

Tool & Equipment Safety Manual

Ms. Schurr, Mr. Sewert & Mr. Taber

Starpoint Technology

"Safety: Expect the Unexpected"

General safety rules for using any tools or equipment:

- 1. Safety glasses are required any time you are standing behind the red line, or when using all equipment and/or hand tools.**
2. Plan and think about what you are going to do, before you do it. Practice common sense.
3. Consider the safety of others, as well as yourself.
4. Use the right tool for the job.
5. Minimize any distractions.
6. Do not use any machine or tools without instructor permission.
7. Make sure your hands are in a safe place at all times. When using hand tools, always cut away from your body.
8. Horseplay is forbidden (this includes purposely distracting others when they are using a tool).
9. Baggy or loose clothes must be tucked-in; long sleeves must be rolled-up.
10. Long hair must be pulled back in a ponytail or bun (shoulder-length limit). Rings, bracelets, watches, and necklaces should be removed.
11. Close-toed shoes must be worn when working in a materials laboratory.
12. Keep proper footing and balance at all times.
13. If someone else is using a tool that you need, be patient and wait your turn to use it.
14. Everyone is responsible for clean up. "Many hands make light work."
15. If any machine or tool is not working properly, tell one of the instructors immediately.
Look, Listen and Smell.
16. **DO NOT** attempt to fix or change any blades or parts on the tools yourself.
17. Please report any accidents or injuries to the instructor even if, "it doesn't hurt."
18. If you have questions or are unsure... **ASK THE TEACHER FOR HELP!**

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Planer:



Uses: For shaving material off the plane of a piece of lumber. The planer allows you to machine your piece of lumber to the proper thickness.

1. Follow all of the general safety rules.
2. Two people should be operating the planer at all times, one person should feed the wood into the front of the planer while the other stands behind the planer and retrieves the piece from the other side.
3. Any piece of lumber fed through the planer should be a minimum of 12" (1 foot) long.
4. **Never** stick anything other than lumber into the planer.
5. Do not shave too much material off the wood in one pass through the planer; only turn the crank $\frac{1}{2}$ of a turn ($\frac{1}{16}$ ") for each pass.
6. Always make sure that the dust collector is turned ON, and that the vent is OPEN.
7. Never leave the machine until it has come to a complete stop!
8. As with every machine, if it is not working properly turn it off and tell the instructor. Since you are unable to see the blades on a planer it is important that you listen to the machine.

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Jointer:



Uses: For shaving material off the edge of a piece of lumber. The jointer will ensure that the edges and planes of your lumber are perpendicular to each other.

1. Follow all general safety rules.
2. The jointer should only be operated by a student under strict supervision of the teacher.
3. Any piece of wood fed through the jointer should be a minimum of 12" (1 foot) long.
4. The piece of wood should be held flat against the fence and the table of the jointer.
5. **Never** pull open the safety guard exposing the blades of the machine.
6. If the piece of wood being jointed is shorter than the fence, push sticks must be used.

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Table Saw:



Uses: To cut straight lines in large sheets of wood or plastic. You will primarily be using the table saw to cut parallel lines when using the fence. However, it is possible to make perpendicular cuts when using the miter gauge.

1. Follow all general safety rules.
2. The table saw should only be operated by a student under strict supervision of the teacher. A second person may be needed to retrieve the wood on the opposite side of the table.
3. Any piece of wood cut on the table saw should be a minimum of 12" (1 foot) long.
4. The piece of wood should be held flat against the fence and the table.
5. **Watch out for kickback.** All fences and kickback guards should be on the saw and down when cutting. Any time you use the fence to make a cut, you must cut down the length of the piece of material.
6. Always use push sticks so that your hands do not get too close to the saw blade.

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Miter/Chop Saw:



Uses: To cut straight lines across the width of the piece of wood or plastic.

1. Follow all of the general safety rules.
2. Disconnect power before making angle adjustments.
3. Always hold the work firmly against the fence and table.
4. Keep fingers outside of blade guards (red lines).
5. Never cross your arms when making a cut.
6. When you are cutting small pieces of wood, watch out for kickback, cut slowly.
7. Allow the motor to reach full speed before starting a cut.
8. Remove scrap stock from table when making multiple cuts. Wait for the blade to stop spinning before removing pieces of wood.

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16 1/2" Floor Model Drill Press & 10" Bench Mounted Drill Press"



Uses: To bore holes into wood, plastic or metal.

1. Follow all of the general safety rules.
2. Always use a piece of scrap wood and set the table or stop to keep from drilling into the tabletop.
- 3. Use a clamp or vice to secure/fasten the wood to the table.**
4. Make sure that your scrap wood, good wood, and any clamp you are using are the ONLY objects on the table. Other objects can get caught in the drill bit and cause injuries.
5. Select the right size and type of bit. Wood bits for wood, metal bits for metal. If you are unsure about what type of bit to use, then ask.
6. Select the correct drilling speed. For metal or hard woods and large drill bits you should use a slower speed.
7. Use a center punch for a guide whenever possible. Always use a center punch when drilling into metal or hard woods.
8. Do not panic if the bit gets stuck in the wood. Turn the machine off; when it has stopped completely, remove the bit from the wood.
9. Always remove the chips from the table after the machine is turned off and is no longer moving. Use a table brush, never your hands.

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14" Band Saw:



Uses: Used for cutting details, mostly straight lines or large curves in wood or plastic.

1. Follow all of the general safety rules.
2. **Adjust the blade guard to where it is 1/4" above the highest part of the wood. Use the "Pinky Test" to make sure that it is SAFE to turn the machine on and start cutting.**
3. Your fingers should be on either side of the blade, but never in front of the blade. Use the 3-finger rule.
4. ONLY one person can use the machine at a time. Everyone else should form a line and wait patiently and quietly.
5. Cut sharp curves on the scroll saw. If you need to cut a curve, use relief cuts.
6. Use a push stick whenever possible and always when cutting objects like a CO₂ car.
7. Never force the material into the blade. Let the machine do the work.
8. Blades do occasionally break. If the blade breaks while you are operating it simply turn it off, and send your partner to get the instructor. Never leave the machine, or try to open the casing and fix it yourself.
9. Never leave the machine until it has come to a complete stop, and then clean the table off by using a table broom, never your hands.

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Variable Speed Scroll Saw:



Uses: To cut sharp curves, details, or the inside of a piece of flat material (wood, plastic, etc.).

It is best to use with thin pieces of wood (<math>< 1/2''</math> thick is preferred).

1. Follow all of the general safety rules.
2. If you are not sure how to cut out an object, get the instructor for help.
3. You have to wait patiently and quietly for your turn on this machine. Give the saw operator room to work.
4. Make all adjustments with the power off.
5. Be sure the teeth of the blade are pointing down and forward.
6. Hold the wood flat against the table, to keep the wood from bouncing around. Use the material hold down at all times.
7. Use both hands to guide the wood through the cut. However, they should remain to the side of the blade, never in direct line with the blade. Use the 3-finger rule.
8. The scroll saw can hurt you as badly as the band saw. The smaller blade will not save your hands or fingers.
9. Scroll saw blades break easily, so take your time to make the right cuts. Remember never force the wood and use the correct speed.
10. If the blade breaks turn off the machine, unplug it, and tell the instructor immediately. Do not try to cut with a broken/bent blade.
11. Never use your hand to clear the table, always use a broom or a push stick.

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Table Router:



Uses: To create decorative edges or to cut grooves/channels into a piece of wood.

1. Follow all of the general safety rules.
2. Check the router base clamping screw to see that it is tight.
3. Keep all of the safety shields in place.
4. Do not place your finger under the plastic shield covering the router bit.
5. Clear the worktable of everything except the piece you are working on. Other objects will get caught in the router bit and cause injuries.
6. Use either a bit with a ball bearing on it, the fence or a jig/fixture to guide a non-bearing router bit. Never make free-hand cuts with the router.
7. The work piece must always travel from the right side of the router table to the left side.

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Disk Sander & Belt Sanders:



Uses: To make wood or plexiglass surfaces smooth.

1. Follow all of the general safety rules.
2. Remember to have patience, and wait quietly for your turn.
3. Check the abrasive disk for tears, or loose areas. If it has any, report them immediately.
4. DO NOT change the spindle on the spindle sander yourself. Ask the teacher to do it for you.
5. Always make sure that the dust collector is turned ON, and that the vent is OPEN.
6. Always sand on the down stroke (left) side of the disk. Sanding on the up side will cause your wood to get caught and thrown, potentially causing serious damage to yourself, lab partners, or school property.
7. The sander is just as dangerous as any saw. Keep all clothing and parts of your body away from the belt, disk or spindle as it rotates.
8. Remember always to hold the wood flat against the table. If you need wood sanded at an angle turn off the sander and adjust the table accordingly.
9. Use just enough pressure to do the job. Too much pressure can ruin the disk, machine, burn the wood and cause injury to someone.
10. Never leave the machine until it has come to a complete stop.
11. As with every machine, if it is not working properly turn it off, and tell your teacher.

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Hand Tools

Jig Saw:



Uses: For cutting smaller pieces of flat material (wood, plastic, some very thin metals, etc.), best to use with thin pieces of wood (<math>< \frac{1}{2}</math>” thick is preferred).

1. Follow all of the general safety rules.
2. Make all adjustments with the power off and cord unplugged.
3. Different saw blades cut different materials, make sure you have the proper blade with the proper tooth count before cutting.
4. Hold the wood flat against a tabletop with the part you wish to cut extended beyond the edge of the table.
5. To keep the wood from bouncing around, use clamps at all times or have someone else assist you.
6. Be sure the teeth of the blade are pointing down.
7. Never place your hands in direct line with the blade; they should remain a minimum of 6” to the sides or behind the blade. If someone is helping you hold the piece of wood you are cutting, make sure his/her hands are in a safe location as well.
8. Jig saw blades break/bend easily, so never force the blade. Use the correct speed and let the blade do the cutting. Take your time to make the cuts.
9. If the blade breaks turn off the machine, unplug it, and ask your instructor for a replacement. Do not try to fix it yourself or try to cut with a broken or bent blade.
10. Never use your hand to clean the tabletop always use a broom or a push stick.

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Drill:



Uses: For drilling holes in material (wood, plastic, some very thin metals, etc.); depth is dependent on the length of the bit.

1. Follow all of the general safety rules.
2. Always place a piece of scrap wood underneath the piece of wood that you are drilling into to prevent drilling holes into the table below.
3. Use a clamp or vice to secure/fasten your wood to a tabletop.
4. Make sure that your scrap wood, good wood, and any clamp you are using are the ONLY objects on the table. Other objects can be caught in the bit and cause injuries. Again, it is important that long strings, hair, or jewelry remain away from the drill bit when in operation.
5. Select the right size and type of bit. Wood bits for wood, metal bits for metal, etc...
6. Use a center punch for a guide whenever possible. Always use a center punch when drilling into metal.
7. Do not panic if the bit gets stuck in the wood. Turn the drill off. When it has completely stopped, remove the material from the bit. Next time use a clamp, and make sure the piece of wood is secure before drilling.
8. Select the correct drilling speed. For metal or hard woods and large drill bits you should use a slower speed.
9. Always remove the chips from the table after the machine is turned off and is no longer moving. Use a brush, never your hands.

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Circular Saw:



Uses: For cutting straight lines on large pieces of flat material (wood, plastic, etc.), can cut as deep as the blade is below the plate (maximum ~ 1 1/2" thickness).

1. Follow all of the general safety rules.
2. Disconnect power before making angle adjustments.
3. Hold the wood flat against a tabletop with the part you wish to cut extended beyond the edge of the table.
4. To keep the wood from bouncing around, use clamps or have someone else assist you.
5. Be sure the teeth of the blade are pointing down.
6. Never place your hands in direct line with the blade. Both hands should remain on the tool at all times to ensure proper control. If someone is helping you hold the piece of wood you are cutting, make sure his/her hands are in a safe location.
7. Allow the motor to reach full speed before starting a cut.
8. Remove scrap stock from table when making multiple cuts. Wait for the blade to stop spinning before removing pieces of wood.
9. The circular saw is used for cutting larger pieces of wood (i.e. plywood); therefore, the minimum width of the piece of wood should be 1 foot – 6 inches. If the piece of wood you would like to cut is smaller than that, use the band saw or jig saw. If you are unsure which tool to use, then ask the instructor.
10. Never use your hand to clean the tabletop always use a broom or a push stick.

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Dremel/Rotary Tool:



Uses: For cutting small pieces of material (wood, plastic, thin metals, etc.), sanding, small hole drilling, grinding, routing, buffing, etc.

1. Follow all of the general safety rules.
2. If used inappropriately, rotary tools have a tendency to burn their motors quickly, make sure you are using the proper attachment and speed for your task.
3. If you are using the sanding bit, check the abrasive surface for tears, or loose areas. If it has any report them immediately.
4. Use just enough pressure to do the job. Too much pressure can ruin the tool, bit, burn your material, or cause injury to someone.
5. Make sure the material is secure against a tabletop surface, while holding the tool firmly in your dominant hand to complete the task. Use a clamp or ask someone for assistance if needed.
6. If you are cutting or drilling through your material, be sure, you have a piece of scrap wood between the tabletop and your material to prevent damage to the tabletop.
7. Always sand or cut away from your body, and make sure that your free hand is out of the way of the bit.
8. Turn off the tool before setting it down.
9. As with every tool, if it is not working properly turn it off, and inform the teacher.
10. Remember to have patience, and wait quietly for your turn.

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Safety Pledge:

I have participated in the tool and equipment safety rules demonstration. I pledge to follow all of the safety rules. I know that if the instructor recognizes a safety concern, s/he will review the safety procedures with me individually or with the group as needed. I have asked all of the safety questions that I have at this time. If I have any safety-related questions in the future, I will ask them before I attempt to use a tool or piece of equipment.

Participant's name printed

Participant's Signature

Date
