

# Hands-on Learning

The makerspace movement promotes hands-on learning for students of all ages

**SESSION** *Makerspaces, Fab Labs, Innovation and Project-Based Learning*

**Presenter** Racine Unified: Terri Tessmann, supervisor of STEAM and personalized learning

In the late 1990s, the makerspace movement began when Mel King, a professor at MIT, trained homeless youth in the city to fix computers. From that project, the South End Technology Center in Boston was born — a two-block-long building where people from the community can do anything from learn how to weld, build a computer, or make crafts.

Terri Tessmann, supervisor of STEAM (science, technology, engineering, arts and math) and personalized learning at the Racine Unified School District, said makerspaces have evolved and can now be found in libraries, community centers and schools across the country. Makerspaces come in all different forms and sizes. They can range from the large South End Technology Center to a table in the back of a classroom with old computer parts or appliances for students to take apart and build.

“A makerspace can be just about anything you want it to be,” Tessmann said. “It’s just a creative space.”

It’s more about the idea and philosophy behind the movement than it is a physical space. It’s about getting students — both boys and girls — engaged and interested in hands-on, technical learning.

Tessmann described one project in which she challenged students to charge a cell phone by using a bicycle. First, she asked teachers to donate old bicycles. In response, she received three dozen bikes. Students designed systems that generated electrical power from the wheels,

others tried developing a system mounted on the handlebars that used solar power. The project required students to learn about circuits and voltage.

“Talk about problem-solving; they never would have done that out of a book,” Tessmann said.

Many of these projects develop skills such as collaboration, critical thinking and other soft skills that businesses so often say students today are lacking.

Tessmann said this kind of learning also exposes students to all sorts of different experiences, roles, and knowledge. So often, students don’t know what might interest them.

“We never ask them about what they’re curious in,” Tessmann said. “You also help kids find skills they didn’t know that they have. This gives them a chance to excel and that is the biggest thing you can do for your students.”

Tessmann remembers one activity in which she gave second-grade students a battery, a light and wires and challenged them to figure out how to get the light to turn on. At one table sat a boy and girl and the boy was determined to figure out how to get his light turned on first. But the girl beat him to it.



**“A makerspace can be just about anything you want it to be. It’s just a creative space.”**

— Terri Tessmann,  
Racine Unified School District

“The boy said, ‘I never knew girls could,’” Tessmann said. “And the girl said, ‘I never knew I could.’”

Tessmann recommended a number of easy makerspace projects such as a Makey Makey — a kit that allows students to turn everyday objects into touchpads. One popular Makey Makey project is to turn a banana into a musical instrument. She also mentioned Raspberry Pi, a hands-on, credit-card-sized computer that students can build off of and modify — learning about circuits, computer hardware, and coding along the way. Tessmann also recommended the Engineering is Elementary curriculum for elementary school teachers. In any makerspace activity, Tessmann said the key is to get students to use their hands to build and create. ■

## MAKERSPACE IDEAS AND RESOURCES

**Makey Makey** | [makeymakey.com](http://makeymakey.com)

**Raspberry Pi** | [raspberrypi.org](http://raspberrypi.org)

**Engineering is Elementary** | [eie.org](http://eie.org)

Or contact Terri Tessmann at [terri.tessmann@rusd.org](mailto:terri.tessmann@rusd.org)