Linwood Holton Governor's School

Fall 2012 Newsletter

www.hgs.k12.va.us Virginia's First Virtual Governor's School



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Director's News

I am happy to report that we are off to another great year here at the A. Linwood Holton Governor's School. Presently we are working with 197 students in our Fall Semester and Year-Long Courses. These students come from all across Southwestern Virginia, a region encompassing over 4,000 square miles and made up of 16 school divisions.

From the convenience of their home high schools, our students make use of sophisticated computer technology to virtually meet with our instructors and their classmates while they learn about a wide variety of very interesting courses and topics. Courses like Astronomy, Anatomy & Physiology, Appalachian History, Engineering & Robotics, Advanced Multi-Media, and others would not otherwise be available to these students.

While our students are completing these courses, and earning both high school and college credit for doing so, they also become very proficient with the sort of equipment and distance learning software they will be required to use when they get to college. Past students testify to the many benefits that they have derived from taking our classes.

One of my favorite things about fall is the opportunity to meet with our new students and many of their parents during Orientation. This year I had the privilege of meeting with 47 We spent about an hour talking about HGS parents. explaining the benefits of our program, answering a variety of their questions, etc. This year, like every other one since I have been here, I asked for their help with a persistent problem we have. I will ask the same from you as well - Help Me Get The Word Out About Our School And Its Many Benefits. You wouldn't think that would still be a problem after 14 years, but I assure you it is. Many of the parents and students I spoke with had not heard of our school until very recently. Unfortunately some of these students were Seniors and would not have another opportunity to take other classes with us and many of the parents said they had older children, who had already graduated, who would have benefitted greatly from what we offer, if they had only known. "If They Had Only Known" are words that I hear too often as I travel around our region. Please help me ensure that everyone does know about the HGS and what we offer free of charge to qualifying students of our region.

Danny Dixon

This school year is off to a running start for Anatomy students. It is hard to believe the course is half over for the students in the Block Class. The holidays have begun and time is a valued commodity to Holton Governor School students.

Anatomy & Physiology

Most Anatomy students are learning new study skills that are more demanding and challenging. This is normal for students who are taking a college level science class with a laboratory component. Memorizing new terminology so that everyone can talk "Anatomy & Physiology" has been our first goal. As a result all classes are now walking through the 11 body systems.

Laboratory activities and experiments are keeping everyone busy. Students are learning how to apply what they are learning in class lectures to the experiments they are completing. Writing a college level laboratory report involves



applying terms learned to the objectives and conclusions of the labs. The lab reports are truly amazing and are really helping students with hands-on applications for learning the scientific concepts.

Thank you to everyone in the homes of my students for letting them take over your kitchen and refrigerator for experiments. Also much appreciation for allowing samples to remain for several days in many different areas. Some students are telling me that they are performing many of the activities more than once because everyone at home wants to know what is going on. This is wonderful because it really helps students to understand the scientific procedure.

Two classes will depart from the Higher Education Center in mid-November for Eastern Virginia Medical School in Norfolk, Virginia. This experience is one of a kind and will thrill the students. While at EVMS students will be in a clinical setting with patients who are actors. They will teach the students how to communicate with a patient to determine what is going on in their bodies. Students will learn how to diagnose simple illnesses. The biggest thrill is the gross anatomy lab. I usually have to bribe the students to leave. They are amazed at how much they learn from this hands-on experience. Much time will be spent with medical students and it will be good to see a former student, Spencer Leong, who is now a 2nd year medical student at EVMS. Spencer graduated from

Abingdon High School and Emory & Henry College. The other classes will be making this same trip in the early spring.

The Block Class is involved in a Shadowing Project. They are spending time with professionals in medical careers that they are interested in. This experience, along with the Medical School one, will help them decide if they can see themselves in the career. Most students really benefit from both opportunities.

My students are now realizing the values of being in a Virtual Classroom. Many are finding that using the Internet and Power Point slides along with the normal lecture and textbook allows them to learn new information much faster. The students are able to make the large

amount of new information they are learning in this course their own. In the Virtual Classroom they are learning outside the mortar and bricks of a regular classroom, and are incorporating the advantages the computer and the Internet offer instead. They are also in classes with students from many different high schools, and this has given them a new and different perspective as well.

It is a great pleasure for me to teach such bright students. I am looking forward to second semester already. Please have a safe and happy holiday.

Karen Webb Smith, Anatomy & Physiology Instructor

ne Mousetrap 400 Ika

Bristol Motor Speedway has the Food City 500 and Linwood Holton Governor's School has the Mousetrap 400. Speed, acceleration, and crashes are characteristic of both. However, students at the school have to use a mousetrap to provide power for their cars rather than a 750 horsepower V-8 engine.

Students had to construct their own cars from balsa wood, four wheels, a piece of string, some glue, and a mousetrap. This hands-on, minds-on project allowed students in Dr. Rapp's Physics class to be creative and to show how physics can be relevant in everyday life. All students had identical components to assemble into a screaming, go-fast race car. As the September 20 race day approached many of the students were getting pretty nervous. Some were wondering if their car would have enough power to finish the race. Others were worried that their car might not even get off the starting line.

Students had to turn in a lab report concerning the race. They timed how long it took their race car to traverse 4 meters (400 centimeters, hence the Mousetrap 400). By knowing the time and distance covered they could calculate the speed of their cars. With this information they also calculated the average acceleration. They could see applications of the physics equations they had learned in class.

The student that had the racecar that reached the finish line in the shortest amount of time was awarded First place. Kristin from Patrick Henry High School had the fastest elapsed time of 1.78 seconds. Second place went to Jordan from Twin Springs High School, with an elapsed time of 3.13 seconds. Third place was awarded to Jared from Bland High School with an elapsed time of 5.06 seconds. All the winners received certificates and a robotics kit.

"Not only did this project allow physics equations to come alive, it also allowed students to satisfy the goals of the National Science Education Standards," said Dr. Rapp.







STUDENTS DOMINATE NASA COMPETITION



Students in Dr. Steve Rapp's Physics and Robotics classes slam dunked the NASA Environmentally Responsible Aviation Essay Contest. The competition was international in scope with more students from Europe and India entering than U.S. students. Holton students received five of the 6 available awards. The winning research papers can be viewed <u>HERE</u>.

The students could enter the completion as a team or as an individual. Listed below are the titles and winning authors. NASA is awarding the students an engraved trophy and a monetary award.

Team Winners:

Ultra-High By-Pass Engines: First (\$1500)

S. Emily Beauchamp (J.I. Burton High of Norton City) Austin Patrick (Gate City High of Scott County) Cameron Hankins (Bland High of Bland County)

Advance Composite Structural Concepts for Weight Reduction: Second (\$750)

Rehan Razzaq (Graham High of Tazewell County) Misbah Muzaffer (Graham High of Tazewell County) Sana Sekkarie (Graham High of Tazewell County)

Drag Reduction through Laminar Flow: Third (\$500)

Ben Pruitt (Rocky Gap High of Bland County) Kathryn Irwin (Rocky Gap High of Bland County)

Individual Winners:

Structural Concepts for Weight Reduction: Second (\$500)

Ryan Williams (Galax City High of Galax City)

How is Laminar Flow used in Modern Engineering?: Third (\$250)

Tyler Cook (Abingdon High of Washington County)

"I am so proud of these students; they worked hard to complete their research papers and did an excellent job," said Dr. Rapp. "For me they provide hope for the future of science and engineering."

About the Competition: As the Next Generation Air Transportation System (NextGen) evolves to meet the projected growth in demand for air transportation, the environmental impacts of noise and emissions are a growing concern and could limit the ability of the system to accommodate growth. Science and pre-engineering students (grades 9 - 12) were invited to submit a well-documented research paper of no more than 12 pages to demonstrate their understanding of one of the following possible solutions to the environmental impacts of aircraft noise and emissions:

- \checkmark Drag reduction through laminar flow, or
- ✓ Advanced composite structural concepts for weight reduction, or
- ✓ Low NOx, fuel-flexible combustors, or
- ✓ Integration of advanced ultra-high by-pass engines for noise reduction and fuel burn improvements.

Criteria for Evaluation:

Each project was judged on its own merit by a group of NASA engineers. Award level entries were to be well written, thorough, and concise. Entries were judged on how well students focused their essay and how well they addressed four basic criteria: Informed Content, Creativity and imagination, Organization, and Writing.

Scores were determined using the following guidelines:

- ✓ Informed Content, 30 points
- ✓ Creativity and imagination, 30 points
- \checkmark Organization of the essay, 20 points
- ✓ Writing, including documentation, 10 points
- ✓ References 10 points

Dr. Elizabeth Ward, Director of Student Programs, at NASA Langley Research Center made these comments in an email to Dr. Rapp, "Thank you again for your diligence to get your students interested in something STEM related that is outside their class work. The kids you have in your class are very blessed to have you as their teacher."

Welcome to our latest Instructor, Ms. Alicia Johnson



Relaxed and focused on work. So are her students!

Alicia joined our team this August of 2012. With a Bachelor's degree in English and a Master's in Instructional Media, Alicia is highly qualified to instruct our *Advanced Multimedia Applications* course. She offers a comforting—yet challenging—personality and instructional style that will capture the hearts of our students.

An English Teacher from Giles County Schools, Alicia taught 8th and 11th grade general education and college prep students for the past five years. Mrs. Johnson earned her Bachelor of Arts in Literature at Mary Washington College, her Master of Science in Instructional Media from Wilkes University, and this fall will begin Virginia Tech's "Instructional Design and Technology" doctoral program. We wish her well in her studies.





Class News

Advanced Multimedia Applications

by Course Instructor, Alicia Johnson

This semester's group of Advanced Multimedia Applications (AMA) students are fully taking advantage of the age of technology. Each of the class members, while attacking the individual aspects of multimedia creation, has been continually demonstrating their creative talents and problem solving skills.

I feel like AMA is such a great course for students, especially those moving on to college. In addition to becoming adept with the hardware and software applications used in creating multimedia presentations, students also work on leaving their comfort zones and finding their voices through the many choices afforded to them by today's media tools. Using technology naturally encourages them to solve problems that arise through its use. The pre-planning, thinking things through and necessary multiple edits required in multimedia design are all skills that cross-over into every aspect of their lives. By getting to know their audiences, students learn the importance of delivering meaningful messages in many different ways. By learning how to critique others' work with purpose (instead of attitude) and accepting that critique maturely, students are able to perfect their much needed communication skills.



Hunter Dishner — Rye Cove High School, work on his digital photograph editing software.

One assignment students completed this semester was to try to find "letters" inside of everyday objects. We had been studying the use of text in multimedia communications, and the importance of font and color selection because of their various affects on their audiences. We went on to discuss that images, by themselves, also convey messages, if we look closely. This led to a practice of looking at things more closely.



Letters, "S," "T," "U," and "V" submitted by Alexa Harrison, Grundy High School.

You might look at these letters and say "so what." But, don't we want our students to *see* more than the average person? If one can look at a meat fork and *see* the letter "U," it does not necessarily mean that they can solve the world's problems. However, because they are training themselves to look *past* the surface, to *see* something inside the "obvious," and then use that thing they *see* to communicate a message in such a way that attracts our attention and holds it...they very well may help others *see* more solutions to the many problems we face today; or at least *see* more possibilities. With their newly acquired skills in multimedia communication, they will be able to share what they *see* with the world...and maybe, help to solve a world problem, right?

What our multimedia students have been practicing this

first semester is, not only seeing the world more closely in order to communicate with it more clearly, but also learning the many tools at their disposal to create that communication.



Michelle Vernon's, Marion High School, example of a close-up shot.

Class News

The History of It All

by Course Instructor, Mark Rogers Hagy

Appalachian History

Continued Student-Led Research Projects

Thanksgiving is behind us and that means, for the ALHGS

Appalachian History class, Course Projects are well underway. Current projects include biographical sketches of Appalachian entertainers such as Dolly Parton and Ralph Stanley and one of Robert Porterfield, founder of the Barter Theatre in Abingdon, Virginia. Other students are adding to the Appalachian History archives holdings dealing with the 1977 flood on a regional basis. "While it is taking a while to get off the ground, our goal of



an archive of student-led research projects dealing with the devastating flood of 1977 is slowly advancing," observed their instructor, Mark Hagy. "Within a few more semesters, I hope we can have a viable, online archive that will serve the region in the future. Thirty-five years have passed since the flood and these young people are recording a past that happened before their births for generations not yet born. The potential is incredible."

The fall 2012 World Civilization course entered the modern period just as

Thanksgiving break came to an end. There are plans underway for group projects on the modern era, with

World Civilization Global History



an emphasis on global history from 1870 to 1950. The projects will focus on imperialism and global conflict in Africa, Eurasia and the Americas during this period. Specific topics will be selected by the students themselves under the direction of the instructor, Mark Hagy. The goal is for a community of learners working on topics of their choosing and presenting their

finding to the entire class in the medium selected by the groups. "Given that this period encompasses the new Imperialism of the late 19th century and 20th century colonialism, the era of the World Wars and the emergence of the post-war era," noted

Hagy, "the students will delve into issues of key importance even today in the current world situation. Also, the students can explore a variety of subjects as a group and, collaboratively, produce a media presentation. This approach reflects the strengths of the ALHGS and the potential of our gifted and talented students."

Western Civilization

Rome's Demographic Differences

Western Civilization owes a tremendous debt to the Romans; viable political lessons for contemporary America permeate the story of Rome. The ALHGS 11:40AM Western Civilization class is devoting a significant amount of time to

studying the reasons for the political turmoil that ended the Roman Republic c. 31AD as well as the major causes of the collapse of

the Roman Empire in Western Europe c. 477AD. Special attention is being paid to the social divisions within the Roman state and the divisions these demographics caused within the Roman body politic. "Given the demographic implications of the 2012 presidential election, the application of Rome's demographic differences to the study of our own society provides a good pedagogical tool for our students," noted Mark Hagy, the instructor, "this is especially helpful given the isolation of our region, demographically speaking, and in the changing mosaic that is 21st century America."



<u>Professor Mark Rogers Hagy</u>

Virginia Highlands Community College 2011-12 Outstanding Faculty Award in Teaching **Congratulations!**

Many Holton Governor's School faculty members wear more than one professional hat. Mark Hagy, the ALHGS history instructor since 2000, also has taught as an adjunct history instructor at Virginia Highlands Community College since 2001.

In April 2012, Mr. Hagy was presented with the VHCC 2011-12 Outstanding Faculty Award in Teaching. The recipients of this award were selected by the students of VHCC. Alma Rowland, division dean, in presenting the award remarked that "students can't always distinguish between full-time and adjunct faculty, but they recognize quality teaching and we wanted to be able to honor our adjunct faculty's contributions." Students who nominated Hagy for this honor stated that Hagy "makes learning a fun process" and that Hagy "not only knows the material that he is teaching, [but] he makes it interesting by adding unusual facts, humor, and descriptions of the times so that the class can relate to what it was like during the time period being studied."



Congratulations, Mr. Hagy!

We here at HGS are very proud of Mark and happy to have him on our faculty. His courses include Appalachian History, Western Civilization, and World Civilization, all of which give students an opportunity to learn more about our history and also get a head start on their College history requirements.

Danny Díxon

Linwood Holton Governor's School Students Searching for Alien Worlds By Dr. Steve Rapp

Students in Dr. Rapp's Astronomy class have become planet hunters, looking for alien worlds outside our own solar system. Just think what it would be like to live on a world that has two stars (suns) instead of just one like the Earth has. Seems strange to even think about it doesn't it. So far, students have about 70 sets of data collected with each set having at least 50 images of a potential alien world (perhaps similar to the image shown below).





Students are using a telescope in the Arizona desert that they can control remotely using their computers. The telescope is provided by NASA and the Smithsonian Center Harvard for Astrophysics. They are taking images of stars thought to be orbited by planets, sort of an "alien" solar system that may be similar to our solar system. Α photo of the Micro-Observatory telescope is shown at left below.

"Micro-Observatory is just a small telescope — its mirror is barely six inches wide — but it can see a billion light-years into space. It has camera inside, so you can take your own images of what the telescope is looking at. It is ideal for searching for other worlds" said Dr. Rapp. Each student has their own user name and password to gain access to the telescope. It has been a pretty busy telescope for last several weeks with students taking images about every three minutes.

The students observed 6 different star systems at different times and dates. Image processing software (MOImage) is used to enhance their images. However, before analysis of the image begins, students need to know how to look for a signal that will tell them that they have discovered an alien world outside of our solar system! So, students work with scientific models to help them predict what they might find - and help them interpret what that do find. As a planet orbits its star, it periodically blocks out some of the light from its star. (This is similar to an eclipse of the Sun, where the Moon blocks out the light from the Sun.)



Left: As seen from Earth, a planet that passes in front of its star blocks some of the star's light. This is called a "transit." Right: After the transit, more of the star's light is visible (plus a little bit of light reflected from the planet.)

The transit detection method is one of the most important ways to find planets in other star systems - and it's the one students used. However, it only works when the orbit of the alien planet happens to be aligned just right, with respect to our line of sight. They did some computer modeling on transit light curves by plotting time on the x-axis and brightness of the star on the y-axis as shown in the image below. The dip in the graph tells the student that an



alien planet has passed in front of the star. Dr. Rapp setup a transit schedule for the students so they could obtain enough data to have an accurate light curve of the potential extrasolar world. One such schedule is shown below.

October 18, 2012						
Name	T time					
Christopher	6:46	6:50	6:53	6:57	7:00	
Adam	7:03	7:06	7:09	7:12	7:15	
Patrick	7:21	7:27	7:33	7:39	7:42	
Nick	7:47	7:50	7:53	7:56	7:59	
Alex	8:02	8:05	8:08	8:11	8:14	
Jonathan	7:17	7:20	7:23	7:26	7:29	
Jeffery	7:32	7:35	7:38	7:41	7:44	
John	7:47	8:00	8:03	8:06	8:09	
Jesse	8:11	8:14	8:17	8:20	8:23	
Katie	8:26	8:29	8:32	8:35	8:38	
Patrick	8:41	8:44	8:47	8:50	8:53	
Nick	8:56	8:59	9:03	9:08	9:14	
Alex	9:20	9:26	9:32	9:38	9:44	
Jonathan	9:50	9:53	9:56	9:59	10:03	

TRES3 Transit Times October 18, 2012

Please go to the Other Worlds / Other Planets website,

<u>http://www.cfa.harvard.edu/smgphp/otherworlds/index.php</u> and then to telescope access, sign in and set up the telescope to take images at the times listed by your name. If the minutes don't match up exactly with the numbers available at the telescope just select the closes one to your assigned time.



This image is a typical image the students obtained using the Micro-Observatory telescope. Student used star charts to figure out where their alien planet might be located. They are analyzing data right now and hope to come to some conclusion about their extrasolar adventure by December 10. Who knows, these planet may discover a new planet or maybe more than one!

How much fun was that!

NRAO Field Trip Student Comments

From March 16, 2012 to March 18, 2012 my classmates and I went on a field trip to Green Bank, West Virginia to visit the National Radio Astronomy Observatory. I had a great experience which was both educational and extremely fun. We observed the particles of hydrogen in the Milky Way. My group and I were able to use the 40-foot telescope to record the frequencies of hydrogen waves. We each had a job in the bunker that controlled the telescope. We could move the telescope and control what particles the telescope would detect. My job was to write down the starting right ascension and the declination. I was also responsible for marking down the frequency at each 10 second mark. Our hydrogen particles were red shifting or moving away from us. My group including Jose Piriz and Austin Patrick observed the first quadrant which is between 0 degrees and 90 degrees. We discovered that things in our Galaxy are rotating around the black hole in the galactic center. We also learned about the use of different types of telescopes in the vicinity. I enjoyed working with my group and exploring the area. The entire group including myself visited the Green Bank Telescope or the Great Big Thing. I was amazed by its size and all of its different uses. The dorms were clean and spacious. While the food and entertainment options were very good. There was never a dull moment as we all talked, played cards, took walks, played in the recreational room, and explored the property. I made new friends and met many of my Physics classmates. Overall the experience was amazing.

Sana Sekkarie (Graham High)

The trip to the Green Bank Telescope (GBT) at the National Radio Astronomy Observatory (NRAO) has been one of the greatest and most interesting experiences of my life. I greatly enjoyed the fellowship and camaraderie that came along with making new friends from across the region. All of my fellow students were very knowledgeable and it was wonderful to converse with them and discuss the results of our findings. The most enjoyable experience, to me, was witnessing the GBT in action. Witnessing such an incredible and miraculous marvel technical innovation work and contribute countless amounts of data toward the advancement of modern science. The cooling process involved in the functioning of the receivers in the GBT was greatly intriguing. Who would believe they would need to be cooled down to fifteen degrees Kelvin! Merely watching the GBT move and position itself to the proper astronomical location was astounding! It was like something out of a science-fiction film. I also enjoyed using the 40-foot telescope. Never in any other field-trip have I been allowed to use such technology with so much freedom. That was a refreshing experience and gave me confidence that I was being trusted to use this technology. Sue Ann, our educator, was very knowledgeable and welcoming to help all of us. I was not afraid to ask her questions. She effectively communicated the procedures and theories we would need to use the machinery and, more importantly, she made it fun and interesting. This was a wonderful trip and I am so excited to have been a part of it.

Austin Patrick (Gate City High)



This Friday, November 30th, superintendents, principals, counselors, facilitators, gifted and technology coordinators, college administrators, and others across the region are invited to attend an Appreciation Luncheon at the Southwest Virginia Higher Education Center on their behalf.

"On behalf of the Faculty and Staff of HGS, I would like to express our appreciation to all of our K-12 and Higher Educational Partners, our Advisory Committee, and our Governing Board for your ideas, guidance, and unwavering support of our school and its programs. It is a pleasure to work with each of you and we look forward to another successful year!" said Danny Dixon, Director of the School. "The goal of the luncheon is to let our supporters know that we are aware of the time and effort that they contribute to our school and students and that they are appreciated."

We look forward to another successful luncheon.

We **All** Thank You!









ALHGS Newsletter

Our Supporters

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Governing Board Members

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Thank You for nurturing the lives of our mutual students!

Advisory Committee Members

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