

# EVERYBODY

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Why and how the Arizona Science Center created its own makerspace.

By RaeAnn Fox



Adults make bows as a part of the monthly First Friday free activity at CREATE at Arizona Science Center®.



All Images: Arizona Science Center staff

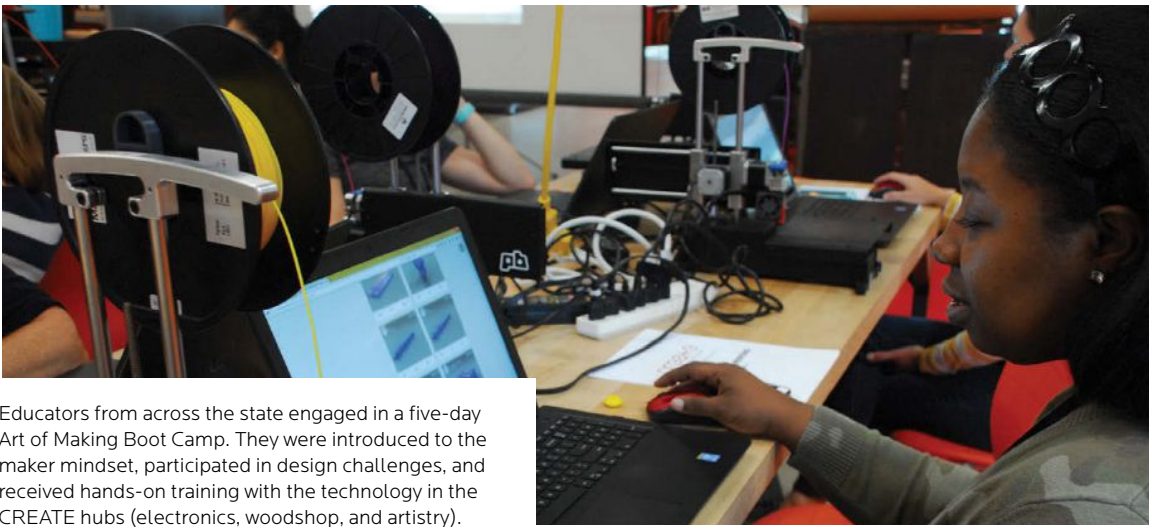
In the science center world, some have debated the relevance and value of makerspaces. They question whether investing in makerspaces is consistent with the educational goals of our institutions.

However, when the Arizona Science Center had the opportunity to establish a community makerspace, we did not hesitate. And we have no regrets.

Arizona Science Center is a place where community members of all ages come for inspiring and engaging science education experiences. Our vision for programming emphasizes hands-on STEM learning

opportunities that uncover and celebrate the daily wonders of science, large and small.

Having a space dedicated to exploration, experimentation, and creation not only aligns with our institutional mission, it allows us to fulfill that mission in new and exciting ways that transcend the typical conception of what museums and science centers offer. In the two years since we opened CREATE at Arizona Science Center®, it truly has become a place where thoughts become ideas and ideas become reality.



Educators from across the state engaged in a five-day Art of Making Boot Camp. They were introduced to the maker mindset, participated in design challenges, and received hands-on training with the technology in the CREATE hubs (electronics, woodshop, and artistry).

### How We Built It

After nearly four years of dreaming and goal-setting, in the summer of 2013, we started planning the CREATE makerspace in earnest. From the outset, Chevy Humphrey, The Hazel A. Hare president and CEO of Arizona Science Center, and the governing board members knew the success of this space would depend on its widespread appeal, flexibility, and availability to all community members.

### Designing the Space

Early on, the planning team gave a variety of individuals from within and outside the community a voice in the planning and design process for CREATE. The planning team organized a series of charrettes—collaborative sessions to develop solutions to design challenges—that directly involved Arizona Science Center staff and board members, local business owners, architects,

## Advice for Making Your Own Makerspace

The CREATE makerspace is now a success, but it took some tinkering. Here are some of the challenges the Arizona Science Center has had to address.



- **This customer service model is different from that of the main science center.** Much of the main science center is self-guided, but we soon realized that CREATE needed to be a more one-on-one, engaging experience. After all, making can be intimidating; for it to be fun, relevant, and accessible, guests need guidance. We hired CREATE coordinators who not only welcome guests, but also offer them tours of the space and ask questions to better connect guests to interesting experiences.



- **Communication and marketing are key.** Just because you build it does not mean people will come. Many in the community may not know anything about making. Others may think it's not for them. Through various marketing and public relations efforts, you will need to explain what a makerspace is all about and the value it offers. We distributed flyers, gave presentations about CREATE to community groups, invited groups to use the space for free, and offered private tours.



- **Don't base your community use or revenue goals entirely on pass holders.** Originally, our goal was to get 100 pass holders, but we soon realized that this group alone wasn't going to keep the space active. In fact, pass holders became a small part of the maker culture we ultimately created, which expanded to educators and drop-in visitors.



- **One size does not fit all.** Get to know your guests and community to find out their needs. This can be accomplished in a number of ways: guest and educator surveys, focus groups, and short-term trial events. Be prepared to adapt your programming and hours—you may need to stay open late—to meet those needs.



- **Staff training is essential.** Making is a skill that requires lifelong learning, practice, and training, in addition to time to research the latest tools, skills, and designs. Staff need time to practice, learn from others, and do their own research, or their development and interest will stagnate.

college students and professors, engineers, designers, local educators, and science and technology center colleagues from around the globe. The groups gathered to discuss how CREATE could best meet community needs, connect with local businesses, and complement the offerings of other education organizations. These discussions helped the planning team nail down its intentions and goals for CREATE's institutional impact, operations, community involvement, construction, and design.

After the charrettes, a smaller design group, led by a project manager working with the chief operations officer, formed to oversee the design and construction process. Everything about the design was intentional (down to the signs for each of the resource centers) and was conceived with flexibility and agility in mind.

CREATE has an industrial wood and metallic look, with zones that define each space but do not constrain them. There are open areas for people to chat, tinker, and collaborate and other areas that can be used separately for safety or privacy reasons. The mobile furniture allows the space to be used for a variety of purposes, from group making activities to meetings and even gala events (thus offering the museum additional revenue streams).

### *Designing and Adapting the Programming*

As CREATE's physical space was being designed and constructed, the planning for its programming and operations was simultaneously underway. Initially, we planned to have CREATE programming available to pass holders, who would

take classes and pay a membership fee to use the tools and equipment.

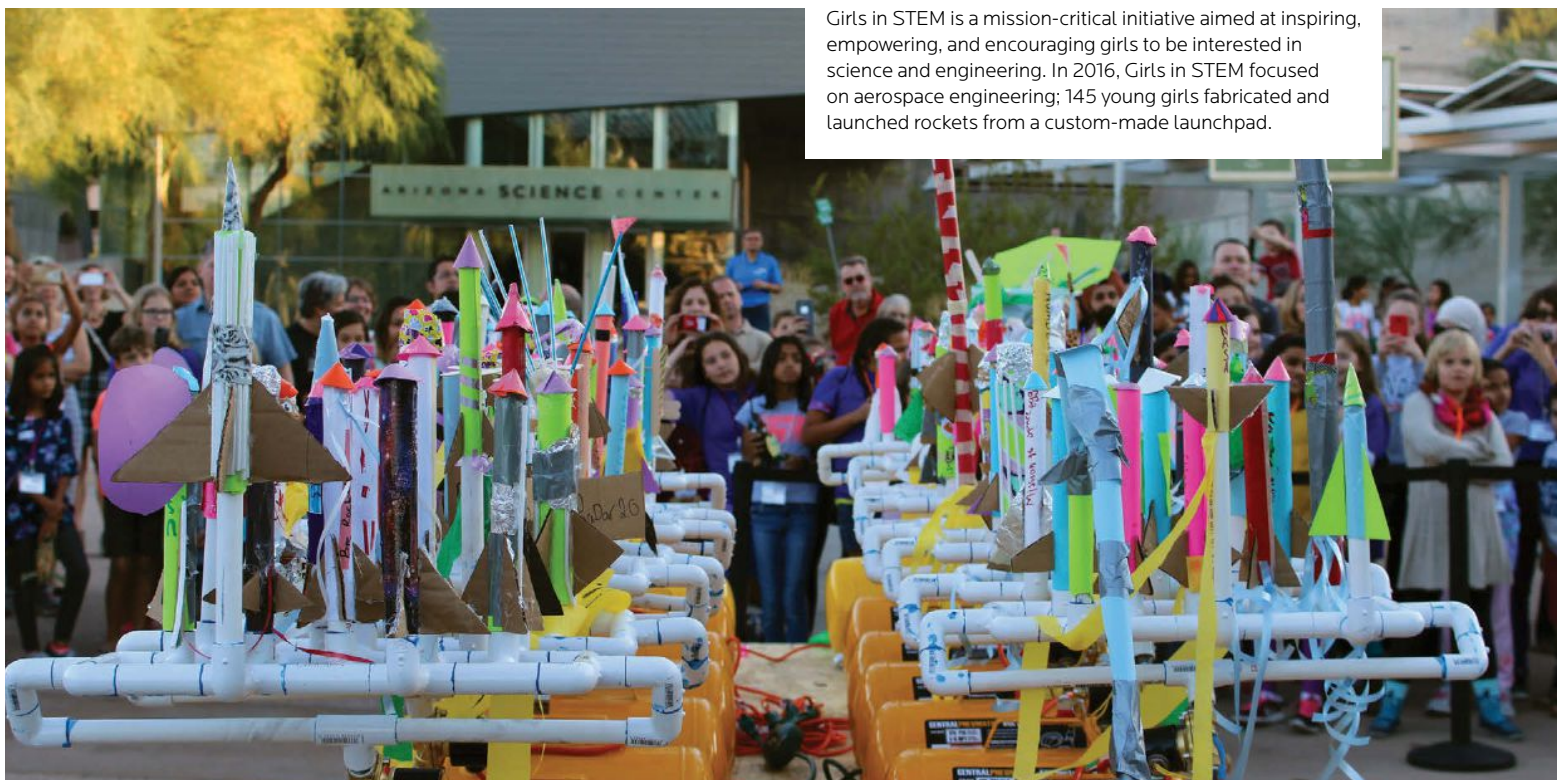
Drop-in visitors and school groups could also engage in various staff-designed "maker challenges" in the three different CREATE zones for a cost that depended on supplies and resources used. In this initial vision, the space would be open to the public during the same hours as the science center.

But as any maker knows, even the best-laid plans don't always work out as originally conceived. So, in keeping with the adaptive nature of the CREATE makerspace, Arizona Science Center's approach to programming and operations has been similarly agile. In fact, much of the initial programming model has been modified to better suit how the community uses the space and its resources.

We now have extended hours three days a week, and we offer a broader range of visitor options: "maker experiences," in which customers choose to make something from a list of items; free tinkering activities; field trips; professional development in making and project-based learning; and long-term afterschool project-based learning opportunities with business experts as mentors.

### **How We Share What We Know**

Even before CREATE's doors opened, word of our makerspace had spread throughout our Arizona community and to science centers around the world. Groups from other countries were coming to see this makerspace and how it would be incorporated into the existing culture of Arizona Science Center and the community. Humphrey and Dean Briere, chief operating officer of Arizona Science Center,



Girls in STEM is a mission-critical initiative aimed at inspiring, empowering, and encouraging girls to be interested in science and engineering. In 2016, Girls in STEM focused on aerospace engineering; 145 young girls fabricated and launched rockets from a custom-made launchpad.



Inspired by the productivity of an inventor's workshop, the creativity of an art studio, the experimentation of a lab, and the connectivity of a commons, CREATE is a 6,500-square-foot community hub that helps turn dreams into reality.

tirelessly explained to all what was happening at CREATE and helped other science centers start their own makerspaces.

We also made a concerted effort to engage school groups. Some groups arrived with an interest in the makerspace movement but didn't know exactly how to incorporate making into their curricula; other groups were new to the concept. We were able to meet everyone where they were. We also scheduled tours that showcased the CREATE space for educators, principals, and superintendents from across the state and engaged them in making activities so they could understand CREATE's value.

One of the central goals of the Arizona Science Center is to improve science teaching in the state, and the CREATE makerspace has enabled us to expand our professional development work. In addition to our teacher residency program and workshops for science teachers, through CREATE we have developed professional development partnerships that provide educators with project-based learning opportunities that incorporate making into science education.

In addition, two CREATE professional development modules offered onsite, "Making as a Mindset" and "The Art of Making," are now earned-revenue streams that help sustain CREATE programming. Our training and consultation work with school districts, in which we help them conduct design charrettes, plan their goals, and design their own makerspaces, is another revenue stream.

Several of the districts we have consulted with have already opened, or will be opening, their own makerspaces. We are honored to have been a partner in their journeys. These school site makerspaces will allow students to imagine, design, and create while connecting concepts they learn in school with real-world projects.

This is precisely the kind of science learning our institution has always wanted to inspire and make a reality.

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*RaeAnn Fox is vice president of programs at the Arizona Science Center in Phoenix, Arizona. She will be a speaker at the AAM 2018 Annual Meeting & MuseumExpo in Phoenix, Arizona on May 6-9, 2018.*