During a typical busy classroom day at Goldendale High School, hard at work are, from left, Gabriel Wadsack, Nadia and Jade Smith (background) teacher Matt Merfeld, Abigail Mains and Edgar Vega.

Above, Rennen Kauffman, left, and Tristen Richmond work on their robot during class. Top, Abigail Mains and Blake Best Jr. set up their robot.

Class Sparks Interest in Robotics

Science, technology, engineering and math prepare students for their next chapters

By Jeanie Senior

Goldendale High School teacher Matt Merfeld's robotics students build prize-winning robots, but a visitor to the class should not expect the whirring, beeping or flashing red lights popular in Hollywood films.

Instead, the students team-built robots are complex mechanisms that carry out assigned tasks with businesslike dispatch, steered by remote control and operating with a combination of battery-powered motors and pneumatics.

As a teacher, Matt says he sees a lot of positives in robotics beyond the skills needed to design and build one.

"Every kid can contribute and succeed," he says. "And they always have colleagues who support their work."

This year, two Goldendale High School teams placed in two robotics state competitions. One was ranked fourth in the VEX-sponsored championship. The other placed sixth in the Technology Student Association-sponsored championship.

This year's game, called Starstruck, requires robots to move around a raised competition table, pick up rubber stars and a heavier stuffed fabric cube, and deposit the items on the other side of a center barrier. Students must design, build and operate the robots. Teams are evaluated for programming, driving and overall robot skills.

The competitions spark interest in robotics, and the school's robotics club raises money to help pay for students who compete.

Goldendale qualified for the VEX world championship competition two years in a row. The weeklong event features 600 of the world's best robots, Matt says. Teams range from middle schoolers to college students.

Goldendale did not place, but Matt says the team was honored just to be invited.

The robotics class is one aspect of the school's increased emphasis on science, technology, engineering and mathematics—better known as STEM. Supporters say STEM prepares students for a future where the number of jobs related to those fields will climb to more than 9 million by 2022.

"There really is something for everyone within the science, technology, engineering and math fields," says Nadia Smith, former state president of TSA, and part of a robot-building team that includes her sister Jade, a freshman.

The team took sixth place in the state Technology Student Association competition, and was invited in April to the national conference.

Nadia, a senior, will attend the Colorado School of Mines next fall, where she plans to major in mechanical engineering and also compete as a member of the school's swim team.

Junior Blake Best, whose team won fourth place in the state VEX competition, says engineering and robotics classes teach and share complementary skills.

"I've just been doing it for fun, enjoying my years of high school before I have to get out there and get a job," Blake says.

After he graduates, Blake plans to enroll at Perry Technical Institute in Yakima.

"This stuff interests me," says senior Edgar Vega, who also plans to explore engineering after graduation.

Besides robotics, Matt teaches woodworking and three STEM classes: Introduction to Engineering design, second-year Principles of Engineering and Computer Integrated Manufacturing.

The introductory course includes 3-D modeling and product design using one of the program's two 3-D printers. This year, the Goldendale City Council asked class members to apply what they learned and design bike racks for Ekone Park.

Students produced about 20 variations, two of which were presented to the city council. Using the plans, the school's agriculture science department is making a prototype.

The second-year class, Principles of Engineering, basically is applied physics. Matt says it incorporates math, calculus and trigonometry.

Computer Integrated Manufacturing, the third-year class, "is the culmination of skills from the first two," Matt says.

Students are charged with building a factory capable of mass production—a wide-open challenge to spark teenage creativity.

Matt's favorite creation so far is a taco-making machine, which incorporates tortillas, meat, cheese and more.

Whether students learn to build and control robots capable of advanced motion, design city infrastructure or create time-saving taco machines, there is something for a variety of students in Matt's robotics classroom. ■