Virginia Board of Education Agenda Item

Agenda Item: N **Date:** April 26, 2012

Title	First Review of a Proposal from Chesapeake Public Schools to Establish the Grassfield High School Governor's STEM Academy		
Presenter	Karen D. Black, Technology Academy Coordinator, Grassfield High School, Chesapeake 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 to Establish a Governor's STEM Academy at Grassfield High School, Chesapeake City Public Schools

Previous Review or Action:
No previous review or action.

Action Requested:
Action will be requested at a future meeting. Specify anticipated date below:
Date: May 24, 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: Governor's STEM Academy

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) has reviewed the attached proposal and recommends that the Board approve the proposal. Staff members of the Virginia Department of Education (DOE) have also reviewed the proposal in the context of the Board's criteria. An executive summary of the proposal is in Attachment A. Attachments B and C are the reports from the reviews by SCHEV and the DOE. Attachment D is the complete proposal.

Currently, there are ten Governor's STEM Academies in Virginia. They are located in Arlington County, Chesterfield County, Halifax County, Hampton City, Loudoun County, Richmond City, Russell County, Stafford County, Suffolk City, and Carroll County.

Summary of Important Issues:
The proposal for the Grassfield High School Governor's STEM Academy is conceptualized with partnerships consisting of Chesapeake City Public Schools; Old Dominion University; Tidewater Community College; James Madison University; City of Chesapeake Economic Development; Lockheed Martin Center for Innovation; NASA Langley Research Center; and D.T. Read Steel Company, Inc.

Through communications, leadership, and state-of-the-art technology, students enrolled in the proposed Academy will receive academic and technical training in three career pathways that will provide them a competitive edge in a variety of post-high school choices. The first pathway, *Engineering and Technology* is in the Science, Technology, Engineering, and Mathematics (STEM) Cluster. Students will participate in in-depth research to provide solutions to various technical problems within different fields, and will actively engage in applying mathematical concepts and scientific principles through engineering-design experiences. Students will be introduced to the career choices in engineering and technology areas such as Aerospace Engineering, Civil Engineering, Environmental Engineering, Chemical Engineering, Biomedical Engineering, Digital Technology and will participate in coursework that will prepare them for postsecondary education.

The second pathway, *Programming and Software Development* is in the Information Technology Cluster. Students enrolled in this pathway require a solid foundation in mathematics and science as well as high-level technical skills. Students will be provided opportunities to design, develop, and produce interactive multimedia products and services. They will explore the use of modeling, simulation, and game development software to solve real-world problems. These activities will include evaluating and testing engineering designs, modeling geospatial data, observing and analyzing physics simulations, programming games for educational purposes, and creating visualization systems with 3D models.

The third pathway, *Marketing Management* is in the Marketing Career Cluster. This pathway prepares students for careers in advertising, public relations, sales and planning. Students will learn about the transfer of goods and services and e-commerce in a global economy for businesses and for individual consumers.

Impact on Fiscal and Human Resources:
Funding must be provided at the local level.

Timetable for Further Review/Action:
The proposed beginning date for Grassfield High School Governor's STEM Academy, Chesapeake City Public Schools, is fall of 2012.

Superintendent's Recommendation:
The Superintendent of Public Instruction recommends that the Board of Education accept for first review the proposal to establish Grassfield High School Governor's STEM Academy, Chesapeake City Public Schools.

The Governor's STEM Academy
at the
Grassfield High School
Executive Summary
April 06, 2012

Partnership Members:	Chesapeake City Public Schools; Old Dominion University, Tidewater Community College, James Madison University, City of Chesapeake Economic Development, Lockheed Martin Center for Innovation, NASA Langley Research Center, and D. T. Read Steel Company, Inc.
Lead Entity:	Grassfield High School
Fiscal Agent:	Chesapeake City Public Schools
Contact Person:	Mrs. Karen Black Technology Academy Coordinator 757 558-4493 Karen.Black@cpschools.com
Academy Location:	The Grassfield High School Governor's STEM Academy 2007 Grizzly Trail Chesapeake, VA 23323
Number Students:	The Grassfield High School Governor's STEM Academy will have the capacity to enroll 240 students, grades 9–12. During the initial school year (2012–2013) applications will be accepted for 60 students.
Career Pathways:	Engineering and Technology Marketing Management Programming and Software Development
Academy Goals and Description:	The overall goals of the Governor's STEM Academy are to provide students with STEM enriched 21st-century technological skill and knowledge necessary to succeed in postsecondary education and the work force. Specific Governor's STEM Academy objectives include: • Improve academic achievement of Academy students • Increase Standards of Learning (SOL) scores and pass advanced rates for all mathematics and science courses. • Increase completion of dual enrollment courses.

- Increase the number of industry certifications awarded to high school students.
- Increase the number of students completing a college and career ready curriculum in high school.
- Provide work-based learning experiences through strong partnerships with business and industry.
- Increase high school graduation rates.
- Reduce dropout rates.
- Increase enrollment and retention in postsecondary education.
- Reduce the number of students requiring remediation in college.
- Increase the number of graduates employed in high-wage, high-skilled careers.

Highlights of the Program:

As a result of participating in the Governor's STEM Academy in the clusters of Science, Technology, Engineering & Mathematics; Information Technology; and Marketing 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

Review of Governor's STEM Academy Proposal

Name of Lead Entity on Proposal: Grassfield High School

Date of Review: April 5, 2012

The State Council of Higher Education for Virginia recommends approval of the Grassfield High School Governor's STEM Academy.

Peter Blake
Director
State Council for Higher Education

4/5/12
Date

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

Title of Proposal: The Grassfield High School Governor's STEM Academy

Lead Entity for Proposal: Grassfield High School, Chesapeake Public Schools

Date of Review: April 5, 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			
D. A statement of assurances that the 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).	X			

Criteria	Documentation			Comments
	Full	Partial	None	
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).				NA
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			
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. Evidence that graduates will qualify for the Technical and/or the Advanced Technical Diplomas; and	X			
6. 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.	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 STEM 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		Opportunities for students to earn credentials are numerous. There is a need to increase the postsecondary opportunities. The Academy plans to increase additional postsecondary opportunities in the future.
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			

Criteria	Documentation			Comments
	Full	Partial	None	
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			
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, or	X			

Criteria	Documentation			Comments
	Full	Partial	None	
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 innovative capacity of the region and/or the state.	X			
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			
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.	X			
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	X			
b. Internships; or	X			
c. Job Shadowing; or	X			
d. Mentorships; or	X			
e. Project-based learning; or	X			
f. Service learning; or				
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. A review of the program design and instructional delivery;	X			
3. Consideration of feedback from students, staff, parents, the community, and partnership members; and	X			
4. 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: a. Complete career interest inventories;	X			
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			

Documentation of insurance, budget, and other fiscal information

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

GOVERNOR'S STEM ACADEMY PROPOSAL

Chesapeake City Public Schools

Grassfield High School

Proposal to Establish the

Grassfield High School

Governor's STEM Academy

Submitted to the

Virginia Board of Education

April 26, 2012

The Grassfield High School Governor's STEM Academy
Board of Education Proposal

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Introduction

Chesapeake City Public Schools serve a diverse student population with a wide variety of needs. It is the school division's mission to provide constituents with a range of options that meets each student's individual abilities and interests, while providing the skills necessary for postsecondary education and future employment. Columbia University's Institute for Learning Technologies asserts, "An educated citizen in the 21st century must be literate in technology to acquire knowledge and wisdom, gain employment, and maximize opportunities. An education for the 21st century must provide people with mastery of the intellectual and technical skills necessary to participate to their full potential." The Governor's Science, Technology, Engineering, and Mathematics (STEM) Academy will be a citywide program housed at Grassfield High School, offering a unique opportunity for students with an interest in STEM to become highly literate in the field, acquire the specialized skills needed for attaining higher education, and enter the work force of emerging STEM careers. The comprehensive college-preparatory curriculum will provide opportunities for students to earn industry certifications, college credit through dual enrollment courses at Tidewater Community College, Advanced Placement courses, and on-the-job training through participation in employer partnerships.

Grassfield High School (GFHS) is the newest public high school in the Chesapeake City Public School Division and affords the latest technology while housing the current Technology Academy. The Governor's STEM Academy will operate as a school within a school in which students will reap the benefits of participating in a small learning community. Each year students from across the City of Chesapeake will apply to be considered for acceptance into this elite magnet program, and those that are accepted will be transported to Grassfield High School. Traditional Grassfield High School students will also benefit from the Governor's STEM Academy

through exposure to instruction by highly trained, industry-certified academy teachers, and cooperative learning experiences with Academy students in their classes.

Rationale for the Governor's STEM Academy

The Grassfield High School Governor's STEM Academy will focus on three specific career cluster areas – Science, Technology, Engineering, and Mathematics, Information Technology, and Marketing. These specialized programs will increase options for Chesapeake City Public Schools' students to acquire the knowledge and skills that will prepare them for the 21st century job market. Virginia has been recognized by *Forbes* magazine the past four years as the top state for businesses and careers. One of the factors in this ranking is that Virginia has an educated labor supply. K-12 educators have a responsibility to prepare our students for the future job market which includes preparation for high-demand jobs in the STEM field.

Science, Technology, Engineering, and Mathematics

The STEM career cluster, with the engineering and technology pathway, meets local and state needs by preparing students with the advanced technological skills to fill these high-demand occupations. Grassfield High School Technology Academy has been recognized as a nationally certified Project Lead the Way (PLTW) STEM program. Project Lead the Way prepares students to be the most innovative and productive leaders in STEM and to make meaningful, pioneering contributions to our world. PLTW provides a rigorous, relevant STEM education. Through engaging in hands-on curriculum, PLTW encourages the development of problem-solving, and critical-thinking skills, creative and innovative reasoning, and a love for learning.

According to the Virginia Employment Commission, as of February 22, 2012, there is a need for more than 5,200 engineers statewide. The number of potential candidates available to fill these

positions is 858 statewide. This indicates a significant shortage of viable employees to fill this need. With a large marine port, military presence, and shipbuilding industry, the Hampton Roads area has an immediate demand for engineers. The Governor's STEM Academy will work toward preparing our students to be successful in the field of engineering. Through rigorous PLTW courses, as well as the state-approved industry certifications, these students graduate high school with college credits and the skills to succeed in the university setting and work force.

PLTW offers a strong, grassroots support system for STEM education and a powerful national college and university presence to create the best opportunities for students and teachers across the country. PLTW courses are infiltrated with a strong backbone of scientific and mathematical concepts related to the field of engineering, thus preparing students for their college courses. PLTW's college and university partners have an important role in our network by providing an impressive and important range of support and services, such as admission preference and scholarships for students or professional development for teachers.

Old Dominion University (ODU), a Grassfield High School Technology Academy partner, works as the local Project Lead the Way affiliated university. Through this partnership, ODU allows Technology Academy students the opportunity to earn college credit for the successful completion of PLTW courses. Academy students can also apply for up to 16 college credits with Rochester Institute of Technology (RIT), another affiliate with Project Lead the Way, by earning an 85 percent or higher in the PLTW course and passing the end-of-course PLTW exam with a 70 percent or higher.

Information Technology

The Information Technology career cluster, with the programming and software development pathway, meets local and state needs by preparing students with technology skills to fill high proficiency occupational areas. According to the Virginia Employment Commission, the computer system design industry is expected to grow by 43.3 percent between now and 2018 in the state.

Students pursuing the programming and software development pathway will have the opportunity to take a dual enrollment course in computer science at Tidewater Community College. Tidewater Community College (TCC) is located less than three miles from Grassfield High School. This computer science course will be offered to students who have taken the prerequisite STEM Academy courses during the spring semester of their senior year. Presently, Grassfield High School is working in collaboration with TCC to adequately prepare Academy students for "test out" options at the college level.

Students will also have the opportunity to take Virginia Department of Education-approved industry certification exams in the specific pathway for programming and software as part of the Governor's STEM Academy. Chesapeake City Public Schools have a full-time career and technical education staff member that is certified to proctor these exams. Students will take these exams at Grassfield High School while enrolled in the STEM courses. This opportunity will increase the number of industry certifications earned by students. The logistical plan for industry testing will provide a secure testing environment where students do not have to miss time from any of their other scheduled courses.

Marketing

The Marketing career cluster, with a marketing management pathway, meets local and state needs by preparing students with innovative ideas to fill key positions in the Commonwealth of Virginia. According to the Virginia Employment Commission, the management industry is expected to grow over 10 percent between now and 2018. By partnering with local businesses and organizations, students will have the opportunity to participate in management job shadowing experiences. Marketing students will also have the opportunity to explore international issues related to STEM through the Global Marketing courses offered at Grassfield High School and the dual enrollment course at Tidewater Community College. Students will also have multiple opportunities to pass industry certification exams as a part of the Governor's STEM Academy.

The co-curricular organization Distributive Education Clubs of America (DECA) is very involved at the local, district, state and international level. Each year we have a large number of students participating in leadership roles and many levels of competition. The students enjoy attending conferences and participating in co-curricular competitions. With the Governor's STEM Academy, we will increase the number of marketing students that participate in state-level competitions and serve as officers at the local and state level. Currently, we have a student running for an international office with the DECA Inc. organization.

According to the Virginia Employment Commission, the profile for the City of Chesapeake has these three career clusters identified as growth areas. In the three areas addressed by the Governor's STEM Academy locally, the projected number of jobs in these areas is over 54,000. The projected long-term growth in each area is above 10 percent with computer and mathematics

occupations projected to increase by 30.97 percent. The need for this specialized program is critical to the continued growth of the Commonwealth of Virginia and the City of Chesapeake.

Projects & Initiatives

Wind Turbine

The Grassfield High School Technology Academy has completed an application to participate in the Virginia Wind for Schools program. This is a Department of Energy funded program managed by James Madison University with a focus on science, technology, engineering, and mathematics. The main goal of the Wind for Schools program is to educate students and the community about wind energy while building a future work force for the wind industry.

This program involves the installation of a small wind turbine on the school grounds of Grassfield High School Technology Academy for the purpose of collecting wind turbine data. The data identifying the electricity generated by the turbine will be available to all schools in Chesapeake for their use. James Madison University will provide specific activities correlated with the Virginia Standards of Learning for use by all grade levels (K-12).

If the application is approved, a 6'W x 6'L x 1 1/2'D concrete platform would be installed to hold the 55' wind turbine pole. A Skystream 3.7 turbine would then be affixed to the top of the pole. The application for this program has been completed through a team effort involving several entities: Grassfield High School Technology Academy, Chesapeake City Public Schools Career and Technical Education Department, Chesapeake City Public Schools Plants, and several departments with the City of Chesapeake.

Installing a functioning wind turbine through the Wind for Schools program at Grassfield High School will allow the Governor's STEM Academy to dynamically integrate current STEM activities into our core and workplace-related curricula using live data that will help students make connections between their academic work and real-world skills. It will also allow us to symbolically communicate our dedication to sustainable management and stewardship of the resources granted to us by the City of Chesapeake and the Commonwealth of Virginia.

Summer Programs

Students from across the City of Chesapeake who accept admission into the Governor's STEM Academy will be invited to attend Academy Fusion the summer prior to their freshman year. The focus of Academy Fusion will be to help students transition from middle school to high school by incorporating team-building activities as well as hands-on STEM activities specific to each pathway. Students will have the opportunity to tour the state-of-the-art facility and see some of the specialized equipment available to STEM Academy students in action. The equipment that will be demonstrated will be the 3D modeling printer, the laser engraver, the wind tunnel, the wind turbine data collection center, the Airliner, and the SMART Board. Note: The Airliner is a wireless slate that allows students to seamlessly interact with the SMART Board to solve problems or demonstrate their knowledge on a specific subject from any location in a classroom.

The summer prior to STEM Academy students' senior year, they will participate in a required internship, mentorship, or job shadowing experience. Students will work with the mentorship coordinator beginning the first week of their junior year. They will meet with the coordinator and discuss the expectations for their summer experience. Throughout their junior year, they will participate in seminars to include résumé preparation, mock interviews, and a dress

for success fashion show; all focusing on the foundation of the Virginia Department of Education workplace readiness skills. Students will prepare a résumé to send to local companies in the Hampton Roads area. Currently, the Technology Academy has helped place students with over 25 companies including: NASA, Bank of America, Canon, Lockheed-Martin, MITRE, Stihl, and the United States Coast Guard. The feedback from students and the business community has been very positive, and we anticipate being able to add to the list of participating companies with the recognition of being a Governor's STEM Academy.

MODSIM

Students in the Governor's STEM Academy will attend the MODSIM World Conference and EXPO in Virginia Beach. This conference will expose students to STEM careers, networking, and guest speakers in each of the career clusters in the Grassfield High School Governor's STEM Academy. In 2010, two of Grassfield High School's Technology Academy instructors presented information on *Overcoming the Critical Shortage of STEM-prepared Secondary Students Through Modeling and Simulation*. The article was published, and the instructors continue to incorporate STEM activities into their daily lessons.

Also, dialogue has occurred with the Old Dominion University's Modeling and Simulation department to create a strong partnership between Grassfield High School and the one-of-a-kind degree program that Old Dominion University is working to implement. We expect to have additional guest speakers come to Grassfield High School, as well as take students on field trips to Old Dominion University.

Guest Speakers

The Governor's STEM Academy students will benefit from guest speakers in STEM-related fields throughout their four year experience. Bank of America representatives will speak about careers in the corporate world pertaining to STEM and how technology is a key component of banking. NASA engineers will address the continuum of projects related to STEM and each of the specific career clusters offered through the Academy. Students will learn about the many programs that NASA has available for students and how they can get involved.

In the summer of 2011, NASA had ten high school students work in a paid internship position at NASA Langley. Three of the ten students selected from across the state of Virginia were from Grassfield High School's Technology Academy. Two of the students have been offered additional hours beyond the summer internship and continue to work with NASA.

VEX Robotics

The Governor's STEM Academy students will be exposed to the VEX Robotics Design System in their engineering classes and will participate in co-curricular activities to compete with the VEX system. We are looking to expand the VEX program as a way to enhance the interest in STEM education and the three career clusters in the Governor's STEM Academy.

VEX Education is dedicated to providing engaging and fun student experiences that enable individuals to reach their full potential while they develop the knowledge and skills vital to success in the 21st century. Given today's global challenges, there has never been an age with a greater need for new scientists, engineers, and problem-solving leaders. Recent breakthroughs in chemistry, medicine, and physics have revealed a new set of challenges and created even greater

opportunity for problem-solving through technology. This underscores a dramatic challenge: there are not enough students choosing related paths to meet that global demand.

VEX Education exists to help schools focus on practical, affordable, and accessible ways of delivering dynamic hands-on STEM educational experiences to as many students as possible. Mixing the excitement and motivation associated with competition and real-world applications of mathematics and science concepts through the use of the engineering design process, VEX focuses on addressing current educational and societal needs on many levels.

The study of robotics, by its very nature, captures all four pillars of STEM; while a competitive environment increases motivation and desire to succeed, thus creating classroom environments where both knowledge and skill development can flourish without having to compromise one for the other.

Career Planning

Career planning for Governor's STEM Academy students will be ongoing. Grassfield High School has a full-time Career Counselor available to all students. The Career Counselor will team with the Academy Coordinator to teach lessons to students in each grade level to prepare them with the 21 workplace readiness skills and postsecondary planning information.

The career planning curriculum will utilize the *R U Ready* magazine, Virginia Wizard, and the College Board Web site. We will also use student leaders in the Governor's STEM Academy to serve as ambassadors and mentors to underclassmen. The Career Center is located directly beside Grassfield High School's Food Court so students can easily access the resources available during their lunch period. The Career Center has computers for students to research and explore STEM careers, collegiate majors, and receive career counseling services.

At the end of each school year, students will participate in a reflections meeting with the Career Counselor, the Mentorship Coordinator, Academy teachers, and the Academy Coordinator. Students will complete a survey and have the opportunity to give feedback about the program, as well as enjoy a luncheon as a large group.

Program Description

1. The Governor's STEM Academy will meet the needs of students by combining academic study with technical training in three career clusters: science, technology, engineering, and mathematics; information technology; and marketing. The STEM Academy curriculum will extend beyond the technology offerings in the regular comprehensive high school. The citywide program will offer state-of-the-art equipment and software which will enrich and enhance student learning. See Appendix A for the program of study and course sequence. See Appendix B for course descriptions in each career cluster.
2. As a school within a school, the Governor's STEM Academy will provide students with the benefits of participating in a small learning community. Students will benefit from an environment where highly qualified teachers are well acquainted with the Academy students' strengths, weaknesses, and learning styles. The Academy staff will meet regularly for teacher collaboration, reinforcement of technology curriculum and competencies, and maximization of individual student achievement.

   Training will be provided to Academy instructors to ensure industry certifications are current, and all instructors teaching in the STEM career cluster are Project Lead the Way certified. Previous instructor training has been provided by Duke University, Old Dominion University,

and the University of Maryland. The Academy Coordinator and the Career Counselor have also attended the required Project Lead the Way training for counselors.

All Academy instructors are required to use an online platform with the Academy curriculum. Currently, the Academy instructors utilize a hybrid method of online instruction and classroom instruction by using platform as well as edmodo. The online learning platforms create a positive setting for class discussions and ease of access to classwork and file submission.

The Academy Coordinator will facilitate academic counseling, group meetings, activities for students and parents, and opportunities for parental input and involvement. One important goal will be to foster a strong *esprit de corps* for all stakeholders connected to the program in order to better meet the needs of the students. This will be achieved by an annual Governor's STEM Academy Open House for students and parents, regular partnership team meetings, periodic meetings with Academy students, annual survey data collection, career lessons, a Governor's STEM Academy Web site, and ongoing communication with all stakeholders via e-mail and phone.

3. The targeted population for the Governor's STEM Academy will be students from across Chesapeake who envision themselves pursuing a STEM-oriented career and/or who have an interest or talent in STEM. The Academy will attract a variety of students with diverse postsecondary goals. Academy students will be encouraged to take honors, Advanced Placement, and dual enrollment courses.

   Governor's STEM Academy curriculum will provide the prerequisite knowledge and skills necessary to prepare students to earn a variety of industry certifications, making it possible

for students to compete for entry-level jobs in the work force after graduation. Academy students may also earn credits that can be applied in advanced technology training or university studies. See Appendix C for a listing of industry credentials.

4. The Governor's STEM Academy's three career pathways: engineering and technology, marketing management, and programming and software development will offer choices to students. Students will be required to take at least one Governor's STEM Academy course per year in order to remain in the program. Each student will be encouraged to pursue the appropriate mathematics and science courses to enhance their Academy experience and prepare them for postsecondary success. Students will take courses of interest from one career pathway or from more than one career pathway according to their individual talents, needs, and interests. Furthermore, Governor's STEM Academy students will be required to work toward earning one of the certificates outlined in Tables 1 and 2 below.

Table 1

Certificate Type	Requirements
Gold	The student must ▪ Pass at least six Governor's STEM Academy courses. ▪ Complete a minimum of two state completer sequences. ▪ Earn at least two BOE-approved industry certifications. ▪ Complete an exit portfolio displaying exemplary work samples from each STEM Academy course taken. ▪ Participate in at least 15-20 hours of approved job-shadowing, internship, and/or mentorship activities. ▪ Maintain a minimum 3.0 weighted GPA overall.

Table 2

Certificate Type	Requirements
Silver	The student must ▪ Pass at least four Governor's STEM Academy courses. ▪ Complete a minimum of one state completer sequence. ▪ Earn at least one BOE-approved industry certification. ▪ Complete an exit portfolio displaying exemplary work samples from each STEM Academy course taken. ▪ Participate in at least 15-20 hours of approved job-shadowing, internship, and/or mentorship activities. ▪ Maintain a minimum 2.0 weighted GPA overall.

5. Chesapeake students interested in applying for the Governor's STEM Academy will apply while in the eighth grade. The Academy Coordinator will conduct assemblies at each of the ten middle schools in the Chesapeake City Public Schools' division. In addition to the middle school assemblies, recruiting will take place at middle school career night and the gifted education fair sponsored by Chesapeake City Public Schools. The Academy Coordinator will host an information night in the evening for parents and students and will

host information sessions with middle school principals, guidance directors, and teachers. Applications will be due January 15 to the middle school guidance department. Multiple criteria will be used to screen applicants, including:

- Positive teacher recommendations
- Parent recommendations
- Evidence of interest in STEM as demonstrated through a short essay and a portfolio of work

The required portfolio of work shall consist of three student-choice projects from a list of options using technology such as Microsoft Word, Publisher, PowerPoint, etc. The options will include items such as a multimedia presentation, newsletter, Web page, pamphlet, brochure, résumé, floor plan, database, and project proposal. The wide variety of options is designed to permit applicants to use formats and technology with which they are familiar. Chesapeake City Public Schools offer standard career and technology elective courses at all middle schools; therefore, the electronic portfolio reflects the level of skills that students are exposed to citywide.

The Academy instructor will collect the applications and a selection committee will review all completed applications, rank the applications using a rubric, and select the top candidates for admission into the program. Those not accepted will be placed on the Governor's STEM Academy waiting list to be considered for any vacancies that may occur during ninth or tenth grades. The Academy Coordinator will notify all applicants of their acceptance status by the end of March. Sixty (60) students will be accepted for the ninth-grade class, beginning with the 2012-2013 school year. Each year thereafter, 60 students will be selected to enter at

the ninth-grade level. The program will attain a full complement of 240 students by 2015-2016. See Appendix D for the Governor's STEM Academy Application.

6. The Transportation Department will organize bus routes for transporting Governor's STEM Academy students who reside outside the Grassfield High School zone. Late-day activity buses will also be made available for out-of-zone students who wish to participate in after school sports, activities, and tutoring.
7. An important feature of the Governor's STEM Academy will be the opportunity for students to extend their knowledge of the use of technology in the workplace by participating in job shadowing, internships, and mentorships in the local business community outside of the regular school day. A Governor's STEM Academy staff member will be identified as the Mentorship Coordinator whose responsibility will be to (1) establish community contacts, (2) disseminate information on job-shadowing, internship, and mentorship opportunities to STEM Academy students, and (3) maintain records and documentation of student participation in business community activities. The Mentorship Coordinator will be assigned one instructional block to perform the above duties.

Objectives and Goals

The goal of the Governor's STEM Academy will be to provide students with the technological skills and knowledge to succeed in either postsecondary education and/or the STEM career field.

Objectives:

1. Students will successfully complete a sequential program of study that focuses on critical technological skills and STEM knowledge.
2. Students will attain industry certification and/or postsecondary credit in STEM fields of study.
3. Students will meet or exceed objectives on Virginia Standards of Learning tests.
4. Students will participate in a program in which collaborative agreements with institutions of higher education result in ongoing program development and assessment. This will allow students to be eligible for the Governor's Early College Scholars Program.
5. Student learning will be extended, enriched, and refined through internship, mentorship, and job-shadowing opportunities that create partnerships with community, business, and industry resources.

Performance Measures

The Governor's STEM Academy will address the program objectives outlined in the Virginia Board of Education's Criteria for Governor's STEM Academies. Baseline data were collected during the 2010-2011 school year. Annually, data will be evaluated and performance measures adjusted, as necessary. The Governor's STEM Academy performance measures are outlined below:

1. Improve academic achievement of Academy students:

   - Increase by 20 percent the number of students taking advanced mathematics options beyond Algebra II upon graduation.
   - Increase by 20 percent the number of students taking four years of science upon graduation.
   - Increase by 20 percent the number of Academy students meeting the requirements of the Advanced Studies and/or proposed Advanced Technical Diplomas.
   - Increase Standards of Learning scores and pass/advanced rates for all mathematics and science courses taken by Academy students by 5 percent by 2013–2014. We will use baseline data from 2010–2011.

Course name	% of pass/ advanced	% passed	% eligible for expedited retakes	% of failures	% of students earning a perfect score
Algebra I	62.73%	36.80%	.47%	0%	8.01%
Algebra II	59.68%	40.32%	0%	0%	8.52%
Geometry	54.50%	44.95%	.55%	0%	6.17%
Earth Science	71.03%	28.97%	0%	0%	14.75%
Biology	63.70%	36.30%	0%	0%	5.18%
Chemistry	54.28%	45.72%	0%	0%	0%

Beginning in the 2012–2013 school year, we will use the increased rigor, and we will work to:

- Increase our Algebra II scores by 5 percent to show Advanced College Path readiness.
- Increase SAT mathematics scores for Academy students by an average of 20 points. Baseline data were collected from 2010–2011 SAT scores. Academy students, on average, scored 590 on the mathematics SAT, while the state average in mathematics is 509 and the national average is 514.

2. Increase completion of dual enrollment courses:

In the 2010–2011 school year, 4.9 percent of traditional Grassfield High School students took dual enrollment courses. By the 2013–2014 school year, we look to increase that number by 5 percent and plan to increase the opportunities of dual enrollment courses to both our traditional and Academy students.

3. Provide workplace readiness experiences through strong partnerships with business:

Workplace experiences will include: supervised internships, job shadowing, mentorships, simulations, project-based learning, and guest speakers.

4. Increase high school graduation rates:

Increase the high school graduation rate by 0.5 percent per year from 94.1 percent (2010-2011) to 94.9 percent (2012-2013). Beginning with the 2012-2013 school year, baseline data for the four-year cohort graduation rate will be calculated and goals for improvement will be established.

5. Reduce dropout rates:

Reduce dropout rates by 0.25 percent per year from 0.66 percent (2010-2011) to 0.16 percent (2012-2013) for Academy students and the general secondary student population through acceleration options with industry. Beginning with the 2012-2013 school year, baseline data for the four-year cohort dropout rate will be calculated and goals for improvement will be established.

6. Increase enrollment and retention in postsecondary education:

- Academy students in the STEM Career Cluster will have an opportunity to earn at least nine transferable college credits via Project Lead the Way as defined in the Commonwealth's Early College Scholars Initiative giving Academy students a community college transcript prior to graduating from high school.
- Academy completers will be surveyed to determine successful enrollment and retention in postsecondary institutions annually, beginning with Academy

graduates from the 2012–2013 school year.

- Increase Academy completer transition to postsecondary institutions by 10 percent beginning in 2013-2014.

7. Increase the proportion of students completing a college and workplace ready curriculum in high school:

Baseline data will be established in the 2012-2013 school year with criteria including: diploma type, dual enrollment credit earned, program completer status, and industry credentials earned.

8. Reduce the portion of students that require remediation in college:

- Academy students will successfully pass the college level English and mathematics placement tests (COMPASS) as a criterion for continued enrollment in Academy programs and will; therefore, reduce the need for college remediation for Academy students by 100 percent.
- Preparatory and remediation sessions will be provided, if needed, for students that do not initially pass the college placement tests based on individual student performance on these assessments.
- The Academy student support structure will help ease postsecondary enrollment transition and improve retention strategies by working with students individually on a case-by-case basis.

9. Increase the number of industry certifications awarded to high school students:

- By 2013–2014, increase by 20 percent the number of Academy students earning industry credentials or licensures to provide well-trained workers to benefit the local area work force and to meet employment needs across the Commonwealth.
- Baseline data will be established in the 2012-2013 school year with the criterion to include industry licensure and credentials earned.

10. Increase the number of graduates employed in high-wage, high-demand, and high-skill careers.

Seventy percent of Academy graduates will obtain employment within identified career pathways and related occupations following postsecondary education as evidenced by a follow-up survey that will be sent to our first graduating class, four years after their graduation date, December 2016.

Industry Credential Area	Tested	Passed
American Association Family/Consumer Science (Education Fundamentals Assessment)	22	21
Adobe Photoshop (CS3 and CS4 versions)	70	30
Internet and Computing Core Certification Global Standard (Computing Fundamentals, Key Applications, and Living Online)	16	16
Microsoft Office Specialist (Word, Excel, PowerPoint, and Access)	99	90
National Occupational Competency (Accounting Basic, Architectural Drafting, Computer Programming, Culinary Arts Prep Cook Level1, Electronics Technology, Pre-Engineering/Engineering Technology)	94	75
National Retail Federation (Customer Service and Sales)	131	121
Oracle (Oracle Database 11g:SQL Fundamentals)	6	0
Project Lead The Way (Introduction to Engineering Design, Principles of Engineering, Digital Electronics, and Civil Engineering and Architecture)	84	84
Chesapeake Center Science and Technology	75	43
TOTAL	597	480

Program Details

The Governor's STEM Academy site will be located in Chesapeake, Virginia at Grassfield High School. The program will begin with 60 freshmen from across the City of Chesapeake in September 2012. Each year thereafter, 60 students will be accepted into the Governor's STEM Academy. The program will serve students in grades 9-12 and will include students that reside within the entire city. Grassfield High School operates on a 4X4 block schedule. Students have the opportunity to take eight courses each school year. The school day begins at 8:40 a.m. and concludes at 3:38 p.m. See Appendix E for the Grassfield High School Bell Schedule.

The curriculum is designed for students to have the opportunity to explore STEM curriculum and derive a career interest from their coursework. Students will be required to take one STEM Academy class per year. The Academy Coordinator and school counselors will ensure students are taking appropriate level mathematics and science courses in conjunction with the required STEM Academy courses.

The Governor's STEM Academy will have an Academy Coordinator who is responsible for recruiting and informing middle school students of STEM. Once accepted into the program, students will have the opportunity to work directly with the Academy Coordinator and the Career Counselor who will team teach career lessons to each grade level. These themed lessons will be geared toward postsecondary academic and career goals, with an emphasis on workplace readiness.

The Governor's STEM Academy will have a Mentorship Coordinator who has a dedicated block to work with students their junior year in preparation for their required mentorship, internship,

or job-shadowing experience. Students will participate in a field-based experience the summer between their junior and senior year.

Chesapeake educators interested in teaching in the Governor's STEM Academy will be proficient in information technology; marketing, and/or STEM education, and either possess appropriate industry certifications needed for their teaching assignments or be willing to participate in training prior to teaching Academy courses. STEM Academy teachers will, in most cases by design, teach both STEM Academy and non-STEM Academy courses. See Appendix F for STEM Academy teacher performance responsibilities.

Each career cluster in the Governor's STEM Academy has one pathway for students to pursue. Each pathway will showcase innovation and best practices for promotion of the career cluster. See Appendix G for Career Pathways Plans of Study.

Program Evaluation

The planning and advisory committees, the individual program advisory boards, the division-wide instructional evaluation process, and various academic and CTE assessments all provide feedback and data for internal evaluation of the Grassfield High School Governor's STEM Academy. STEM Academy planning and advisory committees will continue to meet regularly throughout the establishment process and, once the Academy is established, a specific and purposeful schedule will be developed. The individual advisory boards will meet annually and confer as needed to ensure fidelity to articulated goals and direction. Chesapeake City Public Schools will incorporate its ongoing instructional evaluation process into all STEM Academy programs and applicable courses. In addition, reports to the Virginia Department of Education,

including the CTERS report, and the SEDF report, and the state report card, provide feedback for the internal evaluation process.

Partnership Capacity

Partnerships

The Governor's STEM Academy has created a science, technology, engineering and mathematics partnership consistent with the goals of the Governor's STEM Academy. Members include representatives from private business and industry, economic development, work force development, educational sectors (K-16), community leaders, parents, and career and technical education advisory committee members.

Planning Committee

At the initial meeting of the Grassfield High School Governor's STEM Partnership team, members of the local business and industry sector, work force and economic development entities, postsecondary educational institutions, parents, community leaders, and GFHS discussed the timeline and plans for submitting an application to be recognized as a Governor's STEM Academy. Once the team had an opportunity to review the handbook, each member signed a partnership form. See Appendix H for the list of planning committee members and signed partnership forms.

Advisory Committee

In addition to signing partner identification forms, partners signified their support of specific methods in which they would participate in the Governor's STEM Academy. One of the chosen methods of support was to serve as a member of the Governor's STEM Advisory

Committee. See Appendix I for the list of partnership advisory committee members and signed forms of intent.

Memorandum of Agreement

A formal Memorandum of Agreement was created that outlined ways in which partners would contribute resources to the Governor's STEM Academy to broaden the scope of students' educational experiences. Each partner signed a Memorandum of Agreement signifying their support of the Academy, their willingness to assist in the planning and implementation of the Governor's STEM Academy, and their designation as an integral component in the process of educating the students of Chesapeake City Public Schools. See Appendix J for the signed Memoranda of Agreement forms.

Statement of Assurance

A statement of assurance has been signed by the Superintendent of Chesapeake City Public Schools indicating that operating funds and facilities are available to support The Grassfield Governor's STEM Academy. Chesapeake City Public Schools will serve as the fiscal agent for the STEM Academy. See Appendix K.

Budget

The Governor's STEM Academy has a $630,454 operating budget. Primarily, federal and local funds will be used to maintain the Academy's long-term annual operating budget. Efforts will be undertaken to enlist in-kind support for equipment and summer programs through business and industry contributions. See Appendix L for budget details.

Insurance

Chesapeake City Public Schools is insured by the Virginia Municipal Liability Insurance Program for property and liability. The liability insurance is comprehensive coverage of $1,000,000 per occurrence with no annual aggregate limit. See Appendix M.

Staff Evaluation

Governor's STEM Academy teachers will be evaluated according to the personnel policies of the Chesapeake City Public Schools. See Appendix N.

Appendices

Appendix A:

Program of Study

GOVERNOR'S STEM ACADEMY PROGRAM OF STUDY					
Career Cluster	Course Title	9	10	11	12
Information Technology	Keyboarding Applications	x	x	x	x
	IT Fundamentals	x	x		
	Programming		x	x	x
	Advanced Programming			x	x
	Database Design/Management		x	x	
	Advanced Database Design/Management			x	x
	Design, Multimedia, and Web Technologies		x	x	x
	Computer Information Systems		x	x	x
	Accounting & Advanced Accounting			x	x
	Computer Science CSC 201 - Dual Enrollment TCC				x
Marketing	Entrepreneurship Education (9093)	x	x		
	Sports, Entertainment, and Recreation Marketing (8175)		x	x	x
	Leadership Development (9097)			x	x
	Global Marketing and Commerce (8135)			x	x
	Advanced Global Marketing and Commerce (8136)				x
	Adv. Sports, Entertainment, and Recreation Marketing (8177)				x
	Internet Marketing (8125)			x	x
	International Marketing Management 276 - Dual Enrollment TCC				x
Science, Technology, Engineering and Mathematics	Introduction to Engineering*	x	x		
	Principles of Engineering*		x		
	Digital Electronics*		x	x	
	Aerospace Engineering			x	x
	Civil Engineering and Architecture*			x	x
	Engineering Design and Development				x
	Geospatial Technology	x	x	x	x
	Physics			x	x
	Principles of Technology I		x	x	x
	Principles of Technology II			x	x
All Career Clusters	Dual Enrollment English offered at Grassfield High School				x

**Indicates that students can earn college credit at Rochester Institute of Technology*

Appendix B:

Course Descriptions

GOVERNOR'S STEM ACADEMY COURSE DESCRIPTIONS

STEM Career Cluster

Introduction to Engineering Design *8439*

Course Description: Using computer-modeling software, students learn the design process. They solve design problems as they develop, create, and analyze product models.

Principles of Engineering *8441*

Prerequisite: ***Algebra I Recommended***

Course Description: Students develop an understanding of the engineering profession and the fundamental aspects of engineering problem solving. Students study the historical and current impact of engineering on society as well as ethical implications. Mathematical and scientific concepts will be applied to fundamental engineering topics, including mechanics and electrical circuit theory.

Digital Electronics *8440*

Course Description: Students use computer simulations to learn about the logic of electronics as they design, test, and construct circuits and devices. They apply control system programming and explore sequential logic and digital circuitry fundamentals. Topics in computer circuitry are also presented, including circuitry analysis and an exploration into diodes, transistors, and operational amplifiers.

Aerospace Engineering *8428*

Course Description: This course expands horizons with projects developed with NASA-aerodynamics, astronautics, space-life sciences, and systems engineering.

Civil Engineering and Architecture *8430*

Course Description: This course introduces students to the interdependent fields of civil engineering and architecture; students learn project planning, site planning, and building design.

Engineering Design and Development *8443*

Course Description: This pre-engineering course is designed to follow three core courses (Principles of Engineering, Introduction to Engineering Design, and Digital Electronics) as part of a national engineering program. Students enrolled in the Engineering Design and Development course synthesize knowledge, skills,

and abilities through an authentic engineering experience. Students are expected to develop and formally present an independent study project and a team-oriented project, which are critiqued by an evaluation committee. Students interact and work with community mentors to research, design, and construct solutions to engineering problems.

Physics 4510

Course Description: This course emphasizes a more complex understanding of experimentation, the analysis of data, and the use of reasoning and logic to evaluate and validate evidence. The use of mathematics (including algebra, inferential statistics, and trigonometry) is an important component. A conceptual framework of the physical systems and the laws governing matter and energy are the primary objectives of this course. The practical application of physics in other areas of science, the use of technology, and the role of physics in the world are emphasized.

Principles of Technology I 9811

Course Description: Students in this single-period laboratory science course apply physics and mathematics concepts through a unified systems approach to develop a broad knowledge base of the principles underlying modern technical systems. Students study seven technical principles: force, work, rate, resistance, energy, power, and force transformers, emphasizing how each principle plays a unifying role in the operation of mechanical, fluid, electrical, and thermal systems in high-technology equipment. This "principles and systems" approach to studying these technical principles provides a foundation for further education and career flexibility as technology and technical systems advance. Students must successfully complete the two-year sequence (Physics for Technology I and Physics for Technology II) in order to receive one unit of credit in Physics.

Principles of Technology II 9812

Course Description: Students continue to apply physics and mathematics concepts through a unified systems approach to expand their knowledge base of the principles underlying modern technical systems. This course focuses on seven technical principles: momentum, waves, energy converters, transducers, radiation, optical systems, and time constants, emphasizing how each principle plays a unifying role in the operation of mechanical, fluid, electrical, and thermal systems in high-technology equipment. This "principles and systems" approach to studying these technical principles provides a foundation for further education and career flexibility as technology and technical systems advance. Students must successfully complete the two-year sequence (Physics for Technology I and Physics for Technology II) in order to receive one unit of credit in Physics.

Geospatial Technology *8423*

Course Description: This course is a tool to facilitate the study of geographic information systems (GIS) through: global positioning systems (GPS); remote sensing (RS); digital image processing simulator (DIPS); geodesy, automated cartography (Auto-Carto); land surveying (LS); and navigation. These technologies allow students to explore and analyze the world from a local, global, and expanded perspective. Students will use various processes and techniques to create and utilize data to solve technological challenges. These experiences will employ real-world spatial analysis models and guidelines for integrating, interpreting, analyzing, and synthesizing data to evaluate the implications and limitations of such technologies. Interfacing with telecommunications and automated database management systems will also be explored.

INFORMATION TECHNOLOGY Career Cluster

Information Technology Fundamentals *6670*

Course Description: This course introduces the essential skills needed for students to pursue specialized programs leading to technical and professional careers and certifications in the Information Technology (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. The focus of the IT Fundamentals course is on introducing skills related to information technology basics, Internet fundamentals, network systems, computer maintenance/upgrading/ troubleshooting, computer applications, programming, graphics, Web page design, and interactive media. Students explore ethical issues related to computers and Internet technology and develop teamwork and communication skills that will enhance their employability.

Database Design and Management *6660*

Course Description: This first-year course includes database design and programming. Students study database fundamentals to include database development, modeling, design, and normalization. In addition, students are introduced to database programming. Students gain the skills and knowledge needed to use features of database software and programming to manage and control access to data.

Advanced Database Design and Management *6661*

Course Description: Students study Java programming and Java database applications. The basics of object-oriented programming and the Java programming language are emphasized in this instruction. Students will prepare for industry certification in database applications and programming.

Programming *6640*

Course Description: Students explore computer concepts, use logic procedures, and implement programming procedures using one or more programming languages, such as Visual Basic, Java, and C++. In addition, HTML or Java Scripting is used to program Web pages.

Advanced Programming *6641*

Course Description: Building on a foundation of programming skills, students will use object-oriented programming to develop applications for Windows, database, multimedia, games, mobile, and/or Web environments. Students will have the opportunity to explore and create applications related to the information technology and game design industries.

Design, Multimedia, and Web Technologies *6630*

Course Description: Students develop proficiency in creating desktop publications, multimedia presentations/projects, and Web sites using industry standard application software. Students incorporate principles of layout and design in completing publications and projects. Students design portfolios that may include business cards, newsletters, mini-pages, Web pages, multimedia presentations/projects, calendars, and graphics. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Computer Information Systems *6612*

Course Description: Students apply problem-solving skills to real-life situations through word processing, spreadsheets, databases, multimedia presentations, and integrated software activities. Students work individually and in groups to explore computer concepts, operating systems, networks, telecommunications, and emerging technologies. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Accounting *6320*

Course Description: Students study the basic principles, concepts, and practices of the accounting cycle for a service business and a merchandising business. Topics covered include analyzing transactions, journalizing and posting entries, preparing payroll records and financial statements, and managing cash systems. Ethics and professional conduct are emphasized. Students learn fundamental accounting procedures using both manual and electronic systems.

The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Advanced Accounting *6321*

Course Description: Students gain knowledge of advanced accounting principles, procedures, and techniques used to solve business problems and to make financial decisions. Students use accounting and spreadsheet software to analyze, synthesize, evaluate, and interpret business financial data. Students work in a technology-integrated environment using authentic workplace industry scenarios that reflect current industry trends and standards. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Computer Science I Dual Enrollment TCC

Course Description: Introduces algorithm and problem-solving methods. Emphasizes structured programming concepts, elementary data structures and the study and use of a high level programming language.

MARKETING Career Cluster

Leadership & Entrepreneurship Education *9093*

Course Description: This course introduces students to the exciting world of creating, owning, and launching their own business. Students will learn concepts and techniques for planning an innovative business and living the entrepreneurial lifestyle.

Sports, Entertainment, and Recreation Marketing *8175*

Course Description: Students develop skills in the areas of marketing analysis, event marketing, communication, and human relations, along with a thorough understanding of the sports, entertainment, and recreation industry and career options available. Academic skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

Advanced Sports, Entertainment, and Recreation Marketing *8177*

Course Description: Advanced Sports and Entertainment Marketing will build on students' prior knowledge of sports, entertainment, and recreation marketing. This course focuses on the principles of management and planning supported by research, financial, and legal concepts. Students will be able to plan and execute an event, develop a career plan, and establish a sports, entertainment, or recreation marketing product/business. Academic skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting the course are studied.

Global Marketing and Commerce *8135*

Course Description: Global Marketing and Commerce is a specialized course for students with a career interest in the field of international trade. Students gain an understanding of the various careers in global trade, finance, shipping, and marketing and consider fundamental concepts, principles, and theories of marketing in an international setting. Course content blends macroeconomic and microeconomic theory with international culture, politics, legal issues, concepts, practices, and applications. Internships may be available to provide students with additional opportunities for "hands-on" experiences in international marketing. Academic knowledge and skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

Advanced Global Marketing and Commerce *8136*

Course Description: Advanced Global Marketing and Commerce, a specialized course for students with a career interest in international trade, builds upon concepts learned in Global Marketing and Commerce (8135). Economic and international trade concepts are reviewed, and the world environment of international trade is further explored. Students expand their knowledge about the impact of culture on international trade and continue their study of the legal and political aspects of international marketing. Global product strategies are examined. Concepts detailing entry into international markets, pricing strategies, international promotion, and marketing research are studied. Computer/technology applications supporting international marketing are explored. A review of skills and preparation required for careers in international marketing complete this course. Internships that provide "hands-on" opportunities in the international area may be available to students. Academic knowledge and skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

Leadership Development *9097*

Course Description: Students develop competencies in identifying individual aptitudes in relation to effective leadership skills, understanding organizational behavior, using effective communication in the workplace, handling human resources and organizational problems, supervising and training employees, resolving conflict, and planning for the future. Continuing education in leadership is emphasized as well as practical leadership experiences in cooperation with school and community leaders.

Internet Marketing *8125*

Course Description: Students receive an introduction to marketing functions and the business plan and study Internet marketing's role in the global economy. Students gain knowledge of the tools and techniques used in Internet marketing and learn how to design a Web site. They explore ethical, legal, and security aspects and prepare for a career in Internet marketing. Academic skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

Introduction Marketing Management Dual Enrollment TCC

Course Description: Presents the process of marketing and management and applies it to the marketing of products within the global marketplace. Introduces students to activities involving the gathering and analyzing of information in the development and implementation of an international marketing plan.

College Composition I & II Dual Enrollment TCC

Course Description: This rigorous course is offered for dual enrollment between Chesapeake Public Schools and Tidewater Community College. Students will study and produce college-level composition. The first semester elective credit course provides 3 credit hours of college study. Upon successful completion of the second semester course of study, the student earns both the state of Virginia requisite credit for Grade 12 and 3 credits of college study. Students must complete both semesters to meet Grade 12 graduation requirements. Students must be self-motivated and should possess a strong background in English grammar and usage. Students are also required to complete summer reading.

Appendix C:

Industry Credentials

Industry Credentials GOVERNOR'S STEM Academy			
Course	State Code	Exam	Who will test?
Computer Information Systems	6612	MOS Word 2010	All students in course
Design, Multimedia, and Web Technologies	6630	MOS PowerPoint 2010	All students in course
Advanced Programming	6641	NOCTI Computer Programming	All students in course
Database Design & Management	6660	MOS Access 2010	All students in course
Advanced Database Design	6661	Oracle	All students in course
IT Fundamentals	6670	IC3 Global	All students in course
Global Marketing and Commerce	8135	NPC in Customer Service	All students in course
Adv. Global Marketing & Commerce	8136	NPC in Sales	All students in course
Sports, Entertainment, & Recreation Marketing	8175	NPC in Customer Service	All students in course
Adv. Sports, Entertainment, & Recreation Mktg.	8177	NPC in Sales	All students in course
Aerospace Engineering	8428	End of Course PLTW exam	All students in course
Civil Engineering & Architecture	8430	End of Course PLTW exam	All students in course
Introduction to Engineering	8439	End of Course PLTW exam	All students in course
Digital Electronics	8440	End of Course PLTW exam	All students in course
Principles of Engineering	8441	End of Course PLTW exam	All students in course
Engineering Design & Development	8443	End of Course PLTW exam	All students in course
Leadership & Entrepreneurship Education	9093	Work Place Readiness	All students in course
Leadership Development	9097	Work Place Readiness	All students in course

**Must meet age requirement for NRF.*

Appendix D:

STEM Academy Application

GRASSFIELD HIGH SCHOOL
GOVERNOR'S STEM ACADEMY APPLICATION

Grassfield High School, 2007 Grizzly Trail, Chesapeake, VA 23323

Application Deadline: January 15 -- Submit to middle school counselor.

STUDENT DATA SHEET

Student's Legal Last Name _____ Legal First Name _____ Middle Name _____ Preferred Name _____

Student's Residence – Street Address _____ City _____ State _____ Zip Code _____

Current Middle School _____ Grade Level _____ Student ID Number _____

Birth Date _____ Gender (M or F) _____

Mother's/Guardian's Name _____ Father's/Guardian's Name _____

Home Telephone # _____ E-mail Address _____

Mother's Work # _____ Mother's cell # _____

Father's Work # _____ Father's cell # _____

Student's Zoned High School (if not accepted for Governor's STEM Academy)

_____

Student Essay – Directions to Student

<u>On a separate sheet of paper</u> neatly print or type a thoughtful essay of approximately 350 words that describes your goals for participating in the Governor's STEM Academy. ***The essay should include your thoughts and reasons for which of the three areas of concentration you wish to focus your studies: entrepreneurship, information technology, or pre-engineering*****. Essays should be original, creative, and grammatically correct.**

The Chesapeake Public School system is an equal educational opportunity school system. The School Board of the City of Chesapeake also adheres to the principles of equal opportunity in employment and, therefore, prohibits discrimination in terms and conditions of employment on the basis of race, sex, national origin, color, religion, age, or disability.

GRASSFIELD HIGH SCHOOL GOVERNOR'S STEM ACADEMY

ADMISSIONS AGREEMENT

The Governor's STEM Academy at Grassfield High School offers a specialized curriculum for highly interested and motivated students. For a student to be successful in this program, he/she must be a consistent, dedicated learner. Therefore, applicants and parents are required to make the following commitment.

I agree to the following terms and conditions for participating in the Grassfield Governor's STEM Academy.
I will

1. follow the rules of the school as outlined in the *Grassfield High School Student Handbook.*
2. actively participate in each class by being prepared, listening attentively, offering relevant comments, posing insightful questions, taking notes, and doing any other activities necessary to meet the expectations set forth for each class.
3. submit quality work in a timely fashion seeking additional assistance from my instructors as needed.
4. manifest the highest degree of academic integrity. Incidents of cheating may be grounds for removal from the program.
5. maintain an excellent attendance record, scheduling appointments or vacations at times that do not conflict with classes.
6. remain in the program unless recommended for dismissal by the Academy Coordinator or Academy staff. Recommendation for continuance or dismissal from the program will be determined by student progress, attitude, and motivation.

I understand that if I do not meet the standards of the Academy program, either because of the quality of my work or because of my performance as a serious learner, I may be asked to withdraw from the program to enroll in a course of study which better meets my level of performance. I also understand that if I leave the Academy program, I must return to my zoned high school and, according to Virginia High School League rules, I would not be eligible to participate in VHSL activities for 365 days unless I was granted a waiver under VHSL rule 28-6-2(14).

_____ _____

Student's Signature Date

I hereby grant permission and consent for my son/daughter to enroll in the Grassfield Governor's STEM Academy program and agree to all of the listed terms. Finally, I will support my child's academic growth and encourage development of independent study skills.

_____ _____

Parent's/Guardian's Signature Date

GRASSFIELD HIGH SCHOOL GOVERNOR'S STEM ACADEMY

PARENT **ASSESSMENT FORM**

Student's Name_____

Counselor_____ School_____

Directions to the Student: Complete the information above and have a parent or guardian complete this form.

Directions to the Parent: Your child is applying for admission to the Governor's STEM Academy program at Grassfield High School. For each item below, please place a check mark in the box that best describes your assessment of your child.

	Almost Always	Often	Occasionally	Rarely	Never
Ease of Learning – Enjoys the challenge of problems, assignments, and issues. Learns quickly.					
Adaptability – Approaches ideas and problems from a number of directions. Finds alternative means of solving problems. Thinks about ideas in new ways.					
Initiative and Enthusiasm – Is a highly motivated, independent worker. Seeks additional tasks; is intellectually curious; stays actively engaged in activities.					
Persistence – Stays with tasks; relates progress on tasks to accomplishment of larger goals.					
Reliability and Integrity – Is scrupulous and punctual in fulfilling obligations; readily takes responsibility.					
Reasoning – Uses logical, analytical reasoning and/or creative, divergent thinking to consider ideas or solve problems. (Originality and elaboration of thinking)					
Communications – Communicates effectively.					
Organization – Manages time, resources and materials; meets deadlines; divides tasks into subtasks.					
Leadership Qualities – Shows respect and tolerance of others' views. Is willing to accept the ideas of others and contributes to the group process. Influences others in a positive manner.					
Success – Displays the ability to succeed in a challenging program.					

Student's Name_____

Counselor_____ School_____

Please provide any comments that might assist us in determining your child's potential to succeed in the Governor's STEM Academy program.

_____ _____ _____

Parent's Name (Printed) Parent's Signature Date

Thank you for completing this form. Your input is valued.
Please return this form to your child's school counselor.

Due Date: January 15, 2013

GRASSFIELD HIGH SCHOOL GOVERNOR'S STEM ACADEMY

SCIENCE **TEACHER RECOMMENDATION FORM**

Student's Name _____

Teacher _____ Subject _____

Counselor _____ School _____

Directions to Student: Complete the information above and give a separate form to the following four teachers for recommendation: your current English teacher, mathematics teacher, science teacher, and social studies teacher.

Directions to Student, Parent/Guardian: Teacher recommendations are confidential; please do not ask teachers to reveal the contents to your son/daughter or to you.

Directions to Teacher: The student whose name appears above is applying for admission to the Governor's STEM Academy at Grassfield High School. For each item below, please mark the box that best represents your assessment of this student.

	Almost Always	Often	Occasionally	Rarely	Never
Ease of Learning – Enjoys the challenge of problems, assignments, and issues. Learns quickly.					
Adaptability – Approaches ideas and problems from a number of directions. Finds alternative means of solving problems. Thinks about ideas in new ways.					
Initiative and Enthusiasm – Is a highly motivated, independent worker. Seeks additional tasks; is intellectually curious; stays actively engaged in activities.					
Persistence – Stays with tasks; relates progress on tasks to accomplishment of larger goals.					
Reliability and Integrity – Is scrupulous and punctual in fulfilling obligations; readily takes responsibility.					
Reasoning – Uses logical, analytical reasoning and/or creative, divergent thinking to consider ideas or solve problems. (Originality and elaboration of thinking)					
Communications – Communicates effectively.					
Organization – Manages time, resources and materials; meets deadlines; divides tasks into subtasks.					
Leadership Qualities – Shows respect and tolerance of others' views. Is willing to accept the ideas of others and contributes to the group process. Influences others in a positive manner.					
Success – Displays the ability to succeed in a challenging program.					

Student's Name_____

Counselor_____ School_____

Please provide any comments that might assist us in determining this student's potential to succeed in the Governor's STEM Academy program. We are interested in strong academic students who are highly motivated and exhibit mature decision-making skills.

Teacher, please check only one:

☐ Highly recommended ☐ Recommended ☐ Not Recommended

_____ _____

Teacher's Name (Printed) Teacher's Signature

_____ _____

Subject Date

Thank you for completing this form. Your input is valued.
Please return this form to the school counselor.

GRASSFIELD HIGH SCHOOL GOVERNOR'S STEM ACADEMY

MATH TEACHER RECOMMENDATION FORM

Student's Name _____

Teacher _____ Subject _____

Counselor _____ School _____

Directions to Student: Complete the information above and give a separate form to the following four teachers for recommendation: your current English teacher, mathematics teacher, science teacher, and social studies teacher.

Directions to Student, Parent/Guardian: Teacher recommendations are confidential; please do not ask teachers to reveal the contents to your son/daughter or to you.

Directions to Teacher: The student whose name appears above is applying for admission to the Governor's STEM Academy at Grassfield High School. For each item below, please mark the box that best represents your assessment of this student.

	Almost Always	Often	Occasionally	Rarely	Never
Ease of Learning – Enjoys the challenge of problems, assignments, and issues. Learns quickly.					
Adaptability – Approaches ideas and problems from a number of directions. Finds alternative means of solving problems. Thinks about ideas in new ways.					
Initiative and Enthusiasm – Is a highly motivated, independent worker. Seeks additional tasks; is intellectually curious; stays actively engaged in activities.					
Persistence – Stays with tasks; relates progress on tasks to accomplishment of larger goals.					
Reliability and Integrity – Is scrupulous and punctual in fulfilling obligations; readily takes responsibility.					
Reasoning – Uses logical, analytical reasoning and/or creative, divergent thinking to consider ideas or solve problems. (Originality and elaboration of thinking)					
Communications – Communicates effectively.					
Organization – Manages time, resources and materials; meets deadlines; divides tasks into subtasks.					
Leadership Qualities – Shows respect and tolerance of others' views. Is willing to accept the ideas of others and contributes to the group process. Influences others in a positive manner.					
Success – Displays the ability to succeed in a challenging program.					

Student's Name_____

Counselor_____ School_____

Please provide any comments that might assist us in determining this student's potential to succeed in the Governor's STEM Academy program. We are interested in strong academic students who are highly motivated and exhibit mature decision-making skills.

Teacher, please check only one:

☐ Highly recommended ☐ Recommended ☐ Not Recommended

_____ _____

Teacher's Name (Printed) Teacher's Signature

_____ _____

Subject Date

Thank you for completing this form. Your input is valued.
Please return this form to the school counselor.

GRASSFIELD HIGH SCHOOL GOVERNOR'S STEM ACADEMY

ENGLISH **TEACHER RECOMMENDATION FORM**

Student's Name _____

Teacher _____ Subject _____

Counselor _____ School _____

Directions to Student: Complete the information above and give a separate form to the following four teachers for recommendation: your current English teacher, mathematcis teacher, science teacher, and social studies teacher.

Directions to Student, Parent/Guardian: Teacher recommendations are confidential; please do not ask teachers to reveal the contents to your son/daughter or to you.

Directions to Teacher: The student whose name appears above is applying for admission to the Governor's STEM Academy at Grassfield High School. For each item below, please mark the box that best represents your assessment of this student.

	Almost Always	Often	Occasionally	Rarely	Never
Ease of Learning – Enjoys the challenge of problems, assignments, and issues. Learns quickly.					
Adaptability – Approaches ideas and problems from a number of directions. Finds alternative means of solving problems. Thinks about ideas in new ways.					
Initiative and Enthusiasm – Is a highly motivated, independent worker. Seeks additional tasks; is intellectually curious; stays actively engaged in activities.					
Persistence – Stays with tasks; relates progress on tasks to accomplishment of larger goals.					
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Communications – Communicates effectively.					
Organization – Manages time, resources and materials; meets deadlines; divides tasks into subtasks.					
Leadership Qualities – Shows respect and tolerance of others' views. Is willing to accept the ideas of others and contributes to the group process. Influences others in a positive manner.					
Success – Displays the ability to succeed in a challenging program.					

Student's Name_____

Counselor_____ School_____

Please provide any comments that might assist us in determining this student's potential to succeed in the Governor's STEM Academy program. We are interested in strong academic students who are highly motivated and exhibit mature decision-making skills.

Teacher, please check only one:

☐ Highly recommended ☐ Recommended ☐ Not Recommended

_____ _____

Teacher's Name (Printed) Teacher's Signature

_____ _____

Subject Date

Thank you for completing this form. Your input is valued.
Please return this form to the school counselor.

GRASSFIELD HIGH SCHOOL GOVERNOR'S STEM ACADEMY

SOCIAL STUDIES **TEACHER RECOMMENDATION FORM**

Student's Name _____

Teacher _____ Subject _____

Counselor _____ School _____

Directions to Student: Complete the information above and give a separate form to the following four teachers for recommendation: your current English teacher, mathematics teacher, science teacher, and social studies teacher.

Directions to Student, Parent/Guardian: Teacher recommendations are confidential; please do not ask teachers to reveal the contents to your son/daughter or to you.

Directions to Teacher: The student whose name appears above is applying for admission to the Governor's STEM Academy at Grassfield High School. For each item below, please mark the box that best represents your assessment of this student.

	Almost Always	Often	Occasionally	Rarely	Never
Ease of Learning – Enjoys the challenge of problems, assignments, and issues. Learns quickly.					
Adaptability – Approaches ideas and problems from a number of directions. Finds alternative means of solving problems. Thinks about ideas in new ways.					
Initiative and Enthusiasm – Is a highly motivated, independent worker. Seeks additional tasks; is intellectually curious; stays actively engaged in activities.					
Persistence – Stays with tasks; relates progress on tasks to accomplishment of larger goals.					
Reliability and Integrity – Is scrupulous and punctual in fulfilling obligations; readily takes responsibility.					
Reasoning – Uses logical, analytical reasoning and/or creative, divergent thinking to consider ideas or solve problems. (Originality and elaboration of thinking)					
Communications – Communicates effectively.					
Organization – Manages time, resources and materials; meets deadlines; divides tasks into subtasks.					
Leadership Qualities – Shows respect and tolerance of others' views. Is willing to accept the ideas of others and contributes to the group process. Influences others in a positive manner.					
Success – Displays the ability to succeed in a challenging program.					

Student's Name_____

Counselor_____ School_____

Please provide any comments that might assist us in determining this student's potential to succeed in the Governor's STEM Academy program. We are interested in strong academic students who are highly motivated and exhibit mature decision-making skills.

Teacher, please check only one:

☐ Highly recommended ☐ Recommended ☐ Not Recommended

_____ _____

Teacher's Name (Printed) Teacher's Signature

_____ _____

Subject Date

Thank you for completing this form. Your input is valued.
Please return this form to the school counselor.

REQUIRED ELECTRONIC PORTFOLIO

To be considered for acceptance into the Governor's STEM Academy at Grassfield High School, each applicant must complete an electronic portfolio containing three activities that demonstrates his/her ability in the field of technology.

Directions:

Save your work to a recordable CD (CD-R) using the following guidelines:

- **Create a folder with your student ID number as the name.**
- **Within this folder, save each completed activity in a separate folder.**

Examples of Student Products for the Electronic Portfolio

1. Create a 5-minute, self-running **multimedia presentation** that markets either tourism for the Commonwealth of Virginia or a college athletic program. Self-running describes a program that will run on its own.
   Suggested software: *Microsoft PowerPoint or Microsoft Movie Maker*

2. Create a **newsletter** (no more than four pages) on international issues. Integration of proper grammar and formal diction are expected to be evident in the product. No copied or pasted content accepted and the product must be the student's original work.
   Suggested software: *Microsoft Publisher or Microsoft Word*

3. Create a **Web site** for your own school that can be viewed with Internet Explorer. There should be a Home Page with four additional linked pages. Copies of the school's existing Web page will not be accepted.
   Suggested software: *Microsoft Publisher, Microsoft Word, or any other program that will save in *.html format.*

4. Create a **technical guide** (pamphlet, brochure, or multimedia presentation) that explains to novice users how to analyze and solve simple hardware and software problems. Consider problems such as "a job won't print" or "the computer won't turn on."
   Suggested software: *Microsoft PowerPoint, Microsoft Publisher, Microsoft Word*

5. Create an original **résumé** that would reflect the accomplishments of the student applicant.
   Suggested software: *Microsoft Word*

6. Create a floor plan **design** of a business office of 12-15 employees.
   Any entry not saved in the suggested format will not be evaluated.
   Suggested software: *AutoCAD or any program that will save in *.bmp, *.jpg, *.gif, * .pdf, or *.wmf format.*

7. Create a **working database** for a business in which five employees can enter sales from four products sold (video games, CDs, books, and DVDs). Employees should also be able to track sales by product type or by employee. Enter sufficient data so that the database can be queried.
   Suggested software: *Microsoft Access*

8. Create a **project proposal** that details what is necessary to establish a networked environment for every room in a house. Consider at least one file server and two printers in your proposal.
   Any entry not saved in the suggested format will not be evaluated.
   Suggested software: *Microsoft Word*
   If including floor plans, AutoCAD or any program that will save in *.bmp, *.jpg, *.gif, *.pdf, or *.wmf format.

Submit your CD containing your electronic portfolio with your academy application by January 15, 2012 to your school counselor. Your application will not be considered without the electronic portfolio. Please note that the electronic portfolio cannot be returned to the applicant.

GRASSFIELD HIGH SCHOOL GOVERNOR'S STEM ACADEMY

COUNSELOR CHECKLIST

Student's Name _____ Grade Level_____

Current
School_____

Directions to Student: Supply the information requested above and give this form to your school counselor along with completed items 1, 2, 3, 8, and 10 (list below) by January 15, 2013.

Directions to School Counselor: The final deadline for the student to submit all items to you is January 15, 2013. Please assemble the student's application using the checklist below, make copies if necessary, and forward the entire packet to the Governor's STEM Academy Coordinator at Grassfield High School.

Applications received after January 15, 2013 will not be considered in the first round of acceptances. Late applications will be placed on the Academy waiting list to be considered if any vacancies occur. Before forwarding any late applications, please clearly mark the top of the first page with "late" and indicate the date received.

INFORMATION BELOW TO BE COMPLETED BY THE SCHOOL COUNSELOR

Application Checklist

_____ 1. Student Data Sheet (Page 1)

_____ 2. Admissions Agreement (Page 2)

_____ 3. Parent's Assessment Form (Pages 3 & 4)

_____ 4. Teacher's Recommendation Form #1 (Pages 5 & 6)

_____ 5. Teacher's Recommendation Form #2 (Pages 7 & 8)

_____ 6. Teacher's Recommendation Form #3 (Pages 9 & 10)

_____ 7. Teacher's Recommendation Form #4 (Pages 11 & 12)

_____ 8. Applicant's Electronic Portfolio of three activities (CD)

_____ 9. Counselor's Checklist (Page 14)

_____ 10. Student Essay on separate sheet of paper provided by student (Directions on Page 1)

Counselor's signature_____ Date_____

Note: Applicants' transcripts will be used in screening applicants, but the information will be obtained directly from the Chesapeake Public Schools Information Technology Department. The counselor need not supply this information with applications.

Thank you for assisting in the completion of this student's application packet.

Appendix E:

Bell Schedule

Regular Bell Schedule

<table>
<tr><td>Homeroom / Block 1</td><td colspan="4">8:40 - 10:15</td></tr>
<tr><td>Block 2</td><td colspan="4">10:21 - 11:52</td></tr>
<tr><td>Block 3</td><td colspan="4"></td></tr>
<tr><td rowspan="5"></td><td>1st Lunch</td><td>2nd Lunch</td><td>3rd Lunch</td><td>4th Lunch</td></tr>
<tr><td>Lunch
11:52 - 12:21</td><td>Class
11:58 - 12:26</td><td rowspan="3">Class
11:58 -12:59</td><td rowspan="3">Class
11:58 – 1:32</td></tr>
<tr><td rowspan="3">Class
12:26 - 2:01</td><td>Lunch
12:26 - 12:54</td></tr>
<tr><td rowspan="2">Class
12:59 - 2:01</td><td>Lunch
12:59 - 1:27</td></tr>
<tr><td>Class
1:32 - 2:01</td><td>Lunch
1:32 - 2:01</td></tr>
<tr><td>Block 4</td><td colspan="4">2:07 - 3:38</td></tr>
</table>

Appendix F:

Job Description

Grassfield High School Governor's STEM Academy
Teacher Performance Responsibilities

Teacher Pool

Staffing for Governor's STEM Academy courses is made exclusively from the official Governor's STEM Academy Pool as vacancies become available; therefore, entering the pool serves as the gateway to teaching in the Governor's STEM Academy Program, but does not guarantee ultimate placement in the program. Such placement is dependent upon staffing needs and final approval by the principal.

The following items outline the basic responsibilities for teaching in the Governor's STEM Academy at Grassfield High School. Teachers will be expected to do the following:

Teacher Training

1. Attend technology certification sessions and training to obtain required industry certification(s) during the school year or summer before instructing students in the program.
2. Appropriate certification(s) must be maintained in order to remain eligible to teach in the Grassfield Governor's STEM Academy.

Implementation of the Academy Program

3. Participate in summer curriculum development workshops to create instructional materials. Compensation will be provided for these activities.
4. Serve on a committee as needed to assist in the planning and preparation of Governor's STEM Academy policies and procedures. Committee meetings will be held at Grassfield High School.
5. Transfer to Grassfield High School to teach non-Academy CTE courses in the teacher's area of certification as assigned by the administration prior to becoming an instructor in the Academy, if necessary.
6. Attend Governor's STEM Academy staff meetings and in-services as determined by the Academy Coordinator.
7. Become familiar with the curriculum and assessment requirements, including industry certifications, in one's subject area.
8. Maintain a personal commitment to remaining current in technology and to promoting love of learning in students.
9. Display genuine concern for each student's welfare.
10. Work collaboratively with students in the pursuit of knowledge.
11. Support students academically by providing extra help as needed.
12. Realize that flexibility must be a key component in the instructional setting and that collaboration with other teachers will be necessary.
13. Fulfill Academy teacher responsibilities by placing emphasis on the personal development of students to ensure that each student will
    - Learn to assess and evaluate information.
    - Develop a technology portfolio of exemplary work.
    - Develop problem-solving and decision-making skills.
    - Obtain industry certification credentials.
    - Acquire the skills and attitudes necessary for success in higher education and employment in a highly competitive world.
14. Tailor instruction for different learning styles.

Assessment Responsibilities

15. Ensure that students are informed of current subject content and course requirements.
16. Utilize a variety of assessment methods to measure both the content and process of achievement.
17. Comply with all program deadlines identified by the Academy Coordinator and Grassfield administration.
18. Prepare students for state-approved certification assessments.
19. Facilitate opportunities for student participation in appropriate CTE student organizations.

Appendix G:

Pathway Plans of Study

Commonwealth of Virginia Plan of Study

Science, Technology, Engineering & Mathematics

Student Name: _____
School: Grassfield High School
Date: _____

Cluster: Science, Technology, Engineering & Mathematics **Pathway:** Engineering and Technology

This Career Pathway Plan of Study can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals. This Plan of Study, used for learners at an educational institution, should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements.

EDUCATION LEVELS	GRADE	English/ Language Arts	Mathematics	Science	Social Studies/ Science	Other Required Courses Recommended Electives Learner Activities	Recommended Career and Technical Courses Source: Administrative Planning Guide http://www.cteresource.org/apg/	SAMPLE – Occupations Relating to This Pathway: http://www.doe.virginia.gov/instruction/career_technical/career_clusters/sample_plans_study/index.shtml http://www.careerclusters.org http://www.cteresource.org/cpg/
Graduation Requirements: http://www.doe.virginia.gov/instruction/graduation/index.shtml								Aeronautical Engineering Aerospace Engineering Agricultural Engineering Agricultural Technician Application Engineer Architectural Engineer Automotive Engineer Biomedical Engineer Biotechnology Engineer CAD Technician Chemical Engineer Civil Engineer Communication Engineer Computer Engineer Computer Programmer Construction Engineer Electrical Engineer Electronics Technician Geothermal Engineer Industrial Engineer Manufacturing Engineer Marine Engineer Mechanical Engineer Metallurgist Mining Engineer Nuclear Engineer Petroleum Engineer Project/Process Engineer Survey Technician Systems Engineer Transportation Engineer
MIDDLE	7	English 7 (1115)	Mathematics 7 (3111)	Life Science 7 (4116)	Social Studies 7 (2356)		NOTE: Use state course titles Introduction to Technology (8483)	
	8	English 8 (1123)	Mathematics 8 (3112) or Algebra I (3130)	Physical Science 8 (4126)	Social Studies 8 (2106)	Foreign Language	Inventions and Innovations (8461) Technological Systems (8462)	
Career Assessment: Identify an appropriate career assessment instrument at the middle school level used to help students and their parents plan for high school: VA Wizard ☒ or other assessment (please indicate): _____								
SECONDARY	9	English 9 (1130) or Honors English 9 (1130)	Algebra I (3130) Geometry (3143) or Algebra II (3135)	Earth Science (4210) or Honors Earth Science (4210)	World History and Geography to 1500 AD (2215)	Economics & Personal Finance (6120) Health & PE (2 years) (7310 and 7311) Foreign Language (3 years) Other Electives to Geospatial Technology (8423) Complement Pathway (Core Academic and CTE):	Introduction to Engineering Design (PLTW) (8439)	
	10	English 10 (1140) or Honors English 10 (1140)	Geometry (3143) or Algebra II (3135)	Biology (4310) or Honors Biology (4310)	World History and Geography 1500 AD to present (2216)		Principles of Engineering (PLTW) (8441)	
	11	English 11(1150) or Honors English 11 (1150)	Algebra II (3135) or Trigonometry/Probability and Statistics (3149)	Chemistry (4410) or Honors Chemistry (4410) or AP Biology (4370) or AP Chemistry (4470)	VA/US History (2360) or AP US History (2319)		Digital Electronics (PLTW) (8440) Aerospace Engineering (PLTW) (8428)	
	12	English 12 (1160) or World Literature (1515) or Honors English 12 (1160) or AP English Literature (1195) and Composition or Dual Enrollment College Composition I and II (DE 1600/1601)	Trigonometry/Probability and Statistics (3149) or Calculus (3178) or AP Calculus AB/BC (3177)	Contemporary Physics (4510) (or Principles of Technology I and II)(9811 / 9812) or AP Physics (4570) or other science course	VA/US Government (2440) or AP Government and Politics (2445)		Civil Engineering and Architecture (PLTW) (8420) Engineering Design and Development (PLTW) (8443)	
High school courses in the pathway offered locally for college credit should be coded: DE (Dual Enrollment) and/or VC (Validated Credit)								

List related certifications/credentials approved by VDOE and offered locally: http://www.cteresource.org/apg (Go to Certification – License Section) End of Course Project Lead the Way Exam	Additional Learning Opportunities: CTSO Organization(s): ☐ DECA ☐ FBLA ☐ FCCLA ☐ FFA ☐ FEA ☐ HOSA ☐ SkillsUSA ☒ TSA Work-Based Learning: ☒ Career Research ☐ Cooperative Education ☒ Internship ☒ Mentorship ☒ Job Shadowing ☐ Service Learning Project ☐ Student Apprenticeship
Postsecondary: Placement Assessments such as COMPASS & SAT II	College Entrance Exams such as ACT & SAT

POSTSECONDARY	SAMPLE POSTSECONDARY PROGRAMS RELATED TO THIS CAREER PATHWAY Individual plans must include locally agreed upon courses at the postsecondary level (See page 2)			
	Pathway	**Associate Degree, College Certificate, or Apprenticeship**	**Bachelors Degree**	**Postgraduate Degree**
	Engineering and Technology	Engineering Technology	Engineering	

College: _____ **School Division(s):** _____

Postsecondary: Placement Assessments such as COMPASS & SAT II

POSTSECONDARY - COMMUNITY COLLEGE or APPRENTICESHIP - Determined Locally	Semester	English	Mathematics	Science	Social Studies	Required Courses or Recommended Electives			
	POSTSECONDARY PLAN OF STUDIES MUST INCLUDE POSTSECONDARY ACADEMIC, CTE, AND OTHER ELECTIVE COURSES APPROPRIATE FOR AN ASSOCIATE DEGREE.								
	Year 1 1st Semester	College Composition I (ENG 111) or English Literature	College Algebra (MTH 158) or Pre-Calculus I (MTH 163)	College Chemistry I (CHM 111)	Principles of Psychology (PSY 200)	Introduction to Engineering (EGR 120)			
	Year 1 2nd Semester	College Composition II (ENG 112) or English Literature	Pre-Calculus II (MTH 164)	General College Physics I (PHY 201)	Global Issues	Introduction to Engineering Methods (EGR 125)			
	Year 2 1st Semester	Principles of Public Speaking (CST 100)	Calculus w/Analytical Geometry I (MTH 173) or Ordinary Differential Equations (MTH 279)	General College Physics II (PHY 202)	United States History I (HIS 121)	Engineering Mechanics – Statics (EGR 140)			

	Year 2 2nd Semester	Technical Report Writing (ENG 131)	Applied Calculus (MTH 270)	General Biology (BIO 101)	Introduction to Sociology I (SOC 201) or Ethical and Legal Issues	Continue Courses in the area of specialization			

College courses offered locally in the high school for college credit should be coded: DE (Dual Enrollment) and/or VC (Validated Credit)

Related Industry Certifications Available:

Additional Suggested Learning Opportunities:

Work-Based Learning:

☐ Cooperative Education ☐ Internship ☐ Mentorship
☐ Job Shadowing ☐ Service Learning Project ☐ Registered Apprenticeship

UNIVERSITY

University/College:
Degree or Major:
Number of Articulated CC Credits:

Notes:

Commonwealth of Virginia Plan of Study

Student Name: _____
School: Grassfield High School
Date: _____

Cluster: Information Technology **Pathway:** Programming and Software Development

This Career Pathway Plan of Study can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals. This Plan of Study, used for learners at an educational institution, should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements.

EDUCATION LEVELS	GRADE	English/ Language Arts	Mathematics	Science	Social Studies/ Science	Other Required Courses Recommended Electives Learner Activities	Recommended Career and Technical Courses Source: Administrative Planning Guide http://www.cteresource.org/apg/	SAMPLE – Occupations Relating to This Pathway: http://www.doe.virginia.gov/instruction/career_technical/career_clusters/sample_plans_study/index.shtml http://www.careerclusters.org http://www.cteresource.org/cpg/
Graduation Requirements: http://www.doe.virginia.gov/instruction/graduation/index.shtml								• Animator • Digital Media Designer • Graphic Designer • Instructional Technologist • Media Specialist • Multimedia Author • Multimedia Development • Multimedia Specialist • Producer • Production Assistant • Streaming Media Specialist • Virtual Reality Specialist • Web Administrator • Web Architect/Designer • Web Designer • Web Developer • Web Producer • Webmaster • Game Developer • Operating System Designer/Engineer • Programmer • Project Lead • Software Applications Specialist • Software Applications Tester • Software Design Engineer • Systems Administrator • Systems Analyst • Test Engineer
MIDDLE	7	English 7 (1115)	Mathematics 7 (3111)	Life Science 7 (4116)	Social Studies 7 (2356)		**NOTE: Use state course titles** Introduction to Technology (8483)	
MIDDLE	8	English 8 (1123)	Mathematics 8 (3112) or Algebra I (3130)	Physical Science 8 (4126)	Social Studies 8 (2106)	Foreign Language	Inventions and Innovations (8461) or Technological Systems (8462)	
Career Assessment: Identify an appropriate career assessment instrument at the middle school level used to help students and their parents plan for high school: VA Wizard ☒ or other assessment (please indicate): _____								
SECONDARY	9	English 9 (1130) or Honors English 9 (1130)	Algebra I (3130) or Algebra II (3135) Geometry (3143)	Earth Science (4210) or Honors Earth Science (4210)	World History and Geography to 1500 AD (2215)	Economics & Personal Finance (6120) Health & PE (2 years) (7310 and 7311) Foreign Language (3 years) Computer Information Systems (6612) Design, Multimedia and Web Technologies (6630) Accounting(6320) Advanced Accounting (6321) Other Electives to Complement Pathway (Core Academic and CTE):	Keyboarding Applications (6152) IT Fundamentals (6670)	
SECONDARY	10	English 10 (1140) or Honors English 10 (1140)	Geometry (3143) or Algebra II (3135) Trigonometry/Probability and Statistics (3149)	Biology (4310) or Honors Biology (4310)	World History and Geography 1500 AD to present (2216)		Programming (6640)	
SECONDARY	11	English 11(1150) or Honors English 11 (1150)	Algebra II (3135) or Trigonometry/Probability and Statistics (3149)	Chemistry (4410) or Honors Chemistry (4410) or AP Biology (4370) or AP Chemistry (4470)	VA/US History (2360) or AP US History (2319)		Advanced Programming (6641) Database Design and Management (6660)	
SECONDARY	12	English 12 (1160) or World Literature (1515) or Honors English 12 (1160) or AP English Literature (1195) and Composition or Dual Enrollment College Composition I and II (DE 1600/1601)	Trigonometry/Probability and Statistics (3149) or Calculus (3178) or AP Calculus AB/BC (3177)	Contemporary Physics (4510) (or Principles of Technology I and II)(9811 / 9812) or AP Physics (4570) other science course	VA/US Government (2440) or AP Government and Politics (2445)		Advanced Database Design and Management (6661) Computer Science – Dual Enrollment (CSC 201)	
High school courses in the pathway offered locally for college credit should be coded: DE (Dual Enrollment) and/or VC (Validated Credit)								

List related certifications/credentials approved by VDOE and offered locally: http://www.cteresource.org/apg (Go to Certification – License Section) IC3 Global MOS Access, Word, PowerPoint 2010 Oracle NOCTI Computer Programming and Accounting	Additional Learning Opportunities: CTSO Organization(s): ☐ DECA ☒ FBLA ☐ FCCLA ☐ FFA ☐ FEA ☐ HOSA ☐ SkillsUSA ☐ TSA Work-Based Learning: ☒ Career Research ☐ Cooperative Education ☒ Internship ☒ Mentorship ☒ Job Shadowing ☐ Service Learning Project ☐ Student Apprenticeship
Postsecondary: Placement Assessments such as COMPASS & SAT II	College Entrance Exams such as ACT & SAT

POSTSECONDARY	SAMPLE POSTSECONDARY PROGRAMS RELATED TO THIS CAREER PATHWAY Individual plans must include locally agreed upon courses at the postsecondary level (See page 2)			
	Pathway	**Associate Degree, College Certificate, or Apprenticeship**	**Bachelors Degree**	**Postgraduate Degree**
	Information Technology	Information Systems Technology	Computer Science	

College: Tidewater Community College **School Division(s):** _____

Postsecondary: Placement Assessments such as COMPASS & SAT II

POSTSECONDARY - COMMUNITY COLLEGE or APPRENTICESHIP - Determined Locally

Semester	English	Mathematics	Science	Social Studies	Required Courses or Recommended Electives			
POSTSECONDARY PLAN OF STUDIES MUST INCLUDE POSTSECONDARY ACADEMIC, CTE, AND OTHER ELECTIVE COURSES APPROPRIATE FOR AN ASSOCIATE DEGREE.								
Year 1 1st Semester	College Composition I (ENG 111) or English Literature	College Algebra (MTH 158) or Pre-Calculus I (MTH 163)	College Chemistry I (CHM 111)	Principles of Psychology (PSY 200)	Introduction to Software Design (ITP 100)			
Year 1 2nd Semester	College Composition II (ENG 112) or English Literature	Pre-Calculus II (MTH 164)	General College Physics I (PHY 201)	Programming II (232)	Programming II (236)			
Year 2 1st Semester	Principles of Public Speaking (CST 100)	Calculus w/Analytical Geometry I (MTH 173) or Ordinary Differential Equations (MTH 279)	General College Physics II (PHY 202)	United States History I (HIS 121)	Concepts of Simulation (260) Applications of Modeling and Simulation (265)			

	Year 2 2nd Semester	Technical Report Writing (ENG 131)	Applied Calculus (MTH 270)	General Biology (BIO 101)	Introduction to Sociology I (SOC 201) or Ethical and Legal Issues				

College courses offered locally in the high school for college credit should be coded: DE (Dual Enrollment) and/or VC (Validated Credit)

Related Industry Certifications Available:	**Additional Suggested Learning Opportunities:** **Work-Based Learning:** ☐ Cooperative Education ☐ Internship ☐ Mentorship ☐ Job Shadowing ☐ Service Learning Project ☐ Registered Apprenticeship

UNIVERSITY

University/College:
Degree or Major:
Number of Articulated CC Credits:

Notes:

Commonwealth of Virginia Plan of Study

Student Name: _____
School: Grassfield High School
Date: _____

Cluster: Marketing **Pathway:** Marketing Management

This Career Pathway Plan of Study can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals. This Plan of Study, used for learners at an educational institution, should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements.

EDUCATION LEVELS	GRADE	English/ Language Arts	Mathematics	Science	Social Studies/ Science	Other Required Courses Recommended Electives Learner Activities	Recommended Career and Technical Courses Source: Administrative Planning Guide http://www.cteresource.org/apg/	SAMPLE – Occupations Relating to This Pathway: http://www.doe.virginia.gov/instruction/career_technical/career_clusters/sample_plans_study/index.shtml http://www.careerclusters.org http://www.cteresource.org/cpg/
Graduation Requirements: http://www.doe.virginia.gov/instruction/graduation/index.shtml								Account Executive Accounts Payable Manager Administrative Services Manager Assistant Credit Manager Association Manager Billing Manager Business Development Manager Channel Sales Manager Client Relationship Manager Chief Executive Officer Entrepreneur Facilities Manager Franchisee General Manager Human Resource Manager Independent Distributor Key Account Manager Logistics Manager Management Analyst Manufacturing Manager Marketing Director Marketing Manager Marketing Specialist Meeting and Convention Planner Operations Manager Public Organization Manager Public Relations Manager Product/Brand Manager Purchasing Manager Risk Manager Shipping and Receiving Manager Small Business Owner
MIDDLE	7	English 7 (1115)	Mathematics 7 (3111)	Life Science 7 (4116)	Social Studies 7 (2356)		Introduction to Technology (8483)	
	8	English 8 (1123)	Mathematics 8 (3112) Algebra I (3130)	Physical Science 8 (4126)	Social Studies 8 (2106)	Foreign Language	Invention and Innovations (8461) or Technological Systems (8462)	
Career Assessment: Identify an appropriate career assessment instrument at the middle school level used to help students and their parents plan for high school: VA Wizard ☒ or other assessment (please indicate): 8th Grade Career planning module								
SECONDARY	9	English 9 (1130) or Honors English 9 (1130)	Algebra I (3130) Geometry (3143) or Algebra II (3135)	Earth Science (4210) or Honors Earth Science (4210)	World History and Geography to 1500 AD (2215)	Economics & Personal Finance (6120) Health & PE (2 years) (7310 and 7311) Foreign Language (3 years) Sports, Entertainment, and Recreation Marketing (8175) Advanced Sports, Entertainment, and Recreation Marketing (8177) Other Electives to Complement Pathway (Core Academic and CTE):	Entrepreneurship Education(9093)	
	10	English 10 (1140) or Honors English 10 (1140)	Geometry (3143) or Algebra II (3135)	Biology (4310) or Honors Biology (4310)	World History and Geography 1500 AD to present (2216)		Internet Marketing (8125)	
	11	English 11(1150) or Honors English 11 (1150)	Algebra II (3135) or Trigonometry/Probability and Statistics (3149)	Chemistry (4410) or Honors Chemistry (4410) or AP Biology (4370) or AP Chemistry (4470)	VA/US History (2360) or AP US History (2319)		Global Marketing and Commerce(8135)	
	12	English 12 (1160) or World Literature (1515) or Honors English 12 (1160) or AP English Literature (1195) and Composition or Dual Enrollment College Composition I and II (DE 1600/1601)	Trigonometry/Probability and Statistics (3149) or Calculus (3178) or AP Calculus AB/BC (3177)	Contemporary Physics (4510) (or Principles of Technology I and II)(9811 / 9812) or AP Physics (4570) other science course	VA/US Government (2440) or AP Government and Politics (2445)		Advanced Global Marketing and Commerce (8136) Leadership Development (9097) Introduction Marketing Management – Dual Enrollment (MKT 276)	
High school courses in the pathway offered locally for college credit should be coded: DE (Dual Enrollment) and/or VC (Validated Credit)								

List related certifications/credentials approved by VDOE and offered locally: http://www.cteresource.org/apg (Go to Certification – License Section)	Additional Learning Opportunities: CTSO Organization(s): ☒DECA ☐FBLA ☐FCCLA ☐FFA ☐FEA ☐HOSA ☐SkillsUSA ☐TSA Work-Based Learning: ☒ Career Research ☐ Cooperative Education ☒ Internship ☒ Mentorship ☒ Job Shadowing ☒ Service Learning Project ☐ Student Apprenticeship
Work Place Readiness NRF Customer Service NRF Sales	
Postsecondary: Placement Assessments such as COMPASS & SAT II	College Entrance Exams such as ACT & SAT

POSTSECONDARY	SAMPLE POSTSECONDARY PROGRAMS RELATED TO THIS CAREER PATHWAY Individual plans must include locally agreed upon courses at the postsecondary level (See page 2)			
	Pathway	**Associate Degree, College Certificate, or Apprenticeship**	**Bachelors Degree**	**Postgraduate Degree**
	Management	Management	Marketing Management	

College: Tidewater Community College **School Division(s):** Chesapeake Public Schools

POSTSECONDARY - COMMUNITY COLLEGE or APPRENTICESHIP - Determined Locally	**Semester**	**English**	**Mathematics**	**Science**	**Social Studies**	**Required Courses or Recommended Electives**			
	POSTSECONDARY PLAN OF STUDIES MUST INCLUDE POSTSECONDARY ACADEMIC, CTE, AND OTHER ELECTIVE COURSES APPROPRIATE FOR AN ASSOCIATE DEGREE.								
	Year 1 1st Semester	College Composition I (ENG 111) or English Literature	College Algebra (MTH 158) or Pre-Calculus I (MTH 163)	College Chemistry I (CHM 111)	Principles of Psychology (PSY 200)	Organization, Development and Administration	Consumer Behavior		
	Year 1 2nd Semester	College Composition II (ENG 112) or English Literature	Pre-Calculus II (MTH 164)	General College Physics I (PHY 201)	Global Issues	Marketing Management	Business Management and Supervision		
	Year 2 1st Semester	Principles of Public Speaking (CST 100)	Calculus w/Analytical Geometry I (MTH 173) or Ordinary Differential Equations (MTH 279)	General College Physics II (PHY 202)	United States History I (HIS 121)	Financial Accounting	Managerial Accounting		

	Year 2 2nd Semester	Technical Report Writing (ENG 131)	Applied Calculus (MTH 270)	General Biology (BIO 101)	Introduction to Sociology I (SOC 201) or Ethical and Legal Issues	Continue Courses in the area of Specialization	Complete Management and Entrepreneurship major		

College courses offered locally in the high school for college credit should be coded: DE (Dual Enrollment) and/or VC (Validated Credit)

Related Industry Certifications Available:

Additional Suggested Learning Opportunities:

Work-Based Learning:

☐ Cooperative Education ☐ Internship ☐ Mentorship
☐ Job Shadowing ☐ Service Learning Project ☐ Registered Apprenticeship

UNIVERSITY

University/College:
Degree or Major:
Number of Articulated CC Credits:

Notes:

Appendix H:

Planning Committee

Governor's STEM Academy

Planning Committee

Individual		Title/Organization
Lee	Belfore	ODU Engineering Professor
Carolyn	Bernard	Principal, Grassfield High School
Karen	Black	Technology Academy Coordinator
Anna	Helmer	Assistant Principal, Grassfield High School
Johnny	Moye	Chesapeake Public Schools, CTE Supervisor
Linda	Rice	Tidewater Community College Provost
Thomas	Spencer	Project Lead the Way Instructor, Grassfield High School
Ben	White	Operations Manager, City of Chesapeake Economic Development

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Grassfield High School

Primary Contact

Name: Lee A. Belfore II

Title: Associate Professor

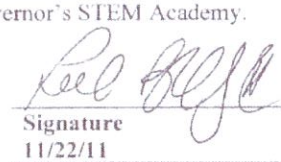
Address: Department of Electrical and Computer Engineering
Old Dominion University
Norfolk, VA 23529

Telephone: 757-683-3746 **Fax:** 757-683-3220

E-Mail: lbelfore@odu.edu

Type of Entity/Institution/Organization: Higher education institution.

My signature below certifies that my institution/organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy.

Lee A. Belfore II	
Print or Typed Name	Signature
Associate Professor	11/22/11
Position Title	Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Grassfield High School, Chesapeake Virginia

Primary Contact

Name: Carolyn Bernard

Title: Principal

Address: 2007 Grizzly Trail

Chesapeake, Virginia 23323

Telephone: 757-558-4749 **Fax:** 757-558-9240

E-Mail: Carolyn.Bernard@cpschools.com

Type of Entity/Institution/Organization: Public School

My signature below certifies that my institution/organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy.

Carolyn Bernard	Carolyn Bernard
Print or Typed Name	Signature
Grassfield High School Principal	11/1/11
Position Title	Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY
Planning Committee

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Grassfield High School, Chesapeake Virginia

Primary Contact

Name: Karen Black

Title: Technology Academy Coordinator

Address: 2007 Grizzly Trail

Chesapeake, Virginia 23323

Telephone: 757-558-4493 **Fax:** 757-558-9240

E-Mail: Karen.Black@cpschools.com

Type of Entity/Institution/Organization: Public School

My signature below certifies that my institution/organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy.

Karen Black	Karen Black
Print or Typed Name	**Signature**
Technology Academy Coordinator	**11/1/11**
Position Title	**Date**

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Grassfield High School

Primary Contact

Name: Anna Helmer

Title: Assistant Principal, GFHS

Address: 2007 Grizzly Trail

Chesapeake, VA 23323

Telephone: 757-558-4749 **Fax:**

E-Mail: Anna.helmer@cpschools.com

Type of Entity/Institution/Organization: 9-12 Public High School

My signature below certifies that my institution/organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy.

Anna Helmer	Anna Helmer
Print or Typed Name	**Signature**
Assistant Principal	11/14/2011
Position Title	**Date**

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Chesapeake Public School

Primary Contact

Name: Johnny J Moye

Title: Career and Technical Education Supervisor

Address: 304 Cedar Rd.

Chesapeake, V A 23322

Telephone: 757-547-1098 Fax: 757-547-1346

E-Mail: Johnny.moye@cpschools.com

Type of Entity/Institution/Organization: Public School Division

My signature below certifies that my institution organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy

Johnny J Moye
Print or Typed Name

Johnny J Moye
Signature

Career and Technical Education Supervisor
Position Title

Nov 15, 2011
Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Tidewater Community College, Chesapeake Campus

Primary Contact

Name: Linda M. Rice, PhD

Title: Provost

Address: 1428 Cedar Road

Chesapeake, VA 23322

Telephone: (757) 822-5202 **Fax:** (757) 822-5203

E-Mail: lrice@tcc.edu

Type of Entity/Institution/Organization: Education

My signature below certifies that my institution/organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy.

Linda M. Rice — Linda M. Rice
Print or Typed Name — Signature

Provost — 11/21/11
Position Title — Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization:	Chesapeake Public Schools - Grassfield High School / Technology Academy

Primary Contact

Name:	Mr. Thomas Spencer
Title:	Pre-Engineering Academy Instructor
Address:	2007 Grizzly Trail Chesapeake, VA 23323
Telephone:	(757) 558-4749 Fax: (757) 558-9240
E-Mail:	thomas.spencer@cpschools.com

Type of Entity/Institution/Organization:	Public Secondary School / High School / Technology Academy

My signature below certifies that my institution/organization agrees to participate in planning and implementation of the proposed Governor's STEM Academy.

Thomas C. Spencer Print or Typed Name	Signature
Pre-Engineering Academy Instructor Position Title	11/15/2011 Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: City of Chesapeake Economic Development Dept

Primary Contact

Name: Ben White

Title: Operations Manager, Economic Development

Address: 676 Independence Parkway, Ste 200
Chesapeake VA 23320

Telephone: (757) 382-8040 **Fax:** (757) 382-8050

E-Mail: bwhite@cityofchesapeake.net

Type of Entity/Institution/Organization: Local Government

My signature below certifies that my institution/organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy.

Ben White
Print or Typed Name

Operations Manager
Position Title

Signature

10/25/11
Date

Appendix I:

Partnership/Advisory

Committee

Governor's STEM Academy

Partnership/Advisory Committee

Individual		Title/Organization
Bob	Banach	Director of Operations - D.T. Read Steel Co. Inc.
Brandon	Berry	Project Lead the Way Instructor, Grassfield High School
Karen	Black	Technology Academy Coordinator, Grassfield High School
Johnna	Coleman-Yates	Director of Workforces Services, Tidewater Community College
Anna	Helmer	Assistant Principal, Grassfield High School
Johnny	Moye	Chesapeake Public School, CTE Supervisor
Jennifer	Pettway	Career Counselor, Grassfield High School
Steve	Notarnicola	Principal Systems Engineer, Lockheed Martin Corporation
Remy	Pangle	Director of Education and Outreach, Wind for Schools State Facilitator James Madison University
Valerie	Roberts	Academy Oracle Instructor, Grassfield High School
Kim	Stanley	Vocational Evaluator, Chesapeake Public Schools
Ben	White	Operations Manager, City of Chesapeake Economic Development
Daniel	Yuchnovicz	Systems Engineer, NASA

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization:

Primary Contact

Name:

Title:

Address:

Telephone: **Fax:**

E-Mail:

Type of Entity/Institution/Organization:

My signature below certifies that my institution organization agrees to be an active partner in planning and implementation of the proposed Governor's Career and Technical Academy outlined in the accompanying proposal.

Print or Typed Name **Signature**

Position Title **Date**

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Grassfield High School Technology Academy

Primary Contact

Name: Brandon Berry

Title: Technology Academy Instructor

Address: Grassfield High School
2007 Grizzly Trail
Chesapeake, Virginia 23323

Telephone: 757-558-4749 **Fax:** 757-558-9240

E-Mail: Brandon.berry@cpschools.com

Type of Entity/Institution/Organization: Public School

My signature below certifies that my institution organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy.

Brandon Berry	
Print or Typed Name	Signature
Teacher	11/15/2011
Position Title	Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Partnership/Advisory Committee

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Grassfield High School, Chesapeake Virginia

Primary Contact

Name: Karen Black

Title: Technology Academy Coordinator

Address: 2007 Grizzly Trail

Chesapeake, Virginia 23323

Telephone: 757-558-4493 Fax: 757-558-9240

E-Mail: Karen.Black@cpschools.com

Type of Entity/Institution/Organization: Public School

My signature below certifies that my institution/organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy.

Karen Black
Print or Typed Name

Technology Academy Coordinator
Position Title

Signature

11/1/11
Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Tidewater Community College Workforce Development

Primary Contact

Name: Johnna Coleman-Yates

Title: Director of Workforce Services

Address: Tidewater Community College Workforce Development
7000 College Drive
Suffolk, VA 23435

Telephone: 757-822-1234 **Fax:** 757-822-1160

E-Mail: jyates@tcc.edu

Type of Entity/Institution/Organization:

My signature below certifies that my institution/organization agrees to allow me to serve as an active partner in planning and implementation of the proposed Governor's STEM Academy.

Johnna Coleman-Yates	
Print or Typed Name	Signature
Director of Workforce Services	3/12/12
Position Title	Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Grassfield High School

Primary Contact

Name: Anna Helmer

Title: Assistant Principal, GFHS

Address: 2007 Grizzly Trail

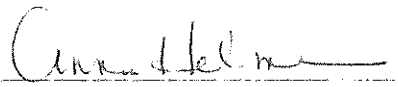
Chesapeake, VA 23323

Telephone: 757-558-4749 **Fax:**

E-Mail: Anna.helmer@cpschools.com

Type of Entity/Institution/Organization: 9-12 Public High School

My signature below certifies that my institution/organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy.

Anna Helmer	
Print or Typed Name	**Signature**
Assistant Principal	11/14/2011
Position Title	**Date**

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Chesapeake Public School

Primary Contact

Name: Johnny J Moye

Title: Career and Technical Education Supervisor

Address: 304 Cedar Rd.

Chesapeake, VA 23322

Telephone: 757-547-1098 Fax: 757-547-1346

E-Mail: Johnny.moye@cpschools.com

Type of Entity/Institution/Organization: Public School Division

My signature below certifies that my institution organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy

Johnny J Moye
Print or Typed Name

Johnny J Moye
Signature

Career and Technical Education Supervisor
Position Title

Nov 15, 2011
Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Grassfield High School, Chesapeake Public Schools

Primary Contact: Mrs. Karen Black

Name: Mrs. Jennifer R. Pettway

Title: Career Counselor

Address: 2007 Grizzly Trail, Chesapeake, VA 23323

Telephone: 757.558.4509 **Fax:** 757.558.9259

E-Mail: jennifer.pettway@cpschools.com

Type of Entity/Institution/Organization: Public School

My signature below certifies that my institution/organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy.

Jennifer R. Pettway	*Jennifer R. Pettway*
Print or Typed Name	Signature
Career Counselor	November 15, 2011
Position Title	Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: GRASSFIELD HIGH SCHOOL

Primary Contact

Name: Steve Notarnicola

Title: Principal Systems Engineer (Operations Research)

Address: 7021 Harbour View Blvd

Suite 105

Suffolk, V A 23435

Telephone: 757-935-9503 Fax: 757-935-9329

E-Mail: Steve.notarnicola@lmco.com

Type of Entity/Institution/Organization: Lockheed Martin Corporation Center for Innovation

My signature below certifies that my institution/organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy.

J. Stephen Notarnicola
Print or Typed Name

Signature

Principal Systems Engineer
Position Title

11/28/2011
Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Virginia Center for Wind Energy at James Madison University

Primary Contact

Name: Remy Pangle

Title: Director of Education and Outreach, Wind for Schools State Facilitator

Address: 14 01 Technology Dr, Suite 120

MSC 4905

Harrisonburg, VA 22801

Telephone: 540-568-8768 **Fax:** 540-568-2761

E-Mail: panglerm@jmu.edu

Type of Entity/Institution/Organization: Academic

My signature below certifies that my institution/organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy.

Remy Pangle	Remy Pangle
Print or Typed Name	Signature
Director of Education and Outreach	3/9/12
Position Title	Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Grassfield High School Technology Academy

Primary Contact

Name: Valerie Roberts

Title: Academy Teacher

Address: 2007 Grizzly Trail

Chesapeake, VA 23322

Telephone: 757-560-3295 **Fax:** 757-558-9240

E-Mail: Valerie.roberts@cpschools.com

Type of Entity/Institution/Organization: Public School

My signature below certifies that my institution organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy.

Valerie P Roberts
Print or Typed Name

Signature

Teacher
Position Title

11/15/11
Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: Chesapeake Public Schools

Primary Contact

Name: Kim Stanley

Title: Vocational Evaluator

Address: 304 Cedar Road

Chesapeake, VA 23322

Telephone: 757-547-1098 **Fax:** 757-547-1346

E-Mail: Kim.Stanley@cpschools.com

Type of Entity/Institution/Organization: Public School System

My signature below certifies that my institution/organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy.

Kim Stanley
Print or Typed Name

Kim Stanley
Signature

Vocational Evaluator
Position Title

11/15/11
Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School Division/Institution/Organization: City of Chesapeake Economic Development Dept

Primary Contact

Name: Ben White

Title: Operations Manager, Economic Development

Address: 676 Independence Parkway, Ste 200
Chesapeake VA 23320

Telephone: (757) 382-8040 **Fax:** (757) 382-8050

E-Mail: bwhite@cityofchesapeake.net

Type of Entity/Institution/Organization: Local Government

My signature below certifies that my institution/organization agrees to be an active partner in planning and implementation of the proposed Governor's STEM Academy

Ben White
Print or Typed Name

Operations Manager
Position Title

Signature

10/25/11
Date

Partner Identification Form

GOVERNOR'S STEM ACADEMY

Include a Partnership Identification Form for each of the partner institutions/organizations participating in this proposal.

Partner School
Division/Institution/Organization: Grass Field High School Technology Academy

Primary Contact

Name: Daniel Yuchnoviez

Title: Systems Engineer, Aerospace Systems Technology Management

Address: 11 Langley Blvd.

M/S 112

Hampton, VA 23681

Telephone: (757) 864-7272 Fax:

E-Mail: daniel.e.yuchnoviez@nasa.gov

Type of
Entity/Institution/Organization: National Aeronautics and Space Administration

My signature below certifies that my institution organization agrees to allow me to serve as an active partner in planning and implementation of the proposed Governor's STEM Academy.

Daniel Yuchnoviez
Print or Typed Name

Signature

Systems Engineer, AST Management
Position Title

11-14-2011
Date

Appendix J:

Memoranda of Agreement

MEMORANDUM OF AGREEMENT
BETWEEN PARTNERS
AND THE GRASSFIELD HIGH SCHOOL GOVERNOR'S STEM ACADEMY

"Inspiring excellence through an advanced Science, Technology, Engineering, and Mathematics (STEM) curriculum to better meet the workforce needs of the 21st Century"

PARTNERS AND THE GRASSFIELD HIGH SCHOOL TECHNOLOGY ACADEMY agrees to enter into this Agreement to support the Technology Academy STEM program. The Technology Academy will provide enhance opportunities in the areas of Information Technology, Entrepreneurship Technology, and STEM Pre-Engineering Technology preparing participants for the 21st century work place, advanced technical training or entrance into college or university studies. A focus of the program will be to increase opportunities for internships in STEM related fields and other fields of innovation based upon workforce needs of the region.

MOA TIMEFRAME:

The MEMORADUM OF AGREEMENT period shall be March, 2012 through June 30, 2013 and will be extended annually unless modified or terminated by a partner.

PARTNERS' AGREEMENTS:

Grassfield High School Technology Academy agrees to:

- Facilitate the Technology Academy Partnership Team
- Provide and monitor comprehensive programs of studies in the Information Technology, Entrepreneurship Technology, and STEM Pre-Engineering Technology concentrations
- Assure that curriculum is aligned with career pathways that meet the requirements for the Governor's Exemplary Standard Award Program, Workplace Readiness Skills for the Commonwealth of Virginia, and Virginia Technical or Advanced Technical Diploma
- Facilitate the administration of industry certifications exams
- Deliver counseling and other services that promote STEM education, career pathways, educational advancement and employment opportunities
- Provide documentation and information as requested by the Department of Education
- Provide the appropriate materials to support and facilitate instruction

Postsecondary Education Partners and Business Partners agree to (one or more of the following):

- Designate an individual to serve as a liaison on the Technology Academy Partnership Team
- Provide resources and opportunities for Technology Academy students to receive real world experiences through project-based learning, field trips, guest speakers, job-shadowing, internships, and mentorships
- Provide guidance and expertise to staff and/or students to promote STEM related teaching and learning
- Provide Opportunities for Dual Enrollment and transferable college credit (if applicable)

By signing this agreement both institutions agree to be active partners and agree to abide by this agreement.

Grassfield High School and Technology Academy	**PARTNER**
Ann Black	3/12/12
Technology Academy Coordinator	Date
LEE A BELFORE II	Associate Professor
Partner Signature	Title
Old Dominion University	3/16/12
Organization	Date

MEMORANDUM OF AGREEMENT

BETWEEN PARTNERS

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Grassfield High School and Technology Academy **PARTNER**

Kara Black — 3/12/12

Technology Academy Coordinator — Date

[signature] — Director of Operations

Partner Signature — Title

D.T. Read Steel Co, Inc — 3-12-2012

Organization — Date

MEMORANDUM OF AGREEMENT

BETWEEN PARTNERS

AND THE GRASSFIELD HIGH SCHOOL GOVERNOR'S STEM ACADEMY

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Grassfield High School and Technology Academy	**PARTNER**
Kam Black	3/12/12
Technology Academy Coordinator	Date
	Systems Engineer Principal
Partner Signature	Title
Lockheed Martin Center for Innovation	_15 March 2012_
Organization	Date

MEMORANDUM OF AGREEMENT

BETWEEN PARTNERS

AND THE GRASSFIELD HIGH SCHOOL GOVERNORS STEM ACADEMY

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Grassfield High School and Technology Academy **PARTNER**

Pam Black — 3/12/12

Technology Academy Coordinator — Date

W. W. — Assoc. Vice President

Partner Signature — Title

Tidewater Community College: VPD — 3/12/12

Organization — Date

MEMORANDUM OF AGREEMENT

BETWEEN PARTNERS

AND THE GRASSFIELD HIGH SCHOOL GOVERNOR'S STEM ACADEMY

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Grassfield High School and Technology Academy **PARTNER**

Ann Black _____ 3/12/12

Technology Academy Coordinator **Date**

John D. Hulvey _____ 3/13/2012

Partner Signature Date

John D. Hulvey, CRA, Director – Sponsored Programs Administration & Accounting

_____

Organization

James Madison University

MEMORANDUM OF AGREEMENT

BETWEEN PARTNERS

AND THE GRASSFIELD HIGH SCHOOL GOVERNOR'S STEM ACADEMY

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By signing this agreement both institutions agree to be active partners and agree to abide by this agreement.

Grassfield High School and Technology Academy **PARTNER**

Sam Black — 3/12/12

Technology Academy Coordinator — Date

BENTON M. WHITE, JR. — ASSISTANT DIRECTOR

Partner Signature — Title

CITY OF CHESAPEAKE ECONOMIC DEVELOPMENT — 3/15/12

Organization — Date

Appendix K:

Statement of Assurances

The Grassfield High School Governor's STEM Academy
Chesapeake Public Schools

STATE OF OPERATING FUNDS AND FACILITIES ASSURANCE

The authorized signature on this page certifies to the Virginia Department of Education that the authorized official assures that:

1. Operating funds and facilities are available to support the Governor's STEM Academy.
2. Materials and equipment will be provided to adequately support the needs of Grassfield High School Governor's STEM Academy.

Certification by Authorized Institutional Official

The applicant certifies that to the best of his knowledge, the information in this application is correct, that the filing of this application is authorized by the partners participating in the process to establish a Governor's STEM Academy, and that the applicant will comply with the above statement of assurances.

JAMES T. ROBERTS — Printed Name of Authorized Official

SUPERINTENDENT — Title

James T Roberts — Signature of Authorized Official

3/26/12 — Date

Governor's Science, Technology, Engineering and Mathematics (STEM) Academy

STATEMENT OF ASSURANCES

The authorized signature on this page certifies to the Virginia Department of Education that the authorized official assures that:

1. The planning committee has reviewed the provisions of *Administrative Procedures Guide for the Establishment of Governor's STEM Academies* outlined in the Guidance Manual, and understands that an implementation proposal will need to address these criteria and/or others approved by the Virginia Board of Education.

2. The planning committee agrees to follow the guidelines set forth in the *Administrative Procedures* Guide for the Establishment of Governor's STEM Academy's document.

3. If the Governor's STEM Academy will be a jointly operated program, an ongoing governing board will be established or maintained to reflect current Board of Education regulations relative to jointly operated schools and programs.

4. A public, government entity will serve as the grant fiscal agent.

Certification by Authorized or Institutional Official:

The applicant certifies that to the best of his/her knowledge the information in this application is correct, that the filing of this application is duly authorized by the partners participating in this process to establish a Governor's STEM Academy, and that the applicant will comply with the statements of assurances.

JAMES T. ROBERTS
Typed or Printed Name of Authorized Official

SUPERINTENDENT
Title
Chesapeake Public Schools

James T. Roberts
Signature of Authorized Official

11/18/11
Date

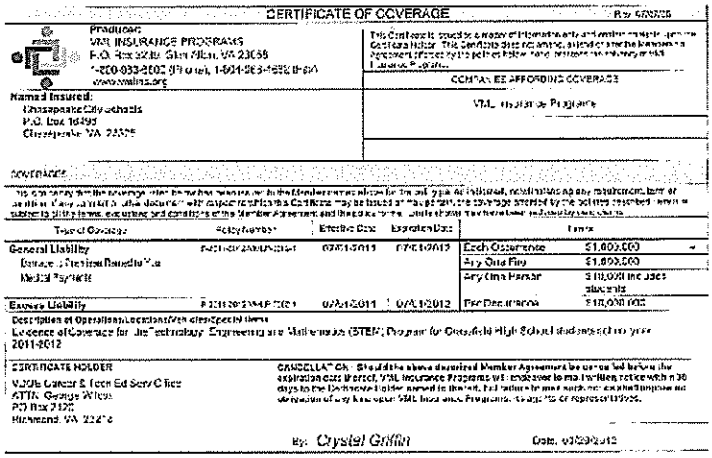
Appendix L:

Budget

GOVERNOR'S STEM ACADEMY BUDGET				
Line Item	State	Perkins	Other/Local	In-Kind
1) Personnel - 1000			432,504	
2) Employment Benefits - 2000			155,300	
3) Purchased/Contractual Services - 3000				
4) Internal Services - 4000				
5) Staff Development - 5000		1,500		
6) Summer Component Activities - 5000	5000			
7) Travel - 5000		6,000		
8) Contractual Services - 5000				
9) Materials and Supplies - 6000			5,850	
10) Equipment - 8000		29,300		
11) Facilities - 8000				
B) Indirect Cost				

Appendix M:

Certificate of Coverage



CERTIFICATE OF COVERAGE

Rev 07/2008

Producer:
VML INSURANCE PROGRAMS
P.O. Box 2120, Glen Allen, VA 23058
1-800-833-2002 (Phone), 1-804-863-1658 (Fax)
www.vmlins.org

This Certificate is issued as a matter of information only and confers no rights upon the Certificate Holder. This Certificate does not amend, extend or alter the Member's Agreement (Contract) by the policies below and/or any other Insurance Program.

COMPANIES AFFORDING COVERAGE

VML Insurance Programs

Named Insured:
Chesapeake City Schools
P.O. Box 16495
Chesapeake, VA 23325

COVERAGE

This is to certify that the coverage listed below has been issued to the Member named above for the policy period indicated, notwithstanding any requirement, term or condition of any contract or other document with respect to which this Certificate may be issued or may pertain, the coverage afforded by the policies described herein is subject to all the terms, exclusions and conditions of the Member Agreement and the policy terms. Limits shown may have been reduced by paid claims.

Type of Coverage	Policy Number	Effective Date	Expiration Date	Terms	
General Liability Damage to Premises Rented to You Medical Payments	[illegible]	07/01/2011	07/01/2012	Each Occurrence	$1,000,000
				Any One Fire	$1,000,000
				Any One Person	$10,000 includes students
Excess Liability	[illegible]	07/01/2011	07/01/2012	Per Occurrence	$10,000,000

Description of Operations/Locations/Vehicles/Special Items

Evidence of Coverage for the Technology Engineering and Mathematics (STEM) Program for Grassfield High School students (Jan) year 2011-2012

CERTIFICATE HOLDER
VJOB Career & Tech Ed Serv Office
ATTN: George Wilcox
PO Box 2120
Richmond, VA 23218

CANCELLATION: Should the above described Member Agreement be cancelled before the expiration date thereof, VML Insurance Programs will endeavor to mail written notice within 30 days to the Certificate Holder named to the left, but failure to mail such notice shall impose no obligation of any kind upon VML Insurance Programs, its agents or representatives.

By: *Crystal Griffin* Date: 07/29/2012

Appendix N:

Staff Evaluation

Staff Evaluation

The staff evaluation is derived from the following components:

- ✓ **Classroom Observation** - This component consists of at least three written observations and subsequent conferences during the year. Deadline for these are November 15, February 15, and May 15. Observers will be looking for criteria items listed on the teacher evaluation instrument. At the time of your observation, please present the following materials to the evaluator:
  - Instructional binder with daily lesson plans
  - GradeQuick grades
  - GradeQuick attendance
  - Assessment folder
  - Parent communication log

- ✓ **Instructional Binder with Daily Lesson Plans** - In the binder issued to every teacher, maintain up-to-date lesson plans using the approved lesson plan format. The binders contain blank lesson plan forms and a sample lesson plan. Binders should also include SOL curriculum frameworks, course pacing guides, and SOL Blueprints (core teachers). Lesson plans should be specific enough for the reviewer to determine the SOL lesson objective and identified essential knowledge/skill, the student activities planned, the resources needed, and the student assessment used.

- ✓ **Review of Grade and Attendance GradeQuick Reports** - GradeQuick grade and attendance printouts will serve as the official grade book; therefore, teachers will need to maintain all end of marking period printouts in a folder. Folders will be collected at the end of each course (January and June). The Assistant Principal for Instruction will conduct periodic audits of teacher grade books and attendance records in GradeQuick. Repeated failure to submit weekly grades and daily attendance to Edline will result in below expectation or unsatisfactory marks on the professionalism evaluation criteria.

- ✓ **Parent Communication Log** - Teachers should contact parents when a significant change occurs in a student's performance. In addition, when parents request increased communication from the teacher regarding student progress, the teacher is expected to honor these requests. Everyone should be making "proud phone calls" to positively reinforce student progress. Attendance at parent conferences is a priority. Teachers should always maintain professional demeanor during conferences, phone calls, and via e-mail correspondence.

- ✓ **Assessment Folder** - Teachers are asked to maintain printed copies of all assessments administered to students in each course. Administrators will monitor the assessments to check for alignment with curriculum and instruction, appropriate content and cognitive level, and a variety of item modalities. In addition, teachers are required to utilize assessment data (i.e., benchmark data, SOL scores, AP scores,

certification testing, skill checklists) to inform instructional decisions and implement strategies that address low reporting categories. Evidence of data-driven decision-making should be maintained in the instructional binder.

IEP and 504 Plans - All teachers will maintain confidential information regarding students with IEPs and 504 plans. Compliance with the plan goals, objectives, and accommodations is required. Special education teachers are required to ensure all protocol is followed and

- ✓ documentation is completed accurately and within the timelines of special education law. Special education teachers and general education teachers will communicate throughout the semester to monitor student progress and ensure IEP compliance.

- ✓ **Substitute Plans** - Up-to-date, relevant substitute plans must be available on the day of the absence prior to the start of the school day. Plans must be of sufficient length to maintain students engaged during the entire ninety-minute block. Teachers are also asked to keep in their classrooms emergency lesson plans.

- ✓ **Administrative Records** - Many criteria items included on the evaluation instrument cannot be observed through the above items. Each administrator will maintain records that fall under his/her duties. Many of the items under the professionalism section will be determined in this manner. Refer to the teacher evaluation instrument for a list of these criteria.

- ✓ **Performance Goals Instrument** - Performance goals are teacher oriented behaviors--goals designed to improve instruction. Each individual being evaluated will select 2-3 goals to focus on for the year. Goals may come directly from the established evaluation criteria. A copy of your Performance Goals Instrument is due by October 15 to your evaluating administrator and will be discussed at each post-observation conference.

Checklist for Teachers Who are Evaluated

GradeQuick Reports

_____All entries are printed clearly

_____Information page in front complete

_____Classes labeled according to GradeQuick directions

_____Grade columns are identified with assignments and dates

_____At least nine graded assignments are recorded each marking period

_____Grades are from a variety of activities

_____Grade weights follow department guidelines and are indicated

_____GradeQuick reports are printed each marking period and kept in a folder

_____Summary page of the 4 quarter grades, final exam and final grade is included

_____Grades are kept up-to-date and entered in GradeQuick at least once a week.

Attendance Records

____All entries are clearly recorded

____Absences are clearly identified

____Cuts are marked

____Tardies are marked

____Attendance is entered in GradeQuick every block

____Bubble sheets are up-to-date and sent to the parent on time

Instructional Binder

Daily plans are kept using approved lesson plan and include:

____Virginia Standards of Learning

____Chesapeake Curriculum Guides

____State Curriculum Framework (SOL Essential Knowledge and Skills)

____SOL Blueprints

____Activities and resources used

____Varied activities

____Research Based Instructional Strategies

____Assessment/evaluation of students' learning at the appropriate cognitive level

Assessment Folder

____Contains a variety of types of student assessments/ evaluations congruent with the established curriculum

Parent Communication Log

List of parental contacts includes dates and topics discussed

Special Education Documentation

IEP and 504 Plan accommodation pages

Chesapeake Public Schools

Lesson Planning Model

1. Standards of Learning/CPS Curriculum Objectives	Identify the objectives (SOL) to be taught and refer to the Chesapeake Public Schools (CPS) Curriculum Objectives to begin planning for delivery and assessment of the lesson. Use the Curriculum Framework for each subject to determine the "essential knowledge" strands to be taught. *What must the student know and be able to do?*
2. Essential Vocabulary	Identify the content related words and terms that students must know and apply in order to attain the essential knowledge being taught.
3. Literacy Strategy	Identify and include appropriate strategy to improve student comprehension of text.
4. Materials/Resources	List materials and resources (including technology) that will be used to teach the lesson.
5. Anticipatory Set	Decide what must be done to focus the attention of students on the concepts they will be studying. Activate prior knowledge, build background, and set the purpose for the instruction being delivered.
6. Direct Teaching	Refer to the Curriculum Resource Guide to determine strategies and resources to access when presenting/explaining the objectives to be taught. Use a variety of methods to deliver instruction that meet the diverse needs of the learners. Teach concepts by demonstrating, giving examples, and modeling procedures.
7. Guided Practice/Checking for Understanding	Facilitate learning by guiding students through means of direct monitoring and conferencing while providing feedback and support. Check for understanding through formal/informal means. Use feedback from students to monitor learning and adjust instruction as needed. Students may be grouped in a variety of ways for practice.
8. Independent Practice	Choose appropriate assignments for classwork/homework, which students can practice independently. Provide feedback in a timely manner.
9. Closure	Have students summarize, or lead a brief discussion of information learned related to the lesson's objectives.

10. Homework	Homework is an important component in the learning process. It extends the time in which formal learning can take place. The basic objective of homework is the reinforcement and application of concepts, principles, and skills that have been taught and learned in the classroom. Correctly monitored, it gives students an opportunity to learn how to work independently and how to be accountable.
11. Assessment Evidence	Select assessments that are aligned to the written and taught curriculum. Written assessments can be teacher-made, curriculum-based or standardized and should be previewed by the teacher before the lesson is taught. Other assessments may include performance tasks, projects, quizzes, anecdotal records, and academic prompts. Assess student work in a timely manner and use results in planning for re-teaching or extended teaching.
12. Bloom's Taxonomy	Identify the level(s) of cognition that will be addressed during the instructional session(s).
13. Research Strategies	Select the instructional strategies that will enhance learning of the concepts and skills being taught. Consider the learning styles of the students. Strategies may include, but are not limited to, those researched by Marzano, Pickering, and Pollack.
14. Reflection	Reflect on the lesson taught and note overall effectiveness of the instruction and assessment. Elicit comments from students when appropriate. Use reflection to guide re-teaching and re-assessment of student learning.

Grassfield High School
LESSON PLAN

Date(s):	**Subject:**	**Teacher:**
SOL/CCO:	**Grade:**	**Estimated Time:**
Objectives: (Essential Knowledge)		
Essential Vocabulary:		
Literacy Strategy:		
Materials/Resource: (Optional)		
Anticipatory Set:		
Direct Teaching:		
Guided Practice/Checking for Understanding:		
Independent Practice:		
Closure:		

Homework:
Assessment Evidence: (ex. Notebook check, project, oral presentation, check for understanding..)

1. IDENTIFY THE LEVEL OF BLOOM'S TAXONOMY USED

Knowledge Comprehension Application Analysis Synthesis Evaluation

2. IDENTIFY THE RESEARCH-BASED STRATEGIES USED

Similarities and Differences

Homework and Practice

Cooperative Learning

Reinforcing Effort and Providing Recognition

Generating and Testing Hypothesis

Fishbowls

Setting Objectives and Providing Feedback

Cornell Notes

Socratic Seminar

Clues, Questions, and Advance Organizers

Summarizing and Note Taking

Nonlinguistic Representations

Technology Integration

Differentiated Instruction