



HERDS Makerspace Green Badge Training

The following document is a study guide for the HERDS Green certification quiz. Upon completion of the quiz with a 100% and approval for the Green Certification Badge by a HERDS Intern, students are allowed to operate manual and battery powered hand tools. 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 2 attempts to pass the Green Certification Quiz.

General Safety

Accidents can happen to anyone working at HERDS, regardless of experience level. Most often, accidents are caused by neglecting to follow safety protocols while using equipment. How can we work together to prevent accidents from happening?

Remember CRAP!:

Communicate

Communication with HERDS Interns as well as other makers around you is important. Every time you enter the makerspace, you should check in with a HERDS Intern and show them your certification badge. Within HERDS, work areas are sectioned off by caution tape; if you are about to begin work in a work area and notice that someone else is standing within the same designated work area, ask them to step away from the area to prevent injuries before you do anything else.

Reduce

Try to **reduce** the risk of an accident where possible – if a tool is missing its color code or has apparent cracks, chips or a loose handle do not use it and immediately report your findings to a HERDS Intern. Make sure you give ample space to your fellow makers and refresh yourself on safety protocols for equipment you are unsure about even if you are certified already.

Assess

Before and during work, be sure to check your surroundings and **assess** the situation. Ensure the work area is clear, make sure anyone in the vicinity is wearing safety glasses and, if necessary, ear plugs before you start working. If you are using a tool that someone else needs, do not give it to them when you are finished unless a HERDS Intern has been notified and approved of the transfer beforehand, especially if that person does not have their green certification.

Prepare

Before you come to HERDS, **prepare** yourself to start working in a safe manner. This means that you should wear the proper attire – no baggy clothing, jewelry such as watches or necklaces, headphones, or open-toe shoes are permitted while working at HERDS. Once you are at HERDS, you should also use the proper personal protective equipment (PPE) – that means safety glasses, your certification badge, and ear plugs if needed. The threshold for requiring ear protection is 85 dB according to [OSHA](#), equivalent to the noise level of a kitchen blender.

Remember – we would much rather say CRAP! before an accident rather than after, but what if an accident does happen?

What to do if an Accident Occurs

In the event of an accident, your first priority should be to make sure no one is in immediate danger and notify a HERDS Intern. Always be aware of your surroundings and remember where important safety equipment is located, such as the First Aid Kit, Fire Extinguisher, Eyewash Station, and all exits that you may need to use. You should be made aware of all these important locations during your HERDS Walkthrough the first time you visit HERDS, but if you forget and need a reminder you can always ask a HERDS Intern to walk you through these locations again. Even though you may be training for your Green certification, that does not mean you should not be aware of potential hazards of others working with tools/equipment requiring a higher certification level. When working near a group using a tool from another badge level you must equip yourself with the proper PPE for both groups.

Bringing Tools to HERDS

HERDS is a makerspace, and it is available for use as a workspace and not just an all-you-can-find tool garage. This means that you are allowed to bring your own tools, however, given the need for proper training and safety procedures if you would like to bring your own tools to HERDS you must consult with the HERDS Director beforehand and fill out our personal tool assessment form. Upon approval, you will receive a copy of your tool assessment form to keep with you while you use the tool at HERDS. **DO NOT LET ANYONE ELSE USE YOUR TOOL!**

More on General Safety and First Aid

After becoming familiarized with the HERDS Makerspace rules, watch the following video on First Aid and General Safety:

[“First Aid Training for Employees by Compliance and Safety”](#)






Leaving HERDS

When you have finished working, check all the tools you used back in with a HERDS Intern. If a tool is left unaccounted for, you must find it and check it back in before you are allowed to leave HERDS. Any debris, trash, or leftover materials should be either recycled, thrown away, or given to a HERDS Intern to be put back in its proper place. Failure to clean your space and properly check tools back in can result in revocation of your Green Certification and the responsibility of replacing any lost/missing tools.

Generalized Green specific hazards

The green badge certification allows creators to use basic hand tools to work on their projects. Many things can be accomplished with hand tools but just like the complex and dangerous miter-saw, some general safety protocols must be followed while using them. Hand tools have been used for thousands of years and the dangers posed by the most primitive tools made of stone still apply today with modern hand tools. This training document generalizes these hand tools into 4 basic hazards they pose: cutting, pinching, puncturing, and striking hazards. Listed below are the 4 generalized hazards, safety precautions for tools that pose these hazards, and examples of tools that pose these hazards. Familiarize yourself with these categories and the hazards that they pose before you take your certification quiz.

	Reasons Accidents Occur	Tools that pose this hazard:	NEVER!!!	Instead,
<p>Cutting Hazards:</p> 	<p>Cutting accidents happen more often than you might think; this usually occurs either due to improper use such as putting too much pressure on the surface you are cutting and your hand slips onto the cutting edge; or improper technique, such as cutting towards one of your body parts. Failing to comply with rules for hand tools could lead to severe injury even death.</p>	<p>Box cutter, razors, pocketknife, paint scraper, glass cutter, drill bits, hand saws, chisels</p>	<p>Cut towards your body.</p>	<p>Position yourself so that you can make your cut AWAY from any body part.</p>
			<p>Try to catch a falling tool.</p>	<p>If you drop a tool, especially a cutting tool, let it fall to the ground before picking it up. The tool is generally cheaper to replace than your fingers are.</p>
			<p>Use rusty blades to cut materials.</p>	<p>Either properly dispose of the blade or carefully remove the rust before use. Only remove the rust if it is a non-disposable blade such as saw blades or drill bits.</p>
			<p>Apply excessive pressure to cutting tool.</p>	<p>Allow the tool to do most of the cutting for you; it may take longer to cut but it will ultimately be safer. If your tool is dull either sharpen it or replace it before use.</p>
			<p>Cut on an unstable surface.</p>	<p>Ensure the work piece is properly secured to the work surface; use clamps, vises, or other safe means to ensure your work piece will not move while cutting.</p>

<p>Pinching Hazards:</p> 	<p>Pinching accidents occur when an operator's body part comes between two surfaces moving towards each other and the body part is pinched between them. An example would be closing a vise on your finger. Failing to comply with rules for hand tools could lead to severe injury even death.</p>	<p>Vise, Vise-grips, metal shears, pliers, punches, and generally any hinged tool</p>	<p>Place a body part between two surfaces moving towards each other, or one moving toward a fixed point.</p>	<p>Make sure that all body parts are clear of the moving tools/objects so that you can avoid pinching yourself or others. If close proximity to moving surfaces is necessary, use thick gloves to minimize any potential safety risk.</p>
<p>Puncturing Hazards:</p> 	<p>Puncturing accidents occur when a tool is forced unintentionally towards a body part puncturing the skin. An example would be if the tool slips from the workpiece and punctures you or if you fall with the tool between you and the ground and it punctures you.</p>	<p>Screwdrivers, knives, drill bits, pens, pencils, rulers, awls, punches, needles (Not a tool but nails, and screws as well)</p>	<p>Place any tools in your pockets</p> <p>Apply excessive pressure to a tool.</p> <p>Leave tools out.</p> <p>Place a part of your body between the tool and the work piece.</p>	<p>Carry tools in your hand or in a container such as a toolbox or bag. If you fall with a screwdriver in your pocket, you could puncture yourself.</p> <p>Apply enough pressure to complete the task safely. If too much pressure is applied the tool could slip from the work piece and puncture workers.</p> <p>Return tools to their proper places when you are done using them; avoid leaving tools on surfaces they could easily fall from. A person could fall into or drop a tool that can puncture and injure themselves or others.</p> <p>Make sure there are no body parts between the tool and the workpiece.</p>

Striking Hazards:



Striking accidents occur when: loose tool heads become dislodged and fly through the air, broken tool head pieces become projectiles upon impact, and accidental striking of yourself or another due to poor spatial awareness. An example would be a loose hammer head flying off mid-swing and hitting the worker next to you

Hammers, slide-hammers, dead-blows, axes, mauls, picks, mattocks

<p>Use a striking tool when others are within your blood bubble. (Your "Blood-bubble" is the spherical volume around you where the radius of that volume is the length from the middle of your chest plus the total length of one arm plus the entire length of the tool.)</p>	<p>Ensure that everyone is clear of your blood bubble before using any sort of tool that poses a striking hazard. To check the radius of your blood-bubble fully extend your arm with the end of the tool as far from you as possible turn 360 degrees; make sure no one lies within or above this circle before using the tool. Here is a link to provide a better visualization, https://www.youtube.com/watch?v=S90KJaX4BHA</p>
<p>Use a striking tool that has not been thoroughly inspected for loose parts, cracks, chips, and deformation.</p>	<p>Inspect striking tools for cracks, chips, deformations, and loose components before use. Tools that have not been thoroughly inspected can break and launch projectiles through the air, causing a hazard for workers nearby.</p>
<p>Strike objects that are not properly secured.</p>	<p>Ensure that all objects that you are working on are properly secured. Objects that are improperly secured could shoot out from under the striking surface and injure workers nearby.</p>
<p>Place body parts between striking and working surfaces.</p>	<p>Make sure all body parts are clear of the space between the striking surface and the work surface before using the striking tool.</p>

Green Certification Quiz

Now that you have familiarized yourself with all of the general safety procedures for the HERDS Makerspace as well as important information pertaining to Green level tools, speak with a HERDS Intern to take your certification quiz. Remember that you have 2 attempts to get a 100% score – good luck and have fun making!

References

- [1] https://www.ccohs.ca/oshanswers/safety_haz/sharp_blades.html
- [2] https://www.mga.edu/environmental-health-safety/docs/safety-manual/machines/info/Pinch_Points.pdf
- [3] <https://ehs.umass.edu/sites/default/files/Cut%20and%20Puncture%20Prevention.pdf>
- [4] <https://www.osha.gov/noise>