

## **S.T.E.A.M. Integration Activities at Mahwah High School**

The acronym S.T.E.A.M. stands for Science, Technology, Engineering, Arts, and Mathematics. It is the process of teaching that integrates these four disciplines to promote real-world experience, teamwork, and the authentic application of technology. Additionally, it also promotes discovery, problem-based learning, and project-based learning. S.T.E.A.M. is supported by the National Science Foundation and the U.S. Department of Education. Additional information can be found at the [STEM Education Coalition](#).

### **Science, Math, and Art Courses**

Numerous courses in math and science regularly integrate S.T.E.A.M. practices into instructional activities. The collaborative nature of student activities to solve real-world problems is fostered through the use of:

- GIZMOs
  - Online simulations that power inquiry and understanding through math and science content.
- Vernier Lab and Logger Pro Technology
  - Versatile sensor interface used for data collection and analysis.
- TI Nspire
  - A colorful, engaging way to explore math and science. Shows real-world examples that help students make connections.
- PHET simulations
  - Provides fun, interactive, research-based simulations to help students visually comprehend physics and chemistry concepts. PhET simulations animate what is invisible to the eye.
- GeoGebra/ Geometer's Sketchpad
  - Dynamic Geometry® mathematics visualization software.

### **Co-Curricular Activities**

#### **FIRST Robotics Club**

The varsity Sport for the Mind™, FRC combines the excitement of sport with the rigors of science and technology. Under strict rules, limited resources, and time limits, teams are challenged to raise funds, design a team "brand," hone teamwork skills, and build and program robots to perform prescribed tasks against a field of competitors. It is as close to "real-world engineering" as a student can get.

This is the 10<sup>th</sup> year Mahwah is participating in the FRC competition. On March 29-30, 2014, the team traveled to Bridgewater High School for the second round of qualifying matches. Our Team 1672 placed 11 out of 46 teams.

The club began with three students, and since its inception 210 students have participated. Currently, there are 34 students members in the club.

#### **GEMS**

The club, GEMS, stands for Girls Excelling in Math and Science. <http://www.gemsclub.org/home>

Activities of clubs to encourage girls in STEAM environments include listening to accomplished female guest speakers from various STEAM-related fields, learning more about women's studies, and exploring different areas of STEAM through hands-on activities. This club will be open to both male and female students.

## **TEAMs : Tests of Engineering Aptitude, Mathematics and Science**

For the past six years, students in grades 9-12 have been competing in the national TEAMs competition. This year's theme was "Engineering Tomorrow's' Cities."

### **DigiGirly**

This Microsoft Youth Spark program gives high school girls the opportunity to learn about careers in technology, to connect with Microsoft employees, and to participate in hands-on computer and technology workshops. Approximately 180 girls have participated in this program over the last 6 years.

### **BAM**

The Blacks at Microsoft (BAM) program is committed to the Microsoft mission of helping people realize their full potential. One of BAM's key commitments is to continually reach out to the external communities and showcase Microsoft's technology and people in order to help others reach their full potential. As part of this commitment, BAM hosts an annual Minority Student Day (BMSD), now in its 23rd year. The goal of the event is to provide area high school students from underrepresented ethnic backgrounds with information about the exciting tools, resources, and career opportunities available to them in high technology. Throughout the day, Microsoft employees guide students through hands-on technology labs and information sessions. Employees also serve as mentors, talking with students about the wide variety of career opportunities available to them in technology.

Over the last six years, approximately 100 MHS students have attended this program.

### **2018 AEM Construction Challenge**

AEM designed the challenge to expose students to new skills and future industry job opportunities, and to highlight infrastructure needs and industry contributions to quality of life. The association partnered with Destination ImagiNation Inc. to produce a hands-on educational experience that engages the interest of teens through creative and problem-solving activities.

In the challenge, teams went head-to-head with other teams in three events. A debate-style format focused on a serious discussion about infrastructure issues related to roads, bridges, and clean water. In a "road warrior" segment, teams designed, selected construction materials, and built and tested a small-scale structure in a short period of time. In the third segment, teams developed industry communications materials and programs.

Mahwah High School team placed 1<sup>st</sup> in the regional completion and traveled to the national competition in Las Vegas, Nevada, where they placed 2<sup>nd</sup> in the product development category, 3<sup>rd</sup> in the dialogue category, and 5<sup>th</sup> overall in the country.

<http://www.youtube.com/watch?v=nR7kgD6tses>