HTH Math and Science

High Tech High offers an integrated approach to math and science that fits well with the HTH design principles of personalization, real world connection, and common intellectual mission. The program prepares students for internships and senior projects involving hands-on work in math and science, as well as college and possible careers in math, science, engineering, and design. Along the way, HTH students are well grounded in the historical and current issues that intersect with the humanities curriculum at HTH.

Course of study

In science, HTH students take physics in the ninth grade and chemistry in the tenth grade. The chemistry course emphasizes the overlap between chemistry and physics. Eleventh graders take two science courses: biology, with an emphasis on the overlap with physics, and physics/engineering, including two trimesters of engineering tech, linking academic and vocational content and methods. Twelfth grade students take thermodynamics, which combines advanced physics and chemistry.

The HTH math curriculum offers a mix of algebra, geometry, trigonometry, and pre-calculus concepts, taught at increasing levels of complexity each year. All HTH students take Math 1, Math 2, Math 3, and Math 4 in sequence until they are ready to take college level calculus at HTH.

Math 1 is more focused on algebra, Math 2 on geometry, and Math 3 and 4 on advanced algebra or pre-calculus.

Students with a wide range of prior experience in math and science learn in the same classroom. While all students work on the same topics, some students work on more basic problems and receive more remedial support, while others work on more advanced problems.

In 2002-2003, all ninth graders will take an integrated physics and math 1 course. We are also piloting an integrated math/chemistry course for tenth graders.

"in my other school, we studied math the traditional way, with the teacher lecturing to the whole class. Here, we can start from where we're most comfotable, then move at our own pace along with a group of study partners. We get instruction from the teacher when we need it. I think it works better for most kids this way.

Armon Radford
Grade 10

"I remember the science because it's fun to do. It's not just stuff you're memorizing for the test. Sometimes we get so excited about a project that we just start talking about it and explaining it, because we really know it well."

Lauren Mitchell
Grade 10

Notes

The HTH math and science curriculum is tailored to meet students' needs and interests. Electives such as robotics and Cisco systems training offer additional in-school opportunities for advanced, project-based work, and students are supported to pursue advanced applications independently through their internships and senior projects.

Competencies and understandings

High Tech High students are expected to acquire and demonstrate the following competencies:

Math and science as inquiry:design and conduct scientific investigations- identify questions and concepts for inquiry, use modern libraries, evaluate sources of information, formulate and revise scientific explanations and models using logic and evidence, recognize and analyze alternative explanations and models, master basic lab techniques, understand measurement, use technology and mathematics to improve inquiry and communication

Scientific and mathematical language:master analytical writing, read complicated texts, demonstrate speaking and listening skills, communicate and defend a scientific argument, display and interpret data via graphing, understand and apply equations and functions

Engineering and design:design and build things-work in project teams, manage resources, engage in problem-solving, understand error, demonstrate project and time management skills

In the course of their investigations, we want our students to develop a deep understanding of the following:

History and nature of math and science: science as a human endeavor, the nature of scientific knowledge, and historical perspectives, including knowledge about under-represented groups in math, science, and engineering

Current and enduring issues that cut across all the sciences and math: the environment, evolution, genetic engineering, artificial intelligence, and energy

Careers in science, math, and related fields