# Career and Technical Education (CTE)

School Type: E **M** **H**
6 7 8 9 10 11 12

## Functional Area Descriptions

Career and technical education (CTE), formerly professional technical studies (PTS), offers career-related courses to middle and high school students. Schools offer different programs based on school size and staffing. The facilities for these programs are separated into three sizes:

- **Small CTE Lab**: Video communications (MS & HS), health services (HS)
- **Medium CTE Lab**: Business education (MS & HS), computer science (MS & HS)
- **Large CTE Lab**: Family consumer science (MS), culinary arts (HS), modular technology/CADD/CISCO/CSS (HS)

The chart shown for planning requirements should be used for space allocation during the planning phase of a school construction project. The architect should work with the school administration to determine the specific programs to be provided at each school. The number of CTE spaces provided must correspond with the student enrollment, but the programs offered will be determined by staff availability and student interest. Refer to Additional Planning Requirements on page eight.

## Adjacency Diagram
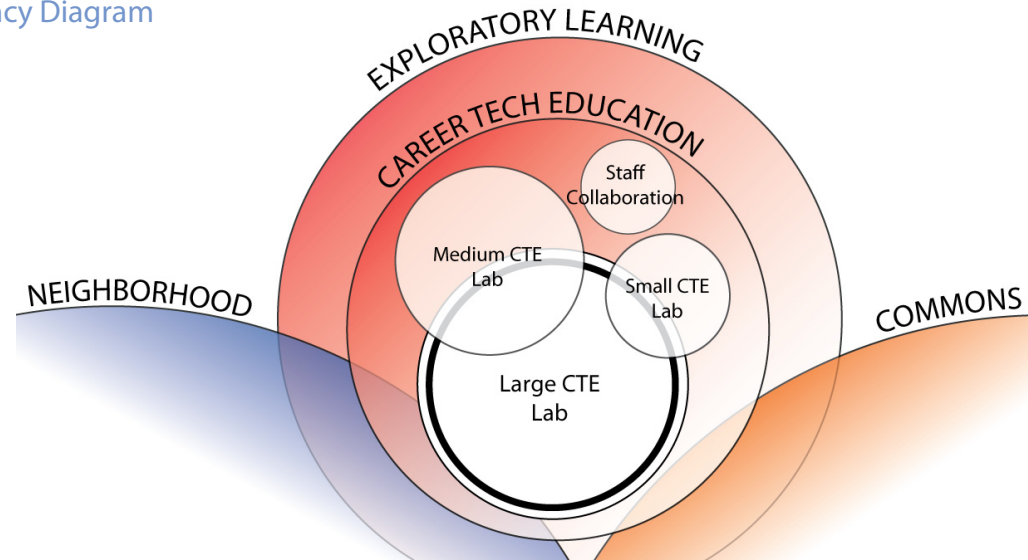


## Planning Requirements

| | Area Description | SF | M² | Notes |
|---|---|---|---|---|
| | **Career and Technical Education (CTE)** | | | |
| 1 | **Small CTE Lab** | 800 | 74 | |
| 2 | **Medium CTE Lab** | 1,200 | 111 | |
| 3 | **Large CTE Lab** | 1,700 | 158 | |
| 4 | **Staff Collaboration** | 100/teacher | 9/teacher | Calculated in Staff Collaboration |

Future flexibility should be kept in mind when designing these spaces, as the CTE curriculum is continually changing to follow trends in future career paths. The following sections discuss the specific needs of each identified program.

**1 Small CTE Lab**
*Video Communications (MS & HS)*
The video communications program encourages students to explore ideas using modern audio visual equipment and techniques. This area provides space for students and instructors to record TV and audio visual material and conduct small group projects with instruction. The space should accommodate up to 12 students.

There are four distinct areas in this space; the studio, the control/editing room, the sound vestibule, and a storage room. Minimum areas are listed for the studio and storage room; other areas shall be distributed to maximize the function of each space.

The **studio** must be a minimum of 400 square feet (37m$^2$). Students produce TV and audio visual material in this multi-use room. They can broadcast material prepared in the studio throughout the school. The studio can also serve as a lecture/classroom space. The room incorporates specialized lighting, various backdrops, and whiteboard space for brainstorming, flow charts, storyboards, etc. It is desirable for this space to be adjacent to a Flex Lab with a connecting door for additional instructional space.

The **control/edit room** provides space for recording and dubbing equipment. The room is set up to work like an actual control room in a recording studio with space for 3-4 people. The edit room must have views of the studio.

The **sound vestibule** must allow people to enter the control/edit room and/or storage room without interfering with the studio. Provide a pair of double doors in the vestibule and into the studio to accommodate large equipment.

The **storage room** is required to be a minimum of 200 sf (19 m$^2$) and should have a combination of open shelving and lockable cabinets for storage of equipment and production materials.

*Health Science (HS)*
The Health Science program may be offered in locations where there is a hospital on the installation to support the curriculum. The space should be designed to be divided into four stations for specialized training. There does not have to be a physical division of the space. Each station should have base and wall cabinets with a sink, similar to what would be found in a doctor's examination room. An area should also be provided with a lateral file and computer workstation with a printer for medical records instruction. Provide tall cabinets for storage of medical supplies and small equipment.

▸ *Medium CTE Lab: Calvin College Science Lab, Grand Rapids, MI*
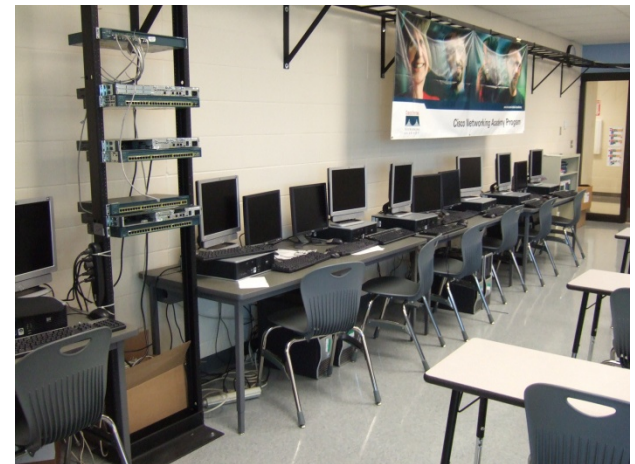
▸ *Small CTE Lab: Columbus Public Schools, Columbus, OH*

NOTE: Images shown are intended to provide real-world examples and spark design creativity.

## 2 Medium CTE Lab

*Business Education Laboratory (MS & HS)*
Business education prepares students to become responsible citizens, capable of making astute personal and professional economic decisions, and is a good foundation for students wanting to pursue a business degree in college. Essentially a computer lab dedicated to business education, this space requires access to the technology integral to business education. Where this program is provided in middle schools, the flex lab should be used.

*Computer Science Laboratory (MS & HS)*
The computer science laboratory setting provides space for individual and group instruction in computer science applications. Essentially a computer lab dedicated to computer science, this space requires access to the technology integral to computer science. Where this program is provided in middle schools, the flex lab should be used.

## 3 Large CTE Lab

*Family Consumer Science (MS)*
The family consumer science program provides individual and group instruction in personal, home, and family practices. This space is a multipurpose learning environment where students work as a group for general instruction, demonstration, and audiovisual presentations. The curriculum includes food preparation and nutrition, clothing care and fabrication, management and economics, and personal and family relationships. Access to an outside covered patio and garden area is desirable.

The **food preparation area** should have space for six kitchen workstations to accommodate up to 24 students. Workstations need approximately 10 linear feet of standard U.S. kitchen counter, a double sink, a standard U.S. stove/oven unit, and wall and base cabinets. The dishwasher can be provided in a teacher kitchen demonstration area rather than at each student workstation. A mirror above the demonstration area allows students to observe food preparation. Space should also be provided for equipment storage and two refrigerator/freezers. Space should be provided for a washer and dryer in a general clean up area.

The **clothing and fashion area** should be separated from the food preparation area. The area should contain space for individual sewing stations, storage cabinets, cutting and pressing stations, and a fitting booth.

Provide a general instruction area between the food and clothing areas. This area is shared and can be a buffer space between the two different functions of the room. This area should provide for group and individual instruction.

The **storage room** is required to be a minimum of 200 sf (19 m$^2$) and may be shared or divided between the two programs. Provide convenient access to the storage room from each area.



▸ *Large CTE Lab: Canby Applied Technology Center (ATC), Dull Olson Weekes Architects, Canby, OR*



▸ *Large CTE Lab: Canby Applied Technology Center (ATC), Dull Olson Weekes Architects, Canby, OR*

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### Culinary Arts (HS)

The culinary arts program provides individual and group instruction for students planning a career in the food service/restaurant field. Students learn by group instruction, cooking demonstrations, computer and audiovisual presentations, independent work, and combined group work. Most of the class time will be in a group work situation in a complete simulated restaurant scenario with food prep, cooking, dish washer, wait staff, and managerial personnel. The facility will have restaurant kitchen equipment and a dining area to accommodate up to 15 people. Overhead ventilation for cooking and baking areas will be provided. Special electrical utility service and a designated water heater will be provided. If natural gas is already supplied to the school, gas appliances may be installed. Natural gas will not be supplied to the school solely for the culinary arts program.

Consider locating the culinary arts space near the food service area of the school. It may be desirable to provide a large transparent garage door that could be opened to the common shared space for larger gatherings.

### Dining Area

One end of the space shall provide a dining area. The dining area will provide space for group instruction, computer and audiovisual presentations, independent work, and consumption of food prepared by the kitchen. Provide space for four circular dining tables with four chairs each, two computers, television/DVD/VCR, ceiling-mounted projector and two speakers, and shelving for cookbooks and video equipment. Special mounting brackets should be installed for the wall-mounted television, projector, and speakers. A pull-down projection screen should also be provided. The dining area should have two LAN outlets with Internet access and cable television.

A **service area** should be provided in support of the dining area. A counter and built-in shelving for dishes, cups, mugs, silverware and bus items shall be provided. Utility connections for coffee maker, ice machine and faucet should be installed. This area shall have a sink with hot and cold water.

A **locker area** should be provided for storage of personal belongings while the students are in class wearing cooking attire and for storage of cooking attire while not in class. A minimum of 20 full height lockers should be provided. This area can be open to the dining area, and should be near the entrance to the culinary arts lab and away from the main food prep areas.

### Student Kitchen

On the opposite end of the space from the dining area, provide space for the student kitchen. This kitchen should be equipped with restaurant kitchen equipment and stainless steel work tables and counters. The student kitchen should contain the following areas:

The **cooking area** includes a stove with a minimum of six burners. The area shall also accommodate a minimum 2 ft x 2 ft (61 cm x 61 cm) grill, deep fryer, char-broiler, two ovens, and a convection oven. The stove, grill, deep fryer, char-broiler, and ovens should be under a vented stainless steel hood.



▸ *CTE Lab: Renaissance Academy, RRMM Architects, Norfolk, VA*

NOTE: Images shown are intended to provide real-world examples and spark design creativity.

The **mixing/blending/microwave area** should have a table with countertop to accommodate a microwave, mixer and blender.

The **food prep area** includes a double sink for washing and draining foods. A large counter adjacent to the sinks for salad/vegetable/fruit preparation is needed. A garbage disposal shall be provided for the sink drain. Provide open shelving above the sink and counter. A chopping/slicing area shall be provided for preparation of non-vegetable and non-fruit foods. A work table/counter shall be provided in this area for final preparation and staging of meals before serving.

The **refrigerator/freezer area** should have a stainless steel stand-up, double-door, large-capacity refrigerator and a stainless steel, stand-up, double door, large-capacity freezer. This area shall be close to the food prep area.

The **wash area** includes the dish washing machine and a counter with two stainless steel sinks for washing and scrubbing. One sink should be a deep sink for washing large items. Open shelving above the sink and counter should be installed for storage of recently washed items. A garbage disposal should be provided for the sink drain.

The **kitchen storage** area should have floor to ceiling shelving for miscellaneous kitchen items such as mixers, locking knife rack, and frequently used kitchen equipment such as grates, blades, blenders, large pots/pans etc.

The **mop area** should have a deep sink for washing mops, space for storage of mop buckets, and a built-in wall rack for the storage of mops. This area can be open to the student kitchen area, but should be away from the main food prep areas.

The **laundry area** should have a full size washer and dryer and built-in shelving for detergent, bleach, and softeners. This area can be open to the student kitchen area, but should be away from the main food prep areas.

The **equipment/food storage room** should have built-in floor to ceiling shelving for the placement of canned foods, oils, condiments, sealed non-perishable food containers, and food preparation/cooking equipment and accessories. This room shall be a minimum of 100 square feet ($9m^2$).

*Modular Technology/CADD/CISCO/CSS (HS)*
The technology program involves four distinct programs that can coexist within a single space or be paired.

Modular technology allows students to work in teams of two to four on a variety of computerized modular workstations. The workstations permit hands-on activities such as: automation and robotics, electricity and electronics, instrumentation and process control, and information technology.

The CADD program instructs students on computer-drafting. This program often shares space with a modular technology lab.

A CISCO program instructs students how to create and maintain CISCO computer networks.

A Computer Service and Support (CSS) program provides instruction in the repair and maintenance of computer hardware. This program is often paired with the CISCO program.

The **studio/lab** area provides the program space required. This space should be designed to accommodate up to 15 students.

The modular technology configuration will vary depending upon the particular courses and modules used. Some modules have specialized utility requirements.

The CADD program requires 15 dedicated computer stations and a large format plotter.

The CISCO program includes rack mounted equipment and several computer stations to form a self-contained network.

CSS requires tool storage and workbench space for computer repair.

The teacher instructional area includes a marker board, projection screen, personal storage cabinet, and desk for the instructor. This area should be located at the front of the instruction area with direct access to the intercom and room entrance.

The studio area and lab area should be divided by a low wall to maintain visibility from one space to the

other. The low wall also provides space for additional electrical and data outlets to support the equipment in this space. Data and power outlets should be provided on both sides of the wall.

Open space along one wall of the studio will accommodate large equipment such as plotters, scanners, or printers. Movable storage cabinets can also be located in this area, but built-in casework should be kept to a minimum to maintain flexibility. A small counter area should be provided for printers, approximately 8—10 linear feet (2.4—3.1 m). This can be along the low wall dividing the studio and lab areas.

A **storage room** is required to be a minimum of 200 sf (19 m$^2$) and accommodates multiple textbooks, workbooks, handouts, specialized equipment, and similar items. In many cases, technology education teachers are multi-tasking; teaching several different courses within the same class period.
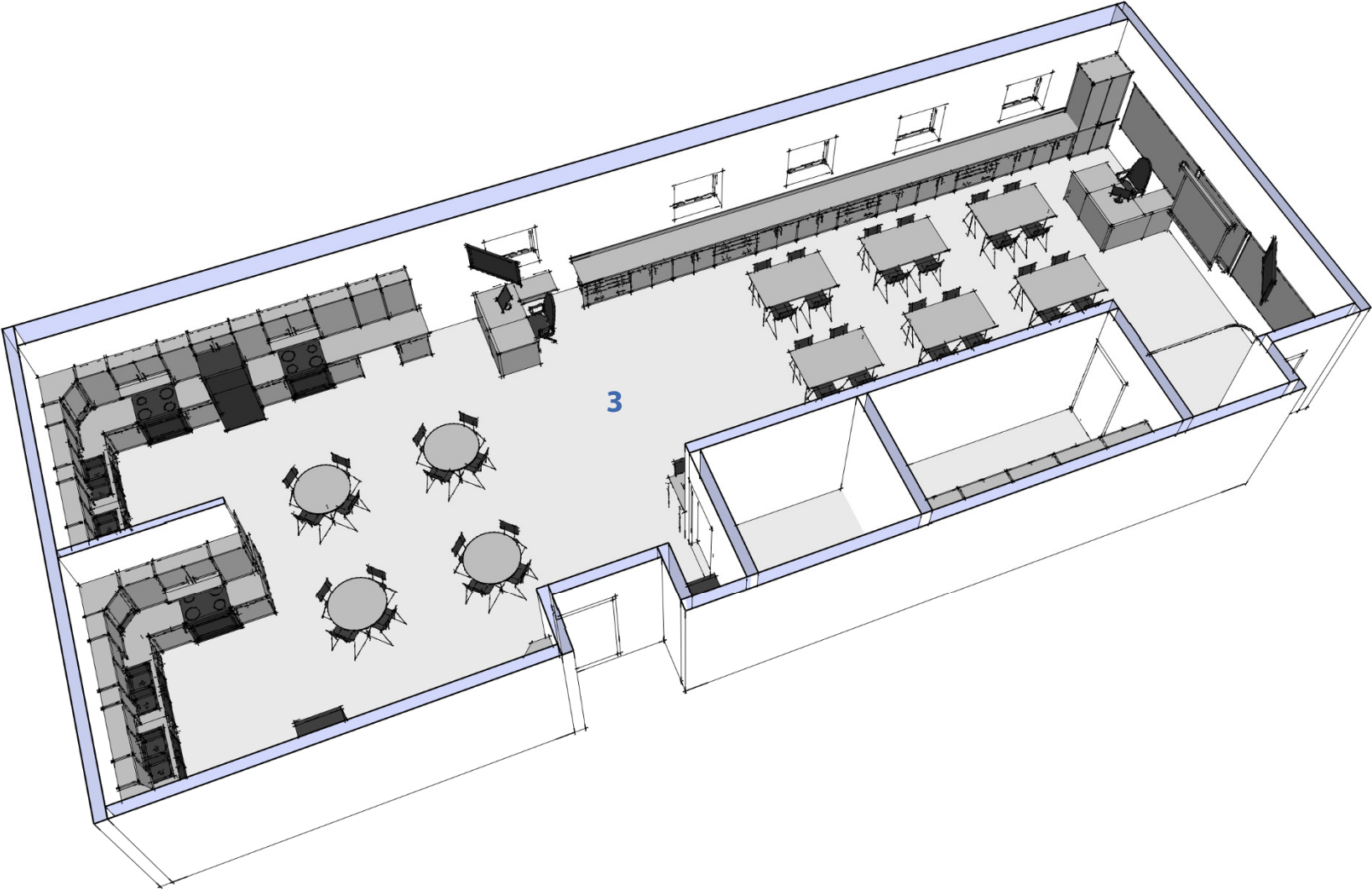
**4 Staff Collaboration**
The staff collaboration space may be included with the instructional area or can be combined into a shared suite for the CTE teachers or any other curriculum grouping.
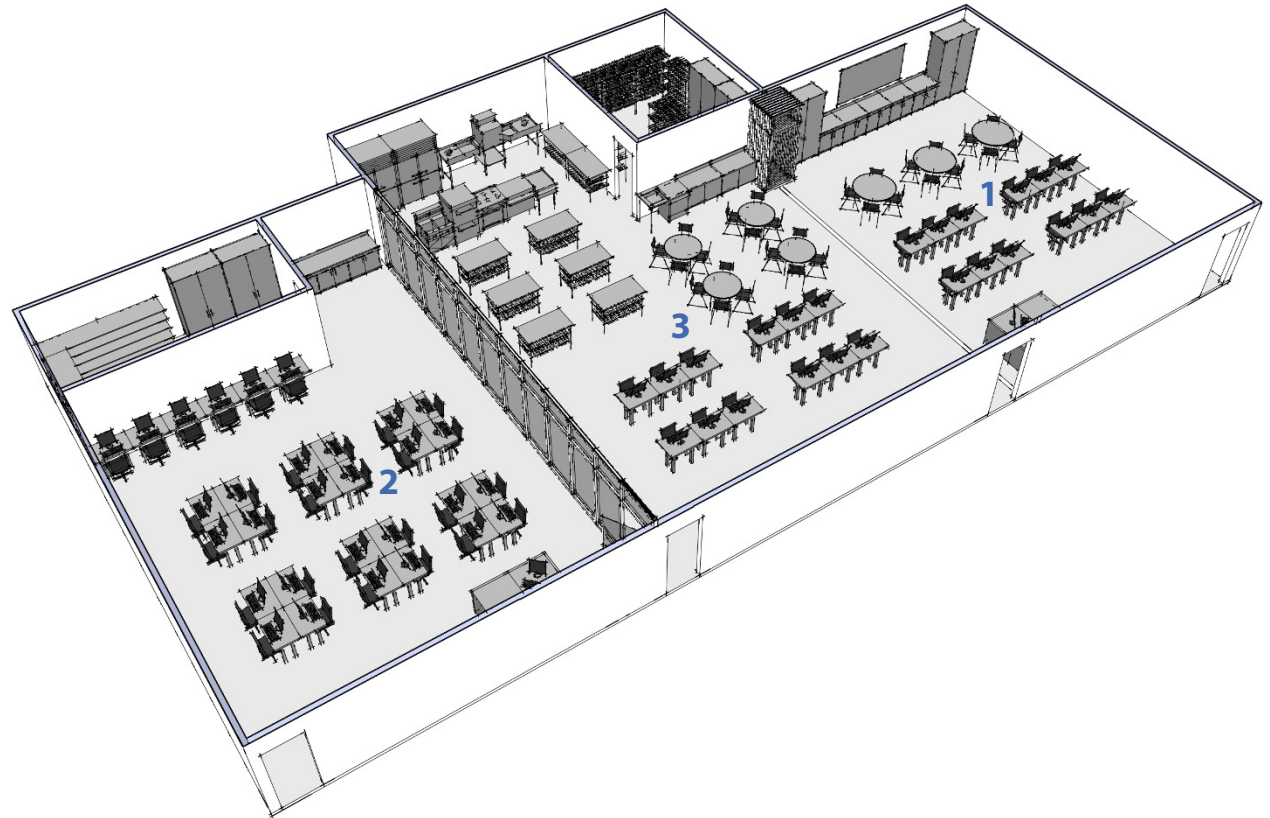


CTE Concept Perspective

NOTE: 3D illustrations are shown for informational purposes and are not intended to limit design options.

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CTE Large — Consumer Science Concept Perspective

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## Additional Planning Requirements

| Career Technical Education (CTE) - MS only | |
|---|---|
| 1 Small CTE Lab | 1 |
| 3 Large CTE Lab | 1 |

| Career Technical Education (CTE) - HS only | 0-99 | 100-299 | 300-499 | 500-699 | 700-899 | 900-1099 | 1100+ |
|---|---|---|---|---|---|---|---|
| Total Staff Positions - HS only | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 Small CTE Lab | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 Medium CTE Lab | 0 | 0 | 0 | 1 | 2 | 2 | 3 |
| 3 Large CTE Lab | 1 | 1 | 2 | 2 | 2 | 3 | 3 |