RVGS Newsletter

Issue 6
Feb 28, 2017

THIS MONTH:

MAR 4	REGIONAL FAIR
MAR 7	INTERIM REPORT
MAR 7	LAST ELECTIVE DAY
MAR 14	ELECTIVE SHOPPING DAY
MAR 16	EARLY DISMISS.
MAR 17	NO SCHOOL FOR STUDENTS
MAR 17	VAJSHS
MAR 18	SHELLY STEM CHALLENGE
MAR 24-25	VIRGINIA STATE SCIENCE FAIR

Counselor's Corner

As March is about to begin, it is obvious that spring is almost here. Spring sports are already in full swing and students will soon be missing more and more time for games. Between sports, college testing, SOL and AP testing, this is a busy time for all of our students. It is very important to remind them of the importance of time management and balance. Some students do very well managing their time, especially when they have limited "free" time. Others need more guidance and reminders as to how to manage that time successfully. If you feel like your student could use some more assistance, please encourage them to see me.

Our Elective Shopping Day is scheduled for Tuesday, March 14th. Students will have an opportunity to learn about all of our elective options on that day and they will be asked to fill out an elective registration form with their top 3 choices marked. That form will be due on Thursday, March 16th. Some of the electives have been historically very competitive, so it is important that students think carefully about all 3 of their choices, as many students will not get their 1st choice. Elective descriptions will be emailed next week so parents can review them with their students prior to the shopping day.

As always, if you have any questions or if there is anything I can do to assist you or your student, please do not hesitate to contact me.

Project Forum 2017: A Resounding Success!

At the Governor's School, 264 students from 13 high schools in seven school districts across the Roanoke Valley come together each year to celebrate science at our annual Student Project Forum.

This year's Forum was a balanced success; not only was every school *district* represented in the category awards, but every *school* was represented, as well. Winners received ribbons, certificates, and cash prizes for their achievements, and many more students were honored with special awards such as "Outstanding Persistence," "A Product We Would Buy" and "Most Likely to Work at MIT."

Project Forum is always exciting and unpredictable, and this year's event was no exception. Our two seniors from Craig County entered the same category and ended up tying for first place. Environmental Engineering B produced a first place triple tie, and students shared third in nine different categories. Every winner in one category was from the same home school, while six different schools were represented in the category awards for another.

Students studied everything from memory to bioplastics to staphylococcus, and each of the four elements was thoroughly investigated. More students entered the Microbiology category than any other, and so many students entered our top three categories that each one had to be split into three sections. Project titles ranged from three words to 16, and the longest title word – *Exiguobacterium* – was made up of 15 letters.

Nineteen students showcased their work at the Student Art Show, and every single Lab Rat made the slideshow. One lucky parent won a cool 105 bucks through our 50/50 raffle, and another inadvertently got a great deal on 14 rounds of golf at three different clubs. Our Silent Auction and Annual Appeal made an absolute fortune, and our awards ceremony was standing room only.

Oh, what a day to remember!

Very special thanks for our very special day to:

* Over 175 parents, local businesses, and community supporters who generously donated gift certificates, services, and cash for the event
* Over 60 judges who encouraged our young scientists and evaluated their projects
* Dozens of volunteers who prepared and served a delicious lunch to the judges, worked a shift at the Silent Auction, and ensured the auction's success by soliciting gift cards from the community
* Governor's School faculty for their commitment to their students and dedication to excellence in scientific research
* Silent Auction co-chairs Lacey Levy and Paul Parnell for their efforts in organizing the Silent Auction and Annual Appeal that raised more than $24,000 to support innovative student research at RVGS

The full list of award winners, major sponsors, and the schedule for the various science fairs that RVGS students may attend are posted on the school website, and almost 200 pictures from Forum are posted to the RVGS Facebook page. Be sure to check them out!

-Regina Carson

Message from the Director

It seems we all made it through intersession and Project Forum in one piece! I am extremely proud of our students for what they were able to accomplish with their research projects. While 'science fair season' will continue through the rest of the year, with regional, state, and international levels of competitions yet to come, the school is finally settling back into the second semester.

Thank you to those who supported the Annual Appeal and Silent Auction. Fundraising this year was very successful and will allow us to reach our goal of purchasing an Atomic Force Microscope earlier than originally planned. Stay tuned for more news on that in the near future.

Students have registered for their core classes for next year, and in a few weeks we will start elective registration. As you will read later in this issue, we are making some changes to electives, with the goal of providing our students the best possible opportunities at RVGS. In addition to alterations to our engineering electives, we will also introduce a Python coding elective to provide options for our students interested in future computer programming careers.

We had two sets of multiple-generation judging families at Project Forum, as well as a number of RVGS alumni. A big thank you to all of those who judged; we couldn't have Project Forum without your help!

Changes to Engineering Electives

For the 2017-2018 school year, the *Introduction to Engineering* course will be replaced by a new class called, *Engineering Design and Fabrication*. This class will offer many more opportunities for students who are interested in engineering or are considering engineering as a possible college major. This class will be very hands-on and will include: CAD (Solid Works) training, 3-D printer fabrication, laser cutting fabrication, 3 axis machining, building-testing electronic circuits, and Arduino programming. All students will design, build, and develop the code for a 3-D Robotic Arm Pick and Place System that is controlled by a microcontroller. Students will be responsible for designing and fabricating all components for their robotic arm and will only be allowed to procure servos, breadboard, and an Arduino microcontroller. Students will learn numerous skills in this class that will not only assist them as they design and fabricate their robotic arm, but will provide them with skills that they can use throughout their college and professional careers.

This new class will serve as the first year of a new engineering elective progression, featuring *Product Design Engineering* as a second year engineering course, with *Engineering Design and Fabrication* as a pre-requisite. This will ensure *PDE* students will have built the robust skill set necessary to develop their unique product ideas.

- Brent Holt and Mark Levy

Alumni Spotlight on Sam Harvey

Nine years later, Sam Harvey, RVGS/Salem High School Class of 2008, is still a Lab Rat, and he wouldn't have it any other way. He's in a fully-funded joint MD-PhD program that has a 3% acceptance rate and actually pays him a stipend, so a very well-educated Dr. Dr. Harvey will graduate completely debt-free. Sam was kind enough to answer some questions for us via email.

Where have you been?

At the College of William & Mary. I became fascinated with molecular biology and molecular genetics while taking Dr. Kowalski's biology class at RVGS, and junior year I took my project on nutritional mutants of *E. coli* all the way to ISEF. One of the main reasons I picked William & Mary was due to the strength of the undergraduate research programs. I wanted to go where I would be able to play a major role in the conception and implementation of my own research project.

What were you doing there?

I became involved in research during my first semester at William & Mary, enrolling in a yearlong lab class that focused on phage biology, which are viruses that infect bacteria.

There I met Dr. Mark Forsyth, an extraordinary mentor and a critical reason for my success in college. He gave me free rein of his **microbiology lab**, advised me throughout my honors thesis, and even introduced me to my future wife!

Where are you now?

At a Medical Scientist Training Program (MSTP) at Northwestern University's Feinberg School of Medicine in Chicago. **MSTPs are MD-PhD programs** that have the distinction of receiving funding from the National Institutes of Health. The entire program is tuition free, and MSTP students also receive a stipend to cover the cost of living. The goal of MSTPs is to train the next generation of physician scientists with the ability to understand the nature of human disease and conceive of innovative methods to target and hopefully cure these diseases.

What are you doing there?

I am currently in year 5 of the 7-9 year program, which means that **I have completed 2 years of medical school and am in year 3 of the PhD program**. My project is to investigate the role of an RNA binding protein called hnRNPM that our lab has shown to be crucial for breast cancer progression and metastasis. I am trying to determine how hnRNPM binds and regulates hundreds of human genes with a focus on alternative splicing in an effort to better understand how RNA binding proteins in general can contribute to cancer. The overall purpose of the project is to **better understand how to predict and prevent breast cancer metastasis**.

Where are you going?

As cancer is my principle area of academic interest, **I plan to graduate from the MSTP in 2020 or 2021 and then begin a residency** in a medical specialty within the realm of oncology. I am not yet sure which specialty I will pursue, but I am currently **considering Medical Oncology, Radiology, Pathology, and Radiation Oncology**. After completing my residency **I plan to become a physician scientist** at an academic medical center where I will split my duties **conducting translational cancer research while also treating patients**.

How is what you learned at Gov. School helping you get there?

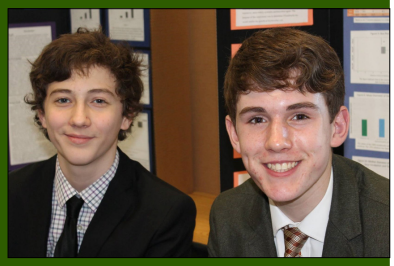
The focus on research early was absolutely key for developing my passion. I became fascinated with the nature of reality and beautiful complexities of biology, and **Intersession allowed me to get a head start on the techniques and lines of inquiry involved in conducting independent research and trying to articulate a scientific hypothesis**. My experiences presenting my research at science fairs allowed me to interact with outstanding peers and **develop the confidence I needed to believe that I could contribute meaningfully to science**.

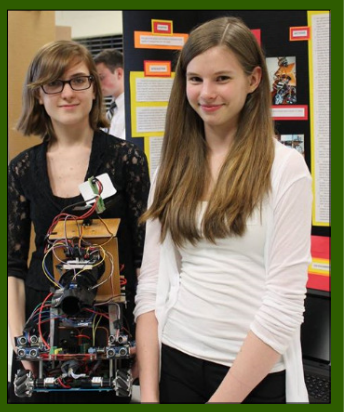
RVGS provided opportunities for me to **meet some critical mentors** and helped me apply to the Virginia Summer Residential Governor's School, where I was first **introduced to the career track of the physician scientist and the existence of MSTP programs**.

The Governor's School's outstanding teachers and resources provided me valuable practical and conceptual experiences, and I hope I have made it clear just how important RVGS was in helping to place me on the path I walk today.

-Regina Carson

Congratulations to our students on an excellent showing at Project Forum! We also want to thank all the generous individuals who supported our Annual Appeal and Silent Auction fundraisers. Lists of student award winners and fundraiser sponsors can be found on the RVGS website.





Recognizing Our Excellent Teachers

Two members of the RVGS staff recently received well-deserved praise for their expertise and dedication.

Mrs. Harnist was selected by her peers as the RVGS Teacher of the Year. She will be recognized along with other school teacher of the year selections at a banquet in April. Congratulations to Mrs. Harnist and a sincere thank you for all you do for our students.

Dr. Frazier was named this year's Outstanding High School Chemistry Teacher by the Virginia Blue Ridge Section of the American Chemical Society. He will be honored at a banquet and will receive a chemistry handbook, a cash award, and funding support for classroom supplies.