NXT/EV3 Robotics Camp
This one week camp is for rising 3rd through 5th graders (6th grade for NXT). Students (in groups of 3) will build an autonomous robot to carry out pre-designed missions. For the majority of each day students will design, build, and program a LEGO NXT/EV3 robot that will operate autonomously to compete against other camp teams in competition. Science activities will also be performed by the students throughout the week. Students will learn project management in a team setting, how to build with the LEGO NXT/EV3 system, and basic programming of the NXT/EV3. The camp will end in a competition on Friday.

VEX IQ Basic Camp
This one week camp is for rising 4th through 8th graders. Students (in groups of 3) will build an autonomous robot to carry out pre-designed missions. For the majority of each day students will design, build, and program a VEX IQ robot that will operate autonomously and via remote control to compete against other camp teams in competition. In this camp the students will be using robotC as their programming language. Students will learn project management in a team setting, how to build with the VEX IQ system, and basic programming of the robot. The camp will end in a competition on Friday.

VEX IQ Advanced Camp
This two week camp is for rising 4th through 8th graders. Students (in groups of 3) will build an autonomous robot to carry out pre-designed missions using advanced building and programming techniques. The first week will be the same as for the basic camp (see description above). The second week the students will learn advanced building and programming skills and will end in a competition on the second Friday.
VEX 1 Robotics Camp

The VEX 1 camp is one week long and introduces rising 6th through 12th grade students to competitive robotics through the VEX robotics design system. This camp is perfect for students that have never done robotics and want to learn the basics of the VEX robotics platform. In groups of 3-4, students will build and program a robot to operate on a field by remote control and through an autonomous program. The teams will compete in a final camp competition Thursday afternoon. Additionally students will learn basic computer programming in robotC by programming a robot to complete challenges throughout the week. The importance of STEM education and opportunities to pursue STEM during the school year will be shared with students and parents.

VEX 1.5 Robotics Camp

In this camp rising 7th through 12th grade students will work in groups of 4 to build and program a robot for the VEX Robotics Competition. In this 2 week camp students will build a robot that incorporates a large drive-train with a 6-Bar lift system. These techniques will be combined with advanced programming topics that will allow the students to navigate autonomously with sensor input. Students will design a custom intake mechanism for their robot. This camp is ideal for students who have experience using the VEX Robotics System through a previous summer camp or through a competitive team during the school year.

VEX 2 Robotics Camp

In this camp rising 8th through 12th grade students will work in groups of 4 to build and program a robot for the VEX Robotics Competition. In this 2 week camp students will design, build, and program a robot to compete in the current VRC game. A variety of building techniques and options will be taught with advanced programming topics that will allow the students to navigate autonomously with sensor input. This camp is ideal for students who have 1-2 years’ experience using the VEX Robotics System on a competitive team and students will need a recommendation from the team coach.
**TARC Rocket Camp**

This one week camp will introduce rising 7th through 12th grade students to rocketry. During the camp, students will learn the basics of rocketry and how they work, rocketry safety as well as building and launching several rockets. Students will also learn how to use RockSim, a simulation tool for building and launching rockets. This camp can prepare the students to be part of a Team America Rocketry Challenge (TARC) team to compete during the school year in the national competition. The camp will have a field trip to safely launch their competition sized rocket on Friday.

**CADD Camp**

This camp is for rising 9th through 12th grade students and explores how significant innovations in the areas of 3D computer graphics and 3D printing technologies are revolutionizing how designers, artists, and engineers create products and tools. Students will learn an overview of modern 3D design and modeling techniques and also explore the range of printing and prototyping technologies in use today. The mission of this 3D Printing and Engineering Design Course is intended to provide students with the tools to bring design ideas to life. Imagining a concept in your mind is just the beginning. A product may then be brought to life through the application of advanced engineering tools like Computer Aided Design and Drafting (CADD) and 3D printing. By the end of the camp, students will have gained hands-on experience creating their own designs and shaping the creative process to final printed production. This camp is half days per week for weeks.

**Programming Camp**

This camp will provide students in rising 9th through 12th grade with new skills in programming and electronics engineering. The goal of this camp is to shift focus away from simply using electronics to understanding how they work by programming them! Students will learn to work with an Arduino Board to combine components like LEDs, motors, and sensors. Students will also learn how to program starting with the very basics, turning on and off an LED, to more sophisticated situations like maneuvering a car. We will use real life examples to help students understand the importance of the skills taught in camp. This camp is half days per week for weeks.
**Cyber Security Camp**

This one week camp is for rising 9th through 12th graders and will introduce the students to the world of Cyber Security. In partnership with the Marshall HS Governor’s STEM Academy (FCPS), this camp is designed to provide students with knowledge and hands-on experience in cyber security and introduce them to the many career opportunities in the growing field. The camp will increase students’ knowledge of networking and computer security including attack and defense strategies, all through tutorials, hands-on activities and will culminate with a mock competition towards the end of the camp. Students must bring their own laptop with the minimum specifications: an i5 or comparable AMD processor (NO Macs/Apple based laptops), 6 GB of RAM and 20 GB free hard drive space available.

**Scratch Camp**

This one week half-day camp is for rising 4th through 6th graders. Students will use the basic concepts of the Scratch programming language to develop creative stories, animations, simulations, and games. Students will work on individual projects and collaborate on group projects. Students will learn about computational thinking skills such as sequencing, loops, conditionals, and operators. Students will learn about computation practices such as iterating, testing, debugging, and reusing. Students will create, personalize, share, and reflect upon their own projects throughout the week.