

Virginia Board of Education Agenda Item



Agenda Item: U

Date: October 25, 2012

Title	First Review of a Proposal from Newport News City Public Schools to Establish the Heritage High School Governor’s Science, Technology, Engineering, and Mathematics (STEM) Academy		
Presenter	Toinette Outland, Program Administrator, Heritage High School, Newport News City Public Schools Lolita B. Hall, Director, Office of Career and Technical Education Services		
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Purpose of Presentation:

Other initiative or requirement. Specify below:

First review and acceptance of the Proposal from Newport News City Public Schools to Establish the Heritage High School Governor’s STEM Academy

Previous Review or Action:

No previous review or action.

Action Requested:

Action will be requested at a future meeting. Specify anticipated date below:

Date: November 29, 2012

Action: Final review and approval

Alignment with Board of Education Goals: Please indicate (X) all that apply:

X	Goal 1: Expanded Opportunities to Learn
	Goal 2: Accountability of Student Learning
	Goal 3: Nurturing Young Learners
	Goal 4: Strong Literacy and Mathematics Skills
	Goal 5: Highly Qualified and Effective Teachers and Administrators
	Goal 6: Sound Policies for Student Success
	Goal 7: Safe and Secure Schools
	Other Priority or Initiative. Specify:

Background Information and Statutory Authority:

Goal 1: The Governor’s STEM Academy is designed to expand opportunities for the general student population to acquire STEM literacy and other critical skills, knowledge, and credentials that will prepare them for high-demand, high-wage and high-skill careers.

Partnerships establishing academies must include at least one public school division, business and industry, and postsecondary education. On November 29, 2007, the Board of Education approved the

criteria to establish a Governor’s STEM Academy. Subsequently, on March 19, 2008, the Board approved the standards for the Governor’s Career and Technical Education Exemplary Standards Awards Program, which all Career and Technical Academies must implement.

As required by the Board of Education, the State Council of Higher Education for Virginia (SCHEV) is currently reviewing the attached proposal. Their report and recommendation is expected by November 1 prior to the second review of the proposal by the Board of Education (Attachment B). Staff members of the Virginia Department of Education (DOE) have reviewed the proposal in the context of the Board’s criteria. An executive summary of the proposal is in Attachment A. Attachment C is the report from the review by the DOE. Attachment D is the complete proposal.

Currently, there are 16 Governor’s STEM Academies in Virginia. They are located in Arlington County, Carroll County, Chesapeake City, Chesterfield County, Fairfax County, Halifax County, Hampton City, Loudoun County, Lynchburg City, New Kent County, Richmond City, Roanoke County, Russell County, Stafford County, Suffolk City, and Virginia Beach City.

Summary of Important Issues:

The proposal for the Heritage High School Governor’s Science, Technology, Engineering, and Mathematics Academy consists of partnerships with Christopher Newport University, Thomas Nelson Community College, Norfolk State University, Newport News Education Foundation, Newport News Shipbuilding, Thomas Jefferson National Accelerator Facility (Jefferson Lab), Canon Virginia, Virginia Peninsula Chamber of Commerce, and the Peninsula Council for Workforce Development.

The Heritage High School Governor’s STEM Academy will offer a program of study designed to expand options for students to acquire skills in science, technology, engineering, and mathematics. The program combines academic coursework and research experience with a challenging and focused school environment to prepare students for 21st century careers. Students will gain the knowledge and skills they need to succeed in postsecondary education and in technology-rich workplaces by learning how to work in teams, communicate effectively, and apply the principles of science, technology, engineering, and mathematics. Students may choose a program of study from six career pathways within three career clusters as follows.

Career Cluster	Career Pathway	Heritage High School Academy Program
● Science, Technology, Engineering, and Mathematics	● Engineering Technology	● Engineering and Electronics
● Architecture and Construction	● Design and Pre-Construction	● Architectural and Engineering Drawing
● Information Technology	● Programming and Software Development ● Web and Digital Communications	● Modeling and Simulation (Computer Science)
	● Network Systems ● Information Support Services	● Computer Systems Technology (Networking)

The *Engineering and Technology* pathway prepares students to apply engineering and technical concepts to develop solutions for problems that exist throughout a broad range of fields from building bridges to flying airplanes to working in the medical industry.

The *Design and Pre-Construction* pathway provides students an opportunity to use their artistic creativity and mathematics skills to transform an innovative concept into a design plan that creates something tangible and guides construction professionals through the building process. Highly-skilled workers who earn specializations and certificates of accreditation are in great demand as this field continues to advance and becomes more competitive.

The study of *Information Technology* requires a solid foundation in mathematics and science as well as high technical skills. Students learn how to design, develop, and manage different types of software programs and hardware. Information technology workers can be found in virtually every sector of the economy, providing assistance at a multitude of levels.

Academy students will be provided an opportunity to participate in dual enrollment courses with the Thomas Nelson Community College and work-based learning experiences..

Impact on Fiscal and Human Resources:

Funding must be provided at the local level.

Timetable for Further Review/Action:

The proposed beginning date for the Heritage High School Governor's Science, Technology, Engineering, and Mathematics Academy, Newport News City Public Schools, is September 2013.

Superintendent's Recommendation:

The Superintendent of Public Instruction recommends that the Board of Education accept for first review the proposal to establish the Heritage High School Governor's Science, Technology, Engineering, and Mathematics Academy, Newport News City Public Schools.

Heritage High School Governor's STEM Academy
Newport News Public Schools
Executive Summary
October 9, 2012

Partnership Members: Newport News Public Schools, Christopher Newport University, Norfolk State University, Old Dominion University, Thomas Nelson Community College, Canon Virginia, Inc., Newport News Education Foundation, Newport News Shipbuilding, Peninsula Council for Workforce Development, Riverside School of Health Careers, Thomas Jefferson National Accelerator Facility, and Virginia Peninsula Chamber of Commerce.

Lead Entity and Fiscal Agent: Newport News Public Schools

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Academy Location: Heritage High School

Number Students: The Governor's STEM Academy will have the capacity to enroll 400 students, grades 9 – 12. During the initial school year (2013–2014) 150 students will be admitted.

Career Pathways: Design and Pre-Construction
Engineering and Technology
Programming and Software Development
Web and Digital Communications
Network Systems
Information Support Services

Academy Goals and Performance Measures: The goal of the Heritage High School Governor's STEM Academy is to promote student achievement and interest in STEM career fields to prepare students for global competitiveness in high-skill, high-wage, and high-demand STEM careers.

The following performance measures have been established by the planning committee:

- Increase the number of students who earn a grade of B or better in advanced mathematics courses beyond Algebra II by 3 percent over the next four years
- Increase the number of Academy students meeting the requirements of the Advanced Studies Diploma by 10 percent over the next four years
- Increase the number of students earning industry certifications by 10 percent over the next four years
- Increase the number of postsecondary credits earned through dual enrollment, advanced placement courses, and the Early College program by 5 percent over the next four years
- Ensure that 100 percent of students participate in work-based learning experiences, through strong partnerships with businesses and organizations
- Increase our school's high school graduation rate by 3 percent over the next four years
- Reduce our school's high school dropout rate by 2 percent over the next four years
- Increase enrollment and retention in postsecondary education by 5 percent over the next four years by giving students the opportunity to earn dual enrollment credit. After graduation from high school, academy graduates will complete Career and Technical Education Follow-Up surveys to determine successful enrollment and retention in postsecondary institutions. Graduates will have the opportunity to network on the Heritage High School's Governor's STEM Academy's social media site. This will allow the school to keep in contact with students and updated with their current postsecondary placements
- Increase the proportion of students completing a college and career curriculum in high school by increasing enrollment and completion rates annually by 5 percent in specified career pathway academy courses
- Reduce the proportion of students requiring remediation in college by 5 percent by carefully monitoring student achievement and providing academic support when necessary. Success will be measured by the number of students who meet the basic college entrance criteria as determined by the Virginia Community College System. An Academic Learning and Tutoring Center will be available for current academy student and academy graduates
- Increase the number of academy graduates employed in high-wage, high-demand, and high-skill careers as identified by the Virginia Employment Commission over the next six years after high school. Approximately sixty percent of Academy graduates will obtain employment within identified

career pathways and related occupations following postsecondary education.

Highlights
of the
Program:

As a result of participating in the Governor's STEM Academy in the pathways of Design and Pre-construction, Engineering and Technology, Programming and Software Development, Web and Digital Communications, Network Systems, and Information Support Services, students will:

- Gain a deeper understanding of the skills and knowledge incorporated in their fields of study;
- Benefit from specialized, project-based courses which develop critical-thinking, problem-solving, and decision-making skills, preparing them for the 21st-century world;
- Acquire greater communication skills;
- Develop workplace readiness skills;
- Receive opportunities to earn industry certifications preparing them to be more competitive in the work force and when applying to advanced training schools or postsecondary institutions;
- Obtain meaningful, real-life, hands-on experiences in their career pathway; and
- Profit from opportunities for internships, mentorships, job shadowing, and cooperative education, which provide students with advantages when entering postsecondary education and/or the workplace.

The State Council of Higher Education for Virginia (SCHEV)

Review of the Heritage High School Governor's STEM Academy – Newport News Public Schools

NOTE: The SCHEV staff is currently reviewing the proposal. Their report and recommendation is expected by November 1 prior to the second review of the proposal by the Board of Education.

**Virginia Department of Education
Governor's STEM Academy
Proposal Review Checklist**

**Title of Proposal: Heritage High School Governor's
STEM Academy**

Lead Entity for Proposal: Newport News Public Schools

Date of Review: October 9, 2012

**Virginia Department of Education
Governor’s STEM Academy
Proposal Review Checklist**

I. Partnership Capacity

Partnerships desiring to implement a Governor’s STEM Academy shall provide the Department of Education with evidence of the following:

Criteria	Documentation			Comments
	Full	Partial	None	
A. An active, ongoing planning committee, including a list of members and signed certifications from each that they are willing and able to serve in that capacity. At a minimum, members must represent K-12 education (superintendent or designee), higher education, and business and industry. All partners must be represented on the committee.	X			
B. An advisory committee, including a list of members and signed certifications from each that they are willing and able to serve in that capacity.	X			
C. A written memorandum of agreement among school divisions, local businesses, postsecondary institutions, and any other partners that outlines ways in which community resources will contribute to the Governor’s STEM Academy to broaden the scope of students’ educational experiences.	X			

Criteria	Documentation			Comments
	Full	Partial	None	
D. A statement of assurances that the Governor’s STEM Academy Planning Committee has reviewed provisions of <i>Administrative Procedures Guide for the Establishment of Governor’s STEM Academies</i> and agrees to follow the guidelines set forth in the document (see appendix).	X			
E. A statement of assurances that, if applicable, an ongoing Governing Board will be established to reflect current Board of Education regulations relative to jointly operated schools and programs (see appendix).	X			
Comments:				

II. Need/Rationale for the Academy

Partnerships desiring to implement a Governor’s STEM Academy shall provide the Department of Education with evidence of the following:

Criteria	Documentation			Comments
	Full	Partial	None	
A. Demonstration of the need/rationale for the Academy. This statement should be concise and state the major reasons to have a Governor’s STEM Academy, including need at the state, local and/or regional levels.	X			
B. A description of the enhanced or additional offerings in science, technology, engineering, and/or mathematics (STEM) that will meet the need described above.	X			
C. A fiscal agent that is a public entity, including a certification that the entity is willing and able to serve in that capacity.	X			

Criteria	Documentation			Comments
	Full	Partial	None	
Comments:				

III. Program Description

Each Governor’s STEM Academy planning committee shall develop cooperatively with local school divisions, business, community, and higher education partners and have available for review and dissemination, a program description that includes:

A. A statement of program goals addressing the following criteria:

Criteria	Documentation			Comments
	Full	Partial	None	
1. Rigorous academic content in career and technical instruction;	X			
2. An emphasis on STEM career pathways;	X			
3. Individualized high school plans to ensure course selections that are aligned with students’ transition and career goals after high school;	X			
4. Evidence that graduates will complete a college and work readiness curriculum, minimally at the level specified for Commonwealth Scholars Course of Study (State Scholars Core) with the possibility of pre-approved substitution of equivalent courses where there may be more relevant course selections for a particular career pathway;	X			
5. Incorporation of Virginia’s Workplace Readiness Skills.	X			
Comments:				

B. A statement of program objectives and performance measures to:

Criteria	Documentation			Comments
	Full	Partial	None	
1. Improve academic achievement of Academy students;	X			
2. Increase completion of dual enrollment courses;	X			
3. Provide workplace readiness experiences for students through strong partnerships with businesses;	X			
4. Increase high school graduation rates;	X			
5. Reduce dropout rates;	X			
6. Increase enrollment and retention in postsecondary education;	X			
7. Increase the proportion of students completing a college and workplace ready curriculum in high school;	X			
8. Reduce the proportion of students requiring remediation in college;	X			
9. Increase the number of industry certifications awarded to high school students; and	X			
10. Increase the number of graduates employed in high-wage, high-demand and high-skill careers.	X			
Comments:				

C. A brief description of the proposed program, including:

Criteria	Documentation			Comments
	Full	Partial	None	
1. Site location;	X			
2. Number of students to be served;	X			
3. Grade levels;	X			
4. General curriculum design;	X			
5. List of courses to be delivered;	X			
6. Description of how/where the courses will be delivered. Courses may be delivered on a high school, technical center or community college campus, online, or in other innovative ways; and	X			
7. Designation of full-day or part-day, academic-year program.	X			
Comments:				

D. Evidence of participation in the Governor’s Exemplary Standards Award Program for Career and Technical Education

	Documentation			Comments
	Full	Partial	None	
	X			
Comments:				

E. Program and course descriptions

E.1. At least two well-articulated career pathways must be included that meet the following criteria:

Criteria	Documentation			Comments
	Full	Partial	None	
Pathway #1				
a. Must include opportunities to earn industry credentials, postsecondary certificates, diplomas or associate degrees while in high school and pursue additional industry credentials and academic degrees at the associate, bachelor's and graduate levels. These pathways may be in the same or different career clusters.	X			
b. Must be in a field identified by a statewide authority or organization, such as the Virginia Economic Development Partnership or the Virginia Research and Technology Advisory Commission, as a strategic growth area for Virginia. Examples include biosciences, information technology, automotive technology and motor sports, as well as modeling and simulation and nanotechnology or	X			
c. Must address regional and local work force demand in a high-wage, high-skill field as identified by employers and work force officials.	X			
d. At least one pathway must be in a STEM-related field. This career pathway should drive the innovative capacity of the region and/or state.	X			

Criteria	Documentation			Comments
	Full	Partial	None	
Comments:				

Criteria	Documentation			Comments
	Full	Partial	None	
Pathway #2				
a. Each career pathway must include opportunities to earn industry credentials, postsecondary certificates, diplomas or associate degrees while in high school and pursue additional industry credentials and academic degrees at the associate, bachelor's and graduate levels. These pathways may be in the same or different career clusters.	X			
b. Must be in a field identified by a statewide authority or organization, such as the Virginia Economic Development Partnership or the Virginia Research and Technology Advisory Commission, as a strategic growth area for Virginia. Examples include biosciences, information technology, automotive technology and motor sports, as well as modeling and simulation and nanotechnology, <u>or</u>	X			
c. Must address regional and local work force demand in a high-wage, high-skill field as identified by employers and work force officials.	X			
d. Of the two pathways described, at least one must be in a STEM-related field. This career pathway should drive the	X			

Criteria	Documentation			Comments
	Full	Partial	None	
innovative capacity of the region and/or the state.				
e. Additional career pathways may address one of the areas described above, or an area identified by the partnership as an area of interest, growth, or expansion for students in the service area of the Academy.	X			
Comments:				

E.2 List of all requirements for successful program completion.

	Documentation			Comments
	Full	Partial	None	
	X			
Comments:				

E.3 Academy graduates must achieve one or more of the following benchmarks:

Criteria	Documentation			Comments
	Full	Partial	None	
a. Earn one or more industry certifications or state occupational licenses, and/or demonstrate competencies on an assessment instrument recognized by postsecondary institutions such as CLEP examinations, collaboratively designed or mutually approved end-of-course tests, college placement tests, or student portfolios reviewed by a team of college and high school faculty; or	X			

Criteria	Documentation			Comments
	Full	Partial	None	
b. Earn at least 9 transferable college credits as defined in the Early College Scholars program (includes dual enrollment, AP and other options); or	X			
c. Earn an Associate Degree.				
Comments:				

E.4 Significant work-based experience must be included representing additional instruction or training beyond the classroom such as:

Criteria	Documentation			Comments
	Full	Partial	None	
a. Cooperative Education; or				
b. Internships; or	X			
c. Job Shadowing; or	X			
d. Mentorships; or	X			
e. Project-based learning; or	X			
f. Service learning; or	X			
g. A combination of the above.				
Comments:				

F. Length of program and daily schedule: Governor’s STEM Academies are defined by program content, not by the location or delivery system of courses. Evidence of the following must be submitted:

Criteria	Documentation			Comments
	Full	Partial	None	
Designation of full-day or part-day, academic-year program.	X			
Comments:				

G. Assurance from the fiscal agent that operating funds and facilities are available to support the Governor’s STEM Academy and are adequate to meet the needs of the program

	Documentation			Comments
	Full	Partial	None	
	X			
Comments:				

H. Materials and equipment to be provided to accomplish program goals and objectives.

	Documentation			Comments
	Full	Partial	None	
	X			
Comments:				

I. Evidence of an internal evaluation process to effect program improvement, including:

Criteria	Documentation			Comments
	Full	Partial	None	
1. A review of the Academy’s policies, procedures, and outcomes;	X			
2. Consideration of feedback from students, staff, parents, the	X			

Criteria	Documentation			Comments
	Full	Partial	None	
community, and partnership members; and				
3. Annual collection and reporting of data to the Department of Education related to student achievement, goal achievement, and other indicators.	X			
Comments:				

IV. Administrative Procedures

Each Governor’s STEM Academy must develop and maintain procedures developed cooperatively with participating partners. There should be evidence of procedures in the four areas that follow.

A. Partnerships - The role of business and industry, public school divisions, and postsecondary institutions in the partnership. The role of workforce and economic development entities should also be included if they are among the partners.

	Documentation			Comments
	Full	Partial	None	
	X			
Comments:				

B. Student recruitment, selection criteria, and admissions.

	Documentation			Comments
	Full	Partial	None	
	X			
Comments:				

C. Code of student conduct and attendance.

	Documentation			Comments
	Full	Partial	None	
	X			
Comments:				

D. Transportation provided by the school division or consortium that is in compliance with all applicable federal and state regulations.

	Documentation			Comments
	Full	Partial	None	
	X			
Comments:				

E. Staff recruitment, selection, and assignment - The Governor’s STEM Academy shall hire staff members who meet the Virginia teacher licensure requirements and/or postsecondary faculty qualifications. Where applicable, they must have industry-specific education with training and experience, including industry certification.

	Documentation			Comments
	Full	Partial	None	
	X			
Comments:				

F. Staff development - The program will provide appropriate staff training in addition to staff planning time.

	Documentation			Comments
	Full	Partial	None	
	X			
Comments:				

G. Staff evaluation – Staff will be evaluated according to the human resources policies of the agency or institution employing Academy personnel.

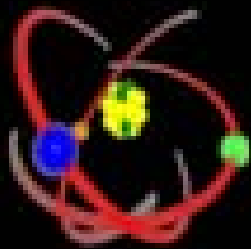
	Documentation			Comments
	Full	Partial	None	
	X			
Comments:				

H. Parent, student and community involvement

Criteria	Documentation			Comments
	Full	Partial	None	
1. Preparation for entering the Academies should begin by eighth grade.	X			
2. Students, parents, teachers, and counselors should work collaboratively to:	X			
a. Complete career interest inventories;				
b. Prepare academic and career plans outlining an intended course of study in high school;	X			
c. Review multiple postsecondary pathways and the steps required to pursue them;	X			
d. Participate in career assessments to identify areas students should strengthen to qualify for their selected pathways; and	X			
e. Discuss available diplomas, seals, and other recognitions including admission to specialized programs such as Governor’s Academies.	X			

I. Documentation of insurance, budget, and other fiscal information

	Documentation			Comments
	Full	Partial	None	
Insurance	X			
Budget (from appendix)	X			
Budget Narrative	X			
Other				
Comments:				



Heritage High School

Proposal to Establish a Governor's STEM Academy



*Submitted to the
Virginia Department of Education
October 25, 2012*

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Heritage High School Governor’s Science, Technology, Engineering and Mathematics Academy Proposal

Program Description and Overview

The Heritage High School Governor’s STEM Academy offers a program of study designed to expand options for students to acquire skills in Science, Technology, Engineering, and Mathematics (STEM). The program combines academic coursework and research experience with a challenging and focused school environment to prepare students for 21st century careers. Students will gain the knowledge and skills they need to succeed in technologically-rich workplaces by learning how to work in teams, communicate effectively, and apply the principles of science, technology, engineering, and mathematics. Students will choose specific career pathways within the Career Clusters of Science, Technology, Engineering & Mathematics; Architecture & Construction; and Information Technology. The courses students choose will equip them with the skills they will need for success in their chosen careers. There will be a strong emphasis on the Career Pathways of Engineering Technology, Design and Pre-Construction, Programming and Software Development, Web and Digital Communications, Modeling and Simulation, and Network Systems. Students may complete study in the following courses in the Governor’s STEM Academy at Heritage High School: Engineering and Electronics, Architectural and Engineering Drawing, Modeling and Simulation, and Computer Systems Technology. The table below shows the Career Clusters and Career Pathways as they relate to the programs offered at Heritage High School.

Career Cluster	Career Pathway	Heritage High School Governor’s STEM Academy Courses
Science, Technology, Engineering and Mathematics	Engineering Technology	Engineering and Electronics <ul style="list-style-type: none"> • <i>Introduction to Engineering (8460)</i> • <i>Advanced Engineering (8491)</i> • <i>Electronics I (8416)</i> • <i>Electronics II (8412)</i>
Architecture and Construction	Design and Pre-Construction	Architectural and Engineering Drawing <ul style="list-style-type: none"> • <i>Engineering Explorations (8450)</i> • <i>Technical Drawing (8435)</i> • <i>Engineering Drawing (8436)</i> • <i>Architectural Drawing (8437)</i>

Career Cluster	Career Pathway	Heritage High School Governor's STEM Academy Courses
Information Technology	Programming and Software Development Web and Digital Communications	Modeling and Simulation (Computer Science) <ul style="list-style-type: none"> • <i>Introduction to Computer Programming (3181)</i> • <i>Honors Computer Programming (3182)</i> • <i>Digital Visualization (8459)</i> • <i>Modeling & Simulation (8460)</i>
	Network Systems Information Support Services	Computer Systems Technology (Networking) <ul style="list-style-type: none"> • <i>Information Technology Fundamentals (6670)</i> • <i>Computer Systems Technology I (8622)</i> • <i>Computer Systems Technology II (8623)</i> • <i>Computer Systems Technology III (8624)</i>

The Heritage High School Governor's STEM Academy is designed to give students in grades 9 – 12 the opportunity to explore several career paths while incorporating *Virginia's Workplace Readiness Skills for the Commonwealth*. Career Pathways prepare students for programs leading to bachelor's degrees, two-year associate's degrees, apprenticeships, and employment. The Heritage High School Governor's STEM Academy will accept approximately 150 students for the initial school year (2013—2014). Becoming a Governor's STEM Academy, we expect to raise student aspirations and attract more students to postsecondary education in preparation for career pathways Engineering Technology, Design & Pre-Construction, Programming & Software Development, Web & Digital Communications, Modeling & Simulation, and Network Systems. Our goal is to provide well-trained workers to support the recruitment of new businesses and industries to the commonwealth and to meet the workforce needs of existing business and industry.

Length of Program and Daily Schedule

Students will have the opportunity to concentrate and take specialized courses in a full-day, year-long academic program at the high school campus (see Appendix A-Bell Schedule). In addition to courses in science, technology, engineering, and mathematics, students will receive a foundation in English, social studies, and health and physical education, and will have the opportunity to study arts and world languages. These core courses will also integrate STEM (see Appendix B-Plans of Studies). During the 12th-grade year, students will have the

opportunity to apply their knowledge of STEM, as well as 21st century skills, in a real-world work experience by participating in an internship related to their chosen career.

Course Sequence

The Heritage High School Governor’s STEM Academy planning committee has selected the following course sequences for students enrolled in the STEM Academy:

CAREER STRAND	9 TH GRADE	10 TH GRADE	11 TH GRADE	12 TH GRADE
Engineering & Electronics	Introduction to Engineering (8490)	Advanced Engineering (8491)	Electronics I (8416)	Electronics II (8412)
Architectural & Engineering Design	Engineering Explorations (8450)	Technical Drawing (8435)	Engineering Drawing (8436)	Architectural Drawing (8437)
Computer Systems Technology (Networking)	Information Technology Fundamentals (6670)	Computer Systems Technology I (8622)	Computer Systems Technology II (8623)	Computer Systems Technology III (8624)
Modeling & Simulation (Computer Science)	Introduction to Computer Programming (6670)	Honors Computer Programming (3182)	Digital Visualization (8459)	Modeling & Simulation (8460)

Related Industry Certifications

Students will have the opportunity to earn industry certifications in the following courses:

- Engineering & Electronics
 - Pre-Engineering Assessment
 - Electronic Technology Assessment
 - Basic Installation Technician Certification Test (Mobile Electronics Certification)
- Architectural/Engineering Design
 - AUTOCAD
 - Skills USA Workforce Ready Technical Drafting Assessment

- Computer Systems Technology
 - CompTIA A+
 - CompTIA Network +
 - CompTIA A+ IT Technician

- Modeling & Simulation
 - IC3
 - Linux
 - CompTIA Network +
 - Microsoft Office Specialist

Course Descriptions

In addition to courses in English, mathematics, social studies, science, health and physical education, art, and world language, students in the STEM Academy will take the following STEM related courses:

Advanced Engineering (8491)—Students will learn the applications and design processes of engineering. Students form engineering teams and select a design problem. Projects may be models, systems, or products that creatively solve an engineering problem.

Architectural Drawing (8437)—Students will learn the principles of architecture and increase understanding of working drawings and construction techniques learned in the prerequisite course. Students use computer-aided drawing and design (CADD) equipment and established standards or codes to prepare models for presentation.

Computer Systems Technology I (8622)—Students learn to construct, troubleshoot, service, and repair computer systems, related components and software, and to install and maintain local area networks.

Computer Systems Technology II (AVO510)—Students learn to diagnose and demonstrate networking concepts and demonstrate steps to correct identified problems.

Computer Systems Technology III (8624)—Students develop a strong understanding of troubleshooting procedures, a practical knowledge in implementing various advanced networking technology solutions, and the ability to implement and manage network security measures.

Digital Visualization (8459)—Students will gain experiences related to computer animation by solving problems involving 3D object manipulation, storyboarding, texture mapping, lighting concepts, and environmental geometry.

Electronics I (8416)—This course engages students in electricity and electronic experiments that focus on the application of scientific theories and mathematics principles. Students solve problems using simple electrical devices and circuits and build electric projects using AC and DC devices and circuits.

Electronics II (8412)—Students work with electronic devices, instruments, and circuits, and build electronics projects to apply theories and laws with electronic components such as resistors, capacitors and transistors. They also study integrated circuits used in computers, amplifiers, computer systems troubleshooting, and repair.

Engineering Drawing (8436)—Students use a graphic language for product design, technical illustration, assembly, patent, and aeronautical drawings. Students use computers, calculators, and descriptive geometry and adhere to established standards to solve design problems. Completion of this course may contribute to a student’s preparation for the AutoCAD industry certification.

Engineering Explorations (8450)—This course is an introduction to the fundamentals of technology and engineering. Students will be exposed to a variety of engineering specialty fields and related careers. Students will gain a basic understanding of engineering history and design, using mathematical and scientific concepts.

Honors Computer Programming (3182)—This course introduces object-oriented programming using C++. (Introduction to Computer Programming is the prerequisite for this course)

Information Technology Fundamentals (6670)—This course introduces the essential skills needed for students to pursue specialized programs leading to technical and professional careers and certification in the IT industry. Students have an opportunity to investigate career opportunities in four major IT areas: Information Services and Support, Network Systems, Programming and Software Development, and Interactive Media.

Introduction to Engineering (8460)—While undergoing an orientation to the careers and challenges of engineering, students are actively involved with high-tech devices, engineering graphics, and mathematical concepts and scientific principles through problem-solving experiences.

Modeling and Simulation (8460) —Will explore the use of modeling, simulation, and game development software to solve real-world problems in STEM. The activities include evaluating physics simulations, programming games for educational purposes, and creating visualization systems with 3D models.

Technical Drawing (8435)—In this foundational course, students learn the language of technical design and make design sketches, technical drawings, models, or prototypes of real design problems.

Materials and Equipment

Materials and equipment for the Heritage High School Governor's STEM Academy will follow state purchasing guidelines and may be obtained through donations from local industry and higher education partners, local school division funds, state equipment funds, and the Carl D. Perkins Career and Technical Education Act of 2006 (Perkins IV).

Equipment purchased with state or federal funds will be selected from the state-approved equipment list for career and technical education programs. Equipment purchased through the Perkins Grant will meet all applicable grant regulations.

Postsecondary Opportunities /Work-Based Learning Experiences

Students in the academy have the opportunity to qualify for an Advanced Studies Diploma and earn the following diploma seals upon graduation: Governor's Seal, Board of Education's Advanced Mathematics & Technology Seal, and the Board of Education's Career and Technical Educational Seal. Upon completion of the academy, students will have the skills they need to continue postsecondary opportunities with local college and university programs to include Thomas Nelson Community College Associate of Applied Science; Old Dominion University College of Engineering and Technology; Norfolk State University College of Science, Engineering and Technology; Christopher Newport University College of Science, Engineering, and Technology; and the Newport News Apprentice School of Shipbuilding.

While participating in the academy, students will have the opportunity to participate in the following work-based learning experiences and college and career activities to include:

- Earning a minimum of nine postsecondary credits with Thomas Nelson Community College (See Appendix C-Thomas Nelson Dual Enrollment Agreement)
- Extensive partnerships and internships with research labs, businesses, colleges, and universities to include a three-week spring internship program with Newport News Shipbuilding, Career Day at NASA Langley, STEM Summit with Jefferson Labs, Computer Science Day with Old Dominion University, and the William R. Harvey Leadership Institute at Hampton University
- Integrated curriculum that helps students see connections among mathematics, science, and technology
- School culture designed to develop students' workplace readiness skills to meet industry needs

- Opportunities to learn about careers through mentors, career and technical student organizations, career clubs, worksite visits, guest speakers, internships, and job shadowing experiences
- Participation in school and community STEM showcase activities

Rationale

According to the U.S. Department of Education’s article on “Supporting Science, Technology, Engineering, and Mathematics Education,” mastery of mathematics, science, and technology is no longer only for future scientists and engineers; it is essential preparation for all students. Despite an overall increase in postsecondary education enrollment for over a decade, the percentage of STEM college graduates has declined. America needs to increase the number of students pursuing STEM fields in their academic studies and careers and improve preparation for the next generation of engineers, scientists, mathematicians, and technicians.

Georgetown University Center on Education and the Workforce reported in a 2011 *USA News* article, entitled “Demand, Pay for STEM Skills Skyrocket,” that over the past 30 years, salaries in STEM-related jobs have jumped faster than those in any other occupation other than health care professionals and managerial occupations. STEM wages jumped 31 percent over the past 30 years, compared with 23 percent for all non-STEM occupations (*USA News*, October 2011).

The Heritage High School Governor’s STEM Academy’s goal is to promote student achievement and interest in STEM career fields to prepare students for global competitiveness. The STEM Academy planning committee has identified the Science, Technology, Engineering and Mathematics; Architecture and Construction; and Information Technology Career Clusters as the initial Academy focus. The courses in Modeling and Simulation (Computer Science) and Computer Systems Technology (Networking) help prepare Newport News Public Schools students to meet the regional workforce demands that have been identified in these high-skill, high-wage careers.

Newport News Public Schools is uniquely positioned to take full advantage of the high concentration of STEM-related careers in this region. The Virginia Peninsula workforce sector is strong and getting stronger. Fourteen manufacturing companies, representing 89.5 percent of the private sector manufacturing workforce in the region, participated in the *Skills to Succeed Inventory* sponsored by the Peninsula Council for Workforce Development and Thomas Nelson Community College, through a grant from the Virginia Community Colleges and the Ford Foundation. The study revealed that these employers report 11,150 jobs will open in 11 advanced technology and manufacturing occupations throughout the Greater Virginia Peninsula.

Newport News Shipbuilding alone estimates that it will hire 10,000 people in the next several years to fill new jobs and replace retiring employees. NASA Langley, Jefferson Lab, Canon

Virginia, Inc., area military facilities, and numerous government contractors in this region offer a wealth of STEM career opportunities for qualified job seekers.

The chart below lists some of the fastest growing STEM and technical occupations projected from 2008 to 2018 according to the Bureau of Labor Statistics.

**Fastest Growing Technical Occupations
in the United States from 2008 Projected to 2018**

Occupation	2008*	2018*	Percentage Growth
Biomedical Engineers	16.0	27.6	72.02%
Network Systems and Data Communications Analysts	292.0	447.8	53.36%
Medical Scientists	109.4	153.6	40.36%
Computer Software Engineers	514.8	689.9	34.01%
Environmental Engineers	54.3	70.9	30.62%
Architects	113.7	141.6	24.00%
Graphic Designers	279.2	316.5	13.00%
Computer Programmers	363.1	406.8	12.01%

***Numbers in thousands**

Source: Bureau of Labor Statistics www.bls.gov February 2012

Goals & Performance Measures

The goal of the Heritage High School Governor’s STEM Academy is to promote student achievement and interest in STEM career fields to prepare students for global competitiveness in high-skill, high-wage, and high-demand STEM careers.

The following goals and performance measures have been established by the planning committee:

- Increase the number of students who earn a grade of B or better in advanced mathematics courses beyond Algebra II by 3 percent over the next four years
- Increase the number of Academy students meeting the requirements of the Advanced Studies Diploma by 10 percent over the next four years

- Increase the number of students earning industry certifications by 10 percent over the next four years
- Increase the number of postsecondary credits earned through dual enrollment, advanced placement courses, and the Early College program by 5 percent over the next four years
- Ensure that 100 percent of students participate in work-based learning experiences, through strong partnerships with businesses and organizations
- Increase our school's high school graduation rate by 2 percent over the next four years
- Reduce our school's high school dropout rate by 2 percent over the next four years
- Increase enrollment and retention in postsecondary education by giving students the opportunity to earn dual enrollment credit. After graduation from high school, academy graduates will complete Career and Technical Education Follow-Up surveys to determine successful enrollment and retention in postsecondary institutions. Graduates will have the opportunity to network on the Heritage High School's Governor's STEM Academy's social media site. This will allow the school to keep in contact with students and updated with their current postsecondary placements
- Increase the proportion of students completing a college and career curriculum in high school by increasing enrollment and completion rates annually by 5 percent in specified career pathway academy courses
- Reduce the proportion of students requiring remediation in college by 5 percent by carefully monitoring student achievement and providing academic support when necessary. Success will be measured by the number of students who meet the basic college entrance criteria as determined by the Virginia Community College System. An Academic Learning and Tutoring Center will be available for current academy student and academy graduates
- Increase the number of academy graduates employed in high-wage, high-demand, and high-skill careers as identified by the Virginia Employment Commission over the next six years after high school graduation

Baseline Data

The charts listed below shows baseline student data from Heritage High School for the 2011—2012 school year in the areas of advanced mathematics, industry certifications, postsecondary credits, workplace readiness experiences, graduation, and dropout rates.

Heritage High School Advanced Mathematics Pass Rates Number of Students Earning a Grade of B or better

ADVANCED MATHEMATICS COURSE	NUMBER OF STUDENTS 2011—2012	Projections 2013—2014	Projections 2014—2015	Projections 2015—2016	Projections 2016—2017
Honors Algebra II/Trigonometry I	27	28	29	30	31
Honors Math Analysis I	12	12	13	14	15
Trigonometry & Elementary Functions	51	52	53	54	55
Probability and Statistics I	10	11	12	13	14
Advanced Placement Calculus	17	18	19	20	21
TOTAL STUDENTS	117	121	126	131	136

**Heritage High School
Industry Certifications, Postsecondary Credits, and
Workplace Readiness Experiences**

	2011—2012	Projections 2013—2014	Projections 2014—2015	Projections 2015—2016	Projections 2016—2017
Number of industry certifications earned	105	107	110	113	116
Number of postsecondary credits earned (Dual enrollment/Advanced placement/Early College)	172	174	176	178	181
Number of students participating in work-based learning experiences	79	150	230	310	400

**Heritage High School
Graduation Completion Data**

	2011-2012	Projections 2013-2014	Projections 2014-2015	Projections 2015-2016	Projections 2016-2017
Graduation Completion Index*	85.42%	85.80%	86.30%	86.70%	87.10%
On Time Graduation**	84.57%	84.90%	85.40%	87.80%	86.30%
On Time Graduation Dropout Rate***	6.65%	6.61%	6.58%	6.55%	6.51%

**The Graduate Completion Index is used to determine school accreditation. The benchmark is 85 and provisional status is 81 to 84.99.*

***The On Time Graduation concerns the percentage of students who were in 9th grade during the 2008-2009 school year and have graduated four years later .*

****On Time Graduation Dropout Rate is determined by adding the number of student dropouts and unconfirmed students (no record of withdrawal).*

Progress will be measured by grade reports in advanced mathematics courses, industry certification pass rates, number of postsecondary credits earned, internship and job shadowing student placements, district graduation index reports, student program enrollment reports, and student surveys.

Program Evaluation

The Heritage High School Governor’s STEM Academy will be evaluated by the planning and advisory committee and various academic and career and technical education assessments to provide feedback and data for internal evaluation. The planning and advisory committee will meet regularly throughout the development process and will continue with a specific and purposeful schedule once the Academy is established. Newport News Public Schools will incorporate its instructional evaluation process into all STEM Academy programs and courses.

Governor’s Exemplary Standards Award Program for Career and Technical Education

The Heritage High School Governor’s STEM Academy will adhere to the Governor’s Exemplary Standards Award Program for Career and Technical Education. The Academy is committed to promoting high academic standards and improving other measures of program quality while strengthening our business and community partnerships and aligning with postsecondary education and industry needs. As we demonstrate relevant and positive outcomes, the Academy will share best practices with other programs striving for this designation.

Operational Structure

Governing Board

Members of the Heritage High School administrative team will serve as the Governing Board for the Heritage High School Governor’s STEM Academy. Governing board members will consist of the building principal, the Heritage High School Governor’s STEM Academy Director, the Assistant Principal of Instruction, the Director of Professional School Counselors, and the Career and Technical Education Instructional Supervisor.

Planning and Advisory Committee

The Heritage High School Governor’s STEM Academy partners will provide at least one active member to the Heritage High School Governor’s STEM Academy Planning and Advisory Committee which shall oversee the responsibility for the design, implementation and evaluation of all initiatives. The Heritage High School Governor’s STEM Academy Director will be responsible for the facilitation, coordination, and/or implementation of the Planning and Advisory Committee recommendations (see Appendix D-Planning and Advisory Committee Agreements).

Coordination

Newport News Public Schools will provide a Governor's STEM Academy Director who currently serves as the Engineering and Technology Magnet Director for Heritage High School. This position will report to the Planning and Advisory Committee and will be supervised by the principal of the high school.

Director Responsibilities

The Heritage High School Governor's STEM Academy Director will serve as a facilitator and/or coordinator of the STEM Academy Partners and Department of Education in the design, implementation, coordination, evaluation, and reporting of the Governor's STEM Academy.

Responsibilities of the Heritage High School Governor's STEM Academy Director will include, but are not limited to, the following:

- Facilitate the Heritage High School Governor's STEM Academy Planning and Advisory Committee regarding the design and implementation process
- Serve as a primary contact to the Virginia Department of Education (VDOE)
- Develop academy marketing materials, Web site, and forms
- Assist with scheduling and coordination of events with sponsoring partners
- Coordinate the application and selection process for the Heritage High School Governor's STEM Academy
- Serve as liaison with colleges and universities in the development and oversight of dual-enrollment courses
- Facilitate business and organizational participation and support of the Heritage High School Governor's STEM Academy
- Prepare and monitor the budget related to the Heritage High School Governor's STEM Academy and information requested by the VDOE, submit state reports, manage program data and demographics as related to defined Heritage High School Governor's STEM Academy outcomes in coordination with other partners
- Coordinate Heritage High School Governor's STEM Academy staff development activities

Administrative Procedures

Staff Selection and Evaluation

Direct supervision of the Governor's STEM Academy instructional faculty will be handled according to the policies and procedures set by the School Board of Newport News Public Schools. Personnel will be hired who meet the Virginia teacher licensure requirements and/or postsecondary faculty qualifications. Where applicable, teachers must have industry-specific education with training and experience, including industry certification. Staff will be evaluated according to the human resources policies of Newport News Public Schools using the Teacher Performance Assessment tool established by the school district.

Staff Development

All teachers will be given the opportunity to participate in engaging STEM professional development activities to assist in providing high-quality STEM instruction to prepare students for academy coursework. Teachers will participate in summer institutes, conferences, workshops, and in-building professional development opportunities to expand their use of project-based and experiential learning strategies.

Teachers will be required to integrate the content and strategies learned into classroom modules and lessons. Opportunities for learning during the school year will be provided through observations of classroom instruction. Follow-up activities and resources will be provided and communicated with teachers. Teachers will be provided an instructional planning period and a professional development period.

Training will support research-based instructional strategies to STEM curriculum. Where applicable, business partners will also assist in providing teacher training. Teachers will collaborate with postsecondary and business partners to create real-world STEM opportunities for students to apply what they have learned.

Heritage High School teachers have recently participated in STEM Staff Development opportunities to include Career Pathways Teacher Internships at Newport News Shipbuilding, Hampton University Teacher's Circle Summer Institute, Old Dominion University's National Science Foundation Funded Marine Tech Teacher Institute, STEM Connection Hampton Roads, and VA STEM Connect (see Appendix E-Teacher Professional Development Opportunities).

Parent, Student, and Community Involvement

Parents, students, and the community will be actively involved in Academy program planning. Student and parent informational workshops, parent-teacher conferences, college visits, and business partnerships will be among the resources used to encourage student, parent, and community involvement with Academy initiatives.

Beginning in middle school, all prospective Academy students will have the opportunity to participate in pre-academy programs, including site tours, open houses, and summer experiences that will be coordinated by the Academy director. Students will complete interest

inventories in middle school, and throughout high school, under the guidance of school counselors, career coaches, and classroom instructors who will monitor individual career pathways identified by the students.

During high school, students will work with school counselors to complete career assessments and create academic and career plans outlining intended courses of study. These career plans will be reviewed annually prior to course registration and adjusted as needed to meet the needs and interests of the student. Postsecondary pathways will also be reviewed and discussed. School admission requirements, industry certifications and credentialing options, career studies, associate or technical college degrees, and advanced college degree programs will also be reviewed with students and parents.

Local businesses and educational institutions will be instrumental in providing STEM resources and opportunities for students enrolled in the Academy, while providing data that will be essential to ensuring that Academy program options are aligned with postsecondary education and industry needs.

Student Enrichment Opportunities/Summer Experiences

Students will be given additional instructional enrichment activities while participating in the Governor's STEM Academy to include the 21st Century STEM Summer of Innovation, Newport News Shipbuilding Career Pathways Job Shadowing Program, Newport News Shipbuilding Spring Break "Make It Work" Internship Program, Camp Connect Summer Program, and The Peninsula Council of Workforce Development Summer Camp Series. With the distinction of becoming a Governor's STEM Academy, we expect to expand upon some of current programs to reach a greater number of students and increase the number of business and industry partners.

The 21st Century STEM Summer of Innovation has been held the past three years at Crittenden Middle School, which is the STEM magnet feeder school for Heritage High School. This is a six-week program designed to give rising third through ninth grade students hands-on, minds-on experiences in STEM. One hundred and fifty students are selected for the program. Students are exposed to several career pathways. Courses offered during the STEM Summer of Innovation include Robotics, Aviation, and Computer Science. Literacy, vocabulary, and mathematics skills are also supported through strategic classroom arrangements, skills driven curricula, and direct instruction. NASA and Newport News Shipbuilding are among the business partners who assist with instruction and activities that support the program's goals and initiatives. With the establishment of the Governor's STEM Academy we plan to expand this program rising ninth and tenth grade academy students. Current eleventh and twelfth grade academy students will be utilized as program tutors (see Appendix F-21st Century STEM Summer of Innovation Program).

An extensive partnership with Newport News Shipbuilding Career Pathways, Newport News Public Schools Career Pathways, and Heritage High School has been established to provide 12th grade students the opportunity to participate in a job shadowing experience at Newport News

Shipbuilding. The program was piloted in March 2012 with 40 students in the Engineering and Technology Magnet program at Heritage High School. The Newport News Shipbuilding Career Pathways internship program afforded students the opportunity to be connected with employees in Engineering and Electronics, Modeling and Simulation, Computer Systems Technology, and Architectural Drawing and Design. Students completed a three-week, 20-hour job shadowing experience that exposed them to several career pathways and the skills needed to be successful in the specified career fields. Students met with members of the Newport News Shipbuilding leadership team, experienced engineering and information technology at work, and saw first-hand the importance of career readiness skills in the workplace. Plans are underway to extend this program to all 12th grade students who will be enrolled in the Heritage High School Governor's STEM Academy. This will be a component of the STEMinar course. We plan to seek additional business partners to participate in this internship program as a result of the academy's establishment (see Appendix G-Newport News Shipbuilding Career Pathways Internship Packet).

The Spring Break "Make It Work" Internship program is also facilitated by the Newport News Public Schools Career Pathways program. High school students are able to apply online to participate in a one-week job shadowing experience. This internship program is focused on several STEM-related career pathways. Since its inception, students have been able to shadow engineers, scientists, and medical professionals at Newport News Shipbuilding, NASA Langley, and Riverside Health Systems. The Heritage High School Governor's STEM Academy Director will work with the Newport News Career Pathways Supervisor to provide additional job shadowing opportunities in the areas of STEM, Architecture & Construction and Information Technology (see Appendix H-Spring Break "Make It Work" Internship).

The Advanced Manufacturing Lab at Thomas Nelson Community College teamed up with local businesses and organizations, including STIHL, Liebherr Mining Company, NASA Langley, Newport News Shipbuilding, New Horizons Regional Education Centers, Virginia Manufacturers Association, Peninsula Council for Workforce Development, Hampton City Schools, and Newport News Public Schools to offer a four-day Manufacturing Technology Camp in July of 2012. This partnership will be an annual event which will be available for Academy students to participate in:

Students will work in teams to:

- build and operate a semi-robotic manufacturing machine
- design a modern, environmentally friendly manufacturing process
- plan and perfect a family of marketable products
- collaborate with experts to resolve design and production challenges
- compete in a "friendly" manufacturing competition

- visit modern, “cutting-edge” automated manufacturing companies
- explore the world of entrepreneurship

CampConnect started in the summer of 2010 with collaboration between Newport News Public Schools’ Career and Technical Education and Youth Development departments. The idea was to provide college, career, and leadership experiences for students during the summer. The partners designed CampConnect to expose rising 7th and 8th grade students to enrichment experiences they may not otherwise have had access to.

The first year of CampConnect included tours of colleges and local businesses, and leadership training from Alternatives, Inc. As part of the leadership training, the students identified issues within their schools to address throughout the year.

In the summer of 2011, the leadership focus of CampConnect was replaced by an emphasis on Youth Development through citizenship. Implicit in that decision was the understanding that leadership opportunities would emerge organically from citizenship and community service experiences. In the second year, Youth Development partnered with Career Pathways—a natural fit for the “College, Career, and Citizen Ready” focus of the camp. The camp provided opportunities for students to visit local businesses, tour colleges on the VA Peninsula and the Southside, and to participate in hands-on community service activities in partnership with the Youth Volunteer Corps of Hampton Roads (YVC-HR).

In the summer of 2012, CampConnect adopted a focus on Science, Technology, Engineering, and Mathematics (STEM). The program also expanded to include rising ninth grade students, for whom leadership opportunities were created. The STEM focus provided a deeper exploration of colleges and careers, as evidenced by the transition from tours of local businesses and colleges, to experiences that blended understanding of the programs offered at local colleges with hands-on/minds-on activities for students. Some of the work-based learning experiences included:

- two-day robotics labs that provided hands-on experiences with robotics kits, computer programming languages, and problem solving in robotics competitions. This event was hosted by Virginia FIRST Tech Challenge, Virginia FIRST Lego League, and Christopher Newport University
- visitations to Thomas Nelson Community College’s Advanced Manufacturing and Technology Labs to include hands-on experiences with hardware and software used in the labs at the college. The students left the college wanting more opportunities to interact with the technology. As a result, the college has invited students from Newport News middle schools to visit the lab during the upcoming school year

- Hands-on workshops sponsored by The Riverside School of Health Careers. Students explored radiology, physical therapy, surgical technology, and nursing laboratories

In promoting experiences that increased Youth Development, the partnership with the Youth Volunteer Corps of Hampton Roads was expanded. This past year, students participated in community service projects that opened their eyes to the wide range of needs in their community, and increased their awareness of the ways they could make a positive difference. The addition of rising ninth graders was a positive Youth Development experience for the older students, as they honed their leadership skills by facilitating activities and experiences for their peers. Many of the younger students expressed a desire to return to the camp in subsequent years in a leadership role.

With the establishment of the Heritage High School Governor's STEM Academy, we will look at ways to expand CampConnect to a year-round program to meet the following goals:

- partner with a local university that matches high school students with university students majoring in STEM fields. The university students will serve as mentors to the high school students throughout the school year.
- provide opportunities for students to visit local colleges and universities to interact with college professors, students, and content to learn about postsecondary education firsthand
- incorporate Youth Development experiences that promote leadership through community service, in partnership with the Youth Volunteer Corps of Hampton Roads
- promote college and career exploration
- identify emerging trends in science, technology, engineering, and mathematics

Additional summer opportunities available included The Greater Peninsula Summer Camp Series 2012 sponsored by the Peninsula Council for Workforce Development, which provides a variety of programs to explore career and education opportunities available on the Peninsula. The camps provide a first-hand look at the jobs and career pipelines available for graduating students. Scheduled throughout the summer, the camps feature presentations by local educators and industry leaders, round-table discussions, and on-site visits to industry and business, all courtesy of its participating partners. Organized by the Peninsula Council for Workforce Development, Thomas Nelson Community College, New Horizons Regional Education Centers, ECPI University, and industry partners, the camps provide students with important information, take-away resources, and a better understanding of industries currently facing continual growth and the demand for a qualified workforce (see Appendix I-Peninsula

Council for Workforce Development Summer Camp Series). Through a partnership with Newport News Public Schools, the Peninsula Council for Workforce Development also sponsors the Youth Career Café located in Patrick Henry Mall in Newport News, which provides career workshops, career speakers, resume development support, and tutoring for students, at no cost (see Appendix J-Youth Career Café).

Heritage High School Governor’s STEM Academy students will participate in various school organizations that will provide educational and leadership development activities. Students may participate in First Tech Challenge (robotics club), SKILLS USA (trade and industrial education student organization) and TSA (technology student association). Establishing the Governor’s STEM Academy will allow for increased student interest and the opportunity to increase participation in STEM related student organizations and the need to establish additional student organizations.

Student Recruitment, Selection Criteria, and Admission Procedures

Student recruitment will be the responsibility of the Heritage High School Governor’s STEM academy director and members of the planning and advisory committee.

Recruitment will begin at the middle school level in grades seven and eight. Visits to middle schools along with parent information nights, open houses, mentorship programs, and school-related functions are conducted to expose students and parents to the opportunities that are available at Heritage High School. Eligible high school students in the division will also be recruited.

All students interested in participating in the Governor’s STEM Academy at Heritage High School will be required to complete a Governor’s STEM Academy application (see Appendix K-Heritage High School Governor’s STEM Academy Student Application).

Students who are selected for the Academy will be required to meet the following criteria to complete the program successfully:

- Complete an advanced mathematics course beyond Algebra II
- Maintain a minimum of a 3.0 grade point average
- Take a mathematics, science, and technology course each year
- Complete a STEM work-based internship (minimum of 15 hours)
- Complete courses within a specific pathway in the STEM, Information Technology, or Architecture and Construction career clusters
- Earn an industry certification or at least nine transferrable college credits

- Complete 200 hours of school/community service (50 hours per school year)
- Complete Senior STEMinar course

The Senior STEMinar course will be an extension of our current public speaking class. A new curriculum will be written so that the STEMinar course will be provided to students in The Heritage High School Governor's STEM Academy. The course will be designed to advance student's preparation in critical reading, technical writing, and communication. Students enrolled in the course will have the opportunity to participate in work-based learning experiences to include a spring internship. Students will complete an electronic portfolio, digital media presentation, and STEM research project on emerging STEM careers. A culminating activity will be required that includes students demonstrating their mastery in their specified career pathway.

Student Code of Conduct, Attendance, and Safety

The Heritage High School Governor's STEM Academy's student discipline, attendance, and safety policies will be handled according to the policies and practice of the school division and/or provider of services (e.g., colleges/universities, business partners).

Transportation

Transportation will be provided by Newport News Public Schools Department of Transportation and will be in compliance with all applicable federal and state regulations. All students who attend Newport News Public Schools and are accepted into the Governor's STEM Academy at Heritage High School will be provided bus transportation. Bus stop locations and school zones can be found online at www.nnschools.org/zonefinder.

Fiscal Agent/Certificates of Insurance

The fiscal agent for The Heritage High School Governor's STEM Academy will be Newport News Public Schools, which currently provides educational services to the community of Newport News, Virginia (see Appendix L-Liability Insurance Certificate and Certificate of Property Insurance).

Budget

All start-up expenses required for The Heritage High School Governor's STEM Academy were incurred with the establishment of the Engineering and Technology Magnet program. Funding for the program will be secured through Newport News Public Schools. In addition to the school division's resources, grants and in-kind donations from business partners will also be used to supplement the program. Equipment and software updates will be funded through the Career and Technical Education budget and Perkins funds (see Appendix M-Budget).

Partnerships Capacity/Memorandum of Agreement (MOA)

Business and industry, the public school division, and postsecondary institutions will be among the partners of the Heritage High School Governor's STEM Academy. Their role will be to

support the goals of the Heritage High School Governor's STEM Academy and to provide STEM resources and opportunities for students enrolled in the program.

A written MOA outlining ways in which community resources will contribute to the Heritage High School Governor's STEM Academy to broaden the scope of students' educational experiences will be signed by all current and future partners. This MOA outlines responsibilities for each of the partner groups to include Newport News Public Schools, local business and industry partners, and postsecondary institutions.

Heritage High School Governor's STEM Academy has formed strategic partnerships with local businesses, institutions of higher education, and workforce development agencies to ensure that our students are prepared to meet the future workforce demands STEM careers in our city and our region.

Newport News Public Schools, in partnership with Newport News Shipbuilding, Canon Virginia, Virginia Peninsula Chamber of Commerce, Peninsula Council for Workforce Development, Jefferson Labs, Thomas Nelson Community College, Norfolk State University, and Christopher Newport University, has developed the Heritage High School Governor's STEM Academy to advance the mission of ensuring that students are equipped with the skills they need to be globally competitive in the 21st century while focusing on careers in STEM (see Appendix N- Partnership Capacity/Memorandum of Agreement).

Statement of Assurances

A statement of assurances has been signed by Newport News Public Schools Superintendent on behalf of the Governor's STEM Academy stipulating that the Heritage High School Governor's STEM Academy Planning Committee has reviewed provisions of Administrative Procedures Guide for the Establishment of Governor's STEM Academies and agrees to follow the guidelines set forth in the document (see Appendix O-Statement of Assurances).