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.

Sample Co-Curricular Authentic Experiences

Animation Club

Animation club teaches every aspect of 2D animation, including character design, storyboarding, storyboard revisions, sound design, and of course, the actual animation process. We spend each year working on and producing an original 2D-animated short film.

Art Club

Students in art club have the opportunity to lead and participate in various art making workshops throughout the year. In addition, art club organizes and curates' exhibitions in the T3 Gallery, including our end of the year annual MHS Art Show.

FIRST Robotics Club

https://www.firstinspires.org/robotics/frc

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 10th 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, currently, there are over 70 students members in the club.

FMP (Future Medical Professionals)
FMP is a club that explores different careers and skills within the vast medical field, as well as the path to get there. Students can explore their interests, learn about fields that fall within the medical profession umbrella, as well as have experiences with guest speakers that can give students guidance and insights on how to best position themselves for success toward a career of service!

GEMS (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)
https://centerforstem.tcnj.edu/teams/

Tests of Engineering Aptitude, Mathematics, and Science (TEAMS) is an annual competition for middle and high school students designed to help them discover their potential for engineering.
During this one-day competition, students apply math and science knowledge in practical, creative ways to solve real-world engineering challenges.

TEAMS sparks excitement by:

- Providing an integrated STEM learning experience
- Allowing students a unique inside look at problem solving from an engineer's viewpoint
- Increasing students' self-confidence in solving complex problems while working on a team
- Inspiring students to consider engineering majors and careers

Students in grades 9-12 have been competing in the national TEAMs competition.

TSA (Technology Student Association)
https://njtsa.tcnj.edu/about-tsa/

The Technology Student Association (TSA) is the only student organization devoted exclusively to the needs of technology education students. Open to students who are enrolled in, or who have completed, technology education courses, TSA is comprised of over 190,000 elementary, middle, and high school students in 2,000 schools spanning 48 states. TSA is supported by educators, parents, and business leaders who believe in the need for a technologically literate society. Our members learn through exciting competitive events, leadership opportunities, and much more!