

Austintown Local Schools

STEM Newsletter



November 2016

Happy Holidays!

Calendar

Nov. 30- 10th & 11th gr. visit
YSU STEM College

Dec. 5 YSU President Tressel
speaks to 11th & 12th graders

Dec. 14- 2hr. Early Dismissal

Dec. 23-30- Winter Break

Jan. 2- School Resumes

Jan. 13- End of 2nd nine weeks



Dr. Steelant, Dean of the YSU STEM College, poses with the 9th grade STEM students. He performed experiments with the students that day.

Greetings STEM Families,

November was an exciting and engaging month in the STEM Program. Students visited Youngstown State University touring all departments of the STEM College. They also received guided tours from the Student Services Department and discussed strategies for success in college and how to receive academic, financial, and personal assistance. It was a “day in the life” of a college student and a valuable experience.

STEM Ambassadors visited Austintown Intermediate School and taught 5th graders the design process using the puzzle cube project, as well as, basics of circuitry, fundamentals of programming, and analog and digital sensors. The highest level of understanding is in the ability to teach others. The Fitch STEM students were able to do just that!



Victor explains how to program motors and sensors on his automated assembly line designed to put chocolate chips on cookies. How “sweet” is that!

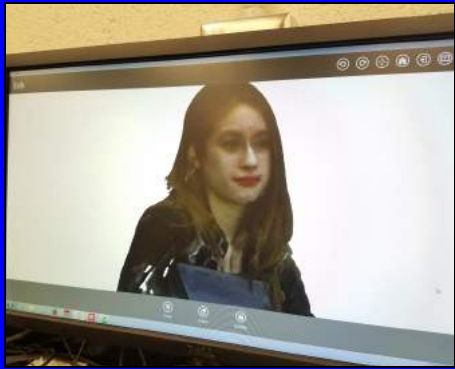


Students and parents can access all assignments and projects via Google Classroom and PLTW.org.

Field Trips



Zach assists Dr. Seelant at YSU in an experiment intended to emphasize things aren't always what they seem.



Emily's bust was created using a 3D scanner at YSU. From here, she can be 3D printed. Modern statues can be made in this fashion.



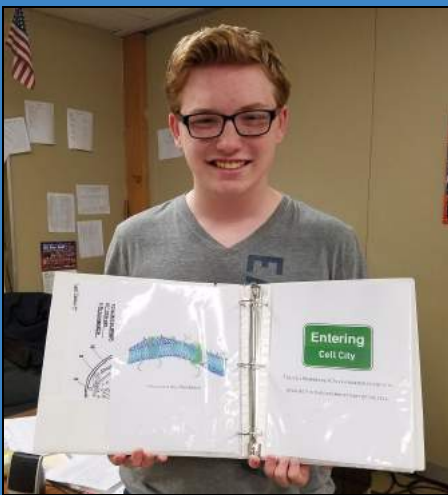
9th grade STEM students pose with various 3D printed parts all made using different building material, such as, paper, plastic, ceramic and different types of metal.



Hannah displays her model of an animal cell complete with labels and organelles.



Mr. Jadue, a computer systems analyst and uranium buyer for First Energy, discusses the importance of analyzing vast amounts of data and communication skills.



Jarod poses with his picture book, titled "Entering Cell City" designed to teach others about the parts of the cell and their functions.

Fitch Focus on STEM

Move Over Coal, Things are Getting Clean with Nuclear Energy By: Tyler Short

Mr. Omar Jadue is a Uranium Specialist, who buys Uranium for First Energy. He has four kids and graduated from YSU in 1984. He attended Cardinal Mooney High School, and he has majors and minors in many different fields. He has a lot of different jobs from a programming specialist to his current job a Uranium Specialist. He spent 18 years at a company called First Energy. He is willing to take time out of his day to teach adolescents about the perks of nuclear energy. As well as life skills needed to be successful.

He came and spoke to the STEM students about nuclear energy. He talked about the emissions of many different energy solutions to the fossil fuel crisis and compared them to one another. He compared coal, natural gas and nuclear energy to one another. A key point of comparing those was how nuclear energy releases no emissions whatsoever into our atmosphere. Also, that nuclear energy could be the key to humanity's energy crisis. He also mentioned that a key life skill was to be able to process data quickly, as well as be able to explain the numbers behind what you have collected. Those were the main points of Mr. Jadue's presentation covered with light detail.



Nathan, Sandro, and Bryan were all smiles walking the indoor track at YSU.



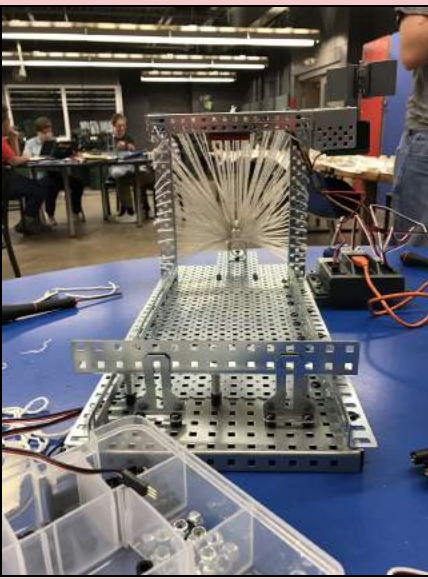
Dr. Steelant performs an experiment with students on the field rip.



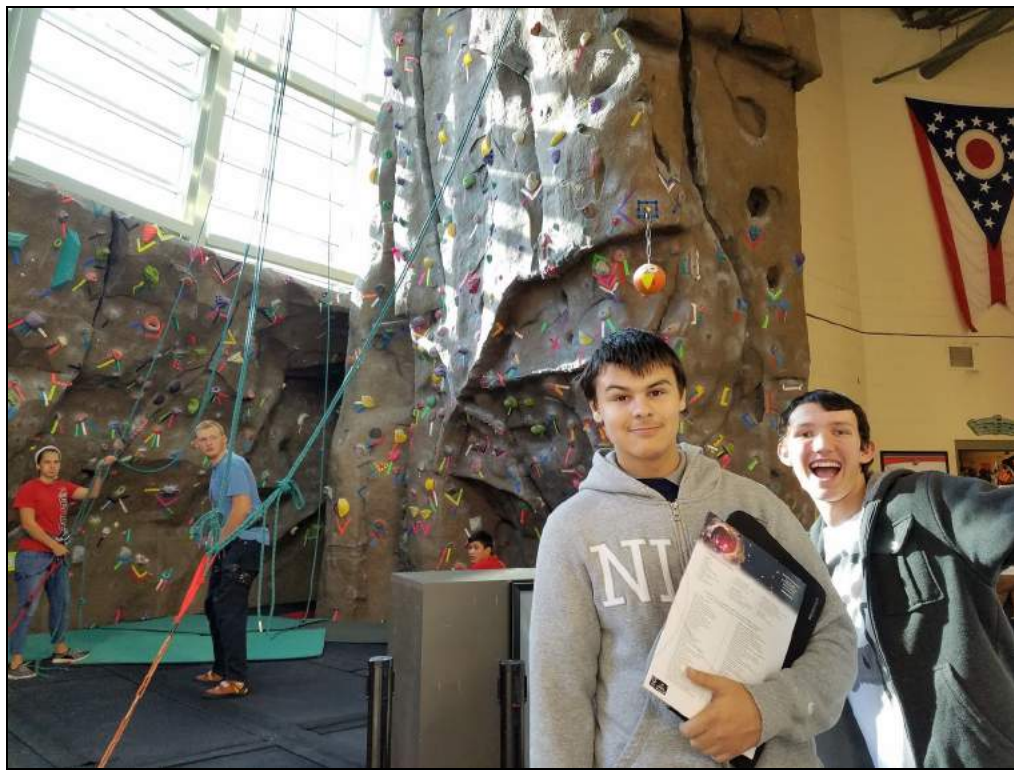
An AIS student interprets isometric sketches to build a Fitch STEM student's puzzle cube during the STEM Ambassador's Program.



Emily keeps still while she is 3D scanned in the 3D Additive Manufacturing Lab at YSU.



Jared, CJ, and Vlad built an model automated soccer goal. It uses sonar sensors to signal lights and rotating fans to celebrate when a goal is made. Go Futbol!



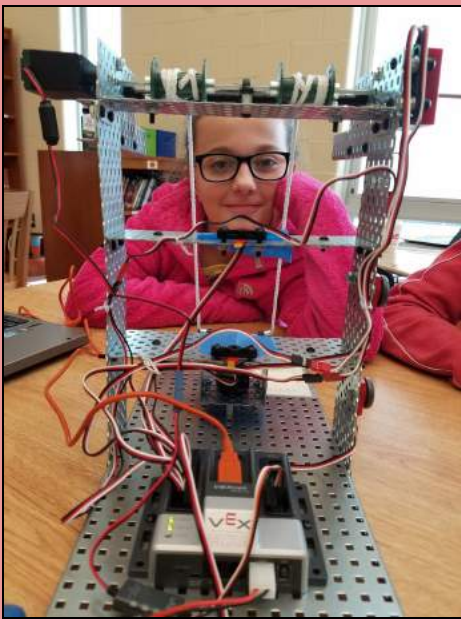
Dallas and Sam went to great heights checking out the climbing wall in the Fitness Center at YSU.



T.J. demonstrates making circuits in series and parallel with students at AIS.



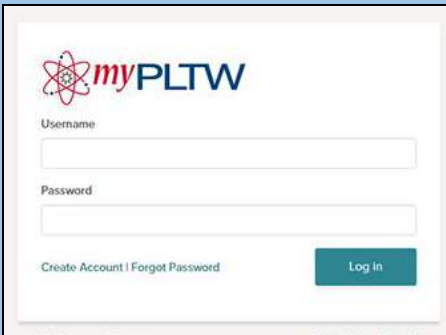
9th grade STEM students take off at the indoor track at YSU.



An AIS student learn about different types of sensors when programming a model elevator designed to stop a different floors.



Zach, Tyler, and Sha'Nia were all smiles while touring YSU. It was the most beautiful fall day of the year.

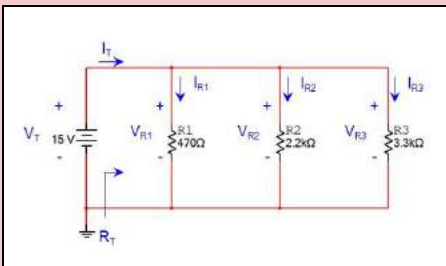


Students login to <https://my.pltw.org/> to access the curriculum and most assignments. Check it out!

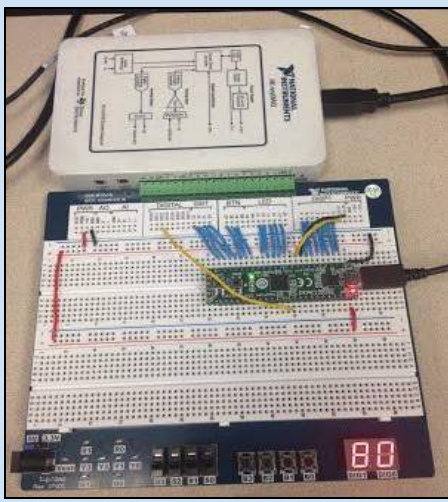
STEM Ambassadors Program



Brie demonstrates making circuits in series and parallel with students at AIS.



POE students used diagrams of circuits to calculate potential in prelude to creating their own circuits using breadboards.



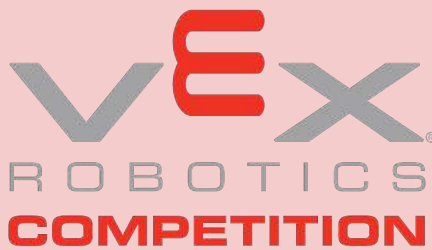
In the Electronics unit for POE, students began creating breadboards, a reusable platform to temporarily build electronic circuits.



Kyle explained how an elevator works with AIS students.

Introduction to Engineering Design (9th grade)

- ★ Students created orthographic and isometric sketches of their puzzle cube invention. Then students used mathematical modeling and statistical analysis to prepare their puzzle cube inventions for packaging and create working prototypes. Next, they will create and automate them using computer modeling techniques in AutoDesk Inventor 2016 and 3D print them.



11th grade students are preparing for the Vex Robotics Competition. They are brainstorming and researching their design.



Zachary presents his puzzle cube invention, the Confusion Cube. Designed for ages 8 and up. "Warning: It will give you a headache and may cause mental strain!"

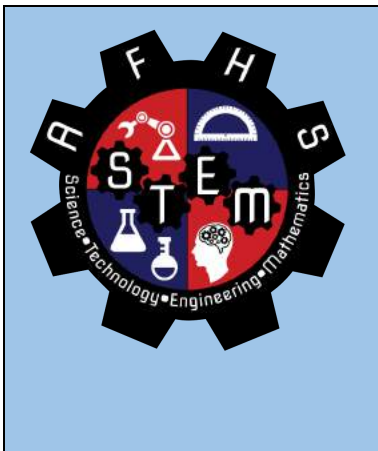


Of the 20 fastest growing careers, 15 of them require a background in math or science.

@NMSI



Zachary gives a thumbs up while wearing his Fitch STEM T-shirt.



9th graders build their puzzle cube inventions. They then creating a packing and marketing plan. Later, they will create their puzzles and automated then using Inventor. The best ones will be 3D printed.

Principles of Engineering (10th grade)

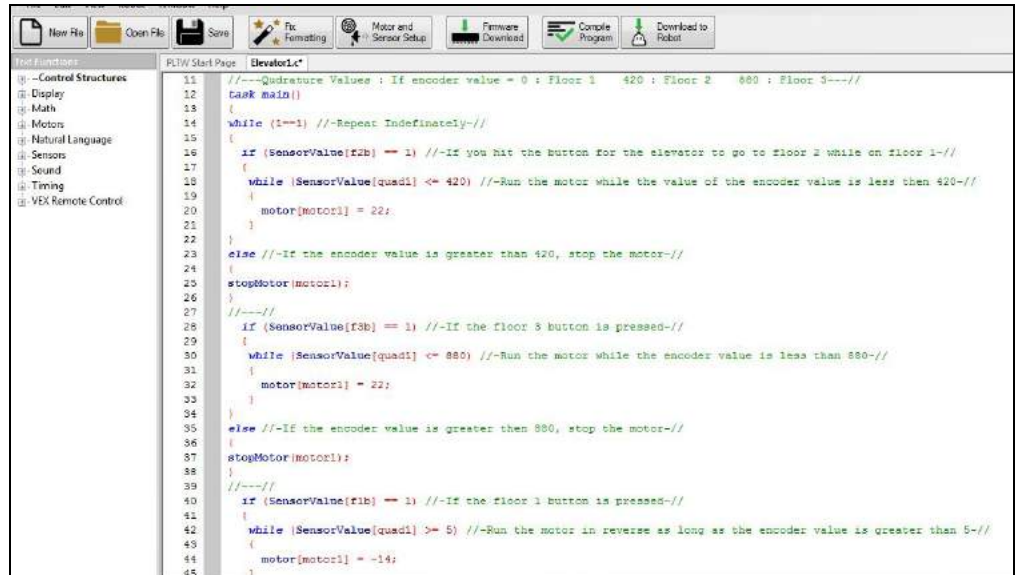
- ★ Students combined their building and programming skills to create an automated system, such as a soccer goal, chocolate chip cookie topper or an elevator complete with many motors and different types of sensors.
- ★ Students began the Energy Unit by analyzing circuit schematics and calculating potential and resistance. They applied these conceptual models to real-life physical models using breadboards, a reusable platform to temporarily build electronic circuits.



Students use a collaborative learning structure stimulating class discussion on dimensional analysis and converting from English to Metric, and vice versa.

Computer Integrated Manufacturing (11th grade)

- ★ Students are developing computer modeling skills using Autodesk Inventor 2016 and fundamentals of programming using RobotC, a variation of natural language C++. They learned the basics of input and output control systems and automation.
- ★ Students are brainstorm build ideas of the Vex Robotics Challenge: Starstruck and analyzing the pros and cons of various drive trains.



```
11 //---Quadrature Values : If encoder value = 0 : Floor 1   420 : Floor 2   880 : Floor 3---//
12 task main()
13 {
14   while (1==1) //Repeat Indefinitely//
15   {
16     if (SensorValue[f1b] == 1) //If you hit the button for the elevator to go to floor 2 while on floor 1--//
17     {
18       while (SensorValue[quadr1] <= 420) //Run the motor while the value of the encoder value is less than 420--//
19       {
20         motor[motor1] = 22;
21       }
22     }
23     else //If the encoder value is greater than 420, stop the motor--//
24     {
25       stopMotor(motor1);
26     }
27     //---//
28     if (SensorValue[f3b] == 1) //If the floor 3 button is pressed--//
29     {
30       while (SensorValue[quadr1] <= 880) //Run the motor while the encoder value is less than 880--//
31       {
32         motor[motor1] = 22;
33       }
34     }
35     else //If the encoder value is greater than 880, stop the motor--//
36     {
37       stopMotor(motor1);
38     }
39     //---//
40     if (SensorValue[f1b] == 1) //If the floor 1 button is pressed--//
41     {
42       while (SensorValue[quadr1] >= 5) //Run the motor in reverse as long as the encoder value is greater than 5--//
43       {
44         motor[motor1] = -14;
45       }
46     }
```

A student's sample program with many while statements and loops.



Willie uses 3 different laptops to complete his toy train in Inventor. Students learned how to create parts and assemble. Then they automated their toy train as it rolled on the track. This is not easy!

Teachers:

Josh Folkwein

Celia Lewis

Ashley Smith

Brian Umstead

Danielle Chine- K-12 STEM Instructional Coach

Email: dchine@austintownschoools.org

Austintown Fitch High School

4560 Falcon Dr.

Youngstown, OH 44515

www.austintownschoools.org

330-797-3900

[Austintown STEM Website](#)

[AMS STEM Student Website](#)

[Fitch STEM Student Website](#)

