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Full STEAM Ahead

Friends' Central School's newly opened Audrie Gardham Ulmer '37 Center for Innovation and Design helps shape today's students into tomorrow's global leaders. by **Jeneane Brown** | photos by **Alison Dunlap**

C.J. Keller is living the STEAM dream. Surrounded by 3D printers, laser cutters, and soldering irons, he gets paid to do what he loves. The best part of his job: daily opportunities to stoke the imaginations of Friends' Central students.

As co-director of the Audrie Gardham Ulmer '37 Center for Innovation and Design at Friends' Central School in Wynnewood, Keller helped facilitate a renovation that will have ripple effects for years to come. Having evolved from a modest, two-story structure once known as the Rex Gymnasium, the 6,800-square-foot technological marvel known as the CID gives Friends' Central a STEAM hub many other schools would struggle to duplicate.

For those who may be unfamiliar with the acronym, STEAM is a pedagogical philosophy that encompasses science, technology, engineering, art, and mathematics. At Friends' Central, the rigor and creativity of STEAM is woven into the daily curriculum. Along with other pillars of a Friends' Central education, such as service learning and leadership, STEAM empowers students to pursue interests and develop skills that will help them succeed in a rapidly changing world.

Keller traces the building blocks of the CID to a conversation with Head of School Beth D. Johnson '77 from a few years ago. They discussed the possibility of a new, state-of-the-art collaborative

space that would serve as a catalyst for the creativity and innovation for which Friends' Central students are known. Combining the school's makerspace with the woodshop and fabrication studios, the new center would allow for new courses including Design Thinking: Concept to Creation, 3D Fabrication, and Intro to Computer Hardware.

The educators wanted to pilot the CID before they settled on a location for the shared creative space; during a "test phase," they moved the makerspace and the woodshop into the Rex Gymnasium for Phase I of the transformation. Keller and his team, along with several students, built shelving, partitions, and furniture, and even installed an exhaust system.

"We had a year and a half of preparing and seeing how the space would be used and what's popular and what's not," he adds. "That informed the final decision for the finished CID."

Johnson led the fundraising efforts to facilitate the renovation project, and, in 2022, catalyzed by the generosity of donors, the renovation commenced. Keller credits the architects for doing "a wonderful job" of creating a modernized space that retains key elements of the former Rex Gymnasium's rich history.

The end result: a charismatic and dynamic facility with a decidedly tech-forward focus. The building's open-concept lobby yields to a fabrication studio on the right, which houses several



contemporary maker tools as well as areas devoted to welding and metalworking. It also has a room dedicated to the creation of robotics for use in competitions. A finishing room for painting and staining boasts a spray-paint booth and welding booths, and a textile station for sewing and other crafts. An outdoor classroom space with a covered porch enables fresh-air lessons and projects that require off-gassing.

The second-floor mezzanine, complete with exposed trusses from the original

architecture, contains design and prototyping studios, as well as a 3D-printing room. A green screen and other tools equip students to produce digital content such as videos and podcasts.

Students' "passion projects" begin upstairs where they sketch out their thoughts. Many will then create a prototype out of cardboard before bringing their project to life in the fabrication studio. An abundance of materials is readily available to students, so the possibilities are almost limitless.

"The student body at [Friends' Central] is incredibly creative and drawn to the center for its diverse state-of-the-art equipment," says Matthew Schoifet, co-director of the CID. "Whether students have interest in woodworking, metalworking, sewing and embroidery, or 3D printing, the space contains something for everyone with technological or artistic interests."

In the past two years, for example, Friends' Central students have built go-karts, drones, costumes, tufted quilts and rugs, and intricate pieces of furniture. Schoifet expects the CID to spark students' interests that could one day become meaningful, lucrative careers.

"The space also has a new robotics lab," he adds. "As the coach of our FIRST Robotics Competition team, The Earthquakers, I am looking forward to continuing to collaborate with our students to teach relevant coding and design skills for robot making. We teach 3D computer-aided design where students customize parts and fabricate them on our CNC and 3D printers as well as Java programming. The space has a larger practice area where we are able to innovate and develop more capable competition robots."

While the edifice has elements of yesteryear throughout, the CID also has contemporary upgrades such as acoustic sound panels in the walls and double-pane windows to mitigate noise. The goal: to have

an adaptable space continually guided by student interest and curiosity.

"We have a lot of equipment on casters, which keeps the space flexible and dynamic," Keller says. "Student interest often drives us to explore new technology, and the space is designed to accommodate these changes and stay up to date with the latest advancements."

Friends' Central, which is in the process of seeking LEED (Leadership in Energy and Environmental Design) certification, designed the CID with sustainability in mind. Keller and his team accompanied the architects of the project on visits to peer schools in the area, as well as the engineering departments of institutions of higher learning—the University of Pennsylvania, Drexel University, Haverford College, and Villanova University—to glean ideas that would inspire Friends' Central students. In fact, the building itself fosters creativity.

"Aesthetically, the building has an industrial look," Keller says. "We didn't want to cover up the mechanical elements, so you can see the original trusses, electrical conduit, and exposed pipes. You can also see how the second-floor mezzanine is suspended. The building's design serves as a living example of STEAM."

The CID team can comfortably accommodate two to three classes at once, or an entire grade. On average, 60 students participate every day. During its busiest times, the space can see as many as 130 in a single school day. Keller and Schoifet, along with Innovation and Design Teacher Qil Jones, collaborate to lead classes, guide students, and facilitate creativity. Each is profoundly excited about the opportunity to shape the futures of students, many of whom will go on to become tomorrow's engineers, animators, designers, and developers.

"STEAM education is a different way for students to map their world experience," Keller says. "They learn science, technology, and math through art. Having all those elements in one space gives students the ability to choose their own adventure." ■



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