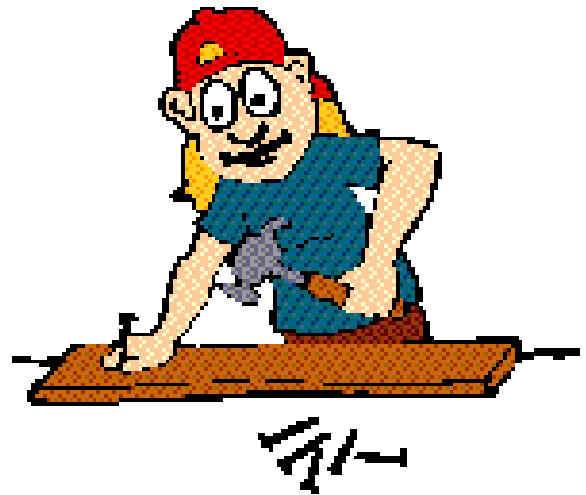


Construction Technologies



Technology Education Safety Procedures and Recommendations For all Woodworking Classes

Safety Pledge:

Read and discuss rules, have students and their parents sign the safety pledge. Students will return the pledge signed by parent we will then keep the pledge on file while the student is enrolled in Technology Education classes.

General Safety:

Discuss general safety rules applicable to any shop or lab.

Hand Tool Safety:

Discuss and demonstrate proper use of common hand tools used in the lab or shop.

Machine Tool Safety:

Students will learn the key features, adjustments, purpose and the safety concerns of the machines utilized in the course they are enrolled in. The machines and power tools are included but not limited to these:

Tablesaw	Radial Arm Saw
Widebelt Sander	Jointer
Miter Saw	Overhead Router
Bandsaw	Belt/Disc/Spindle Sander
Drill Press	Router Table
Panel Saw	Panel Router
Hand Router	Corded/Cordless drills
Orbit Sander	Portable Belt Sander
Circular Saw	Saber Saw
Plate Joiner	Wood Lathe
Planer	Pocket Hole Cutter

Students will be evaluated by tests and quizzes, performance evaluations, and observation by the instructor.

Unsafe behavior is the number one cause of accidents and injuries on the job and in woodworking workshops. Get into the habit of working safely. You'll benefit yourself and your co-workers.

Develop a Safe Attitude

- Work quietly and give your full attention to the task at hand.
- Never indulge in horseplay or other foolish behavior.

Keep Yourself and the Work Area Neat and Clean

- Fewer accidents occur in shops that are well maintained.
- Prevent slips and falls by keeping the floor clear of clutter and wiping up any spills.
- Wash your hands before eating to avoid ingesting hazardous substances.

Dress for the Job

- Don't wear loose clothing, jewelry, or dangling sleeves that can get caught in the machinery.
- Don't wear sandals or open toed shoes. Wear safety, shoes or boots with non-skid soles.
- Tie back long hair or wear you're your hair under a cap.
- Always use the appropriate personal safety equipment.

For small jobs, it some times doesn't make sense to spend time setting up large machines. Hand tools and portable power tools are often convenient for these jobs because they set up quickly and easily. They are also small enough that you can take them with you for jobs at other locations. However, hand tools and portable power tools must be handled as the larger machines. Follow these safety rules whenever you use them:

- Use a hand tool only for the task for which it was designed.
- Always wear safety glasses or goggles.

Using a plane

- Wear eye protection when planing.
- Secure stock in a vise.
- Make adjustments carefully. The plane iron is sharp.

Using a Chisel

- Secure the workplace so it cannot move.
- Keep both hands behind the cutting edge and the chisel away from the body.
- Hold the tool correctly. If you are right handed, use your right hand to push the handle while the left hand guides the blade. When using a mallet, the left hand should hold the handle, while the right hand taps the tool. If you are left handed, do just the opposite.
- Protect the handle by using a wood or plastic mallet or a soft-faced hammer. Never use a metal hammer.
- Always hit the tool squarely on top of the handle.
- Never allow the edge to touch other tools. Avoid dropping the chisel on the floor or any other hard surface.

Using a Portable Drill

- Be sure the drill is disconnected from the power source before installing drills, bits, or other tools. If using a cordless power drill, remove the battery pack.
- Make sure the twist drill or bit is properly sharpened before installing it in the chuck.
- If a chuck key is used, make sure it has been removed before starting the drill.
- Clamp the work piece in a vise or to the top of a workbench before drilling.
- Use a scratch awl or punch to mark a starter hole.

Follow these safety rules when using stains, paints, and other finishes:

- Wear approved eye protection.
- Wear a respirator when spraying finishing materials.
- Avoid breathing fumes from toxic materials.
- Wear rubber or vinyl gloves to minimize risk of skin irritations when using a cloth or a pad to apply solvents, bleaches, stains, and finishes and when cleaning brushes.
- Wash your hands after using any finishing materials.

Finishing Room Safety

- Do all finishing in a separate, well-ventilated area specifically designed for finishing.
- Make sure the proper types of fire extinguishers are available in the room.
- For spraying, use a properly installed spray booth. Keep the spray booth clean and well maintained.
- Keep the entire area clean and free from spills.
- Never leave opened finishing materials unattended.
- Never use tools or machines that can cause sparks or start a fire in the finishing area.

Using and Storing Solvents

- a) Solvents emit dangerous fumes. Use only in a well ventilated area.
- b) Many solvents are extremely flammable. Keep all solvents away from sources of heat, sparks, and fires.
- c) Store solvents in their original containers. If, for some reason, this is not possible, be sure the new container 's clearly labeled.
- d) Be sure to read and obey the labels on each type of solvent

Radial Arm Saw Safety Notes

1. Obtain the instructors permission before using the radial arm saw the first few times.
2. When properly used, the radial arm saw is one of the safest power tools in the woodshop.
3. For all crosscutting operations the stock is held against the table and guide fence. This eliminates kickback, a major cause of saw accidents.
4. Be wide awake and alert when operating the radial arm saw. Concentrate only on what you are doing.
5. Be sure there are no tools on the radial arm saw table when using it.
6. If the blade is dull, do not use the saw.
7. Do not attempt to use the radial arm saw for cutting small pieces of stock. This is a very dangerous practice and will result in an accident.
8. Keep the blade guard in position and do not remove it without permission from the instructor.
9. Before turning the saw on make sure all locking handles and clamps are tight and the depth of cut is correct.
10. Always return the saw to the rear of the table after completing a cut. Return it by hand rather than letting it slam back.
11. Never remove the stock being cut from the table before the saw has been returned back to the column.
12. Never attempt to remove small scraps from around a moving blade, wait until the saw comes to a complete stop.
13. Maintain a 4" margin of safety. To do this you must keep your hands this distance from the path of the saw blade.
14. Shut off the power and wait until the saw comes to a complete stop before making any adjustments to it.
15. When cross cutting long stock to length, make sure someone is supporting the overhanging end so it will not tip up into the saw when the cut is completed.
16. Be extremely careful you do not bump into the stock being cut out or into the operator of the saw when he is cutting on the radial arm saw.
17. The table should be kept clean and free of scrap pieces and excessive amounts of sawdust.
18. Do not cut round stock on the radial arm saw. The stock has a tendency to spin into the blade.
19. When cutting stock thicker than 1" or a hard wood, the radial arm saw has a tendency to want to "climb over" the stock. Therefore be sure you have a good grip on the handle when pulling the blade through the wood.
20. Secure permission from the instructor before making any ripping cuts or other special setups.

Follow these safety rules when using a radial-arm saw:

- Make sure that the blade is sharp and is the correct kind for the cutting operation.
- Mount the blade on the arbor so that the cutting edges turn toward you.
- Before starting the motor, make sure the guard is in place and that all the clamps are tight.
- Make sure the saw is at full speed before making the cut.
- Keep your hands away from the path of the blade. Maintain a 4 inch margin of safety.
- Hold the stock firmly against the table for crosscutting operations.
- When ripping, always feed the stock into the blade so the bottom teeth are toward you. This will be the side opposite the antikickback fingers.
- Make all adjustments with the motor and blade at a complete stop.* After turning off the machine, do not try to stop the blade by holding a stick or similar item against it.
- Return the saw to the rear of the table after completing the cut. Never remove stock from the table until the saw is returned.

Table Saw Safety Notes

1. Obtain permission from the instructor before using the table saw the first few times.
2. Keep the blade guard in position. And do not remove it without permission from the instructor.
3. Be sure that the correct blade is placed correctly in the saw
4. Adjust the saw so that it clears the top of the stock by 1/8".
5. Make sure that clamps and locking handles are tight before turning the saw on.
6. Be sure that the saw blade is sharp. A dull blade is extremely hazardous due to kickback.
7. Make all adjustments with the saw at a complete stop. Never try to stop the rotating blade by holding a stick against it.
8. Never stand directly behind the saw blade. Stand to one side so you are out of the way if the wood kicks back.
9. Never reach over the saw to pick up a piece of stock, walk around the saw.
10. Maintain a 4 inch margin of safety. Do not let your hands come closer than 4 inches to the operating blade.
11. Never attempt "freehand" cutting on the table saw. Always use a guide.
12. The stock being cut out must be jointed on the edge that contacts either the fence or miter gauge.
13. Cut stock that is free of loose knots, splits, and warp.
14. Make sure that the miter gauge works freely in the slot.
15. Hold the stock firmly when cutting. Keep your fingers away from the path of the saw.
16. Never clear scraps away with your fingers. Use the push stick to move them.
17. Never attempt to cut round stock on the table saw without a special jig.
18. When ripping long stock, have someone responsible assist you to "tail off" the work. However, never allow the person to pull or tilt the board as it is being ripped. The operator controls feed and direction of the cut.
19. When ripping a piece of stock narrower than 5 inches, use a push stick. The push stick must be of the approved type and not just a piece of scrap.
20. Before ripping make sure the fence is locked tight.
21. Be sure that the fence or miter gauge will not strike the blade when the blade is tilted for angle or bevel cutting.
22. Allow the saw to come to full speed before starting to cut. The stock must not contact the blade before turning on the power.
23. Turn off the power immediately if saw does not sound right.
24. Watch carefully what you are doing. Avoid distractions and never look around while operating the saw.
25. Resawing and other special set-ups must be inspected and approved by the instructor before the power is turned on.
26. Before leaving the saw, it should be at a complete stop.
27. Think before acting.

The table saw is probably the most commonly used machine in the woodworking shop. It is therefore important to know and follow the safety rules that apply to working with a table saw. Follow these rules:

- When changing saw blades or installing a dado head, make sure the main switch is off. When possible, pull the plug from the receptacle to prevent accidental starting.
- Always stop the saw before making any adjustments, including height of the saw blade, angle setting, fence adjustments, and all special setups.
- When setting up the saw, check to see that the saw blade revolves freely in the correct direction, that the blade is securely fastened to the arbor, and that any clamps or knobs on the fences are properly tightened.
- Have your instructor check all special setups and blade changes before the saw is started.
- Raise the saw blade from 1/8 to 1/4 inch higher than the thickness of the stock to be cut.
- Make sure the antikickback pawls (fingers) behind the saw blade are always in place. These resist the tendency of the saw to throw the stock upward and toward the operator.
- Always use the saw guard. Never operate the saw without the guard in place unless a special jig or fixture is used as a guard.
- Do not try to cut cylindrical (round) stock on the saw.
- Stand to one side of the saw blade. No one should ever stand in line with the blade, where the kickback could cause serious injury.
- Hold the stock to be sawed against the fence or miter gauge. Never try to saw without holding the stock against the fence or miter gauge.
- Do not force stock into a saw blade faster than it will cut.
- If the space between the saw blade and the fence is 5 inches or less, use a push stick to push the stock past the blade.
- When cutting stock, do not allow your fingers to come closer than 5 inches to the saw blade.
- Never reach over the saw blade.* Have a helper take the stock away.
- Use a stick or board to clear away scraps close to the saw blade. Do not use your hand.
- Remove all special setups and the dado head from the saw after use.
- Use a rip fence for ripping operations.
- Use the splitter, guard, and antikickback pawls when ripping. If a splitter is not used, stop the machine and insert a wedge in the kerf as soon as the cut has passed the back of the blade.
- Stock to be ripped must have a straight true edge and must lie flat on the table. Never cut stock on the saw if it is warped, "in wind," or has a rough or bowed edge.
- Whenever helping to "tail-off," hold the board up and allow the operator to push the stock through the saw. Never pull on a board being ripped.
- Fasten a clearance block to the rip fence when cutting off short lengths of stock. Make sure the block is clamped ahead of the blade. Use a sliding miter gauge to hold the stock.

Follow these safety rules when using a jointer:

- Adjust the tables for the depth of the cut before turning on the power. Turn off the jointer before making any adjustments.
- Never allow your hand to pass directly over the cutterhead.
- Do not use a jointer to process stock less than 2 inches wide or 12 inches long or 1/2 inch thick.
- Always have the guard in place over the knives while the jointer is being operated. (The only exception to this rule is when rabbeting stock.)
- Stand to the left of the jointer, never directly behind it.
- Feed the stock into the machine in the direction opposite of the grain.
- Do not allow your fingers to come any closer than 4 inches to the rotating knives when jointing stock. Always keep your hands on top of the work.
- Do not use the jointer for cuts heavier than 1/8 inch. A cut that is too heavy may cause kickback. It is safer to take several lighter cuts.
- Feed work firmly and at a rate that will not overload the machine.
- Keep your hands on top of the stock and not on the ends.
- Use an approved push block to push stock through the machine when planing the face of the board.

Follow these safety rules when using a router:

- Be sure switch is in the OFF position before plugging in the router.
- Select the appropriate bit or cutter for the specific Job and adjust it to the proper depth.
- Use the proper wrenches to tighten the nuts that hold the bit or cutter in the shaft.
- Fasten the workpiece securely in a vise or with clamps.
- Check to see that the bit rotates freely and all adjusting nuts and knobs have been tightened.
- Always wear ear and eye protection when using a router.
- Make a trial cut on a scrap piece of the same thickness before attempting the final cut.
- Keep your hands clear of the rotating cutters.
- Hold the router firmly in both hands. Take special care when turning the machine on and off
- Feed the router into the stock at an appropriate speed. Never force it faster than it will cut. Feeding too slowly will cause the bit to heat up.
- Move the router in the proper cutting direction.
- After turning off the power, wait until the machine comes to a complete stop before setting it on its side.

Follow these safety rules when using a power sander:

- Be certain the sanding belt or disc is correctly mounted. The belt must track in the center of the rollers and platen.
- Make sure the guards and workable adjustments are securely locked.
- Use the worktable, fence and other work guides to control the position of the work, whenever possible. Position the table 1/16 inch from the sanding belt or disc.
- Hold small or irregularly shaped pieces in a hand clamp, or make a special jig or fixture to hold them.
- Do not use power sanders to shape parts when the operations could be performed better using other machines.
- Sand only clean, new wood. Do not sand work that has excess glue or finish on the surface. These materials will ruin the abrasive.
- Keep the stock in motion when sanding to prevent burning due to friction.
- Be sure to wear a dust mask.

Using Stationary Belt Sanders

- When sanding the end grain of narrow, pieces on belt the sander, always support the work against the worktable.
- Feed the stock directly against the sanding belt. Never feed it in from the left or right as it may catch and rip or pull the belt off.

Using Stationary Disc Sanders

- Do not operate the disc sander if the sanding paper is loose. Make sure the adhesive is holding the sanding disc tightly to the platen.
- Sand only on the side of the disc sander that is moving downward, toward the table. Check the rotation of the disc. Some rotate clock-wise, others counterclockwise.

Follow these safety rules when using a planer:

- Check the board to be sure it is free of nails, loose knots, and other imperfections. Plane a warped board only after one surface has been trued on a jointer.
- Make sure that the board is at least 2 'inches longer than the distance between the feed rolls. For a small planer, this usually means a board should be at least 14 inches long.
- Never plane more than one thickness at a time. If several thicknesses are to be surfaced, always plane the thickest first, until it is about the same thickness of the others.
- Always stand to one side of the planer when planing. Never stand directly behind the board.
- Keep your hands away from the board after it starts through the planer.
- Never look into the planer as the board is passing through. Loose chips may be thrown back with great force.
- If a board sticks, turn off the switch. Wait for the cutterhead to stop. Then lower the table and remove the board.
- Never reach over the planer. If the board is long, have a helper support the surfaced stock as it is being fed out of the planer.
- Whenever helping to "tail off," simply support the board and keep it level. Never pull on a board being planed. Allow the outfeed rollers to feed the stock out of the planer.
- Stop the planer to make any adjustments or to clean or oil it.

Follow these safety rules when using a lathe:

- Wear proper eye protection for the lathe operation.
- Make sure the wood is free of checks, knots, and other defects.
- All glued-up work must dry at least 24 hours before being turned on the lathe. If the glue has not set properly, the pieces may fly apart during turning.
- Lubricate the dead center (in the tailstock) with oil or beeswax.
- Securely lock the tailstock before starting the lathe.
- Check for end play (left or right movement) by rotating the stock.
- Set the tool rest as close as possible to the workpiece without actually touching it. If there is too much space between the tool rest and the workpiece, the turning tool may catch and be pulled from your hands.
- After centering rough stock on the lathe, turn the stock a few times to make sure it will clear the tool rest.
- Keep the tool rest in the locked position. Never try to adjust the tool rest while the lathe is running.
- Start all turning operations at the lowest speed until the stock is roughed down to a cylindrical (round) form. Then increase to a higher speed. Do not turn large diameter stock at high speeds. Do not exceed the recommended speed for the size stock and turning operation you are using. Excessive turning speed can cause pieces to be thrown from the lathe, which could result in serious injury.
- Hold all turning tools firmly with both hands.
- Maintain a firm, well-balanced stance on both feet.
- Always stop the lathe when checking the diameter of stock with calipers.
- When faceplate turning, screw the faceplate securely to the wood.
- Avoid cutting too deeply or you may, strike the screws.
- When sanding or polishing, remove the tool rest to prevent accidents.

Follow these safety rules when using a drill press:

- Use a drill bit with a round or hex shank - never a square one.
- Use a slow speed for large holes and a faster speed for smaller holes.
- Clamp work securely, especially when operating the drill press in high speeds.
- Keep your hair and loose clothing away from all moving parts.
- Always wear eye protection.
- Place the drill bit in the chuck straight and tighten it securely.
- Always remove the chuck key before starting the machine.
- When preparing the setup, make sure the drill bit will not mar the vise or table. Place a piece of scrap stock under the work to be drilled.
- Clamp cylindrical (round) stock in a V-block before drilling.
- Keep your fingers at least 4 inches away from the rotating tool.
- Remove shavings with a brush or stick, never your fingers.
- Feed the drill or bit smoothly into the workplace. When the hole is deep, withdraw the bit often to clear the shavings.
- Check the setup carefully before doing special operations such as shaping or sanding.
- On a variable speed machine, follow the manufacturer's instructions when changing speeds. On a step pulley machine, disconnect the power before making any changes.

Follow these safety rules when using a sliding compound miter:

- Always wear eye protection.
- Make sure the saw is securely bolted to a workbench or a stand designed especially to hold it.
- Always unplug the machine before inspecting or servicing it.
- Carefully inspect the blade for cracks, missing teeth, or other damage before plugging the tool into an outlet. Report any damage to the instructor immediately.
- On many machines, there is a slight, but distinct, movement of the saw head when the power is switched on. Hold the handle tightly.
- Keep all guards in place.
- Use care and common sense when operating a power saw.
- Use one hand to press the power switch. Keep your other hand at least 4 inches away from the blade.
- Never hold any workplace by hand. It must be secured by the holddown clamps provided.
- Make sure the blade is not in contact with the workpiece before pressing the power switch.
- Always make sure the blade rotates freely before doing any work.
- Wait until the blade attains full speed before lowering it into the material.
- When the saw is turned off, the blade will coast (continue to turn) for a time. Keep your hands away from it.
- Wait until the blade has completely stopped turning before raising the saw head and removing the workpiece.

Follow these safety rules when using a band saw:

- Use the correct blade. Choose the largest one with the coarsest teeth that will cut the stock cleanly. Make sure it is sharp and in good condition.
- Before operating the saw, check the blade for proper tension and proper mounting. The teeth should point down on the downward stroke.
- Be sure the wheels turn clockwise as viewed from the front of the saw. The arrow on the motor pulley indicates the direction of rotation.
- Be sure the wheel guards are closed before turning on the machine.
- Adjust the upper guide assembly so it is 1/2 inch above the stock.
- Hold the stock flat on the table.
- Cut cylindrical (round) stock by holding it in a special "V" fixture.
- Allow the saw to reach full speed before starting the cut.
- Keep your fingers at least 2 inches from the side of the blade. Never put your fingers in front of the blade.
- Feed work into the side of the saw blade firmly and at a rate that will not overload the saw.
- Keep from twisting the blade or crowding it beyond its cutting capacity.
- If you need to back the saw blade out of a long cut, first turn off the power and allow the machine to come to a complete stop.
- Clear away scraps close to the blade with a stick, not with your fingers.
- Stop the band saw before making any adjustments.

Follow these safety rules when using a scroll saw:

- Be certain the blade is properly installed in a vertical position, with the teeth pointing down.
- Check the belt guard to be sure that it is closed and tight.
- Adjust the hold-down to the thickness of the stock being cut. This will prevent the work from moving up and down with the blade.
- Do not allow your fingers to come any closer than 2 inches from the blade when cutting stock.
- Keep your fingers to the side of the blade, never in front of it.
- Cut cylindrical (round) stock by holding it in a special "V" fixture.
- Stop the scroll saw before making any adjustments.

Follow these safety rules when using adhesives and hazardous materials:

- Always wear a charcoal-filtered respirator to protect your lungs from fumes when using adhesives. Be sure the filters in the respirators are new.
- Work in a well ventilated area.

Using a Glue Gun

- The tip of the glue gun becomes very hot. Do not touch it.
- Allow glued surfaces to cool before touching them with your hands.

Using a Hot Iron with Veneers

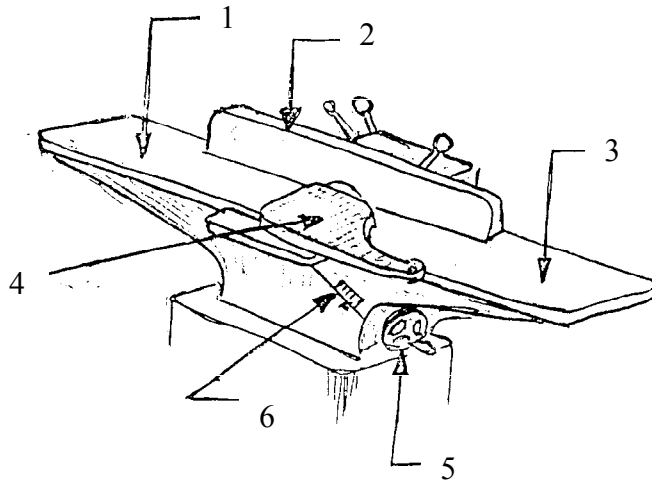
- Don't touch the heated portion of a hot iron with your hands.
- Let the ironed surface cool before touching it.
- When you have finished using the iron, turn it off and set it aside in an upright position on a flat surface.

Using Hazardous Materials

- Read labels on containers carefully before use. Follow directions *exactly* as stated on the container.
- Familiarize yourself with the Material Data Safety Sheet on the product.
- Keep all flammables away from sources of heat, fire, and sparks.
- Close all cans and containers tightly after use.
- Whenever possible, store all products in their original containers. Make sure they are clearly labeled.
- Dispose of all used rags and disposable gloves in a fireproof container.
- Dispose of all leftover combustible materials immediately, or store them in approved containers.
- Store aerosol containers in a cool place.
- Keep all flammable materials in a fireproof cabinet.

Safety/Operation Test – Jointer

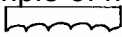

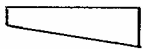
Name _____ Grade _____ Date _____



Identify the parts of the jointer:

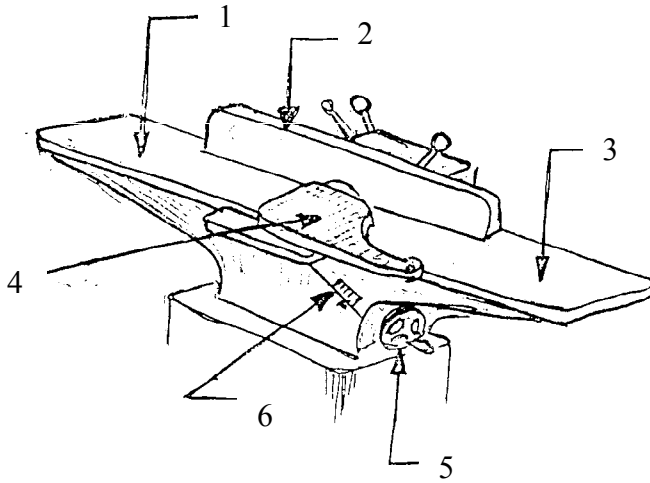
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

- _____ 1. Always check the depth of a cut before starting the machine. T or F
- _____ 2. Jointing a board means:
a. removing all the warp,
b. cutting to uniform thickness
c. gluing boards edge to edge
d. straightening the edges
- _____ 3. The size of a jointer is determined by:
a. the length of its knives
b. its depth of cut
c. the length of its tables
- _____ 4. In adjusting the depth of cut on the jointer for an edge cut, you should limit the cut to:
a. 1/16"
b. 1/8"
c. 1/4"
d. 3/16"
- _____ 5. The depth of cut is determined by the adjustment of the _____ table.
- _____ 6. To make a straight cut, the outfeed table is adjusted so that the top surface is tangent to the cutting circles of the knives in the cutting head. T or F

- _____ 7. The shortest length of stock that should be jointed is:
- no limit
 - 6"
 - 12
 - 18"
- _____ 8. The jointer will do the following:
- cut on side of the board parallel to the other
 - make an edge smooth and straight
 - sand a board smooth
- _____ 9. The fence on the jointer will:
- not tilt
 - tilt right or left
 - tilt right only
 - tilt left only.
- _____ 10 The squareness of a cut is determined by the adjustment of the _____.
- _____ 11. Try to cut _____ the grain, not against it and avoid jointing loose knots or boards with defects.
- _____ 12. A push stick device should be used if jointing stock less than 4" wide. T or F
- _____ 13. An example of mill marks is:
- 
 - 
 - 
- _____ 14. One of the following is NOT a reason knives need sharpening:
- planed wood has a fuzzy look
 - it's difficult to feed the stock
 - stock moves easily over the knife
 - stock chatters when cutting
- _____ 15. The guard must always be used when joining edges. T or F

Safety/Operation Test – Jointer (MASTER)

Name _____ Grade _____ Date _____



Identify the parts of the jointer:

1. rear outfeed tab
2. fence
3. front feed tab
4. front guard
5. depth scale
6. front table adj. Height wheel

T _____ 1. Always check the depth of a cut before starting the machine. T or F

d _____ 2. Jointing a board means:
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c. gluing boards edge to edge
d. straightening the edges

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c. 1/4"
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infeed _____ 5. The depth of cut is determined by the adjustment of the _____ table.

T _____ 6. To make a straight cut, the outfeed table is adjusted so that the top surface is tangent to the cutting circle of the knives in the cutting head. T or F

c _____ 7. The shortest length of stock that should be jointed is:
a. no limit
b. 6"
c. 12
d. 18"

b _____ 8. The jointer will do the following:
a. cut on side of the board parallel to the other
b. make an edge smooth and straight
c. sand a board smooth

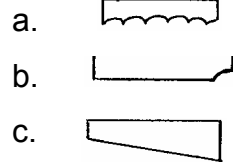
c _____ 9. The fence on the jointer will:
b. tilt right or left
c. tilt right only
d. tilt left only.

fence 10 The squareness of a cut is determined by the adjustment of the _____.

with 11. Try to cut _____ the grain, not against it and avoid jointing loose knots or boards with defects.

F _____ 12. A push stick device should be used if jointing stock less than 4" wide. T or F

a _____ 13. An example of mill marks is:



c _____ 14. One of the following is NOT a reason knives need sharpening:
a. planed wood has a fuzzy look
b. it's difficult to feed the stock
c. stock moves easily over the knife
d. stock chatters when cutting

T _____ 15. The guard must always be used when joining edges. T or F

- C** _____ 14. One of the following is NOT a reason knives need sharpening:
a] planed wood has a fuzzy look, b] it's difficult to feed the stock, c]
stock moves easily over the knives, d] stock chatters when cutting.
- True** _____ 15. The guard must always be used when joining edges. T or F

Safety Test – Jointer

Name _____ Grade _____ Date _____

True or False:

- _____ 1. Dull joiner knives are a safety hazard.
- _____ 2. It is necessary to see that the fence and other adjustments are securely tightened each time you use the jointer.
- _____ 3. Any scrap of wood will serve as a pushstick as long as your fingers are not near the cutterhead.
- _____ 4. End grain can be planed if the width of the board is 12" or more.
- _____ 5. The shortest piece of stock you can joint is 12".
- _____ 6. It is not necessary to shut the jointer off if you only leave it for a few seconds.
- _____ 7. Chattering stock is an indication of dull knives.
- _____ 8. It is permissible to joint the end grain of an 8" wide board.
- _____ 9. The only time the guard is not used is when cutting a bevel or chamfer.
- _____ 10. The minimum distance between your hand and the cutterhead is 2".
- _____ 11. You alone should turn the machine on and off.
- _____ 12. You should not talk to anyone when using the jointer.
- _____ 13. At times it may be dangerous to joint wood against the grain.
- _____ 14. The maximum thickness of cut when jointing an edge is 3/16".
- _____ 15. Be sure the student helping you pulls and guides stock through the jointer slowly to avoid you cutting yourself on the knives.
- _____ 16. The outfeed table is not adjusted by the student.
- _____ 17. Hold the stock securely against the table and fence to avoid having it tip and allowing your hand to hit the knives.
- _____ 18. Rapid feeding of stock into the jointer will not only produce a rough cut, but is also dangerous.
- _____ 19. Knots, splits, and checks in a board are dangerous when running it through the jointer.
- _____ 20. It is possible to get a kickback from the jointer.
- _____ 21. Stand to the left of the infeed table when jointing.
- _____ 22. It is necessary to hold your stock with two hands when jointing it.

Safety Test – Jointer (MASTER)

Name _____ Grade _____ Date _____

True or False:

- T _____ 1. Dull joiner knives are a safety hazard.
- T _____ 2. It is necessary to see that the fence and other adjustments are securely tightened each time you use the jointer.
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Safety Test – Radial Arm Saw

Name _____ Grade _____ Date _____

True or False:

- _____ 1. The instructor must approve all special set-ups on the radial arm saw.
- _____ 2. It is important that the board being crosscut makes full contact with the fence.
- _____ 3. When sawing thick or hard wood, the radial arm saw has a tendency to climb into the wood being cut.
- _____ 4. A dull blade is safer to use on the radial arm saw because it does not cut through the wood quickly.
- _____ 5. The wood being cut must be in contact with the blade before turning the machine on.
- _____ 6. Clear scrap wood away from the blade with your hand before shutting the saw off.
- _____ 7. The guard is never removed from the radial arm saw.
- _____ 8. It is not necessary to hold the saw handle firmly because it will feed itself into the wood.
- _____ 9. The radial arm saw forces the wood down and against the table.
- _____ 10. Always return the saw to the rear of the table when completing a cut on the radial arm saw.
- _____ 11. When crosscutting long wood on the radial arm saw, have a helper hold the long end to prevent it from tipping up and into the saw blade.
- _____ 12. Your fingers or hands should not come any closer than 4" from the path of the blade.
- _____ 13. Cutting small pieces of wood on the radial arm saw is very dangerous.
- _____ 14. The saw must be shut off and coasting to a stop before leaving it.
- _____ 15. Never cut round wood on the radial arm saw.
- _____ 16. If the saw should jam in the wood, shut the machine off before doing anything.
- _____ 17. Cross arm sawing on the radial arm saw is very dangerous.
- _____ 18. Safety guard should be left on the radial arm saw at all times.

Safety Test – Radial Arm Saw (MASTER)

Name _____ Grade _____ Date _____

True or False:

- T _____ 1. The instructor must approve all special set-ups on the radial arm saw.
- T _____ 2. It is important that the board being crosscut makes full contact with the fence.
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- T _____ 17. Cross arm sawing on the radial arm saw is very dangerous.
- T _____ 18. Safety guard should be left on the radial arm saw at all times.

Safety Test – Circular Saw

Name _____ Grade _____ Date _____

True or False:

- _____ 1. No cutting operation can be performed on the circular saw without the guard over the blade.
- _____ 2. Ripping with a crosscut blade rather than a rip blade is more likely to cause a kickback.
- _____ 3. The circular saw blade turns up and away from you.
- _____ 4. The blade should not protrude more than 1/8" above the wood being cut.
- _____ 5. Moving the fence is the only adjustment made with the saw running.
- _____ 6. Never stop the circular saw by sticking a piece of wood into the teeth of the blade.
- _____ 7. Stand directly behind the blade when cutting to prevent being struck by kickback.
- _____ 8. It is very dangerous to reach over a moving blade.
- _____ 9. Your hand should never be closer than 4" to the moving blade.
- _____ 10. Freehand cutting is only allowed on the circular saw if the angle cannot be cut using the miter gauge.
- _____ 11. A dull blade increases the chance of kickback.
- _____ 12. Warped wood can bind in the circular saw when being ripped, and increase the chance of kickback.
- _____ 13. It is necessary to joint the edge of a board if you are crosscutting or ripping the board.
- _____ 14. Round wood can be crosscut safely by holding it tightly by hand to the miter gauge.
- _____ 15. The person tailing off for you should only guide the wood if your cutting is inaccurate.
- _____ 16. Any scrap wood can be used as a push stick as long as your fingers are away from the blade.
- _____ 17. The wood must not be in contact with the saw blade when turning the saw on.
- _____ 18. You must never leave the machine with the motor running or the blade coasting regardless of the length of time you are gone.

Safety Test – Circular Saw (MASTER)

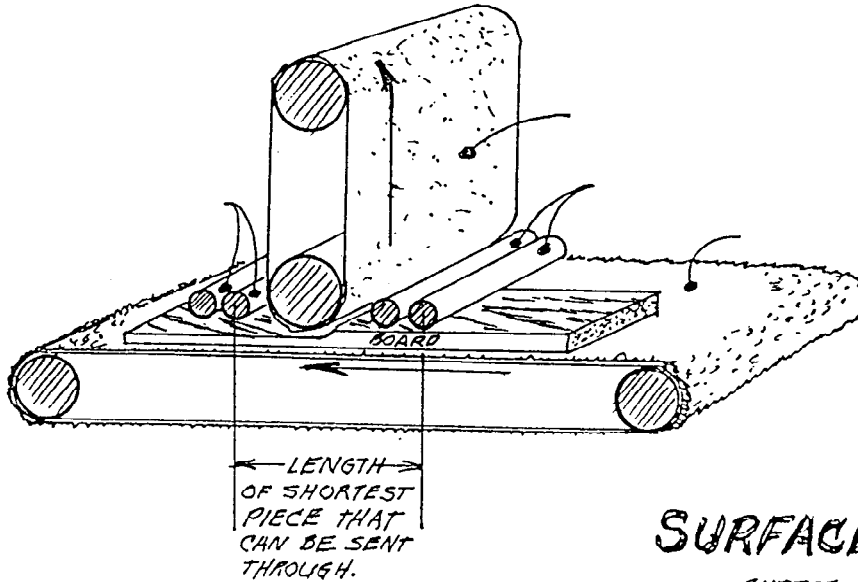
Name _____ Grade _____ Date _____

True or False:

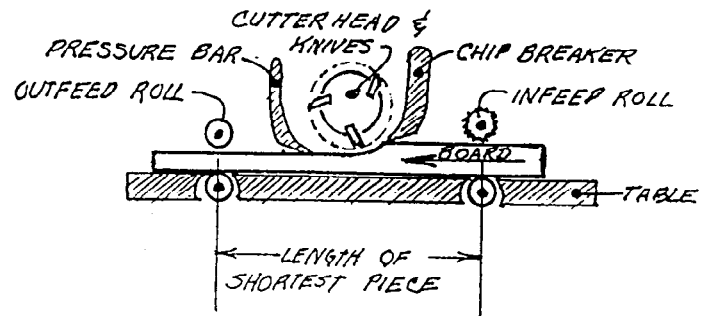
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Wide Belt Sander Safety Notes

Name _____ Grade _____ Date _____



SURFACER-PLANER

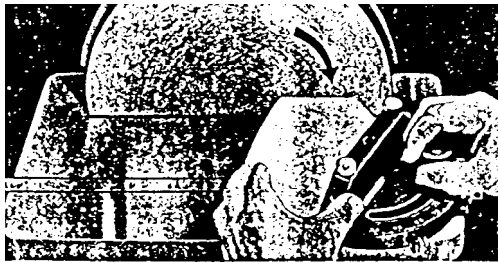
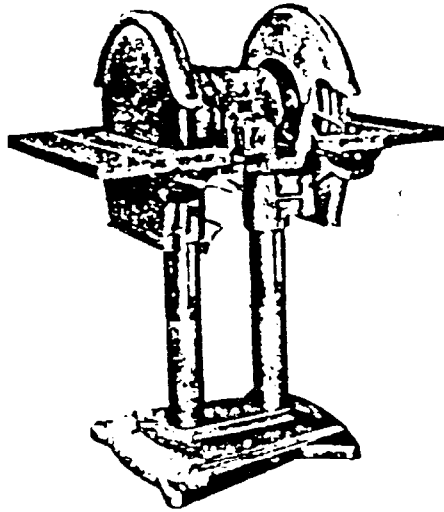


-
-
-
-
-

- Adjust the amount of cut greater than the thickness of the board. As the stock passes through, raise the bed until you can hear the abrasive belt sand the material.
- Be sure the arrow on the abrasive belt travels in the same direction as the machine rollers rotate in.

Safety Rules for Sanding Machines

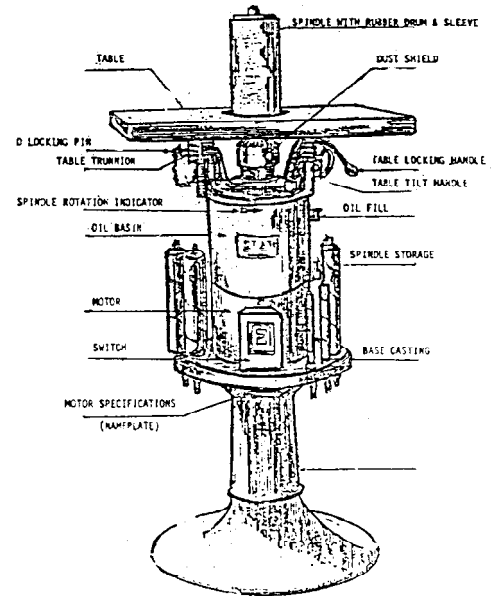
Disc Sander



Sand only on the downward side of the disc.

Spindle Sander

STATE MODEL MSR-84 OSCILLATING SPINDLE SANDER



1. Be certain the belt or disc is correctly mounted. The belt must track in the center of the drums and platen. Do not operate the disc sander if the abrasive paper is loose.
2. Check the guards and table adjustments to see that they are in the correct position and are locked in place.
3. Use the table fence and other guides to control the position of the work whenever possible.
4. Small and also irregular shaped pieces should be held in a hand clamp or a special jig or fixture.
5. When sanding the end grain of a narrow piece on the belt sander, always support the work against the table.
6. Sand only on the side of the disk sander that is moving down towards the table. Move the work along this surface so it will not burn.
7. Always use a pad or push block when sanding thin pieces on the belt sander.
8. Do not use power sanders to form and shape parts where the operations could better be formed by other machines.
9. Sand only new clean wood. Do not sand wood that has excess glue or finish on the surface. These materials will load and foul the abrasives.

Chapter 3
Text pp. 45-60
WOODSHOP SAFETY

Name _____ Grade _____ Date _____

- only _____ 1. Using a tool the correct way is also the _____ way.
- c _____ 2. The minimum distance your hands should ever come to the cutting tool while it is in operation is called the:
- a. Safe zone.
 - b. Cutting area.
 - c. Margin of safety.
 - d. Danger zone.
- d _____ 3. Power equipment usually requires some kind of safety device. Which of the following is NOT a safety device?
- a. Push stick
 - b. Push block.
 - c. Feather board.
 - d. Wood claw.
- d _____ 4. Which of the following is not a safety rule for the joiner?
- a. Before turning on the machine, make adjustments for depth of cut and position of fence.
 - b. Stock must be at least 12" long.
 - c. Feed the work so the knives will cut with the grain.
 - d. Small or irregular pieces must be clamped to the table.
- a _____ 5. When using a table saw, never cut stock freehand. The position of the stock must be controlled either by the fence or the:
- a. Miter gauge.
 - b. Edge of the table.
 - c. Guard.
 - d. Bed.

- c _____ 6. Which of the following is NOT a safety rule for band saws?
- Maintain a 2" margin of safety.
 - Plan saw cuts to avoid backing out of curves.
 - Roll the machine over by hand to see if there is clearance for the blade and if the tension sleeve has been properly set.
 - Adjust the upper guide assembly so it is 1/4" above the work.
- down _____ 7. The scroll saw blade must be installed properly for safe operation. It should be in a vertical position with the teeth pointing _____ (up or down).
- b _____ 8. Which of the following safety rules is NOT a proper safety rule to follow when using the radial arm saw?
- Stock must be held firmly and against the fence.
 - Maintain a 2" margin of safety.
 - Be sure the blade is stopped before leaving the machine.
 - Secure approval from your instructor before making ripping cuts or other special setups.
 - Wear safety glasses.
- d _____ 9. The safe speed for drill press operation is related to the size of the hole being bored. Holes over _____ inches in diameter should be bored at the lowest speed.
- 1/8"
 - 1/4"
 - 3/8"
 - 1/2"
- c _____ 10. Which of the following is NOT describe a safe practice for lathe work?
- Use a scraping cut for all faceplate work.
 - Keep the tool rest close to the work.
 - Large diameters must be turned at high speeds.
 - Wear goggles or a face shield to protect eyes.

- toward _____ 11. When using a disk sander, sand only on the side of the sander that is moving _____ the table.
- e _____ 12. Which of the following thinners and reducers should be applied in a well-ventilated room?
- a. Naptha.
 - b. Benzene.
 - c. Laquer thinner.
 - d. Enamel Reducer.
 - e. All of the above.
- c _____ 13. Why is a chip-limiting saw blade safer than the traditional style saw blade?
- a. It has fewer teeth.
 - b. It has larger teeth.
 - c. It has protection in front of each tooth.
 - d. The teeth have a reversed rake angle.
- gloves _____ 14. New Occupational and Safety Administration (OSHA) rules identify _____ as the best available hand protection.
- d _____ 15. Which of the following chemicals are identified by the Environmental Protection Agency (EPA) as ozone-depleting chemicals?
- a. Carbon-tetrachloride.
 - b. Trichloroethane.
 - c. Methyl Chloroform.
 - d. All of the above

Health and Safety

Name _____ Grade _____ Date _____

- _____ 1. Accidents occur as a result of:
- a. Hazardous conditions.
 - b. Reading labels, safety instructions and warning signs.
 - c. Unsafe acts.
 - d. Both a and c.
- _____ 2. The best preparation for any cabinet work is to:
- a. Read.
 - b. Watch.
 - c. Understand.
 - d. All of the above.
- _____ 3. Place a check next to each statement that describes an unsafe act.
- _____ a. Performing a machine operation with proper knowledge and thorough planning.
 - _____ b. Working while under physical or emotional stress.
 - _____ c. Taking breaks when frustration interferes with concentration.
 - _____ d. Distracting someone who is operating a machine.
 - _____ e. Making set ups when the machine is running.
 - _____ f. Putting all guards in their protective positions.
 - _____ g. Carrying sharp tools only by the handles.
 - _____ h. Lifting with your back, not with your knees.
- _____ 4. List three ways to reduce the slippery nature of concrete or wood floors.
- _____
- _____
- _____
- _____ 5. Class 1 liquids are the most dangerous because the _____ is within room temperature.

- _____ 6. Store flammable liquids in :
a. Old plastic soft drink bottles.
b. Glass jars.
c. Approved safety cans.
d. Ungrounded metal containers.
- _____ 7. Machines and electrical equipment should be wired in compliance with the _____.
- _____ 9. Electrical _____ can prevent you from being socked or electrocuted.
10. Name three fire protection devices.

- _____ 11. Fire extinguishers should be located within _____ feet of any work area.
- _____ 12. The soda acid liquid extinguisher is effective only for Class ____ fires.
- _____ 13. The carbon dioxide extinguisher is effective on Class _____ and _____ fires.
14. List and describe five types of protective equipment that should be worn in the shop.

15. Why shouldn't gloves be worn in the shop?

- _____ 6. Which of the following prevents machines from operating while dangerous parts are exposed?
- a. Automatic guards.
 - b. Interlocking guards.
 - c. Enclosure guards
 - d. Point-of-operation guards

Health and Safety (key)

Name _____ Grade _____ Date _____

- d _____ 1. Accidents occur as a result of:
- a. Hazardous conditions.
 - b. Reading labels, safety instructions and warning signs.
 - c. Unsafe acts.
 - d. Both a and c.
- d _____ 2. The best preparation for any cabinet work is to:
- a. Read.
 - b. Watch.
 - c. Understand.
 - d. All of the above.
3. Place an "X" next to each statement that describes an unsafe act.
- _____ a. Performing a machine operation with proper knowledge and thorough planning.
 - X b. Working while under physical or emotional stress.
 - c. Taking breaks when frustration interferes with concentration.
 - ~~X~~ d. Distracting someone who is operating a machine.
 - X e. Making set ups when the machine is running.
 - f. Putting all guards in their protective positions.
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4. List three ways to reduce the slippery nature of concrete or wood floors.
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- _____
- _____
- _____
- _____
- _____
15. Why shouldn't gloves be worn in the shop?
- _____
- _____

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- a. Automatic guards.
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 - c. Enclosure guards
 - d. Point-of-operation guards

MACHINE TOOL SAFETY

Safety in Woodworking Review

Name _____ Grade _____ Date _____

- _____ 1. It is all right to use a machine if:
 - a. you have used that machine before.
 - b. you have been instructed in its use.
 - c. you have received permission to use it from your instructor.

- _____ 2. Use hand tools instead of machine tools:
 - a. only if machine tools are not available.
 - b. for small pieces of work and simple operations.
 - c. if you are afraid to use a machine tool.

- _____ 3. Wood should be checked before it is machined in order to:
 - a. discover nails or screws in the workpiece.
 - b. determine what kind of wood it is.
 - c. locate any knots.

- _____ 4. When you use a table saw, approximately _____ of the blade should show above the workpiece.
 - a. 1/2"
 - b. 1/4"
 - c. 1/8"

- _____ 5. To adjust a workpiece in the circular saw, you may reach in under the
 - a. you have used that machine before.
 - b. anytime, as long as you use a stick.
 - c. after the blade has stopped revolving.

- _____ 6. The radial arm saw can be more dangerous than the table saw because:
 - a. the blade rotates at a high speed.
 - b. the whole blade is above the table and the blade travels through the whole work.
 - c. the machine has a very powerful motor.

- _____ 7. The blade guides on a band saw should be positioned _____ above the workpiece.
- 1/8"
 - 1/2"
 - 1/4"
- _____ 8. Cutting can begin on the band saw as soon as:
- the operator is ready.
 - the machine reaches full speed.
 - the power has been turned on.
- _____ 9. To be cut on the jointer, a wood piece must be at least _____ long.
- 12"
 - 6"
 - 10"
- _____ 10. During a cutting operation on a wood lathe, the tool rest should be kept as close to the _____ as possible.
- headstock.
 - work.
 - tailstock.
- _____ 11. Before you start an operation on the drill press, set the machine at a speed suitable for:
- the type of wood to be bored.
 - the diameter of the bit to be used.
 - the time you can spend on the operation.
- _____ 12. When using a disk sander, position your work to contact the abrasive surface of the disk:
- toward the top center of the disk.
 - where the disk comes out of the table.
 - where the disk revolves down into the table.

MACHINE TOOL SAFETY (key)

Safety in Woodworking Review

Name _____ Grade _____ Date _____

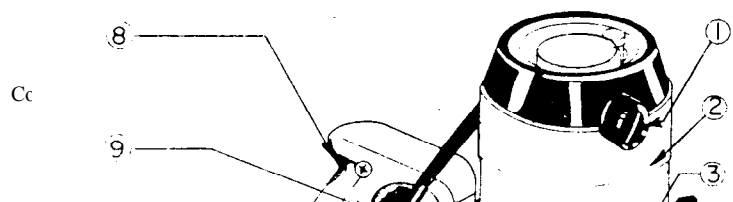
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- 1/8"
 - 1/2"
 - 1/4"
- b _____ 8. Cutting can begin on the band saw as soon as:
- the operator is ready.
 - the machine reaches full speed.
 - the power has been turned on.
- _____ 9. To move a workpiece that stops part way through the planner:
- reach into the delivery end of the machine and pull the piece through.
 - push the workpiece into the machine with the palm of your hand.
 - push the workpiece into the machine with a push stick.
- a _____ 10. To be cut on the jointer, a wood piece must be at least ____ long.
- 12"
 - 6"
 - 10"
- b _____ 11. During a cutting operation on a wood lathe, the tool rest should be kept as close to the ____ as possible.
- headstock.
 - work.
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- toward the top center of the disk.
 - where the disk comes out of the table.
 - where the disk revolves down into the table.

Safety in Woodworking Review

Name _____ Grade _____ Date _____

- A. Part Identification
Identify the parts of the router illustrated below:



- _____
- _____
- _____

4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

B. Safe Operating Procedures

1. Changing router bits or cutters
 - a. Disconnect router from power source,
 - b. Select proper bit for the job to be completed.
 - c. Have proper router chuck and collet tools available for loosening and tightening chuck.
 - d. Loosen locking handle and remove router base.
 - e. Check manufacturer's procedure for changing bits. In particular, the method of holding motor or chuck to properly tighten bit.
 - f. Insert router bit at least 1/2" into the chuck. Tighten securely. Turn router by hand to make sure the bit clears the router base. Replace the base.
 - g. Release the motor locking base before connecting router to power source.
2. Cutting a rabbit, dado or molding
 - a. Select proper cutter for the job. It must be sharp. Replace plastic window over cutter area if-router has a plastic window cover.
 - b. Clamp work securely and make all adjustments before starting the router.
 - c. Lock the cutter in the router and adjust the base to the desired height using depth adjustment gage. Lock depth adjustment.
 - d. If cutting a groove, a fence guide is required. Insert fence adjustment bars into router base and tighten lock screws.
 - e. Place the router base on the work with the cutter clear of the wood before turning on the power. Adjust fence guide.
 - f. Hold router firmly when turning on the motor to resist starting torque. Check stance so you are well-balanced having full control of the router.
 - g. Make a practice cut on a piece of scrap lumber.
 - h. Hold the router with both hands, using the handles provided.
 - i. When making a cut along a straight edge, move left to right. Cut end grain first, then edge grain to avoid chipping of ends.
 - j. When making circular cuts, move counterclockwise around the circle.
 - k. Use steady, slow, even feed. Don't overload the motor.
 - l. Cut only clean lumber free of paint, varnish and nails. Keep in mind the cutting of plywood dulls the cutter because of the glue in the plywood.
 - m. Make sure the fence gage is tight against the edge.

- n. When the cut is completed, turn off the motor. Do not lift the router from the work until the motor has stopped.
- o. Between cuts lay the router on its side on a table in a position where it will not roll.
- p. Remove the cutter from the router after the job is completed and return it to its proper storage place.
- q. Special precaution should be used in operating this power tool as the cutter bit travels between 20,000 and 30,000 RPM and the bit cannot have a guard or it would not function.

C. General Safety Practices

- 1. Wear eye protection and remove loose clothing.
- 2. Do not operate router without permission from lab instructor.
- 3. Use only sharp cutters for job to be done.
- 4. Double check all adjustments to be certain they are tight. Replace plastic window.
- 5. Be sure the router is disconnected from power source when changing cutters.
- 6. Never start the router when the cutter is in contact with the material.
- 7. Be sure the router is properly grounded electrically. Note location of cord to avoid cutting it. New models may be double insulated; therefore, the cord will not have the three-prong grounded type electrical plug.
- 8. Do not talk to anyone while operating the router.
- 9. Check to see if the switch is off before inserting the plug into the outlet.
- 10. Work area must be free of obstructions, such as scrap boards.

D. Completion Questions

- 1. The router is a dangerous power tool because the cutter bit travels at _____RPM and the bit is not _____.
- 2. The router bit is held in a _____ type chuck.
- 3. The variety of router cuts is obtained from the great assortment of _____ available.
- 4. The bit should be inserted at least _____ into the chuck.
- 5. The commonly used freehand cuts are the _____ and _____ cuts.
- 6. The cutter will be dulled when cutting _____ because of the glue.
- 7. A router should be left laying on its _____ between cuts.
- 8. A _____ cutter bit should not be used.

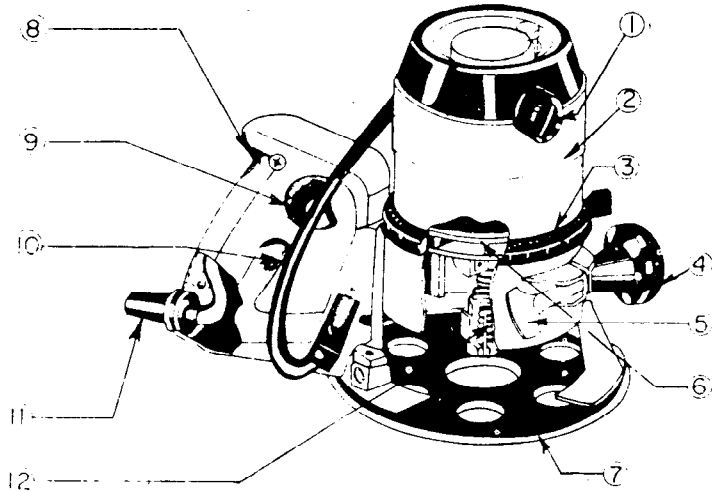
9. Be sure switch is _____ before inserting the plug into an outlet.
10. In making long straight edge cuts the direction of travel should be from _____ to _____.

Safety in Woodworking Review (key)

Name _____ Grade _____ Date _____

A. Part Identification

Identify the parts of the router illustrated below:



1. brushes
2. router motor
3. depth gauge
4. knob handle
5. locking nut
6. motor cooling fan
7. base
8. D-handle
9. trigger switch
10. motor safety disconnect
11. electric cord
12. collet style chuck

B.

- b. Select proper bit for the job to be completed.
- c. Have proper router chuck and collet tools available for loosening and tightening chuck.
- d. Loosen locking handle and remove router base.
- e. Check manufacturer's procedure for changing bits. In particular, the method of holding motor or chuck to properly tighten bit.
- f. Insert router bit at least 1/2" into the chuck. Tighten securely. Turn router by hand to make sure the bit clears the router base. Replace the base.
- g. Release the motor locking base before connecting router to power source.

2. Cutting a rabbit, dado or molding

- a. Select proper cutter for the job. It must be sharp. Replace plastic window over cutter area if-router has a plastic window cover.
- b. Clamp work securely and make all adjustments before starting the router.
- c. Lock the cutter in the router and adjust the base to the desired height using depth adjustment gage. Lock depth adjustment.
- d. If cutting a groove, a fence guide is required. Insert fence adjustment bars into router base and tighten lock screws.
- e. Place the router base on the work with the cutter clear of the wood before turning on the power. Adjust fence guide.
- f. Hold router firmly when turning on the motor to resist starting torque. Check stance so you are well-balanced having full control of the router.
- g. Make a practice cut on a piece of scrap lumber.
- h. Hold the router with both hands, using the handles provided.

- i. When making a cut along a straight edge, move left to right. Cut end grain first, then edge grain to avoid chipping of ends.
- j. When making circular cuts, move counterclockwise around the circle.
- k. Use steady, slow, even feed. Don't overload the motor.
- l. Cut only clean lumber free of paint, varnish and nails. Keep in mind the cutting of plywood dulls the cutter because of the glue in the plywood.
- m. Make sure the fence gage is tight against the edge.
- n. When the cut is completed, turn off the motor. Do not lift the router from the work until the motor has stopped.
- o. Between cuts lay the router on its side on a table in a position where it will not roll.
- p. Remove the cutter from the router after the job is completed and return it to its proper storage place.
- q. Special precaution should be used in operating this power tool as the cutter bit travels between 20,000 and 30,000 RPM and the bit cannot have a guard or it would not function.

C. General Safety Practices

- 1. Wear eye protection and remove loose clothing.
- 2. Do not operate router without permission from lab instructor.
- 3. Use only sharp cutters for job to be done.
- 4. Double check all adjustments to be certain they are tight. Replace plastic window.
- 5. Be sure the router is disconnected from power source when changing cutters.
- 6. Never start the router when the cutter is in contact with the material.
- 7. Be sure the router is properly grounded electrically. Note location of cord to avoid cutting it. New models may be double insulated; therefore, the cord will not have the three-prong grounded type electrical plug.
- 8. Do not talk to anyone while operating the router.
- 9. Check to see if the switch is off before inserting the plug into the outlet.
- 10. Work area must be free of obstructions, such as scrap boards.

D. Completion Questions

- 1. The router is a dangerous power tool because the cutter bit travels at _____ high _____ RPM and the bit is not _____ guarded _____.
- 2. The router bit is held in a _____ collet _____ type chuck.
- 3. The variety of router cuts is obtained from the great assortment of _____ router bits _____ available.
- 4. The bit should be inserted at least _____ 1/2" _____ into the chuck.

5. The commonly used freehand cuts are the ____rabbett____ and _____profile_____ cuts.
6. The cutter will be dulled when cutting ____plywood_____ because of the glue.
7. A router should be left laying on its _____side_____ between cuts.
8. A ____dull_____ cutter bit should not be used.
9. Be sure switch is _____turned off_____ before inserting the plug into an outlet.
10. In making long straight edge cuts the direction of travel should be from _____left_____ to ____right_____.