

AdvancED® STEM Certification

Executive Summary Questions

Use these prompts to inform the STEM Review Team with additional information about your school's STEM program. Provide responses to both writing prompts. Save this document in Word and submit to your school's STEM Lead Reviewer.

- 1) Provide a general description of the learning experiences in which the STEM students were most successful. Additionally, generally describe the learning experiences that need improvement for greater student success.

Munster High School is a school of 1,526 students and is the only high school within the School Town of Munster's boundary. The school is ethnically diverse with an approximately seventeen percent free and reduced population. Approximately sixty percent of the population is white, twenty-two percent is Hispanic or Latino, eight percent is African-American, six percent is Asian, and three percent identifies as two or more races.

Munster High School has been a 1:1 school since the fall of 2011. Each student has a school issued Dell laptop that utilizes Moodle as the standard Learning Management System and PowerSchool as our Student Information System. Since becoming a 1:1 school, our standardized test scores have continued to rise, and we continue to consistently score among the top five schools in the state on a yearly basis. Recently all Munster students have linked their PSAT score with KHAN Academy. This recent partnership between these two institutions allows individualized practice for the SAT test. Students in grades eight through eleven take the PSAT every October.

Our graduation rate over the past three school years has fluctuated between ninety-six and ninety-eight percent. The 2015-2016 school year saw approximately sixty percent of students earning an Academic Honors Diploma, thirty-one percent earning a Core 40 Diploma and twelve percent earning a General Diploma. All students earning these diplomas are required to take STEM classes, and in many instances AP level STEM classes. Each year approximately ninety percent of our graduates attend a two-year or four-year college/university.

Munster High School has an extensive selection of courses for students to choose from. Twenty-one unique science courses, eight unique technology courses, four unique engineering courses and thirteen unique math courses are offered. In addition to these STEM classes, the arts are incorporated within the STEM model. Courses such as Digital Design I/II, Student Media, Photography, Theater Arts and Technical Theater incorporate STEM-related concepts within their curricula. Our Project Lead the Way programs for the engineering and

biomedical fields are highly requested by students. Our PLTW engineering class recently acquired a three-dimensional printer which is used extensively by both PLTW students and the Robotics Club. Of the twenty Advanced Placement courses offered at Munster High School, eleven are STEAM related. Our AP scores have exceeded the state average and nearly every AP course offered at MHS boasts an average passing score of three or higher.

Munster High School educators are committed to high student-engagement, rigor within the classroom, and continued professional development to enrich their skills to allow for continued student engagement and growth. Each classroom is equipped with a DELL interactive projector. The array of software each teacher uses within the classroom is expansive and is tailored to meet the needs of each teacher and his or her individual students. Each teacher has created an Understanding by Design unit which includes a final performance task that incorporates multiple transfer goals and interdisciplinary components.

Our teachers are committed to cross-curricular strategies implemented in each subject from data analyzed through the PSAT. Analyzing non-fiction and technical writing in STEM areas and writing to explain have been implemented within each UBD unit by utilizing such strategies as Close Reading and Argumentative Writing.

Teacher Professional Development has been a strong focus within the last several years. A recent Marzano survey indicated that teachers wanted to observe teachers utilizing different best practice strategies within the classroom. Project CRISS, technology presentations and other STEM related strategies have been observed by teachers during Thursday Resource Time or by sacrificing a plan period to observe other teachers.

In addition to the strong student engagement within the classroom, our students have multiple opportunities for school day and extended school day adult-interactions through clubs, mentorships and internships. Some of our most popular clubs include Science Olympiad, Robotics, TEAMS (Tests of Engineering Aptitude, Mathematics, and Science), HOSA (Health Occupation Students of America) and Academic Super Bowl. These clubs have over one hundred and twenty-five participants. These clubs have also experienced numerous state championships, national rankings and a National Championship (TEAMS).

We are also fortunate to have outstanding community partners who work with our students daily. Engineers, a Master Gardener, an EPA official, researchers, professors, computer scientists, Community Hospital employees and many others have willingly or will devote time to our students during these internship experiences (Community Hospital and Purdue University Northwest) or during the school day as guest lecturers and consultants.

Opportunities for improvement have also been identified while going through the Internal Review. It has been noted that more time for interdisciplinary work between STEM teachers

is necessary to facilitate identifiable community concerns that can be solved within our STEM classes by designing a common UBD unit to address this need. We can use Mustang Resource Time for students who are enrolled in these STEM classes to facilitate the creation of the solution to the community concern.

Another area that can be improved is to meet with our community partners on a more regular schedule that will allow us to set measureable goals that the school and partners identify collaboratively.

Finally, our STEM team would like to establish a STEM fair to encourage more involvement for underrepresented groups to engage in STEM extracurriculars and enroll in more STEM classes.

2) Provide examples of how the STEM educators and facilitators implement and sustain the core tenets of an effective and age-appropriate STEM curriculum.

Munster High School educators are committed to implementation and high rigor within our STEM classrooms.

Recently, Munster High School applied for a Google STEM grant and proudly received this honor. One stipulation of the grant was to increase participation in STEM classes for underrepresented populations within the school.

STEM is a priority within the community. Several partnerships and mentorships have been established and will be established between Munster High School and surrounding institutions and individuals.

Future classes such as AP Computer Science Principles will be in place for the 2017-2018 school year. Additionally, Munster High School will partner with Shedd Aquarium's MATE (underwater ROV) and Drone programs.

All teachers at Munster High School have recently established Understanding by Design units that ultimately tackle real-world problems through culminating performance tasks. Teachers also continue to search for strategies that help students enhance critical thinking strategies that align with the Common Core.

Multiple professional development activities that are made available and that teachers take advantage of ensure that the core tenets of an effective and age-appropriate STEM curriculum is sustained.

Time is designated during the school day to ensure that STEM teachers and STEM interdisciplinary teams have the ability to coordinate effective instruction within the classroom. Small teams of Professional Learning Communities have been established within departments and who meet before school. During this time teachers work together to coordinate curriculum and discuss best practices for topic units. This school year these PLCs have been working together to discuss real-world application problems that can be solved through interdisciplinary units/transfer goals between subjects and culminating in a final performance task.

In addition, all math teachers have the same common plan time each day which enables them to meet to discuss remediation strategies, STEM problems to introduce to their classes and other curricular topics.

A professional development outlook calendar has been established that allows teachers to view different software technologies utilized within the different classrooms. Teachers have taken advantage of this practice and have also presented these strategies through breakout sessions on Thursday mornings. These strategies have been recorded and posted on Moodle which allows teachers to revisit these strategies at a later date. In addition, STEM interdisciplinary teachers have designated time on the school Resource Calendar that will allow them to identify community issues that our students will be able to solve through completion of identified performance tasks.

All STEM teachers have access to the school purchased STEM monthly magazine and eleven teachers recently attended a National STEM conference which was held at Purdue University, West Lafayette.

Finally, our teachers are free to attend any professional development they seek out that will help them improve instruction within the classroom. Many teachers have and will establish prestigious partnerships with institutions such as the University of Chicago and the Shedd Aquarium. Our Parent Teacher Organization has been very generous over the past several years to allow for payment to these professional development training sessions.