

Austintown Local Schools STEM Newsletter



January 2017

Calendar

February 6, 7 & 9- Field Trips to Taylor-Winfield Technologies

Thurs., February 16- Parent and Teacher Conferences

Fri., February 17- No School

Mon., February 20- No School for President's Day

Fri., February 24- Bridge Building Competition at YSU

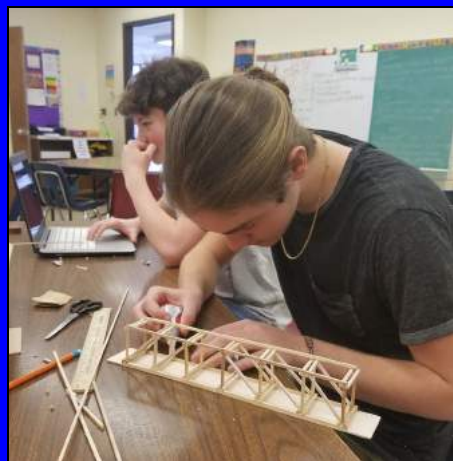
Tues. March 7- Fitch STEM students at AIS STEM Day

Mon. April 10 - Fri. April 14- Spring Break

Wed. May 31- Last day for students



Bill Nye, *The Science Guy*, made a guest appearance at *Creative Arts Night* at Fitch this month. Chad "photoshopped" Bill Nye into the picture. Representing the STEM Program, (pictured from left) Chad, Marcellena, Jared, Hannah, and of course Bill Nye himself.



Victor completes a practice build of his bridge in preparation for the Mahoning Valley Miniature Bridge Building Competition at YSU on February 24th.



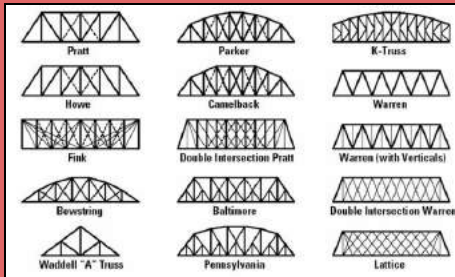
Students showed the community and their peers the artistic side of STEM during *Creative Arts Night*.



Students will be touring Taylor-Winfield Technologies, a sister company of Brilex, to experience first-hand innovative engineering techniques and witness skills necessary to succeed in the field.



10th grade students will be competing in the Mahoning Valley Miniature Bridge Building Competition Feb. 24th at YSU. Click below for more information.
www.mvmbbc.org



10th graders are learning about truss structures in the statics unit. Pictured above, are types of building structures used for bridge construction. Students use truss calculations, symmetry, and knowledge of building structures to build bridges.



Justin demonstrates to 5th grades during the *STEM Ambassadors Program* how to use different types of screwdrivers, wrenches, and allen drivers to build gear trains.



Josh gave the "thumbs up" to his 5th grade team competing in the Marshmallow Challenge at AIS.



Tylor and Jackson were dressed to impress while participating in the *Creative Arts Night* representing the STEM Program.



Tyler poses with Blake, a fifth grade future engineer at AIS. Blake could not wait to show the Fitch STEM students his mechanically powered car he designed specifically with materials he found at home.

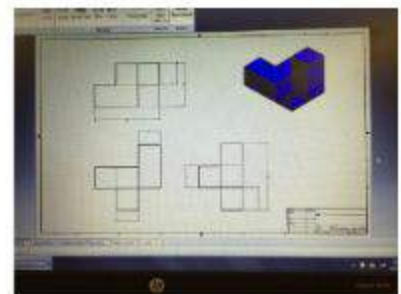
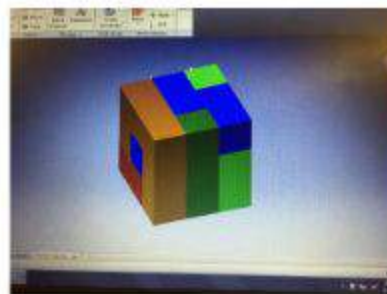


5th grade students practice their team building skills and engineering knowledge while participating in The Marshmallow Challenge with the Fitch STEM students.

Introduction to Engineering Design

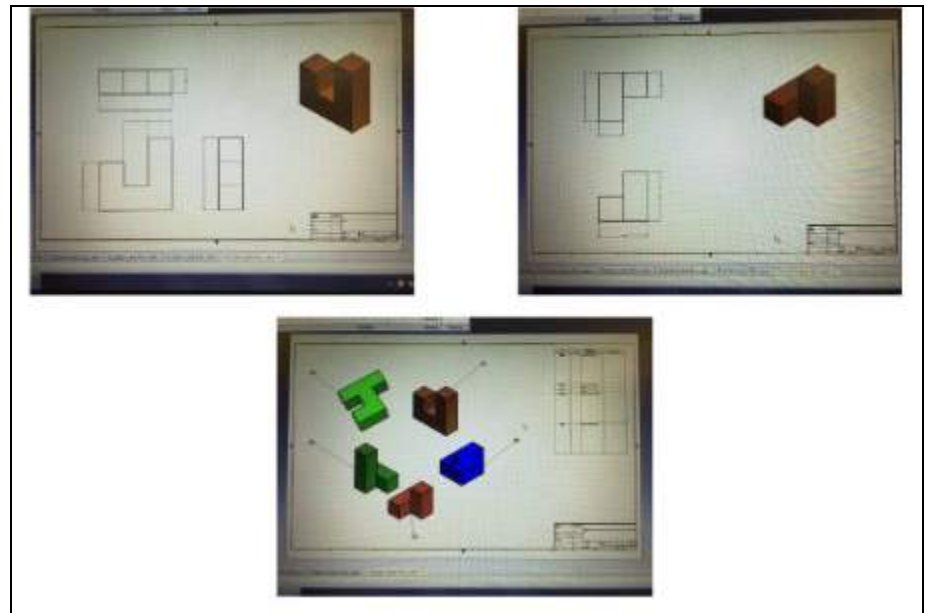
- ★ 9th graders students finished their final portfolios of the Puzzle Cube Project. Students went through the whole design process creating their unique puzzle cubes. They created isometric and orthographic sketches, built working prototypes, and calculated statistical analysis of their measurements. Finally, they used computer modeling software to build individual parts and automate the final assembly using both parametric and geometric constraints. They marketed their toy and designed their own packaging as well.

CAD Drawings & Puzzle





5th grade STEM students eloquently pose with their structure while participating in *The Marshmallow Challenge*.



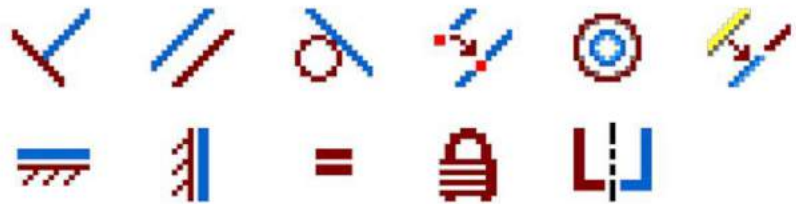
Zachary displays parts of his puzzle cube project that was included in his final portfolio.



Tuesday, March 7th the AMS and Fitch STEM students will be hosting STEM Day at AIS. ALL 4th graders will receive hands on, STEM lessons from experienced STEM students.

Review of Geometric Constraints

Perpendicular, Parallel, Tangent, Coincident, Concentric, Collinear



Horizontal, Vertical, Equal, Fix, Symmetric

Some of the geometric constraints used in Autodesk Inventor Professional 2016 are similar to terms and symbol used in Geometry class.

Principles of Engineering

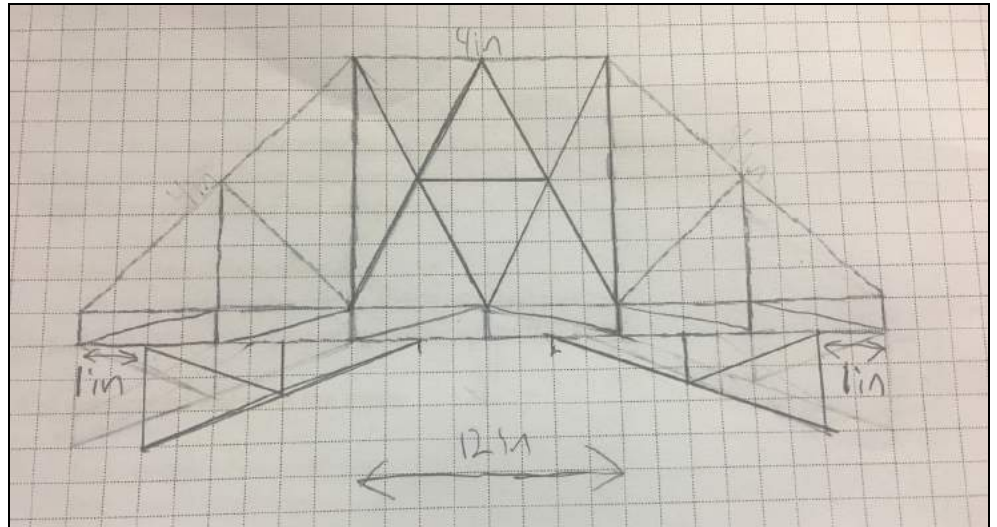
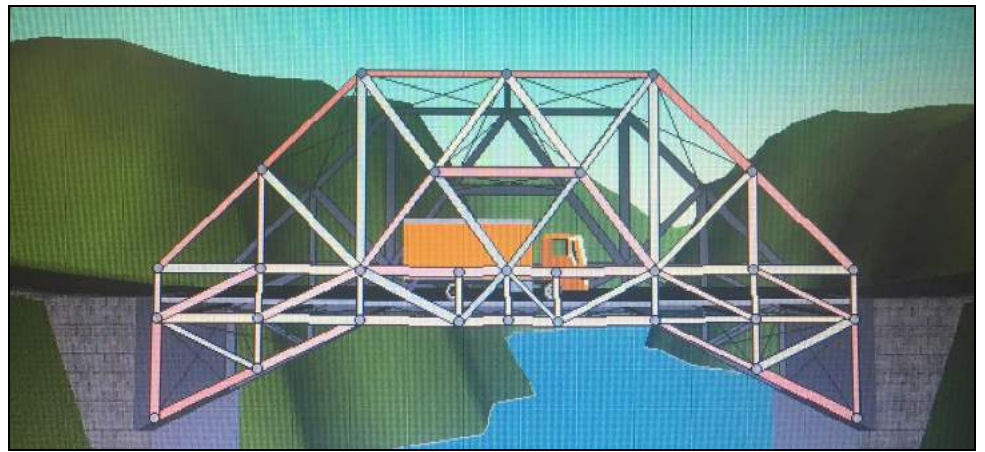
- ★ Students designed and created a bridge utilizing West Point Bridge Designer software. The software allows students to apply engineering design, material science, and statics to the creation of a truss bridge carrying a two-lane highway that spans a riverbed.
- ★ Students will use their knowledge of truss calculations, statics, materials, and experience using bridge simulations to build their own balsa wood bridge. The most successful two teams will participate in the Mahoning Valley Miniature Bridge Building Competition at YSU on February 24.



Computed Integrated Manufacturing students have begun building their robotic arms in preparation for programming.



Willie puts together the motherboard of his robotic arm. Soon students will begin using the programming software to “pick and place” parts similar to what’s used in industry.



Owen shows his rough sketch and computer model of his bridge prior to building in preparation for the Mahoning Valley Miniature Bridge Building Competition.



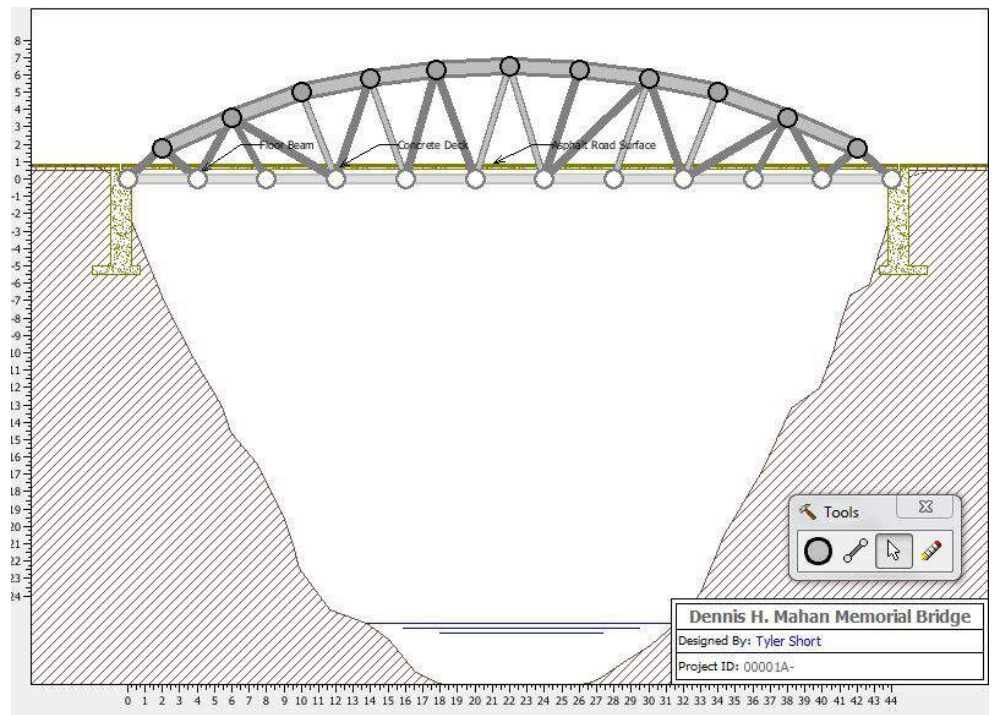
Jackson puts together his motherboard for his robotic arm. Students will program their robotic arms to “pick and place” items mimicking advanced manufacturing techniques used in the field.



Kyle builds a makeshift apparatus used to measure the force necessary to break students’ custom-built bridges in

preparation for competition.

“Education
is the mOst
POwErful Weapon
wHiCH you can
use to ChAnGE
the World.”
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Tyler's bridge test is shown above. According to Tyler, "this test is showing a truck driving across a 24 meter gap. The bridge drops down 4 meters below the height off of the bridge. The Designer is showing the dimensions of the bridge with 3 different materials being used throughout. Hollow tubes also allow for the bridge to be more elastic throughout. The material size has a range from 120m x 120m solid bar to 300m x 300m x 15m hollow tube. The bridge is at the maximum threshold for its design as the cost has been made lower than it should have been."

Computer Integrated Manufacturing

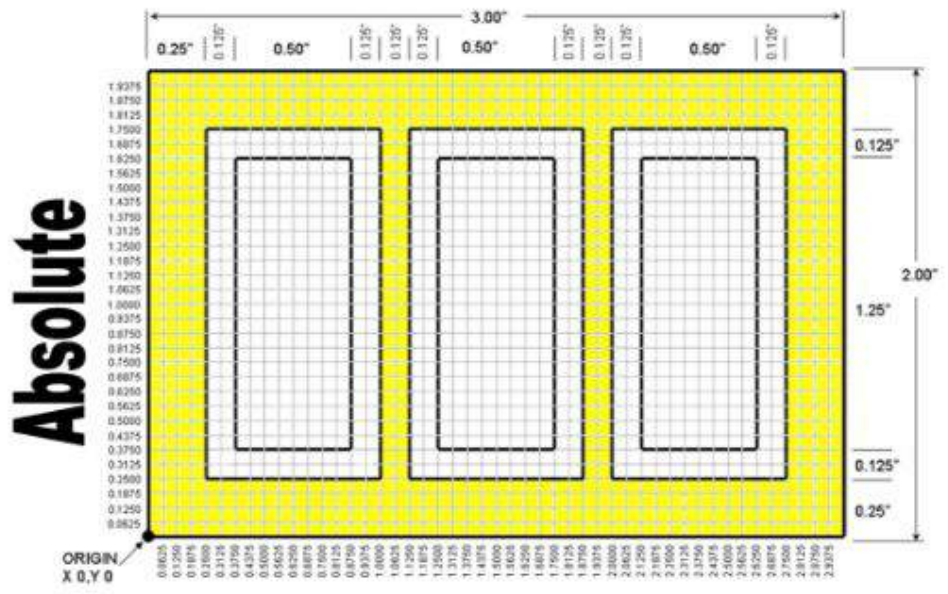
- ★ Students are learning about the development of robot technology and application and how handling impacts a manufacturing environment. This will be emphasized while visiting Taylor-Winfield Technologies and experiencing first hand engineering problems and solutions.
- ★ Students are building LexMotion Robotic Arms, a small scale model of robotic arm automation used in industry today. Concurrently, students are learning how to program their robotic arms using a simulation, calculating roll angles and creating a program for a robotic arm to communicate with another device.



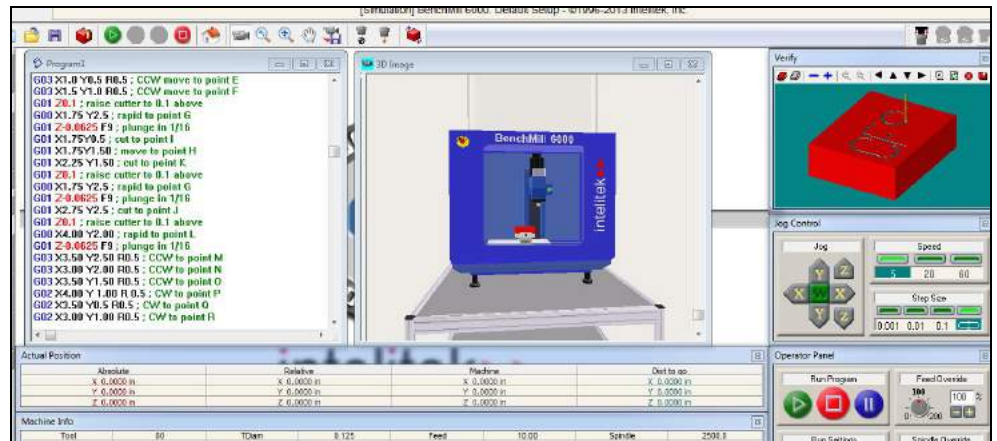
Dylan assists a 5th grader with using an allen driver and various screws and washers during the STEM Ambassadors Program at AIS.

Educating
the mind
without
educating the
heart is no
education
at all.
—Aristotle

curiano.com



The computerized grid system is seen above, students use G & M codes to write their initials in the above grid.



Students applied G & M codes to automate the benchmill.



A 5th grade student was all smiles building various gear trains during the STEM Ambassadors Program.

Marshmallow Challenge

Build the Tallest Freestanding Structure



- Teams of Four People
- Eighteen Minutes
- Using the Following Ingredients



20 sticks of spaghetti



one yard tape



one yard string



one marshmallow

9th grade STEM students assisted 5th graders in participating in the Marshmallow Challenge. This team-building engineering exercise challenges you to build the tallest freestanding structure with a limited amount of materials. Teamwork and creativity are the recipe

for success with elementary kiddos performing surprising well putting college business majors to shame. Click the video below to try it yourself!

[Marshmallow Challenge video](#)



All Fitch STEM students are touring Taylor-Winfield Technologies, a sister company to Brilex Group with a focus on creating minimal operating cost and maximizing customer satisfaction. Students will witness optimization and problem solving at its finest.

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[Austintown STEM Website](#)

[AMS STEM Student Website](#)

[Fitch STEM Student Website](#)

