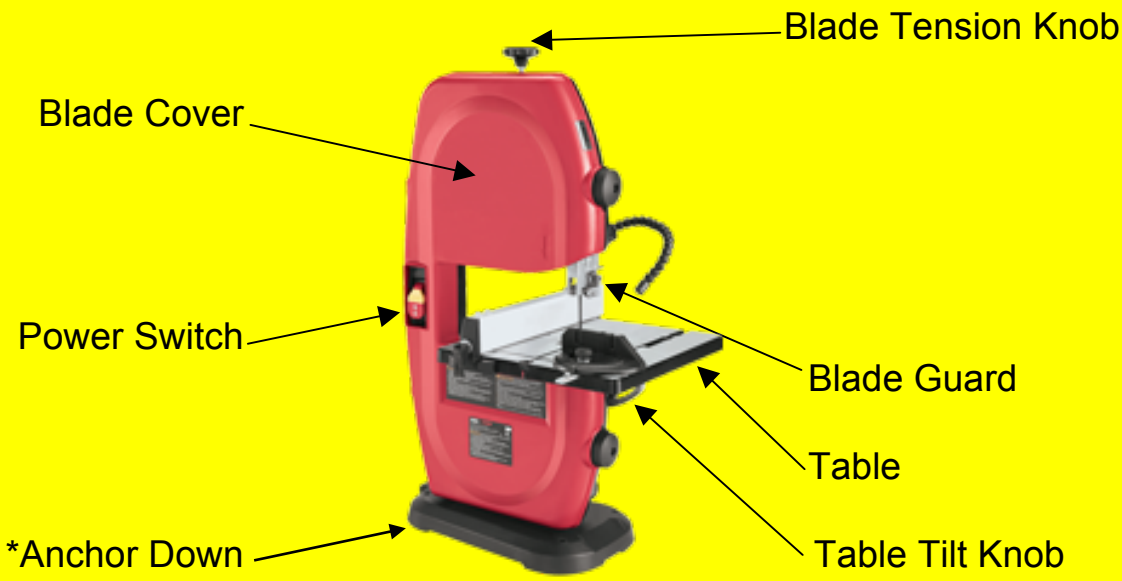
BAND SAW



1. **Ask for instructor's permission before using the Band Saw.**
2. **Remove all jewelry, eliminate loose clothing, and confine long hair.**
3. **Always wear sanitized safety glasses with ANSI Z87.1 markings while operating the Band Saw.**
4. **Check all material for foreign objects before cutting.**
5. **Set the blade guard 1/8th of an inch above the piece to be cut.**
6. **Check to ensure that all the safety guards are in place and working correctly.**
7. **Have all cut lines clearly marked before operating the Band Saw.**
8. **Hold the material away from the blade before you turn on the Band Saw.**
9. **Hold the material firmly on the table while cutting on the Band Saw.**
10. **Keep your fingers away from the cut line and blade. 2 inches minimum.**
11. **When cutting a tight curve, first cut relief cuts then push the work piece slowly without twisting or bending the blade. Do not force the work into the blade.**
12. **Do not cut a smaller radius than the blade width will allow.**
13. **Use a V-Block to cut material that is round.**
14. **Turn off the Band Saw when finished cutting.**
15. **Wait for the Band Saw to come to a complete stop before cleaning it.**
16. **Clean up all scraps and dust from the Band Saw before you leave it.**

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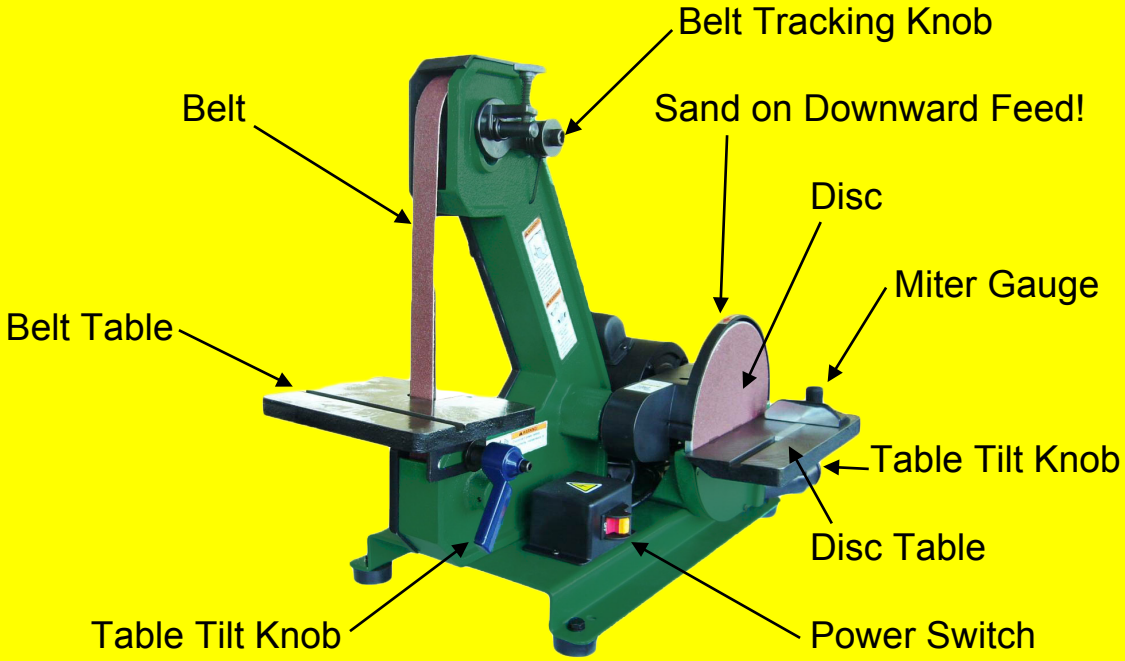
BELT/DISC SANDER



1. **Ask for instructor's permission before using the Sander.**
2. **Remove all jewelry, eliminate loose clothing, and confine long hair.**
3. **Always wear sanitized safety glasses with ANSI Z87.1 markings while operating the Sander.**
4. **Check all material for foreign objects before cutting.**
5. **Check to ensure that all tables are at the correct angle and secure.**
6. **Make sure the belt and disc are not loose, torn, or clogged up.**
7. **Hold the material firmly on the table while sanding.**
8. **Keep your fingers away from the belt/disc.**
9. **Use only the downward side of the disc while sanding.**
10. **Do not force material against sanding surfaces.**
11. **Make all adjustments with the power off, EXCEPT when adjusting the belt tension.**
12. **Hold the material away from the belt/disc before you turn on the Sander.**
13. **Turn off the Sander when finished.**
14. **Wait for the Sander to come to a complete stop before cleaning it.**
15. **Clean up all scraps and dust from the Sander before you leave it.**

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CNC MACHINES

1. Ask for instructor's permission before using any CNC machine.
2. Remove all jewelry, eliminate loose clothing, and confine long hair.
3. Always wear sanitized safety glasses with ANSI Z87.1 markings while operating and observing a CNC machine.
4. Make sure the power is turned off before setting up the machine or making adjustments.
5. Check spindle rotation, speed, depth of cut, and all power feed adjustments before starting the cut.
6. Run a simulation or dry run (without a tool bit) before starting the final run to ensure all movements are correct and prevent tool or machine damage.
7. Keep set up tools off of machine and out of the work area.
8. Make sure the work piece is mounted or clamped securely.
9. Make sure all doors to the work area are fully closed.
10. Remain with machine for the duration of its operation.
11. If a malfunction occurs, immediately press the emergency stop button and contact the instructor.
12. Brush away chips and shavings only when the machine is completely stopped.
13. Use the proper tools to tighten the bit/cutter head in the collet chuck, then remove all tools from the work area before operating the CNC machine.
14. Carefully remove bit when finished (BIT MAY BE HOT AND SHARP).
15. Clean up area when finished and return the CNC to the home position.

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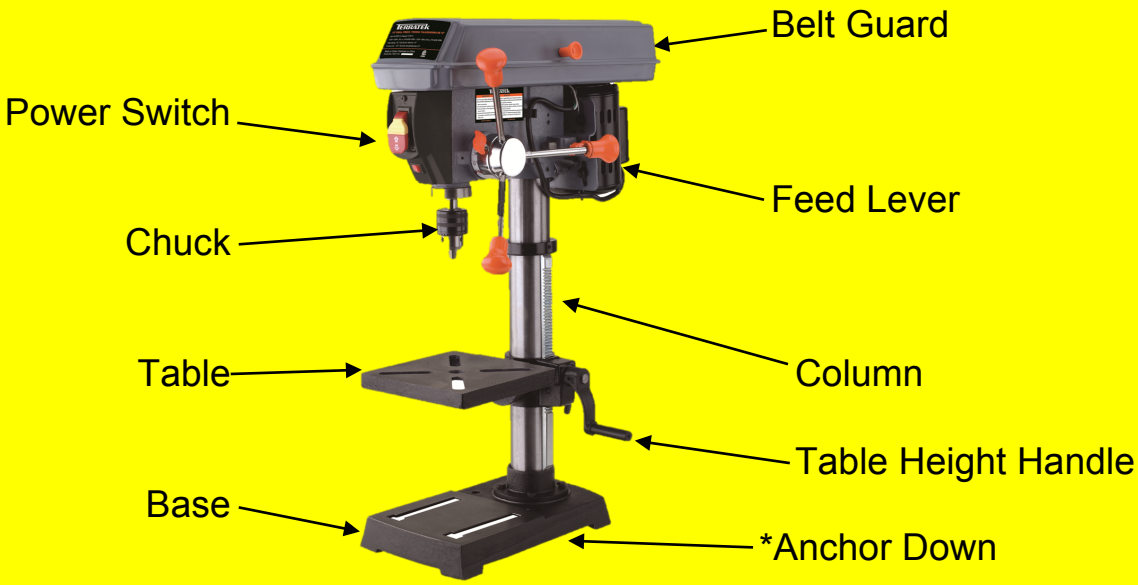
DRILL PRESS



1. **Ask for instructor's permission before using the Drill Press.**
2. **Remove all jewelry and gloves, eliminate loose clothing, and confine long hair.**
3. **Always wear sanitized safety glasses with ANSI Z87.1 markings while operating the Drill Press.**
4. **Center punch all holes to be drilled.**
5. **Check the end of the drill bit – Make sure it is not square.**
6. **Make all adjustments with the power turned off.**
7. **Use the chuck key to tighten the drill bit in the chuck.**
8. **REMOVE THE CHUCK KEY before turning on Drill Press.**
9. **Make sure drill bit lines up with the hole in the center of the table to avoid drilling into the table.**
10. **Back up stock being drilled to avoid splintering.**
11. **Clamp material to the table – It should extend to left.**
12. **Check the depth stop.**
13. **Do not force the drill bit through the material.**
14. **Carefully remove drill bit when finished (BLADE MAY BE HOT AND SHARP).**
15. **Clean up the Drill Press and area around it.**

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LABORATORY RULES

1. Sanitized safety glasses for solids and chemical splash goggles for hazardous chemicals, both with ANSI Z87.1 markings, are required to be worn by all occupants.
2. Follow all directions the first time they are given.
3. Respect all people, chemicals, tools, and machines.
4. Be courteous in language and actions, and respect others and their property.
5. Be on time and prepared to participate.
6. Running, playing, yelling, and throwing objects are NEVER allowed.
7. Food and drink are NEVER allowed in the laboratory.
8. Working in the laboratory while impaired is NEVER allowed.
9. Students must pass all chemical safety, and tool and machine safety tests with 100% accuracy.
10. Students will only be able to use tools and machines when they have obtained permission from the instructor and the instructor is in the laboratory.
11. Students should not work alone in the laboratory.
12. Students should wear proper clothing that protects their arms, legs, and feet from injury. Open toed shoes are NEVER permitted in the laboratory.
13. Remove all jewelry, eliminate loose clothing, and confine long hair.
14. Never use dull or damaged tools.
15. Only the operator is allowed in the machine safety zone while a machine is running unless otherwise specified by the instructor.
16. Do not talk to anyone while operating a tool or machine.
17. Only carry what you can safely handle.
18. Clean up spills, scraps, and dust immediately.
19. IMMEDIATELY report any injury (no matter how minor), faulty equipment, and other unsafe conditions to the instructor.
20. When in doubt, seek assistance from the instructor.
21. Know how to operate laboratory safety controls – eye wash, shower, etc.

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HAND AND PORTABLE POWER TOOLS

1. Ask for instructor's permission before using any tool.
2. Remove all jewelry, eliminate loose clothing, and confine long hair.
3. Always wear sanitized safety glasses with ANZI Z87.1 markings while operating any tool.
4. Wear hearing protection (ear plugs or ear muffs) when necessary.
5. Only use a tool for its intended purpose (ex. a flat screwdriver is not a chisel).
6. Select the correct tool to safely complete the task.
7. Use tools in the proper environment (i.e. Do not use a grinder that emits sparks around flammable vapors or dust).
8. Do not use hand tools with loose or damaged handles.
9. Do not use portable power tools which have frayed, cut, or separated cords from the tool housing.
10. Keep tools and equipment well maintained (i.e. blades sharp, cords well maintained, guards in good working order, etc.).
11. On all metal portable power tools make sure that a 3-pronged grounding type plug is always used.
12. When working outside always use a "Ground Fault Circuit Interrupter" (GFCI) type extension cord, and do not put extension cords around your or shoulders when using portable power tools.
13. Keep hands clear of all cut lines or areas of impact.
14. Never leave a blade or tool unattended.
15. Do not leave any tool hanging over the edge a workbench or table.
16. If hot, do not touch the tool, and let it tool cool down before returning it to its proper location.
17. Ask the instructor for safety information specific to each tool.

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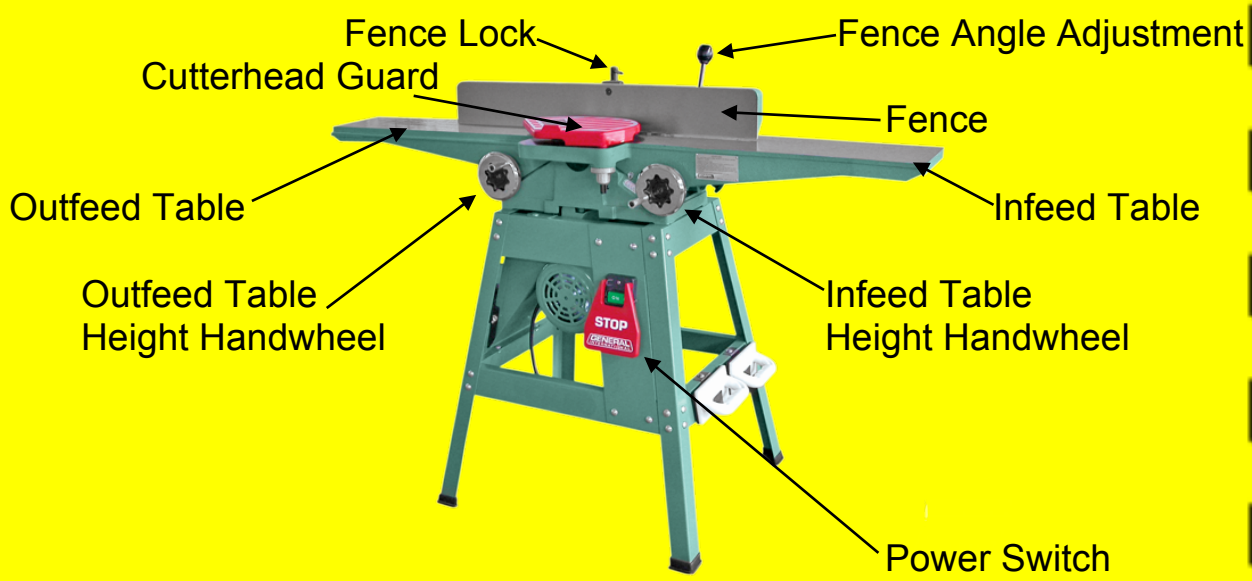
JOINTER



1. **Ask for instructor's permission before using the Jointer.**
2. **Remove all jewelry, eliminate loose clothing, and confine long hair.**
3. **Always wear sanitized safety glasses with ANSI Z87.1 markings while operating the Jointer.**
4. **The guard should be covering the cutterhead at all times when not operating the machine.**
5. **Make all adjustments with the power off.**
6. **Be sure to check all material for loose knots, nails and other foreign objects.**
7. **Do not place your hands within 12 inches of the cutterhead.**
8. **Students should NOT adjust the height of the outfeed table.**
9. **Only joint boards with the grain.**
10. **Stand off to the left and out of line of the cutterhead.**
11. **Never joint stock less than 12 inches long.**
12. **Cut with the concave side of the board facing down.**
13. **Hold firmly against the fence and the table.**
14. **A push stick is required when hands would pass over or within 2 inches of the cutterhead.**
15. **Adjust the infeed table to cut 1/32 of an inch per pass.**
16. **Never make cuts more than 1/16 of an inch thick.**
17. **Material should be pushed through, not pulled.**
18. **Run stock the entire way through the jointer until the cutterhead guard has returned over the throat and knives.**
19. **Turn off, and wait for the cutterhead to come to a complete stop before cleaning it.**
20. **Clean up all scraps and dust from the Jointer before you leave it.**

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LASER ENGRAVER/CUTTER

1. Ask for instructor's permission before using the Laser Engraver or Cutter.
2. Always wear the proper sanitized eye protection with ANSI Z87.1 markings while operating and observing the Laser Engraver or Cutter.
3. Never leave the Laser Engraver or Cutter unattended during operation.
4. Ensure exhaust system is working for proper CO_2 ventilation.
5. All parts of the machine must be fully grounded, in case the static electricity cuts out.
6. Flammable and explosive substances are not allowed near the Laser Engraver or Cutter.
7. Any total reflection objects or diffuse objects are prohibited inside the machine to prevent the laser beam from reflecting out to hurt people.
8. Do not attempt to engrave/cut: nylon, ABS, polyethylene, Lexan/polycarbonate, PVC, vinyl, Teflon, or carbon fiber. Also, do not inhale glass dust.
9. Make all adjustments with the power turned off.
10. Before cutting, ensure the lens housing (laser head and gantry) will not collide with any objects on the honeycomb (cutting) table.
11. Do not push and/or pull the laser head and its gantry.
12. The cover must remain down and in place during the entire operation.
13. The continuous working time for the Laser Engraver or Cutter can't exceed 5 hours.
14. If applicable, the water cycle must be kept clean and at a temperature recommended by the manufacturer.
15. Small sparks and smoke are acceptable, but large flames are not.
16. If there are large flames or the machine malfunctions, immediately cut off the power supply.
17. When the operation is finished, carefully remove parts.
18. Follow all safety guidelines provided by the Laser Engraver or Cutter manufacturer.

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LASERS

1. **Ask for instructor's permission before using and device with a laser.**
2. **Always wear the proper sanitized eye protection with ANSI Z87.1 markings when working around lasers.**
3. **Do not look directly into the laser.**
4. **Do not operate Lasers over a CLASS II rating.**
5. **NEVER point the laser at another individual.**
6. **NEVER point the laser at a reflective surface (e.g. mirrors, glass, Mylar balloons, etc.) unless granted permission by the instructor.**
7. **Appropriate "Laser In Use" warning signage must be posted at all entrances.**
8. **Follow all manufacturer procedures and safety rules.**

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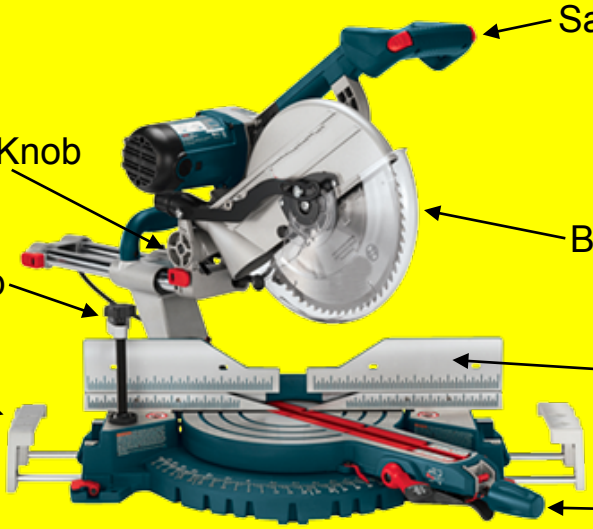
MOTORIZED MITER SAW



1. **Ask for instructor's permission before using the Miter Saw.**
2. **Remove all jewelry, eliminate loose clothing, and confine long hair.**
3. **Always wear sanitized safety glasses with ANSI Z87.1 markings while operating the Miter Saw.**
4. **Check all material for foreign objects before cutting.**
5. **ONLY CROSSCUTTING (cutting across the grain) is allowed on the Miter Saw.**
6. **Check to ensure that all the safety guards and tables are in place and working correctly.**
7. **Disconnect the power before making any angle or blade adjustments.**
8. **Have all cut lines clearly marked before operating the Miter Saw.**
9. **Keep your fingers away from the cut line and blade.**
10. **Do not start the blade while it is touching the stock.**
11. **Support long stock on the ends to prevent binding or jamming.**
12. **Hold the stock firmly on the down on the table and against the fence while cutting.**
13. **Allow motor to reach full speed before beginning to cut.**
14. **If using a Sliding Miter Saw, pull the blade toward you as far as possible, than cut down and away from you to avoid kickback.**
15. **Wait for the Miter Saw blade to come to a complete stop before cleaning it.**
16. **Clean up all scraps and dust from the Miter Saw before you leave it.**

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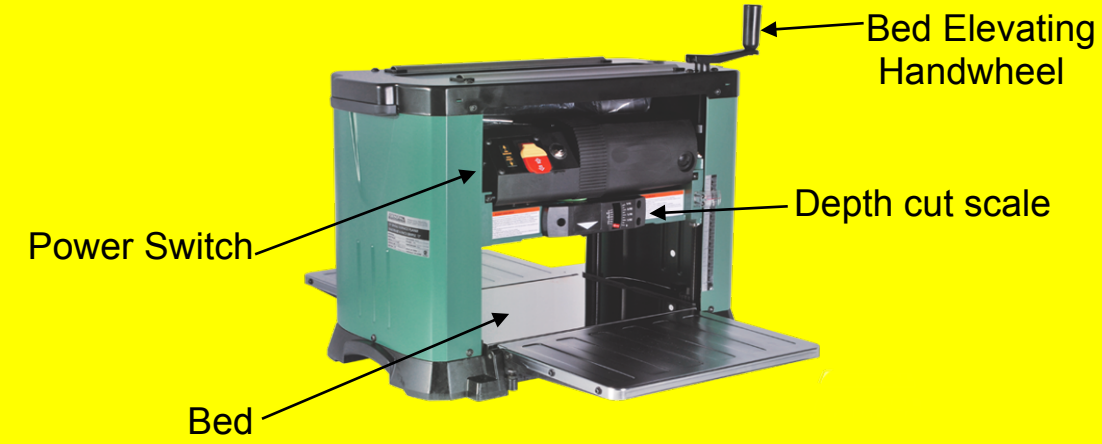
PLANER



1. **Ask for instructor's permission before using the Planer.**
2. **Remove all jewelry, eliminate loose clothing, and confine long hair.**
3. **Always wear sanitized safety glasses with ANSI Z87.1 markings and ear protection while operating the Planer.**
4. **Be sure to check all boards for loose knots, nails, and other foreign objects.**
5. **If the machine is not working or sounding proper, immediately shut off the power and inform the teacher.**
6. **Feed boards into the planer going with the grain of the wood.**
7. **Do not force boards through the planer. Keep hands off the board and let the power feed operate.**
8. **Be careful not to pinch fingers between the board and table.**
9. **Do not attempt to plane a piece that is shorter than the distance between the rollers.**
10. **Select the proper depth of cut and the rate of speed depending on the stock being planed.**
11. **Depth of cut should not exceed 1/16th of an inch per pass (1/2 turn of the handwheel).**
12. **To remove a board that is stuck, shut off, once Planer completely stops lower the table.**
13. **Never look or directly into the throat of a planer at table level while it is running or in operation.**
14. **Keep hands away from the chip guard and the point of operation. Never reach into the Planer.**
15. **Do not stand directly behind the board being planed in case of kickback.**
16. **Wait for the Planer blades to completely stop spinning before cleaning the machine.**
17. **Clean up all scraps and dust around the Planer before you leave the area.**

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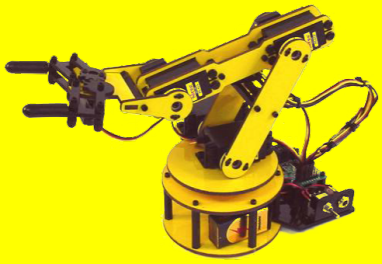
ROBOTICS



1. **Ask for instructor's permission before using any Robot.**
2. **Understand the program of the robot actions and motions prior to use.**
3. **Always wear sanitized safety glasses with ANSI Z87.1 markings while working on, operating, and observing any Robot.**
4. **Stay out of the designated safety zone during operation.**
5. **Ensure the safety zone is free of tools and materials.**
6. **Check for malfunction lights or messages before beginning.**
7. **When possible, run a simulation before having the robot execute the program.**
8. **Start with slow movements until points are confirmed.**
9. **If a malfunction occurs, immediately press the emergency stop button and contact the instructor.**
10. **Clean up area when finished and return robot to the home position.**

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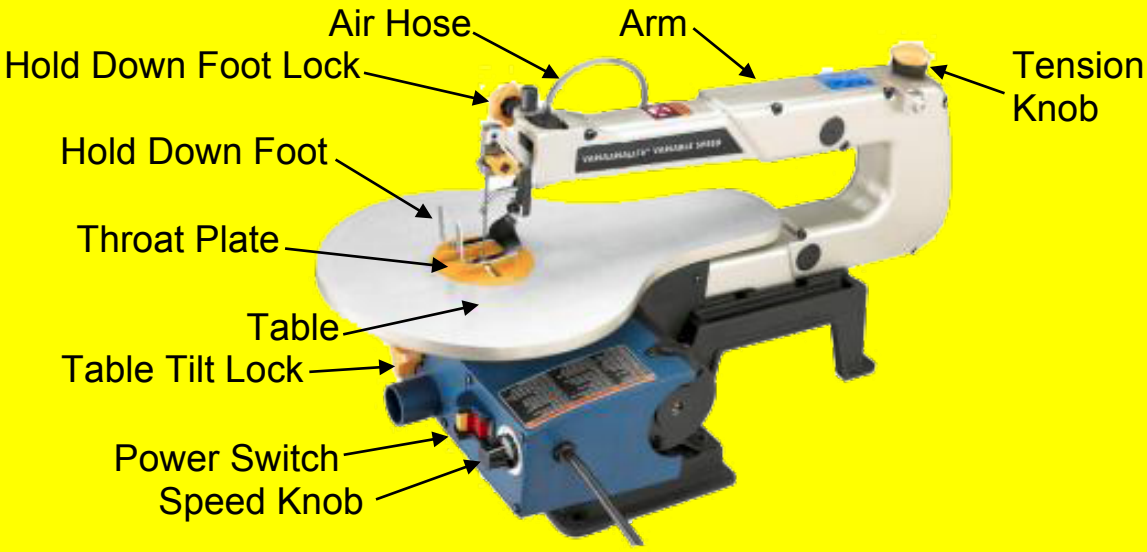
SCROLL SAW



1. **Ask for instructor's permission before using the Scroll Saw.**
2. **Remove all jewelry, eliminate loose clothing, and confine long hair.**
3. **Always wear sanitized safety glasses with ANSI Z87.1 markings while operating the Scroll Saw.**
4. **Check all material for foreign objects (nails, staples, etc.) before cutting.**
5. **Clearly mark all lines to be cut.**
6. **Hold the material away from the blade before you turn on the Scroll Saw.**
7. **Keep your fingers away from the cut line and blade. 2 inches minimum.**
8. **Hold material firmly down on table.**
9. **When cutting a tight curve, first cut relief cuts then push the work piece slowly without twisting or bending the blade.**
10. **Do not force the work into the blade.**
11. **Slowly cut around tight curves – speed up on the straight lines.**
12. **Be cautious when gently blowing sawdust away so that you can see the line of cut.**
13. **If the blade breaks turn the power off and notify the instructor immediately.**
14. **Turn off the Scroll Saw when finished cutting.**
15. **Wait for the Scroll Saw to come to a complete stop before cleaning it.**
16. **Clean up all scraps and dust from the Scroll Saw before you leave it.**

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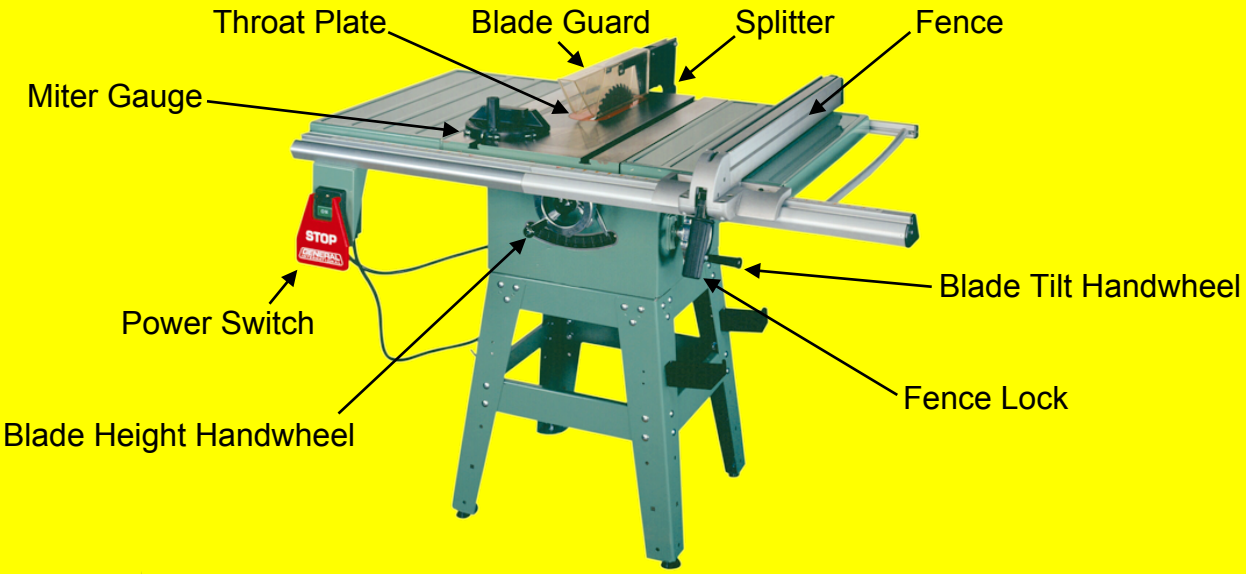
TABLE SAW



1. **Ask for instructor's permission before using the Table Saw.**
2. **Remove all jewelry, eliminate loose clothing, and confine long hair.**
3. **Always wear sanitized safety glasses with ANSI Z87.1 markings while operating the Table Saw.**
4. **Check all material for foreign objects before cutting.**
5. **Check to ensure that all the safety guards are in place and working correctly.**
6. **Always use the saw guard, splitter, and anti-kickback device if equipped.**
7. **Make all adjustments and remove chips or dust with the power off.**
8. **NEVER use the miter gauge and fence together in the same operation.**
9. **The saw blade should extend above the work piece until the gullets of the blade clear the material.**
10. **NEVER cut free hand. Use the miter gauge when cross cutting (cutting across the grain), and the fence when ripping (cutting with the grain).**
11. **NEVER reach over the saw blade.**
12. **Use a push stick when ripping narrow stock or when hands would be close to the blade.**
13. **Do not stand in line of the cut when operating the saw in case of kickback.**
14. **Use extra care and precaution when sawing large material, or when using a dado or molding cutter head.**
15. **Use a helper to support cutting long stock, but operator should control the cutting.**
16. **Be sure the machine has come to a full stop and lower the blade and before leaving.**
17. **Do not start the saw with the blade touching the material.**
18. **Turn off the Table Saw when finished cutting.**
19. **Wait for the Table Saw blade to come to a complete stop before cleaning it.**
20. **Clean up all scraps and dust from the Table Saw before you leave it.**

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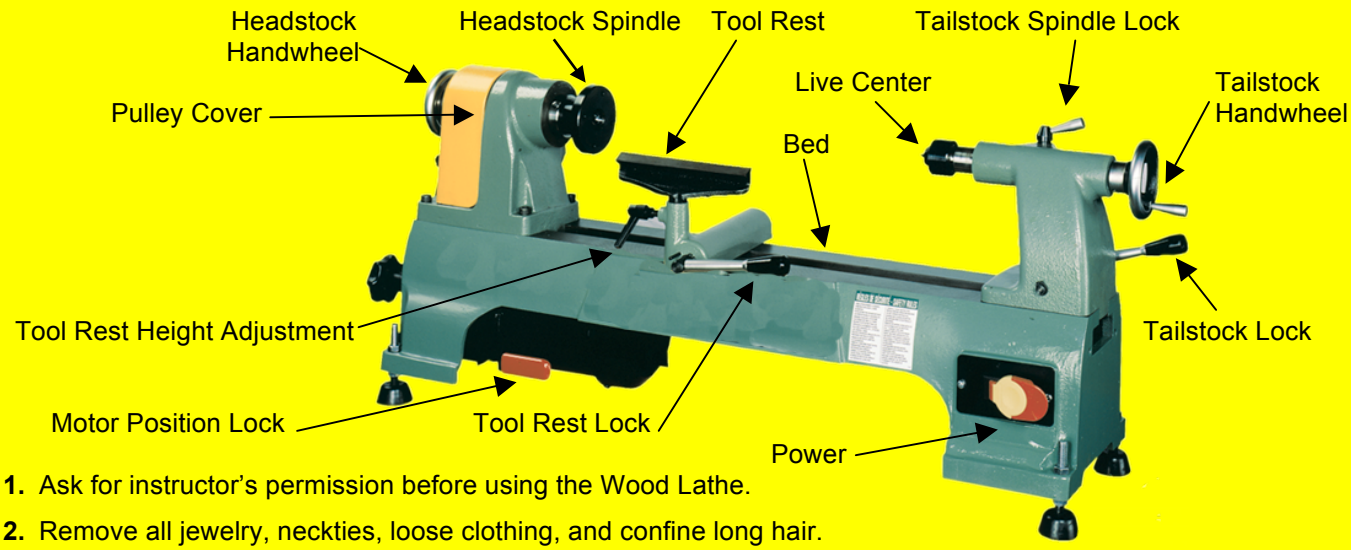
WOOD LATHE



1. Ask for instructor's permission before using the Wood Lathe.
2. Remove all jewelry, neckties, loose clothing, and confine long hair.
3. Always wear sanitized safety glasses with ANSI Z87.1 markings or a face shield while operating the Wood Lathe.
4. Check the stock for any foreign materials, soundness, and proper centering before cutting. When centered properly, clamp tailstock firmly in place and tighten the tailstock spindle lock.
5. Be sure to allow laminated or glued-up blanks to dry thoroughly before turning.
6. Never leave the lathe running unattended. Keep the lathe unplugged when not in use and before making adjustments
7. The proper speed should be selected for the diameter and hardness of the material. In general, roughing stock and beginning cuts are done at low speeds.
8. Adjust the tool rest and turn the stock using the headstock handwheel before power is turned on to be sure it can run clear of the tool rest. All adjustments to tool rest are to be made when machine is COMPLETELY stopped.
9. The lathe tool rest should be set 1/4 of an inch or less from the rough stock. The tool rest should be 1/8 of an inch above the center of and parallel to the stock.
10. Be sure that you have selected the proper sharp tools for the operations and that the handles are secure.
11. Hold the lathe turning tool firmly down against the tool rest.
12. Never use your fingers to check the work for roundness while the lathe is running, especially during roughing operations. Stop the lathe to check the progress.
13. The tool rest shall be removed for all sanding operations.
14. Wear a dust mask when performing sanding operations.
15. Tools should not be left on the bed of lathe while it is in operation.
16. Do not allow anyone to stand behind the lathe while it is in operation. Lathe tools caught by the wood can be thrown in that direction.
17. Clean up all scraps and dust with the power turned off before leaving the Lathe.

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ADDITIONAL LABORATORY SAFETY RULES

1. **Never operate any equipment in the lab without first receiving safety training and reviewing (and signing) the safety acknowledgement form with the teacher.**
2. **Appropriate occupancy loads are established and enforced.**
3. **All exits are to be access free.**
4. **Machines are to be anchored as designed (to the floor, bench, etc.) before operating.**
5. **When working with machines that produce wood dust, make sure a wood dust collection system is turned on and operating as designed!**
6. **All electrical receptacles are GFCI protected and operational.**
7. **Make sure all electrical cords and plugs are in good operating order before using any equipment requiring electrical power.**
8. **A means of communications (intercom, telephone, cell phone) is available in case of an emergency.**
9. **An emergency eye wash and shower with 10 second access and tepid water (60-100 degrees F or 15.6-37.8 degrees C) are available.**
10. **A first aid kit is readily available in case of a safety injury.**
11. **An ABC type fire extinguisher is appropriately hung for easy access.**
12. **Flammable materials for disposal (rags, etc.) should be placed in an appropriate metal disposal container. The container must be emptied into a secondary holding container outside of the building at the end of each day.**
13. **All flammable liquid chemicals should be stored properly in a flammable liquid cabinet.**
14. **Proper storage is available for tools, wood, metal, etc.**
15. **An appropriate number of sinks, soap dispensers, and paper towel dispensers for hand hygiene are provided.**
16. **Always clean up during and after equipment use to prevent slip and trip fall hazard accidents.**
17. **Failure to follow the safety rules will result in a loss of laboratory privileges!**

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