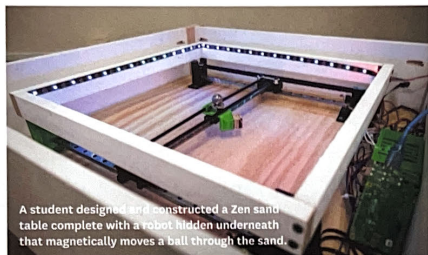# Spartan

Summer 2024

2024

Honoring Our
2024 Graduates!

Asha Williams '24 records an episode of her SIP podcast focused on politics and voting rights.

Lainey Leslie '25 (below) adjusts her designed, built and coded pink handheld video game device.

A student designed and constructed a Zen sand table complete with a robot hidden underneath that magnetically moves a ball through the sand.

someone who is an expert outside St. Stephen's, to work with community members just to get a different perspective," says Blount.

Asha Williams '24, entering her freshman year at the University of California, Berkeley, with plans to major in political science, produced a political podcast that explores why it is important for her peers not only to understand the political process and the issues but also to exercise their right to vote this year. Her three episodes cover politics, women's issues and an interview with an Austin city leader.

"This is my first year voting. I turn 18 right before the election, and when I try and look at election information for all the different elections, I just kind of get lost. And I feel like a lot of people feel that way too," says Williams. "I thought, 'What can I do about this?' because I have always been very outspoken, I love to share my opinion, I love to hear other people's opinions. I think the most powerful tool we have is our voice."

Artist Jerry Zhang '24, who plans to study art at Rhode Island School of Design, painted two new captivating and colorful murals for the Chapel that tell a story of personal and academic growth.

Mentored by alum and Austin-based artist, illustrator and muralist William Hatch Crosby '05, Zhang wanted to leave a lasting impression at St. Stephen's.

"I really wanted to leave a part of my legacy at the school," says Zhang. "Ms. Zepeda (fine arts and visual arts instructor) earlier in the year had conversations with us as an art class about working on new paintings for the Chapel. And so I just thought, 'Why not take this opportunity to both leave something behind and also inspire upcoming artists?'" says Zhang.

JUNIOR AND SENIOR SCIENCE PROJECTS

Student-produced projects carry over into core subjects like science. Electronics and Robotics Instructor Troy Lanier teaches the Projects in Science and Technology class, which allows students to take on a yearlong STEM project of their choice. Students imagine and pitch 10 ideas and, together with Lanier, they choose one to pursue.

"It's intentionally a class in which students build things. And in that process, they learn about project management, part

sourcing and presenting their ideas," says Lanier. "Akin to the software and hardware industry, we use 'sprints' to measure progress instead of having traditional tests."

Lanier explains two other unique features of the class. "First, unlike an independent study in which a student works on the project alone and then returns to the teacher/sponsor with results, this class meets every day in the rotation with a teacher present. Second, and most unique, we infuse the class with scientific, technology and engineering principles," says Lanier.

With Lanier's guidance, students develop their ideas from a pencil sketch on paper to design, prototype and full product operation — all while incorporating different skills and knowledge acquired from previous Middle and Upper School robotics, biology, chemistry and engineering classes. For example, a student might need to manage voltage and current, as they learned in electronics class, or use the concept of torque from physics, or implement coding skills from computer science class.

Lanier talks through a couple of projects set up in the classroom in Hines Hall.

"One of our students is basically making

a computer from scratch — wiring her own clock module and using the original 6502 CPU chip. It's similar to an original Apple II computer, and she's learning to program in machine language," says Lanier.

"Another student is building a Zen sand table with a hidden robot underneath that magnetically moves a ball through the sand," says Lanier. "While the ball seems to have autonomy, it doesn't. It's following an algorithm. Part of the project involved the student using her microcontroller skills from robotics class as well as new programming skills, like how to program a Raspberry Pi single-board computer. This knowledge will be applicable when she majors in electrical engineering at The University of Texas at Austin next year."

Harrison Oddo '24, who has been accepted to Columbia University, built a high-end hydroponics system that could be potentially viable in the St. Stephen's Dining Hall to grow mini vegetable and fruit plants on site. Harrison is a member of the Green Goblins environmental club and thought this would be a fun project to tackle. He plans to experiment with radishes and then graduate to tomatoes.

"I've been working more recently on using information that I've learned in Chemistry I and Chemistry II on pH and how to balance liquid solutions," says Oddo. "Specific plants live in a range of pH that is comfortable for them, and a little too much acid stunts their growth or prevents them from growing at all. There are a lot of different systems you can buy that only cost a couple hundred dollars and you'll get something and it works. But I think there's something more valuable in making it yourself," says Oddo.

"[Harrison] has built a whole control box for it, and the control box needed fuses in it because of possible current overload," says Lanier. "So we're talking about Ohm's law, we're talking about amperage and possible fuses that he needed for power management for that system. It's more than simply putting together PVC; he had to figure out flow calculations, and he used a microcontroller to receive data from the system and then make modifications."

Inspired by the Nintendo DS and Gameboy Advanced from the late 1980s and early 2000s, Lainey Leslie '25 designed, built and coded a pink handheld video game with music, graphics and a number of characters. It works much like

Electronics and Robotics Instructor Troy Lanier stands next to student Harrison Oddo '24, who designed, built and wired a fully operational hydroponics system.

the game Guitar Hero, except Leslie 3D printed tiny heart-shaped yellow and pink buttons with a very specific gamer in mind.

"This is a big project because it's got a lot of software and hardware," says Leslie. "On the software side, I coded the game from scratch. I didn't use a game engine; it's all text. It's all code. I wrote it in Lua, which is a programming language that is really beautiful."

Leslie says she wanted to build an ergonomic piece just for women, as women are often ignored in the tech and gaming industry.

"When I was in elementary school, I went to this summer camp called Girls Make Games, and I fell in love with it," says Leslie. "These past couple summers, I've been going back as a counselor and helping teach. And when I came to make my project, I wanted to make something for the girls that they would think was really funny and cute."

Leslie's and Oddo's projects are just two of a multitude of other student-led projects under Lanier's guidance throughout his tenure at St. Stephen's. In addition to the projects themselves, Lanier is equally excited about observing his students' growth from middle school until now. He points to photographs of Oddo in 8th grade and Leslie in 6th grade, when they were learning basic science principles.

"It's kind of fun to see [Harrison] in 8th grade come through the whole program, and now he's here building something that's electrically based," says Lanier. Lanier speaks about these projects ,and others with joyful enthusiasm, and his

love for teaching the subject matter is infectious. He says that what his students are learning today measures up with courses in higher education institutions. To keep his students motivated and focused on their next chapter, Lanier shares stories of previous successful projects that have emerged from this class.

From a student-designed, fully operational food delivery robot to an astronomy radio that detects the Milky Way, Lanier sees these science projects and the Projects in Science and Technology class as a gateway to the future.

"While we're a college prep school, we're also preparing kids for life," says Lanier. "We're a school that celebrates what it means to be human, and like it or not, the human experience is largely defined by technology today, sometimes for better and sometimes not. Having an understanding of how technology works equips us all to understand the human experience as we live it today," says Lanier. 🖋