



Nikola Tesla STEM High School

EVERY STUDENT FUTURE READY: PREPARED FOR
COLLEGE, PREPARED FOR THE GLOBAL
WORKFORCE, PREPARED FOR PERSONAL SUCCESS

What is a STEM Education?

An interdisciplinary approach to learning where rigorous academic concepts are coupled with real world lessons

The application of science, technology, engineering, and mathematics in the context of real world problem solving (Problem-Based Learning)

Science, Technology, Engineering, and Mathematics Education: What Form? What Function? , Hays Blaine Lantz, Jr., Ed.D., 2009



Why Tesla STEM?

Preparation for the competitive university and college experience

Highly focused learning environment with committed student body

Exemplary teaching staff and STEM professionals

The Class of 2019

6 National Merit Scholars

30 Commended Merit Scholars

79 AP Scholars

144 AP Scholars
with Distinction

37 National AP
Scholars



2018: Solid Scores

ACT Tesla Composite: 29.5

WA State Composite: 21.9

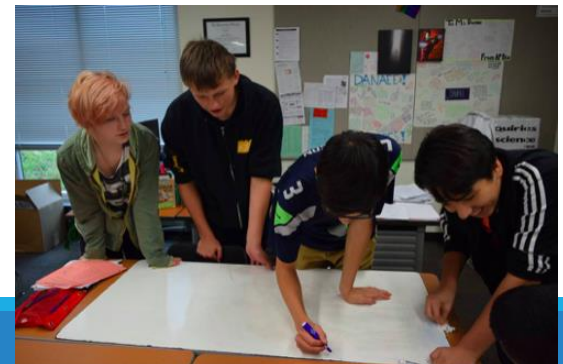
Tesla AP Pass Rate: 88.3%

WA State Pass Rate: 63.3%

SAT (Mean Scores): Tesla / WA State

Math: 711/533

ERW: 676/530



Tesla STEM Graduates are Now Attending

Princeton University	California Institute of Technology	Vanderbilt University
Massachusetts Institute of Technology	Johns Hopkins University	Bellevue College
Georgia Institute of Technology	Carnegie Mellon University	UC Berkley
Cornell University	Stanford	Washington State Univ.
University of Chicago	Rice University	USC
Texas A&M	University of Washington	Gonzaga
Western Washington Univ.	Whitman College	Notre Dame

The Curriculum: Biology, AP & Honors

Students collaborate to accomplish authentic scientific lab work, problem-solve and communicate their ideas

Personal experience in scientific inquiry

Application of systems biology, a holistic approach that allows for critical thinking across scientific disciplines

Students explore and develop skills to succeed in STEM fields and occupations



STEM Lab Concentration: Biomedical Engineering

Students engage in systems biology problem solving.

Course includes Human Anatomy & Physiology and Biomedical Engineering. Students can also apply for UW credit for the Anatomy & Physiology course.

In 2018, Tesla students won 1st place in Dental Science and 2nd place in Researched Persuasive Writing as well as Medical Terminology at a State HOSA Competition. Every year we send numerous teams to the International HOSA Leadership Conference.

BioMed students design and test 3D printed prosthetics and engineered tissues. After testing their creations, students write scientific journal articles and submit them in a state science fair for competition. This year students have the opportunity to compete in the Junior Science and Humanities Symposium, which has a national competition in the spring.

STEM Lab Concentration: Forensic Science/AP Psychology

Students compete at CSRSEF (regional competition) with a chance to qualify for the international science fair, ISEF.

Students can earn 10 college credits through AP and UW in the High Schools brain & addiction curriculum.

Unique PBL investigations include:

- *Crime Scene / Blood spatters
- *NAS Engineering Project
- *Decomposition study



The Curriculum: Chemistry & AP Chemistry

Goals of First Year Chemistry:

Prepare students for AP Chemistry, College Chemistry, AP Biology, and college level lab work

AP Chemistry – a 2nd Year Course

Use models to communicate & solve problems

Use mathematics appropriately

Engage in scientific questioning to guide investigation

Plan and implement data collection strategies

Use scientific theories to explain what is observed

Connect and relate knowledge across disciplines

The Curriculum: AP Environmental Science

A critical component of STEM literacy on a warming planet

AP College Credit (4-5 credits)

Integrated with AP Biology



Entrepreneurship

Students complete projects through the year focusing on customers and conscientious design with an emphasis on Sustainable Development Goals.

Focus is on employability skills including: time management, teamwork with sharing roles and content, using social media and creating a professional portfolio of work.

Engineering projects: Arduino, Makey Makey, Micro:bits to rapid prototype concepts like building adaptable controllers, using IoT devices as sensors and wearables.

Applied learning: soldering, 3D printing, laser cutting and sustainable building.



STEM Lab Concentration: Environmental Engineering & Sustainable Design

Concentration for the 11th grade year

Alternative Transportation

Green Building Techniques & Materials

Waste Water Engineering

Ecosystem Services

GIS, & 3D Modeling Technology

Dual credit with the University of Washington – Atmospheric Science
211 (5 credits)

Students participate in numerous contests based on engineering,
climate change and independent research.



The Curriculum:

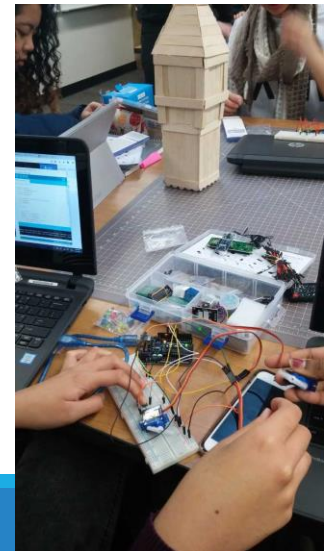
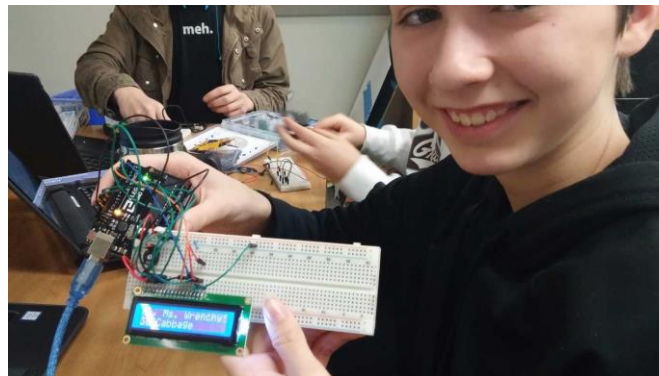
Computer Science

Year 1: Introduction to Computer Programming with AP Computer Science Principles

- Python as a beginning programming language
- The Seven Big Ideas of Computer Science

Year 2: AP Computer Science with Java/Programming with Java

Year 3: Data Structures – using Java to explore advanced CS principles



The Curriculum: 9th Grade Physics

Why Tesla STEM uses a Physics First framework:

Our students are exposed to physics in grade 9 instead of the national average of only 39% of students taking ANY physics in high school.

Building useful conceptual models in younger brains is easier before misconceptions become hardened.

Simple, everyday physical phenomena lends itself to student centered inquiry.

Emerging problem solving skills are used in students' future coursework as well as in STEM fields.

Physics is a combination of conceptual understanding & application of math concepts students have learned or are currently learning through problem solving.

STEM Lab Concentration: Advanced Physics/ Global Engineering

One of the only public school programs in Washington State to offer calculus-based E & M

Opportunity to stretch mental abilities and develop abstract conceptualization and problem solving skills

Opportunity for students to engage in open-ended inquiry based lab investigations

Introduction to sensors and electronics (Arduino)

Aerospace Rocketry internship for past 3 years

The Curriculum: Engineering 1, 2 and 3

Engineering 1 is UT Austin's superb Engineer Your World curriculum. This hands-on, project-based course uses the engineering design process to solve real-world design challenges. Students learn the skills and habits of mind that enable engineers to design products to meet customers' needs.

Engineering 2 gives students and opportunity to apply the processes & skills from Engineering 1 on more complex, independent projects. CAD, laser cutting, and 3D printing are explored.

Engineering 3 focuses on entrepreneurship with students engaging in a structured process to create a start-up to bring a real product to the market.



The Curriculum: Math

Foundational Courses

Algebra 1

Geometry

Algebra 2

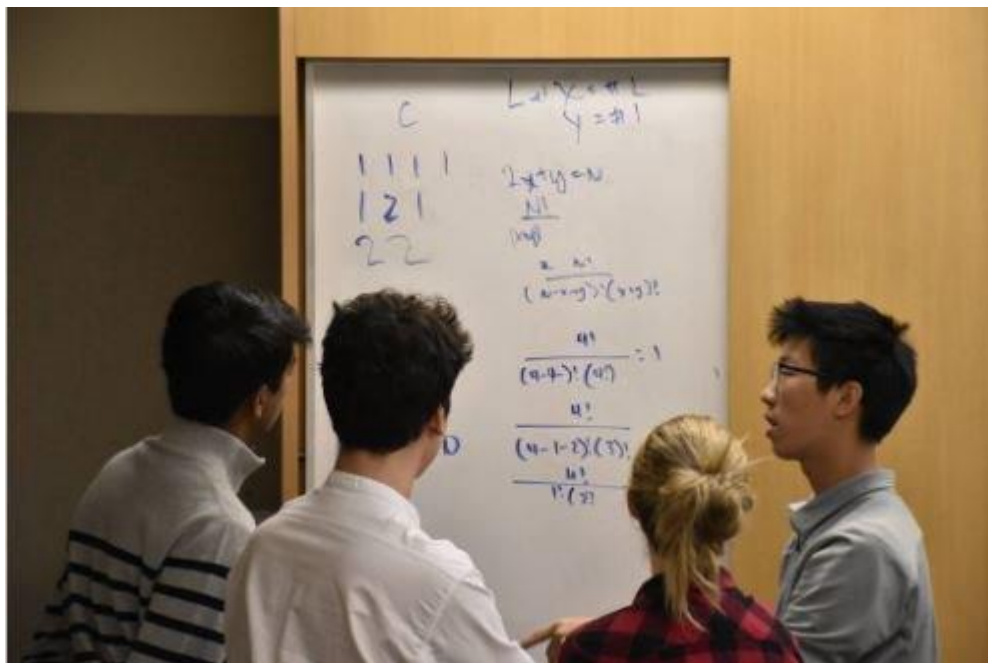
Upper Level Courses

Math Analysis

AP Calculus AB

AP Calculus BC

AP Statistics



The Curriculum: The Humanities

English Language Arts: Students take all 4 years, including English 9 Honors, English 10 Honors, AP Language & Composition and World Literature.

History: Juniors take AP US History and Political Science. Seniors take Contemporary World Problems and Civics.



The Priority of Research, Writing and Presentation

The curriculum in English Language Arts and History focuses on preparing students for the demands of college writing and research assignments. The coursework also includes extensive training in public speaking and presentation. During their time at STEM, students will complete:

Multiple inquiry-based writing projects that focus on analysis and argument.

Formal debate strategies.

Multiple responses to “Document Based Questions.”

An original, memorized speech.

Multiple structured argument essays.

The Curriculum:

The Humanities

Spanish

Spanish Honors 1, 2 and 3

These immersion courses start with language basics and build to fluency in the language

Graphic Art/Production

Required studio course for freshmen designed to expand their visual communication skills and think creatively

Students will study “design” as a verb. They will live the processes and qualities of designing in a PBL environment.

Problem-Based Learning Internships

This program is unique to STEM, allowing our students the opportunity to explore their passions in real world settings under the guidance of experienced, innovative professionals.



2018-19 Internships

Students are currently interning with the following:

Backyard Brains (neuroscience)

Concur

Data I/O

STEM Reach

Urge to Submerge

Waste Management

Water Tracker

Zengalt

ZSolutionz



Contest-Based Mentorships

STEM-Related contests challenge students to solve or bring a viable solution to a real life problem.

Opportunity to work with a professional mentor (UW professor, Engineer etc.) who can help guide them through their research

To compete in contests, students have to master multiple skills, including research, project design, evidence-based presentations, and/or testing prototypes of new ideas.

Many contests are sponsored by STEM-related organizations and have regional and national contests, which often are accompanied by the chance to secure scholarships or monetary awards.

Contest-Based Mentorships

Some examples of CBM projects are:

Implementation of a carbon dioxide refrigeration system as a cogeneration appliance and replacement for halocarbon-based refrigeration systems

Application of 3D printing technology in the fabrication of wrist joints for the use of string instruments and ankle joints in the use of skiing and dance

3D modeling of bilateral glioblastoma multiforme for surgical resection

Lottery and Application Process: Everything Online

Application Available Online: December 10, 2018 at LWSD.org

Applications Due: January 18, 2019 by 4:00 p.m. (No hard copies will be accepted)

Lottery: February 1, 2019, held at district Resource Center; done by computer

Notification of Acceptance to Families: February 8, 2019 via email

Acceptance Deadline: February 22, 2019



Inspire. Educate. Innovate.

Teachers and Student Ambassadors will be available following the presentation to answer your questions. THANK YOU FOR COMING!

