Makerspace Safety
Educator develops safety systems and protocols for the unique tools and materials stocked in their makerspace.

Key Method
Educator understands the specific risks and precautions necessary for all the tools in their makerspace.

Method Components
Maker Media’s Youth Makerspace Playbook, School Edition, begins their chapter on makerspace safety by describing how “…if you are doing anything interesting with your members there are some risks involved...Learning how to use tools isn’t all that helpful unless you also learn the risks and precautions you have to take in order to come out of your project build with all your eyes, ears, fingers, and limbs attached” (17).

Even if your makerspace is not stocked with high-risk tools like saws, drills, and lasers, it is critical to recognize and anticipate all potential challenges and dangers that may arise while students explore your makerspace, and to plan for safety accordingly.

“Stimulating a culture of safety…” the Makerspace Playbook continues, “…can dramatically cut down on shop mishaps as members are encouraged to watch out for the safety of each other and respect the equipment. You can accomplish this by modeling safe behavior in your own actions and in how you set up the space, setting up a strict training regimen, and posting signs and checklists.” (17).

Steps to take and questions to ask when developing a safe makerspace:

What are the potential risks, challenges, and dangers?
- The first step to take, no matter the kind of makerspace your community has, is to take the time to recognize the dangers and challenges in your own space. This means examining the tools and materials available in your space and doing your research. Power tools and fabrication equipment will present certain clear, obvious dangers that you must take into account. Some materials are dangerous in ways educators don’t expect.
  - For information about common tools and materials, see the Resources section
- Test tools, materials, and projects ahead of time. Amber Creger of Arlington Heights Memorial Library in Illinois discovered this lesson the hard way when she set out to make DIY pinball machines in her library makerspace (See Resources section). “Who knew the glue could burn?” she said. A trial run lets you work out the bugs before involving [young learners]” (Catalano).
- It is also crucial to remember that the danger/risk might not always be physical.
  - Perhaps the most dangerous tool or material in your makerspace is a popular item that learners might not be inclined to share. This potential “emotional danger” can be just as detrimental to the learning process, and thus systems and protocols need to be put in place to help mitigate these risks.

Can everyone use everything?

Except where otherwise noted, this work is licensed under:
http://creativecommons.org/licenses/by-nc-nd/4.0/
If not, what system will you implement to control who has access to what? Do certain tools/materials require special training in order to “earn” access to them? Teaching learners to respect the tools and materials they have access to is a critical skill to foster within your makerspace. Maker Ed’s Youth Makerspace Playbook describes how “many makerspaces establish that all tools, from hammers to laser cutters, require training before being free to use without adult supervision.”

Training can take on many forms. Consider the ways in which your tool/material trainings can be youth-centered.
- At STEAMLabs, a community makerspace in Toronto for example, “...when a new tool is introduced, the facilitator leads a conversation about the right tool for the job, followed by a conversation about how to use the tool. For the second time a child uses a tool, instead of telling them the rules for the tool again, children are encouraged to teach another child how to use the tool, with a mentor listening.”

Develop understandings of safety as a community.
- Along with training around specific tools and materials, it is critical to develop a culture of safety and respect for materials within your makerspace. This comes from having open, learner-driven conversations in your space about safety expectations.
- Ask questions to spur discussion around tools and materials and their potential risks. Some of these questions might include:
  - What do you notice about the tool/material?
  - What do you wonder about it?
  - What can it be used for?
  - What might go wrong?
- Through this kind of questioning, “…understanding and agreements about proper and safe use can be built collaboratively with [learners], establishing shared ownership and investment. Resulting conversations may sound like, ‘It’s cool you can melt things with the soldering iron. I’ll bet it could hurt, too. Can it set paper on fire? Does it stay hot after I’m done with it? How can I let people know that it’s still hot when I’m done?’” (Chang et al. 38-39).

How will safety precautions be presented to users?
- Even with clear, developed trainings for the materials in your makerspace, there are always opportunities for things to go wrong, and new challenges to arise. This is where signage comes in. Well-designed signage allows you to get key information across in a clear, concise, and quickly digestible way. “Naturally,” the Youth Makerspace Playbook states, “…the standard implements of safety, such as eye protection, first aid supplies, and fire extinguishers, are necessary in any makerspace. But equally as important is clear and abundant communication. When the groundwork of acceptable behavior and tool use is clearly laid out and reinforced using signage, there’s less room for misunderstanding, mitigating the chance of accidents” (Chang et al. 38).

“Signs can provide helpful on-the-spot instruction and reminders throughout your space.” At DIY Girls in Los Angeles for example, “…each piece of equipment has an instructional sign on the wall next to it promoting safe usage. There is also a contract, which outlines the rules and agreements of the space, that each of the girls who uses the space signs. The verbiage of the contract is also posted on the wall as a reminder.” (See Resources section) Take a look at the signs created by DIY Girls, as well as a few other examples of makerspace safety signage in the resources section (Chang et al. 39).

With these considerations in mind, begin creating signs, having conversations with learners, and developing the culture and community of respect for tools and materials necessary to maintain a safe makerspace.
- Remember, as the Makerspace Playbook, School Edition describes, “…every teacher writes their own rules, often adapting someone else’s rules to the idiosyncrasies of his or her own space, and adding more as they go along (and students reveal new rules that need to be written!) Rules work best when they are in your own voice, as you’ll be repeating them often” (14).
Supporting Research


Resources


- Information about common tools and materials and safety information about them http://bit.ly/2czNs1Z


- Arlington Heights Memorial Library DIY Phone Stands http://www.ahml.info/teens/diy

- DIY Girls http://www.diygirls.org/#home


Submission Guidelines & Evaluation Criteria

Following are the items you must submit to earn this micro-credential and the criteria by which they will be evaluated. To earn the micro-credential, you must receive a passing evaluation for Parts 1 and 3 as well as a “Yes” for each component in Part 2.

Part 1. Overview Questions
(200-word limit total per response):

- In what type of learning environment do you work? (school, after-school, library, museum, etc.)
- Ages of learners?
- What subject(s) do you teach?
- Do you currently have safety systems and protocols in place for tools and materials in your learning environment? If so, describe them.
  - **Passing**: Educator includes a description of the learning environment, the age/grade level of the learners, as well as the educator’s instructional subject(s). The educator also provides a sufficient description of their previous safety system and protocols.

Part 2. Work Examples/Artifacts

Based on the tools and materials currently in use in their learning environment or makerspace, educator should create a plan for their space’s safety system.

**Educator’s submitted plan should include the following:**
A. List of key tools and materials currently in use in the space. Using guides provided in the resources sections, and any other necessary research, note potential risks (physical, emotional, etc.) of each tool/material.
B. Drafts of new safety signage that will be used in the space OR documentation of current signage/safety systems. Earner may decide form of documentation.
C. Reflection on how the signage does or will take into account the unique community, tools, and materials that make up the educator’s learning environment.

<table>
<thead>
<tr>
<th>“Yes”</th>
<th>“Almost”</th>
<th>“Not Yet”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educator submits list of tools and materials currently stocked in their space, including descriptions of potential risks/dangers.</td>
<td>Educator submits list of tools and materials currently stocked in their space without descriptions of potential risks/dangers.</td>
<td>Educator does not submit list of tools and materials currently stocked in their space.</td>
</tr>
<tr>
<td>Educator submits documentation of drafted safety signage or documentation of existing safety signage.</td>
<td>Educators submitted documentation is not clear, or is not explicitly tied to safety signage.</td>
<td>Educator does not submit documentation of existing, or intended drafted safety signage.</td>
</tr>
<tr>
<td>Educator submits reflection on planned safety signage that takes their unique community of learners into consideration.</td>
<td>Educator does not submit reflection on planned safety signage, or reflection is only ambiguously tied to their drafted safety signage.</td>
<td>Educator does not submit reflection on planned safety signage.</td>
</tr>
</tbody>
</table>

Part 3. Educator Reflection
(300-word limit per response):

- Can everyone use everything in your space? If not, how will you determine the process of gaining access to different tools and materials.
- How do you plan to develop a culture of safety with your community of learners?
  - Passing: Educator identifies issues related to accessibility and elaborates on processes for expanding any accessibility limitations and developing a culture of safety among their community of learners.