THEODORE ROOSEVELT HIGH SCHOOL  
San Antonio, TX

The Roosevelt High School CTE Makerspace is unique because it’s not a fixed physical space, but rather a design for mobile makerlabs that can be moved about the school and community as needed. The mobile makerlabs help solve space limitations and student logistical issues faced by many schools. Each of the five mobile makerlabs has a unique theme and provides novel exploratory and project-based maker experiences. The Roosevelt High School mobile makerlabs provide opportunities for genetics exploration, wearable programming, fabrication in different content areas, and many other hands-on learning challenges.

Meet the Makers at Theodore Roosevelt High School

July Update

1. How is your vision for a makerspace innovative?
The portability, scalability, and potential for modular combination of the mobile makerlabs render the Roosevelt High School project uniquely transferable to a broad spectrum of schools and communities. The mobile and themed makerlabs hold a variety of tools and materials to provide uniquely engaging opportunities for all students and their communities. Schools and community centers can adapt the mobile makerlab concept to meet their unique learning needs.

2. What are you most excited to get started on this summer?
We are so excited to start building our mobile makerlabs. Students and teachers have been working together to cut and assemble the rolling maker stations. Also, the receipt of in-kind prizes has been a bit like an awesome maker holiday with inspiring maker tools.

August Update

3. Can you describe the types of people who have been involved in your build out?
Our build out has been focused on prototyping the makerlabs before the CTE students begin construction of the other units. District CTE coordinators have helped us get the equipment we need. A lot of the hands-on work with the initial prototype has been done by our campus lead teachers.

4. What has been the most challenging part of the summer build out thus far?
The most challenging parts so far have been coordinating everyone’s schedules, really flushing out the details of the makerlabs design, and developing the most efficient way to assemble them. This is our first time building a CTE mobile maker lab so it has been a unique experience for us all. It’s been enjoyable working as a team. It’s not every day that we can get together as faculty and use a table saw.
5. Have you made adjustments to your original plan since starting your build out? If so, can you describe how you have changed your plan and what sparked the change?
We’ve slightly adapted the dimensions for a smoother look. Also, the plans suggested a bit of accuracy with the table saw that isn’t as tenable as it first seemed. So we’ve adjusted for the saw kerf. Also, we’re looking at different coaster sizes to handle the weight of the makerlabs.

*September Update*

6. What advice do you have for other schools developing making programs?
Student and teacher interest will guide the evolution of the space more than the tools. During the development, consider a variety of instructional techniques and the presentation of the tools. How can the new tools and their affordances be made most salient to students, teachers, and the community?

Tools such as vinyl printers, sewing machines, and CNCs (after demonstration) make great gateway tools because they are easy for novices to see the possibilities available in a makerspace. More sophisticated and unfamiliar tools, such as Laser cutters, provide great demos for exciting imaginations.

On a more cautious note, ensure you follow your organizations’ procurement and vendor approval process. Leave yourself enough time in your planning to secure vendor approvals well before building out the space. School districts have very specific requirements on procurement and vendor approvals, and some vendors may not respond quickly or at all. This becomes problematic when the makerspace item is quite specific and not available through other vendors.

Finally, ensure that you include teacher training in the implementation timeline and allow time for make-up sessions, if needed.

7. As you reflect on your progress, of what are you most proud?
Building the mobile carts is a pretty big accomplishment. We started with a design that we found needed tweaking as we advanced through the building process. Fortunately, our architecture teacher is a proficient trouble shooter and skilled builder. We are thrilled that the tools and makerspace discussion have gotten students excited about what they can make, including projects for our upcoming STEAM carnival.

8. What else do you have in the works for this fall?
We will be rolling out all of the mobile maker labs as the semester progresses. This will include a launch of the maker labs during lunch periods to bring maker opportunities to the broader student populace. We are also using the mobile maker labs to increase awareness and interest in our district and community wide STEAM carnival.

*October Update*
9. How has your makerspace benefitted your school's CTE program?
The mobile makerlabs have helped increase broader student access to and interest in technology. For example, the sheltered instruction teacher utilized the makerlab with MakeyMakeys for a hands-on creative lesson with circuits. The students were proud of their projects and were able to subsequently describe the parts of a circuit. Similarly, the makerlabs have afforded art students access to technologies such as MakeyMakeys, LEDs, and soldering irons, which they have been using to prepare for the upcoming STEAM carnival. Also, the makerlabs have provided hands on technology access for Computer Science students, such as soldering and woodworking. As the woodwork labs and materials were set up in the art and architecture rooms, there has been a bit of cross pollination whereby pre-AP Computer Science students have developed greater familiarity with the art and architecture tools, teachers, and course offerings.

10. What was the highlight of your trip to World Maker Faire?
Mrs. Daggett: I enjoyed seeing all the innovation that is occurring in classrooms across the country. I left with a cornucopia of great ideas to bring back to our district.

Mr. Davis: the highlight of the World Maker Faire trip was talking to Drew Fustini from OSH Park and learning more about Free and Open Source Hardware. The ESP8266 in conjunction with the Adafruit IO libraries sounds like an especially promising approach for engaging and personally relevant student programming projects.

Mrs. Philbrick: I loved seeing the different projects and getting inspired with new ideas. I also loved meeting others that shared the same ideas about teaching and making.

11. Can you tell us about a standout project that is underway or has been completed in your makerspace?
Currently, there are many projects being completed with the makerlabs in preparation for the STEAM carnival. The students are making many artistic projects programming LEDs, stepper motors, and Piezos. One unique project that stands out involved an automated plant watering system. It is being developed by a student who plans to be a viticulturist and use it to grow grapes. Currently, he is experimenting with an Arduino and hydroponics system to measure soil hydration and then power a pump to water peas as necessary.