



HERDS Makerspace Blue Badge Training

The following document is a study guide for the HERDS Blue certification quiz. Upon completion of the quiz with a 90% and approval to begin the physical test for the Blue Certification Badge by a HERDS Intern, students are allowed to operate saws, drills, sanders, and soldering equipment. If you are unsure what certification level a particular tool requires, look for the color-coded strip of tape or tag that will be visible on all usable pieces of equipment. Keep in mind that you have a total of 3 attempts to pass the Blue Certification Quiz. To pass the physical test, your dimensions must be within $\pm 5\%$ the dimensions labelled on the part drawing.

This table gives some safety rules for the types of tools that the Blue Badge encompasses.

<u>Type of Tool</u>	<u>General Safety Rules</u>	<u>Types of tools</u>	<u>Specific Safety Rules</u>
Saws	With any type of saw make sure all body parts are clear of the saw blade during operation. For portable saws NEVER put the saw down while the blade is still moving. For corded saws ALWAYS make sure the cord is out of the cutting path. NEVER remove guards or safety devices from any saws. NEVER wear loose clothing while operating any type of saw. Make sure all work is properly clamped or supported before cutting. Make sure there are no nails or screws in the material before cutting. Always power saws up all the way before cutting NEVER try to make cuts while saw is	Circular (Skilsaw)	Never try to move the cut line while operating; this saw is only meant for straight cuts, avoid twisting while in the kerf. Always do a dry run before cutting (make sure you can reach the end of your cut). Make sure you adjust the depth of the blade, so it won't cut unwanted material beneath your work piece. Never place your hands behind the cut path; kickback may run the rotating blade over, or more likely through your fingers. Make sure all adjustment knobs/levers are tight before operating the saw.
		Miter	Ensure that your material is properly secured before cutting; If the work piece is not held securely in place the work piece could become a projectile. Do not move material while cutting.
		Table	Do not try to twist material while cutting, this saw is only meant for straight cuts. Use a push stick (to push material) when your hand may come close to the blade.
		Band	Portable band saws are heavy, NEVER rest the saw on any part of your body. Do not twist the blade while in a cut.
		Scroll	Do not force material, the blade could break becoming a projectile.
		Jig, Reciprocating Oscillating	Ensure an extra firm grip is present as these types of saws can vibrate profusely. Do not apply excessive pressure.

	<p>coasting. Never adjust the blade or change blades while the saw is connected to a power source. Always inspect cables/batteries before operating any saw. Always inspect blades before using a saw, if damaged alert a HERDS Intern immediately. Never operate power tools around water. ALWAYS let the tool do the cutting, don't try to force any saw. Wear a mask when significant amounts of saw/metal particulates are airborne to prevent lung damage.</p>	Chain	<p>Chainsaws are the most dangerous type of saw and must only be used after proper training has been received. This saw requires its own training unto itself. Ask a HERDS Intern if this type of saw is anticipated for a project. May be used to construct structures in the field.</p>
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<p>Drilling/ Hole Creation</p>	<p>Always keep hands free from rotating heads of tools. Avoid using gloves when possible as they can get caught in rotating tools and severely injure extremities. ALWAYS make sure material is secure (clamped or by other means) before drilling. Never operate near water. Keep power cords away from cutting heads. ALWAYS disconnect power sources before changing bits or working on the tool. Wear a mask when significant amounts of saw/metal particulates are airborne to prevent lung damage.</p>	Drill Press	<p>Be extra cautious when drilling, if a work piece comes loose, it could leave the base plate and harm someone.</p>
		Power Drill with bits/Impact Driver/Rotary hammer	<p>Make sure you have a secure grip when operating, if a bit "catches" all the torque that was applied to the bit will now be transmitted to your poor wrist; considerable damage is... imminent.</p>
		Dremel style tools	<p>Avoid applying excessive pressure; the bits are very small and broken pieces could become projectiles</p>

<p>Sanding/ Finishing tools</p>	<p>Keep fingers and exposed skin away from sanding surfaces. ALWAYS remove the tool from a power source before changing pads/belts. The work piece may catch on</p>	Belt Sander	<p>Do not apply excessive pressure to the tool.</p>
		Orbital Sander	

	the belt and become airborne stand clear of possible projectile paths. Wear a mask when significant amounts of saw/metal particulates are airborne to prevent lung damage.	Planer	Keep hands free of rotating planer head, significant reduction of skin on digits and hands... imminent
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Electrical Tools	Always make sure you operate electrical equipment away from water sources. Only work on electrical equipment when separated from its power source.	Soldering Iron	Keep hands free of the soldering tip. Never place your hands below items being soldered, hot solder can drip onto your hands causing considerable burns. Use clamps or tweezers to hold the work while soldering.
		Multimeter	Only leads by the insulated handles. NEVER touch the bare metal of the probes.