



the work permit system: holding students accountable for their actions

The work permit system applies industry practices to remind students that they are responsible for their safety actions every day.

This month's Safety Spotlight focuses on holding students accountable for their safety actions in STEM (science, technology, engineering, and mathematics) labs and makerspaces. Most teachers should understand the importance of a proper safety program. As STEM educators, we should review the safety rules and regulations for our labs/makerspaces with our students every year. We must also demonstrate the appropriate practices for all hazardous tools or pieces of equipment. It is critical that we document students' knowledge of this information via safety tests and supervised demonstrations. Additionally, we are required to keep students' safety tests with passing scores on file as evidence of their safety knowledge.

Part of instructors' professional and legal responsibilities is to not only teach safety, but to also hold students accountable for their safety actions in the lab/makerspace. Over time I have tested many strategies to hold students accountable for safety violations. I have tried clipboards, notes on a

seating chart, highlighted seating charts, an iPad, Siri notes, and even a PDA (if you do not know what a PDA is, Google it). Despite the technological advantages of some of these devices, they all required additional instructor work.

Inspired by Industry

Last year I tried something different that assisted with my hectic teaching schedule. While teaching as an adjunct for Millersville University of Pennsylvania, I was reminded that, in industry, employees are required to earn work permits or credentials prior to performing a hazardous task. Work permits signify that the individual near the hazard has had appropriate training to properly address associated safety risks. The permits also provide a form of legal documentation that demonstrates that the employer provided appropriate training (as mandated by OSHA) in the event of an accident. There are several types of work permits utilized in industry; some examples include confined

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space, cold work, hot work, excavation, height, or electrical permits. Many of those may not be applicable in STEM labs or makerspaces, but they provide the opportunity to discuss the importance of safety and the various hazards students may encounter if pursuing a career in industry.

The work permit system adapts the industry permit concept for use in STEM labs or makerspaces. The customized permits have a small list of general safety rules for the lab or makerspace on one side. On the other side they denote the class and year for which the permit is applicable. The permits are copied on color-coded cardstock to help differentiate between the various class sections using the lab or makerspace each semester. The color-coding also helps identify which students have permission to use certain tools/equipment if they visit after school or during study hall to work on projects while supervised (e.g., CNC permits are a different color than metalworking equipment permits). The permits also have three "Xs" on this side to help document safety violations, and two phone pictures signifying mobile phone usage infractions while in the lab (Figure 1).

How the System Works

The work permit system is fairly simple. After a student passes all of the required safety tests, they are issued a permit dated and signed by the instructor. If the student violates a minor, non-accident-related safety rule (e.g., not wearing safety glasses, throwing an object, horseplay, etc.) they get a hole punched through one of the Xs on their permit. (I purchased a star-shaped punch so that students could not replicate it with a generic hole punch.) The first hole punched constitutes a warning, whereas the second hole punched results in a teacher detention with parent contact. Three hole punches on the same permit results in the loss of the permit and right to work in the lab, as well as an office referral for further disciplinary action. For major safety violations, the instructor always reserves the right to revoke the student's permit and lab access.

Badge holders and clips can be purchased online at a minimal cost. Students should be required to wear their permit at all times when they are in the lab (unless performing an activity where the permit would create a safety hazard, in which case the permit should be kept nearby or could be hung from a permit board near the entrance of the lab). I have been implementing the work permit system at my school district for the past year, and I can honestly say that I LOVE it! After issuing these permits, students clip them on, knowing where they stand in terms of safety infractions and mobile phone usage. It serves as a reminder to students that each day they will be held accountable for what they do (or don't do) in terms of safer work practices. It also teaches them to be more responsible technologically literate citizens. If they lose their permit by misplacing it or by violating multiple safety rules, they have to take all of the safety tests

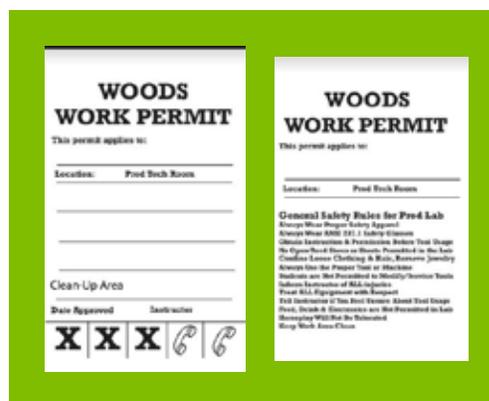


Figure 1. Mobile phone usage infractions while in the lab.

again in order to be issued a new permit. This system has worked well because the expectations are clear and tangible, providing an equitable way to teach students about accountability while maintaining a safer learning environment.

Resources for Instructors

Copies of the work permits created using Adobe Illustrator are available in Google Drive (<https://drive.google.com/drive/folders/0B8TFIW31jNKR0NsYmxCZTdvcKE?usp=sharing>) and can be accessed via the QR code in Figure 2. Please feel free to download the files and modify them to suit your school district's needs. If you modify more than just the names, please upload your modifications to the folder to share with others.



Figure 2. QR code.

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