

Governor's STEM Academy Brief



Office of Career, Technical, and Adult Education

VOLUME 63—ARCHITECTURE AND CONSTRUCTION

MAY 26, 2017

The purpose of the monthly brief is to provide information, resources, and a networking vehicle to support the Governor's STEM (science, technology, engineering, and mathematics) Academies in Virginia.

GOVERNOR'S STEM ACADEMIES SPOTLIGHTS

During the 2016-2017 school year at the Blue Ridge Crossroads Governor's STEM Academy for Technical Education, Carroll County Public Schools, students in *Design and Illustration* developed scale drawings for a prototype cabinet to hold a classroom set of 15 Chromebooks with charging capability. Upon approval of the prototype, the students in *construction* fabricated 90 cabinets that were distributed throughout the county.

Instead of purchasing commercial cabinets or carts, this project-based learning experience provided students an opportunity to apply knowledge and skills, as well as saved the division thousands of dollars. The Technology Department installed the Chromebook cabinets for classroom sets of 15 in seven elementary schools, for a total of 1,869 Chromebooks (one for each student).

During this project, students developed an efficient process for constructing high-quality oak cabinets. Construction included the use of table saws for cutting cabinet components, a programmable CNC router for slotted tops and bottoms that serve as custom ports to hold the individual Chromebooks, power and hand tools, pneumatic nailers, and pocket screws for assembling the cabinets. Students used mathematics skills to measure components to be cut from a 4-foot-by-8-foot piece of oak plywood with a tolerance of 1/32 inch. They used the Pythagorean Theorem to understand measurements that were used to square the cabinets during assembly. This was truly a collaborative example of project-based learning.

CURRENT DEVELOPMENTS IN ARCHITECTURE AND CONSTRUCTION

Listed below are some latest developments in the professions:

- [Florida leads nation for construction jobs added in February](#) (*Orlando Business Journal*; March 26, 2017) — analysis by the Associated General Contractors of America
- [Apprenticeship: A Path to Good Jobs in Construction](#) (U.S. Department of Labor Blog; August 23, 2016) — apprenticeship is common path to high wages in construction
- [Encouraging women to pursue construction as a career they can build on](#) (*The Baltimore Sun*; March 25, 2017) — one woman's entry into a career
- [How I became a female CEO in construction: Tracy Young of PlanGrid](#) (*USA Today College*; March 17, 2017) — weighing job choices
- [Prairie Ridge High School architectural design class gives students real world experience](#) (*Northwest Herald*; March 4, 2017) — a real life-size solution to what the client wants

INSTRUCTIONAL STRATEGIES IN ARCHITECTURE AND CONSTRUCTION

Useful instructional materials such as lesson plans, PowerPoints, and assessment information are listed below:

- [Art & Architecture \(Education at the Getty\)](#) — lesson plans for elementary, middle, and high school from the J. Paul Getty Museum
- [Schools & Teachers](#) — school visits, distance learning, teaching kits, and more from the National Building Museum

- Lesson plans and worksheets at Lesson Planet
 - [Architecture Teacher Resources](#)
 - [Carpentry Teacher Resources](#)
 - [Basic Plumbing Teacher Resources](#)
 - [HVAC Teacher Resources](#)
 - [HVAC Teacher Resources](#)
 - [Civil Engineering Teacher Resources](#)
- [High School Electricity](#) lesson plans, homework, and quizzes at BetterLesson — a detailed source
- [How to Draw a House in 2-Point Perspective: Narrated](#) — YouTube video from Circle Line Art School
- [The Cornerstone](#) — a construction publication — for workforce development source
- [Lesson Plan for Bridge Building](#) — from BEAM at UCLA, “bringing science and engineering to Los Angeles schools”
- [Construction Lesson Plans](#) — from the Career and Technical Center of Northeast Metro 916 (Minnesota) Intermediate School District — multiple subjects featuring math
- [Disaster-Proof Housing](#) — activity from eGFI in which students design structures that can withstand flooding and high winds
- [Lesson Plans](#) — from TryEngineering — many categories

CAREERS IN ARCHITECTURE AND CONSTRUCTION

The Architecture and Construction cluster utilizes skills in design, planning and management to work in careers building and maintaining structures such as buildings, homes, bridges and public works. The Architecture & Construction cluster employed approximately 281,100 Virginians in 2014 and is projected to employ about 25,400 more Virginia workers in 2024, for a total of approximately 306,500. Links below provide statistics for individual professions, including salaries:

- [Occupational Outlook Handbook: Architects](#)
- [Occupational Outlook Handbook: Carpenters](#)
- [Occupational Outlook Handbook: Civil Engineers](#)
- [Occupational Outlook Handbook: Construction Equipment Operators](#)
- [Occupational Outlook Handbook: Construction Managers:](#)
- [Occupational Outlook Handbook: Electricians](#)
- [Is Electrician A Good Career Choice?](#) (The Electrician Careers Guide)
- [Electrician Degrees & Careers](#) (Learn How to Become)
- [Why Become An Electrician?](#) (Explore the Trades)
- [Why Become A Plumber?](#) (Explore the Trades)
- [Why Become an HVAC Technician?](#) (Explore the Trades)
- [How to Become a Carpenter in 5 Steps](#) (Learn.org)
- [Pavements and Construction Equipment](#) (U.S. Air Force Careers)
- [The Job Duties of a Framing Carpenter](#) (Chron)
- [How Much Does a Heavy Equipment Operator Make?](#) (Chron)
- [Types of Architecture Jobs](#) (Chron)

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