

Stellar LEARNING

Engaged learning taking place across our campus and beyond

HOW DO WE BEST PREPARE OUR CHILDREN for a world we cannot yet see? Ravenscroft faculty members are adopting innovative approaches inside and outside the classroom to live out the School's mission in a vibrant, relevant way and to best position students for success in a world that is changing rapidly.

Thanks to a sturdy foundation of academic excellence that dates back more than 150 years, Ravenscroft is able to pursue unique instructional avenues that help shape 21st century learners into 21st century leaders, ready to succeed in a complex and interdependent world.

Our baseline of academic excellence has not changed over time. However, the ways that our faculty teach and the manner in which our students learn have changed. This means not only adapting the way we teach traditional subjects like math, science, history, language and composition, but also accepting and embracing our role as teachers of good citizenship and of ethical leadership.

Whether it is developing digital portfolios in the Lower School, offering a math lab that empowers Middle School students to refine essential skills, or engaging Upper School students in independent scientific research, faculty are demonstrating that academic excellence is dynamic rather than static at Ravenscroft.

Lower SCHOOL

STUDENTS ARE CREATING DIGITAL PORTFOLIOS

Remember all the art projects and essays that your parents kept from your classes? Perhaps they are stored in a dusty attic somewhere, or maybe they were lost or tossed out years ago.

Fifth-grade students at Ravenscroft will always have access to the school work they are doing now and that they will do in the future thanks to a pilot program that has them creating personal digital portfolios known as “My Raven Portfolio.” The portfolios reside as a Google Site, accessible through the Internet from any computer. Teachers and students choose the assignments or projects they wish to share on the pages of their digital portfolio, and in the process, reflect and direct their own learning, along with becoming site publishers, site editors, and site managers.

My Raven Portfolio is designed to be a personal and collaborative learning space for members of the Ravenscroft community. The digital portfolio is used to support individual learning plans and provide students with the ability to direct their own learning, share their learning with others, and ultimately reach their full potential as citizen leaders in the Ravenscroft community and beyond.

Head of Lower School Payton Hobbs challenged her colleagues to think differently about the future of teaching and learning. She created a partnership with an educational design firm called 2 Revolutions and Ravenscroft's Chief Technology Officer Jason Ramsden to introduce this concept to fifth-grade students, anticipating that its success would lead to its introduction in other divisions.

Project leaders were Cindy Fordham, instructional technology specialist; Rhonda Zayas-Palmer, Lower School librarian; Kathleen Christopher, academic computing coordinator; Sue Whitehouse, teaching assistant; and fifth-grade teachers John Fiedler, Cara Dancy-Jones, Rachel Newton, and Barbara Paul.

“Once we had established the objectives for the project, we chose a beta group of students — two from each of the four fifth-grade classes,” said Fordham. “We discussed the purpose of a digital portfolio, showed examples, set each student up with



A page from the portfolio of EMMA BAKER '21. Scan this QR code to view several student digital portfolios.



their Google site using Hapara Teacher Dashboard, and showed the students how easy it was to access their portfolios. Using Chromebooks as well as desktop computers, students set up their Purpose page, their About Me page, a Reflection and Goal Setting page, a Citizen Leader page, and “synced” their class assignments from Google Drive to their personal Learning page.”

The eight “beta” students eventually became the teacher leaders and helped their classmates develop their own portfolios, and all fifth-grade students continue to edit their work, manage their pages, and collaborate with teachers for a more individualized approach to learning. As they mature and their skill levels increase, they can update and extend their previous work and readily see their academic growth.

Teaching students to have control over their own web presence empowers them and provides them with a better understanding of the digital world and the possible consequences of its misuse.

Administrators and faculty members involved in this project are proud and excited about what they and their students have accomplished. They will continue to perfect the process with next year's fifth graders, building a virtual library of student digital portfolios.

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TEST STUDENTS FOR THE FIRST DIGITAL PORTFOLIOS

Middle SCHOOL

STUDENTS ARE IMPROVING MATH SKILLS THROUGH CLASSROOM TUTORING

College students quickly learn where to go when they have questions about class work. University tutorial centers offer help in writing, math, various sciences, foreign languages, and many other subjects. Faculty members and teaching assistants are available, free of charge in most cases, to answer questions and provide useful resources.

Could that model work at Ravenscroft? That is the question that Elisabeth Dempster '83, mother of Jack '15 and Kate '18, asked. As a faculty lecturer at N.C. State, she teaches freshman calculus and understands the value of math "labs" and suggested the idea last year for Middle School students.

"I've seen how important it is for students to learn from people other than their classroom teacher, whether that is another teacher or an older student. I have a teaching assistant who works with my students, and that different voice often helps them understand a concept," Dempster '83 said. "I really appreciate the math lab for Middle School students because it puts the responsibility on the student to seek help. In a classroom setting, students are often so busy trying to take notes and listen to the lecture that they aren't really able to comprehend the material. The math lab provides that time and one-on-one teaching."

The concept had been tried in the past at the Upper School but was discontinued because of scheduling issues. However, Head of Middle School Denise Colpitts was open to piloting the program this year, and asked Melissa Spainhour, Middle School math department co-chair and science instructor, to open a math lab every lunch period for Middle School students.

"Melissa has taught all levels of Middle School math as well as science, so she was the perfect choice for this pilot program," Colpitts said. "This is an opportunity for students to drop in, stay as long as they would like, get specific help with a math concept, study for a test, or do homework. It's been a successful program to date."

Spainhour asks students to fill out forms in advance so she can prepare study guides and practice examples for them. Teachers may also fill out a form for a student, detailing specific math concepts they'd like her to address.

"Students usually come in pairs or small groups and eat their lunch while they work. It's casual, and they can stay as long as they want. Math lab is not

meant to replace after-school tutorial; rather, it is an additional opportunity for students to seek help," Spainhour said.

Cole Hudson '18 often uses the math lab. "Math lab helps me better understand topics and skills. I usually attend before a test so I can get extra practice and make sure I understand all concepts that will be covered," Hudson said. "Mrs. Spainhour always explains the topics in an easy, understandable way."

Another enthusiastic participant is Astrid Barth '18, who says, "It's great for clarifying or just learning little easy shortcuts and tricks and for preparing for tests," she continued. "Sometimes I am doing my homework and I'll approach a problem I don't understand and decide to skip it and show up in math lab. Mrs. Spainhour explains it, and I can finish my homework. My grades have improved tremendously compared to last year when math lab did not exist."

90+

NUMBER OF STUDENTS
WHO HAVE BEEN HELPED IN
THE MATH LAB



Alexis Murphy '18 grabs lunch and math help



View the poster for the NASA Project

Upper SCHOOL

NASA PROJECT, METEOR SEARCH FUEL UPPER SCHOOL STUDENTS' INTEREST IN SCIENCE

Four Ravenscroft Upper School students will have a unique entry on their respective academic transcripts that reads "NASA Independent Research Project" thanks to their work with Mike Murphy, an Upper School astronomy and physics instructor.

Olivia Aschman '15, Robin Kikuchi '15, Jonathan Prather '15, and Lee Whitely '15 participated with Murphy in the NASA/IPAC Teacher Archive Research Program this past fall. The students discovered 10 young stellar objects (stars undergoing formation) as part of their research, the results of which they presented before professional astronomers during the American Astronomical Society meeting in early January.

"Our students did super. I knew they were going to be challenged with the data and all of the analysis that was going to be done," Murphy said. "We worked together and compared results. It was a collaboration, so we were all very collegial. It was a lot like working with grad students."

The project is consistent with Murphy's desire to have all of his students conduct real-life research and to contribute to science. He has provided opportunities to do both over the course of the 2013-2014 academic year, first in the solar system course he teaches in the fall and then in the stellar and galactic course that is offered in the spring. The 2013-2014 school year has proved to be a particularly productive "year of discovery," as he calls it.

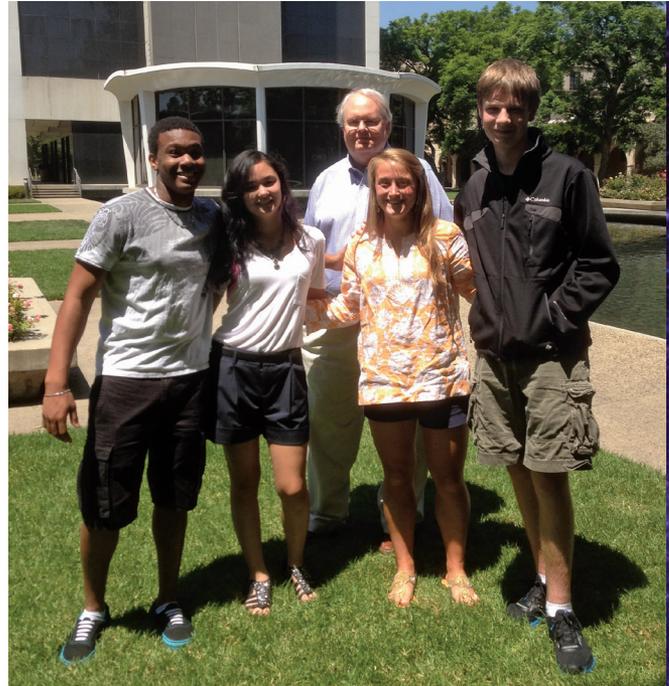
Students from both sections of his solar system course worked in teams of three this past fall to search for asteroids as part of Project IASC, the International Astronomical Search Collaboration. It is the third year that Ravenscroft has participated in the project, which identifies asteroids, comets, or other objects that are potential threats to earth.

During a five-week search campaign in October and November, Murphy's students detected 23 asteroids that had never been seen before. The project took on heightened meaning in the wake of the meteorite that fell to earth outside the city of Chelyabinsk, Russia in February 2013.

For the NASA project, Murphy and the four students utilized data from an infrared telescope to study the formation of new stars. The students were selected after an application process that included a review of their grades, letters of recommendation, and personal interviews. The group took a weeklong trip to California Institute of Technology (Caltech) last summer to work with Dr. Luisa Rebull, a research scientist from the Spitzer Science Center.

Murphy, who wanted the students to understand that astronomers are regular people, prepared his inquisitive quartet for the trip with a series of projects of increasing difficulty. He says the group made a positive impression at Caltech, demonstrating enthusiasm and an ability to complete tasks promptly.

The Ravenscroft researchers started their NASA work with 7,000 sources that were potential stars. They ran those sources through an algorithm that identifies specific characteristics that



JONATHAN PRATHER '15, ROBIN KIKUCHI '15, Mike Murphy, OLIVIA ASCHMAN '15, and LEE WHITELY '15, and pose in front of the Millikin Library at Caltech

are consistent with a star undergoing formation. The process left them with 115 candidates for new stars. Next, they reviewed existing research literature for the part of the sky they were investigating, which revealed how many of the 115 star candidates were already known. From this group, they discovered the 10 new stars.

In addition to providing a notable entry on their academic transcripts, Murphy explains that these hands-on projects offer students valuable lessons about the practice of research, including the uncertainty of data and occasional imprecision of research instrumentation.

Murphy, who has his own observatory, says his interest in astronomy began in elementary school when his father returned from a naval deployment with a telescope as a gift for him. He minored in astronomy at the University of Virginia and later earned a master's degree in the subject after completing six years of service as a U.S. Navy officer, an M.B.A. from the University of North Carolina, and a career in investment banking.

A full year spent in Murphy's courses takes students into the solar system and beyond. However, his preferred outcome is about more than his personal passion.

"I'm not trying to build astronomers," Murphy said. "I'm just trying to develop an interest in science." *R*

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NUMBER OF STARS
RAVENS-CROFT STUDENTS
DISCOVERED