

Blueprints for CTE Learning Spaces

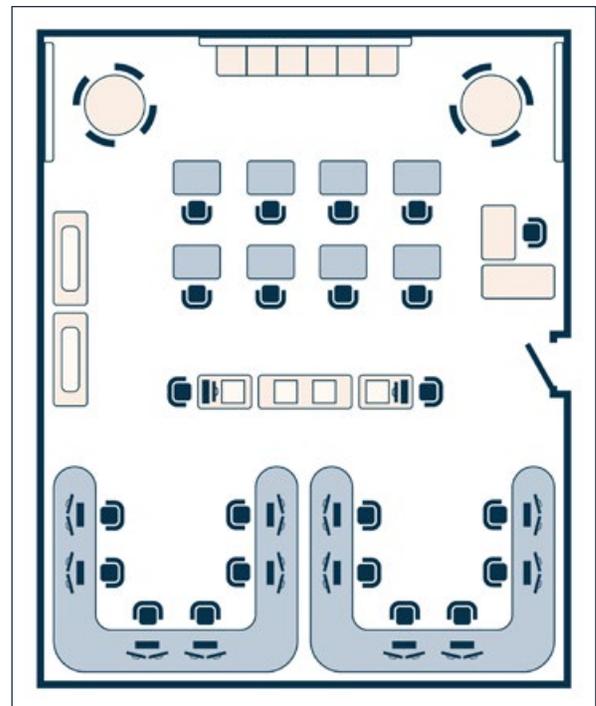
Career Technical Education learning spaces go by many names and take a variety of forms that are reflective of a program's unique choices and relationship to other subjects. For the most part, modern CTE learning spaces are designed to prepare students for “new-collar” careers (jobs focused on specialized technology skills). This growing trend in the job market dovetails with school curricula that emphasize project-based learning and the push for increased STEM-based education.

Spaces that house the kind of technology required for optimum CTE-learning often have special needs, such as ventilation for machines such as 3-D printers, or sound dampening and customized electrical wiring. Some of the machines can be large format, so additional space might be required.

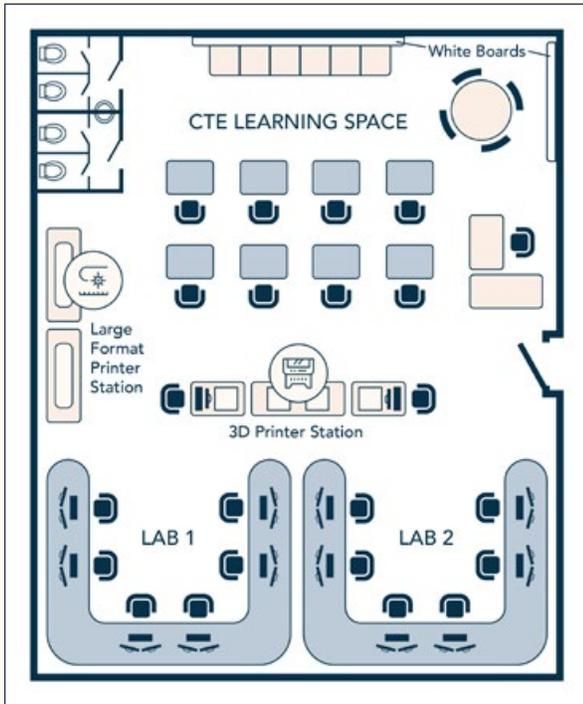
With an increased national need of new-collar workers and growing implementation of project-based learning, modern CTE learning spaces provide high school students with the skills necessary to succeed in post-secondary/college education, entry-level employment and career advancement.

Makerspaces can take many shapes and forms but have in common an intention to equitably provide maker activity to all students and promote creativity, innovation, and a culture of persistence. A STEM lab is, in essence, another name for a makerspace, but with a title that highlights disciplinary connections rather than a maker philosophy. These spaces are designed to support key engineering design components such as:

- Ideation and design,
- Prototyping and fabrication,
- Assembly and testing, and
- Display and communication of solutions.



*See <https://www.mosherdrew.com/cte-mira-mesa-high-school-1> for details and better view.



CTE Learning Space

This example from the Mosher Drew architecture firm in California highlights some of key CTE Learning Space elements:

- Computer Areas
- Collaboration Spaces
- Maker Spaces
- Classroom Area
- Equipment Lab for 3D printing, CNC (Computer Numerical Control), etc.
- Storage
- Restrooms

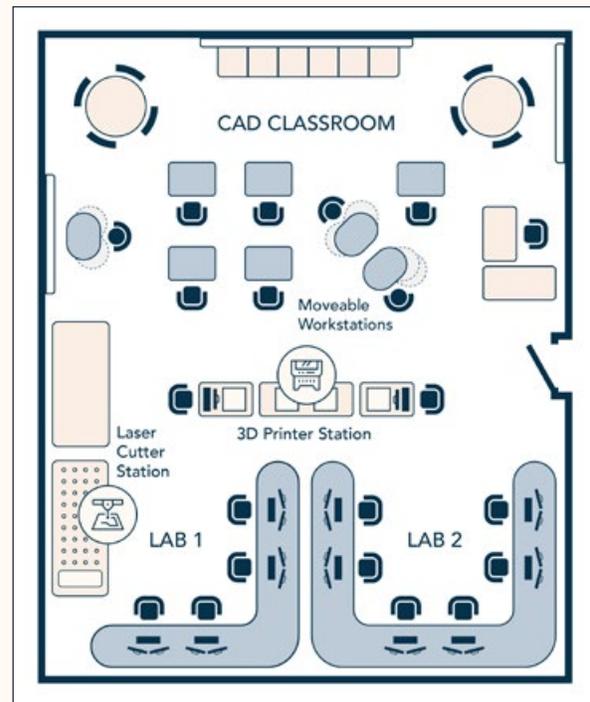
While not every school district will have the means to build out such a space, this example can be used as a model to help schools see what is possible in creating a rich environment for 21st century learning.

CAD Classroom

Students learning the principles of architecture and engineering typically use Computer-Aided Drafting (CAD) programs to increase understanding of drafting practices, working drawings, and construction techniques. They also help students to learn established standards or codes to prepare plans for presentation while mastering contemporary career skills.

A CAD space typically requires the following equipment:

- Printers
- Large format printers
- 3D printers
- Laser cutters
- Moveable workstations
- Design stations with two monitors each

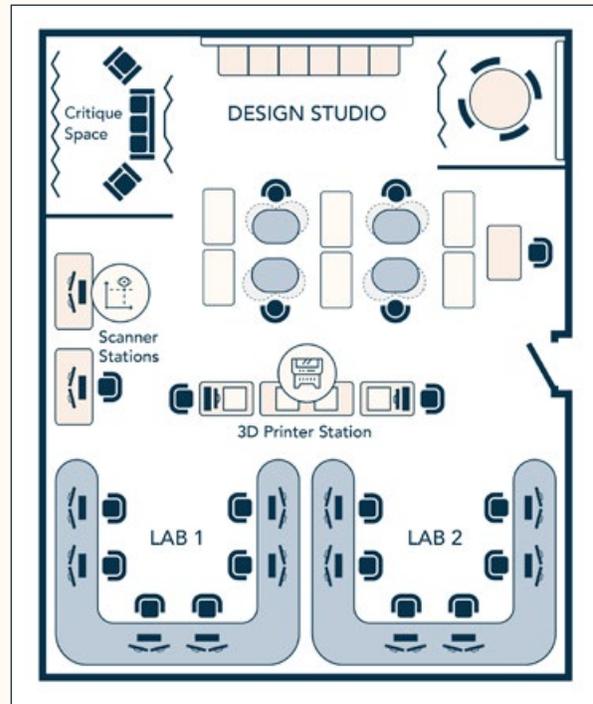
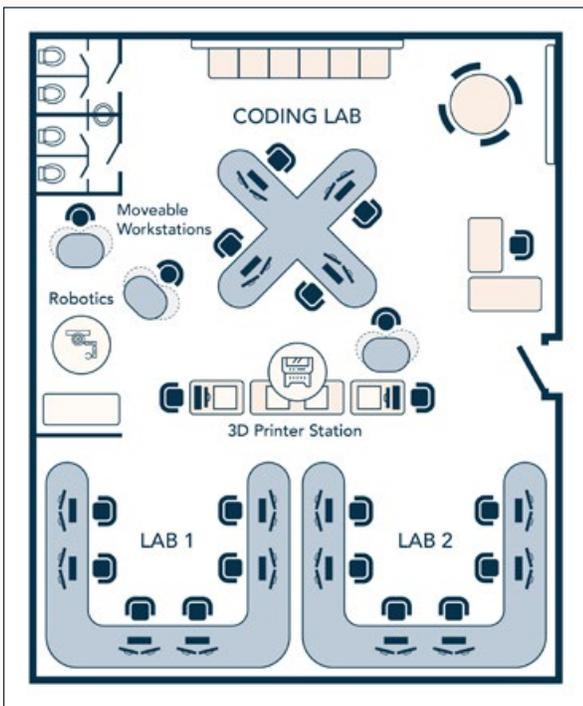


Coding Lab

Coding programs typically introduce students to a variety of computer languages including HTML, CSS, DNA, SQL and Javascript. Program projects may also include an introduction to mobile app development, remote server workflow, data queries, web development, and the production of data-driven applications.

Tables and workstations can be utilized in a conventional instructional setting (desks facing the teaching wall), or a more fluid seating arrangement for group discussion and project collaboration. Tools and equipment facilitate instruction and project development.

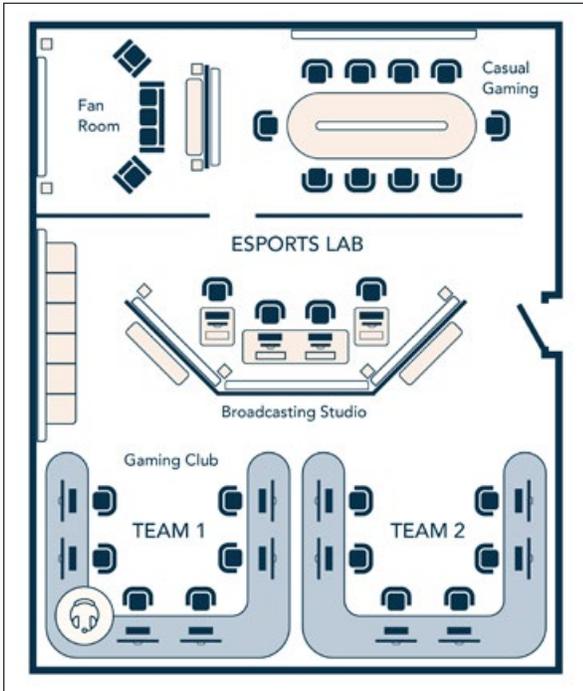
- Moveable workstations
- Design stations with two monitors each
- Robotics area
- Collaboration space
- 3D printers
- Large format printers



Design Studio

Digital Design Labs should provide a comprehensive range of software and machines to realize innovative design ideas. Computer-controlled multi-axis devices can efficiently fabricate a variety of materials into complex and compound surfaces with a high degree of precision.

- High-performance graphic workstations with two monitors each
- Moveable workstations
- 3D printers
- Scanner
- Large wall-mounted presentation screens
- Laser cut machines
- CNC machines
- Adobe Creative Suite software
- Autodesk Building Design Suite
- Various software (V-Ray, CorelDRAW, Microsoft Office Professional, Rhinoceros 5.0, ACDsee 5.0, SketchUp, etc.)



Esports Lab

Players of esports are divided into teams based on the online game they play competitively. Most schools hosting esports programs institute an academic requirement (like with traditional sports) with teams competing with other teams statewide and nationwide and hosting their players on Twitch, a streaming site for gamers.

- Typical esports labs offer esports teams, a gaming club and an area for casual play.
- High-performance workstations with large monitors
- Comfortable, ergonomic chairs
- State-of-the-art gaming controls
- Large wall-mounted presentation screens
- Couches for viewing area
- Sound system for viewing area
- Broadcasting studio (portable green screens, microphones, webcam equipment, etc.)
- Less powerful PCs for casual play

Media Lab

A CTE Media Lab is typically a state-of-the-art, fully equipped broadcast quality digital media studio. These facilities support courses related to programs in journalism, radio, television, video and film production.

- High-definition digital cameras
- High-performance graphic workstations with two monitors each
- Moveable workstations
- Adobe Creative Suite/State-of-the-art video editing/production software (such as Avid), After Effects, Dreamweaver, etc.
- Professional-quality audio software such as Pro Tools and Cubase
- Microsoft Office (for writing, presentations, etc.)
- Audio boards allowing both digital and analog technologies
- Broadcasting studio (portable green screens, high-quality microphones, webcam equipment, soundproofing, teleprompter, etc.)

