VIRGINIA DEPARTMENT OF EDUCATION

BRIEFING

STATUS REPORT ON THE GOVERNOR'S CAREER AND TECHNICAL ACADEMIES

PRESENTED TO THE

JOINT SUBCOMMITTEE TO STUDY SCIENCE, MATHEMATICS, AND TECHNOLOGY EDUCATION (HJ 90, 2008 GENERAL ASSEMBLY)

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The Governor's Career and Technical Academies

BACKGROUND

- In July 2007, Virginia was one of six states to receive a $500,000 grant from the National Governors Association (NGA) Center for Best Practices to improve science, technology, engineering and mathematics (STEM) education. The funds were awarded as part of the NGA Innovation America initiative and made possible through the Bill and Melinda Gates Foundation and the Intel Foundation.

- The NGA defined STEM literacy as an "interdisciplinary area of study that bridges the four areas of science, technology, engineering, and mathematics. STEM literacy does not simply mean achieving literacy in these four strands or silos. Consequently, a STEM classroom shifts students away from learning discrete bits and pieces of phenomenon and rote procedures toward investigating and questioning the interrelated facets of the world."
  Reference: "Building a Science, Technology, Engineering and Math Agenda" from the National Governors Association at http://www.nga.org/Files/pdf/0702INNOVATIONSTEM.PDF

- Virginia's grant proposal to NGA identified career and technical education as a promising avenue for developing STEM literacy and other critical 21st century skills through contextual learning. As such, the Virginia Office of Workforce Development provided $500,000 in required matching funds from the state's federal Workforce Investment Act (WIA) funds, for a total of $1 million over two years to jump-start the establishment of career and technical academies in Virginia.

PURPOSE

- The Governor's Career and Technical Academies are intended to expand options for the general population of students to acquire STEM literacy and other critical knowledge, skills, and credentials that will prepare them for high-demand, high-wage, and high-skill careers in Virginia.

- The Academies provide a contextual learning complement to Virginia's successful Standards of Learning program. They offer learning opportunities that apply the concepts learned in mathematics, science, and English and other content areas to real-world experiences identified in career and technical education such as technology and engineering.

- An additional focus of the Academies is to help all educators and parents understand the importance of STEM literacy and other critical 21st century skills for today's students and the role that a high-quality career and technical education program can play in achieving this competency level.

REQUIREMENTS TO ESTABLISH A GOVERNOR'S CAREER AND TECHNICAL ACADEMY

- In November 2007, the Virginia Board of Education established criteria for the Governor's Career and Technical Academies (See Appendix A.). All proposals for the establishment of academies must undergo a review by the State Council of Higher Education for Virginia (SCHEV).

- Applicants must be partnerships of business and industry; public school divisions; higher education institutions, including community colleges, universities, and/or private postsecondary institutions, as applicable; and may include local government, including work force and economic development entities.

- In some cases, an Academy may be a program created by one school division and its partners. In other cases, Academies may be Joint Schools as provided for in the *Code of Virginia*, and will include representation from multiple school divisions within a region on the governing board.

- Governor's Career and Technical Academies are defined by program content, not by the location or delivery system of courses. Courses may be delivered on a high school campus, on a technical center or community college campus, online, or in other innovative ways. Governor's Career and Technical

Academies may be full-day or part-day, academic-year programs.

- ❑ The fiscal agent for the project must be a public entity and must assure that operating funds and facilities are available to support the Governor's Career and Technical Academy and are adequate to meet the needs of the program.

- ❑ Approved Governor's Career and Technical Academies must agree to participate in the Governor's Exemplary Standards Award Program for Career and Technical Education administered by the Virginia Career Education Foundation (VCEF). This program will require a local/regional industry-led team to validate that a program has met the rigorous criteria for the awards, before the program can apply to the VCEF for this designation (See Appendix B.).

- ❑ Requirements for a Career and Technical Academy include:
  - ♦ Rigorous academic content with career and technical instruction;
  - ♦ An emphasis on STEM career pathways (See http://www.careerclusters.org/list16clusters.php);
  - ♦ Individualized high school plans to ensure course selections that are aligned with students' transition and career goals after high school;
  - ♦ Assurance that graduates complete a college and work readiness curriculum, minimally at the level specified for Commonwealth Scholars Course of Study (State Scholars Core);
  - ♦ Assurance that graduates will qualify for the new Technical or Advanced Technical Diplomas to be developed by the Board of Education; and
  - ♦ Virginia's Workplace Readiness Skills (See http://www.cteresource.org/verso2/public/tasklist/across_the_board/enhancing_workplace_readiness_skills/2008/WRS).

- ❑ 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 (See http://www.careerclusters.org/list16clusters.php.).

- ❑ At least one career pathway 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.

- ❑ At least one career pathway must address regional and local work force demand in a high-wage, high-skill field as identified by employers and work force officials.

- ❑ Of the two pathways previously 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.

- ❑ Academy graduates must achieve one or more of the following benchmarks:
  - ♦ Earn one or more industry certifications or state occupational licenses, and/or demonstrate competencies on an assessment instrument recognized by postsecondary institutions such as College Level Examination Program (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
  - ♦ Earn at least nine transferable college credits as defined in the Early College Scholars program (includes dual enrollment, Advanced Placement and other options); or

- Earn an Associate Degree.

- Significant work-based experience must be included, such as
  - Additional instruction or training beyond the classroom;
  - Cooperative Education;
  - Internships;
  - Job Shadowing;
  - Mentorships;
  - Project-based learning;
  - Service learning; or
  - A combination of the above.

NEWLY APPROVED CAREER AND TECHNICAL ACADEMIES (2008)

COMPETITIVE STARTUP FUNDING

- The NGA grant, coupled with the WIA matching monies, provided funding to support start-up expenses for six Governor's Career and Technical Academies.
- The six grant recipients were selected from a pool of 22 applicants by a panel of reviewers from K-12 education, higher education, and business and industry.
- The grant recipients each received a $20,000 planning grant upon notification of the award, and an additional implementation grant of $100,000 upon approval of their Academy by the Board of Education.
- Beyond these start-up funds, partnerships must provide their own funding to sustain the Academies.

OPENING IN 2008-2009

- As of July 2008, all six grant-funded partnerships have been approved by the Board of Education, and will open their doors in fall 2008. While there are numerous

partners supporting each Academy (See Appendix C.), the lead partner for each of these six Academies is:

- Halifax County
- Hampton City (New Horizons Regional Education Center)
- Northern Virginia Community College (with Arlington County Public Schools)
- Russell County
- Stafford County
- Suffolk City (The Pruden Center for Industry and Technology).

♦ Partnerships that are not supported by the NGA/WIA funds may also seek approval to establish a Career and Technical Academy from the Board of Education.

- As of July 2008, one additional Academy has been approved in Loudoun County.
- Additional proposals are anticipated throughout the coming school year.

❑ NEXT STEPS

♦ The Virginia Department of Education is planning a variety of STEM-related events to encourage the establishment of additional Governor's Career and Technical Academies.

- A Web-ex for partnerships considering establishing Academies will take place in the fall of 2008.
- A Governor's Career and Technical Academy symposium to showcase established Academies and present ideas to partnerships considering establishing Academies is being considered for the spring of 2009.
- The Virginia Department of Education will continue to maintain its STEM Web site found at http://www.doe.virginia.gov/VDOE/Instruction/ct_academies/index.html. This Web site posts all of the information a partnership needs to begin the process of establishing an Academy as well as overviews and contact information for existing Academies.

APPENDIX A

Process for Initiating a Governor's Career and Technical Academy
Approved by the Virginia Board of Education
November 29, 2007

Developing and implementing the program and administrative arrangements for a Governor's Career and Technical Academy involves extensive planning and discussions among the participating partners. Additionally, the Academy proposal must be reviewed by the State Council of Higher Education for Virginia (SCHEV) and approved by the Board of Education. Partners should take this process into consideration when preparing a planning and implementation timeline. The process includes the following steps:

1. Governor's Career and Technical Academies must be partnerships of business and industry; public school divisions; and higher education institutions and may include local government, including work force and economic development entities.

2. Partnerships desiring to implement a Governor's Career and Technical Academy shall provide the Department of Education with documentation of the following:

    a. The existence of an active, ongoing Governor's Career and Technical Academy Planning Committee of superintendents or their designees from the participating school divisions and representatives from other partnering organizations. To the extent possible, these councils will come from existing regional industry advisory boards convened under the auspices of the regional work force investment boards, community college work force offices and Tech Prep/Career Pathways leadership teams convened by colleges and schools.

    b. A statement that demonstrates the need/rationale for the Academy. This statement should be concise and state the important reasons to have a Governor's Career and Technical Academy that provides enhanced or additional offerings in science, technology, engineering, and mathematics (STEM), and career and technical education.

    c. Identification of the fiscal agent, which must be a public entity.

    d. A brief description of the proposed program, including site location, number of students, grade levels, and general curriculum design.

    e. A written memorandum of agreement, among school divisions, local businesses, and postsecondary institutions, and any other partners. This agreement will suggest ways in which community resources will contribute

to the Governor's Career and Technical Academy to broaden the scope of the students' educational experiences.

f. A statement of assurance that the Governor's Career and Technical Academy Planning Committee has reviewed provisions of the attached *Administrative Procedures Guide for the Establishment of Governor's Career and Technical Academies* and agrees to follow the guidelines set forth in the document.

g. A statement of assurance that, if applicable, an ongoing Governing Board will be established to reflect current Board of Education regulations relative to jointly operated schools and programs.

3. The Department of Education will review the proposal and documentation and forward the completed proposal to the State Council of Higher Education for Virginia (SCHEV).

4. Subject to approval of the process by the SCHEV Council, SCHEV will review the proposal to determine if it meets the criteria for a Governor's Career and Technical Academy, with particular focus on postsecondary components, and will make a report to the Council with a recommendation. The Council will vote to recommend or not recommend the proposal to the Board of Education.

5. The Department of Education will make a report to the Board of Education with a recommendation, noting SCHEV's recommendation in its report.

6. The Board of Education will approve or deny designation as a Governor's Career and Technical Academy.

7. At any point in the process, the applicant may withdraw its proposal from consideration and resubmit at a later time if desired.

8. The Virginia Department of Education, The Virginia Community College System, and The State Council of Higher Education for Virginia will provide technical assistance to programs during the planning and implementation process as needed.

ADMINISTRATIVE PROCEDURES GUIDE FOR THE ESTABLISHMENT OF A GOVERNOR'S CAREER AND TECHNICAL ACADEMY

I. Introduction

The Governor's Career and Technical Academies shall provide expanded options for the general population of students to acquire science, technology, engineering and mathematics (STEM) literacy and other critical knowledge, skills, and credentials that will prepare them for high-demand, high-wage, and high-skills careers in Virginia.

II. The Role of the Department of Education

The Department of Education will act as a resource for these programs, providing technical assistance related to program and curriculum design, instructional strategies, and evaluation.

III. Program Description

Each Governor's Career and Technical 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 the following:

A. Statement of program goals addressing the following criteria:
   1. Incorporate rigorous academic content with career and technical instruction;
   2. Have an emphasis on STEM career pathways;
   3. Develop individualized high school plans to ensure course selections that are aligned with students' transition and career goals after high school;
   4. Ensure that graduates 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;
   5. Be designed (or later adapted) to ensure that graduates will qualify for the new Technical or Advanced Technical Diplomas to be developed by the Board of Education; and
   6. Incorporate Virginia's Workplace Readiness Skills.

B. Statement of program objectives and performance measures to:
   1. Improve academic achievement of Academy students;
   2. Increase completion of dual enrollment courses;
   3. Provide workplace readiness experiences for students through strong partnerships with businesses;
   4. Increase high school graduation rates;
   5. Reduce dropout rates;

6. Increase enrollment and retention in postsecondary education;
7. Increase the proportion of students completing a college and workplace ready curriculum in high school;
8. Reduce the proportion of students requiring remediation in college;
9. Increase the number of industry certifications awarded to high school students; and
10. Increase the number of graduates employed in high-wage, high-demand, and high-skill careers.

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

D. Program and course descriptions

1. At least two well-articulated career pathways must be included that meet the following criteria:
   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.
   b. At least one career pathway 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.
   c. At least one career pathway must address regional and local work force demand in a high-wage, high-skill field as identified by employers and work force officials.
   d. Of the two pathways described above, 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.
   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.
2. Academy graduates must achieve one or more of the following benchmarks:
   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
   b. Earn at least nine transferable college credits as defined in the Early College Scholars program (includes dual enrollment, Advanced Placement and other options); or
   c. Earn an Associate Degree.
3. Significant work-based experience must be included, such as:
   a. Additional instruction or training beyond the classroom;
   b. Cooperative Education;
   c. Internships;
   d. Job Shadowing;
   e. Mentorships;
   f. Project-based learning;
   g. Service learning; or
   h. A combination of the above.

E. Length of program and daily schedule
   1. Governor's Career and Technical Academies will be defined by program content, not by the location or delivery system of courses. Courses may be delivered on a high school, technical center or community college campus, online, or in other innovative ways.
   2. Governor's Career and Technical Academies may be full-day or part-day, academic-year programs.

F. Assurance from the fiscal agent that operating funds and facilities are available to support the Governor's Career and Technical Academy and are adequate to meet the needs of the program.

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

H. Evidence of an internal evaluation process to effect program improvement, including
   1. A review of the Academy's policies, procedures, and outcomes;
   2. A review of the program design and instructional delivery;
   3. Consideration of feedback from students, staff, parents, the community, and partnership members; and
   4. Annual collection and reporting of data to the Department of Education related to student achievement, goal achievement, and other indicators.

IV. Administrative Procedures

Each regional Governor's Career and Technical Academy will maintain procedures developed cooperatively with participating partners that address the following topics:

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

B. Student recruitment, selection criteria, and admissions.

C. Code of student conduct and attendance.

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

E. Staff recruitment, selection, and assignment - The Governor's Career and Technical Academy shall hire staffs 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.

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

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

H. Parent, student and community involvement
   1. Preparation for entering the Academies should begin by eighth grade.
   2. Students, parents, teachers, and counselors should work collaboratively to:
      a. Complete career interest inventories;
      b. Prepare academic and career plans outlining an intended course of study in high school;
      c. Review multiple postsecondary pathways and the steps required to pursue them;
      d. Participate in career assessments to identify areas students should strengthen to qualify for their selected pathways; and
      e. Discuss available diplomas, seals, and other recognitions, as well as the requirements for admission to specialized programs including Governor's Academies.

I. Documentation that insurance and other fiscal information will be provided.

V. Evaluation

The Department of Education may conduct a periodic evaluation of each Governor's Career and Technical Academy.

APPENDIX B

Virginia Governor's CAREER & TECHNICAL EDUCATION EXEMPLARY STANDARDS AWARDS PROGRAM

Criteria for Identifying Exemplary Programs

In determining an exemplary program, the evaluation criteria will include program excellence, educational significance, evidence of effectiveness and success, and replicability/usefulness to others.

A. Program Excellence

Standard 1: Learning goals and objectives are clear, challenging, and measurable.

Indicator 1a. Goals and objectives are clearly stated, realistic, and measurable.

Indicator 1b. Goals and objectives are based on current research and successful practice.

Indicator 1c. Goals and objectives reflect high expectations for learner achievement.

Indicator 1d. Goals and objectives are aligned with the mission and vision of the institution.

Indicator 1e. Goals and objectives emphasize higher-order thinking skills and problem solving.

Standard 2: The program content aligns with learning goals and is accurate, current, and relevant.

Indicator 2a. The program is technologically current; provides opportunities for learners to use state-of-the-art technology within their industry area; and reflects the impact of technological advances within each chosen field.

Indicator 2b. The learning environment reflects a positive climate.

Indicator 2c. Curriculum and instruction are culturally and ethnically sensitive, free of bias, and reflect diverse learner interests and participation.

Indicator 2d. The content and instruction emphasize development and understanding of all aspects of industry and the world of work, and include work-based learning experiences.

Standard 3: The program is aligned with academic standards.

Indicator 3a. The program goals, content, and assessments are aligned and integrated with appropriate local, state, and national academic standards.

Indicator 3b. The program ensures that students are prepared with academic knowledge and technical skills and are ready to transition into further education and/or the workplace.

Standard 4: The program is aligned with industry standards and validated by Virginia business/industry representatives.

Indicator 4a. The program goals, content, and assessments are aligned and integrated with appropriate state or national occupational or industry skill standards.

Indicator 4b. The program is validated by Virginia business/industry representatives.

Indicator 4c. The program goals, content, and assessments include Virginia's Workplace Readiness Skills and other appropriate employability skills and competencies.

Indicator 4d. The program is certified or recognized by industry, professional, and/or trade associations or state licensing agencies and can lead to postsecondary degrees, industry certifications, licensure, and other recognized credentials.

Standard 5: Collaborations maintained with internal and external organizations as well as stakeholders who serve to strengthen the quality and effectiveness of the program.

Indicator 5a. Strong, visible partnerships with measurable results are established and maintained with business, industry, and community collaborators. Various groups may become involved with the general program and curriculum planning, workplace learning experience development, and program improvement strategies.

Indicator 5b. Partnership agreements designed to address or meet various program goals have been developed and are being implemented effectively.

Indicator 5c. There is evidence of support from leaders from within and outside the organization.

Indicator 5d. Collaboration results in articulated and well-developed career pathways at the secondary and postsecondary levels.

B. Educational Significance

Standard 6: The program addresses important individual, societal, and business/industry needs.

Indicator 6a. The program prepares learners to become productive citizens, leaders, and lifelong learners.

Indicator 6b. The program contributes to local and regional work force development and to the community's economic growth and development.

Indicator 6c. The program promotes equity and equal access for all learners, including members of special populations and students preparing for nontraditional careers.

Standard 7: The program contributes to educational excellence for all learners and leads to other positive results or outcomes.

Indicator 7a. The program contributes to whole school or systemic reform.

Indicator 7b. The program maintains an atmosphere of mutual respect and high expectations for all learners.

Indicator 7c. The program contributes to increases in teacher/faculty knowledge of effective teaching and learning theory and practice.

Standard 8: The program design is innovative, dynamic, and reflective of current research.

Indicator 8a. The program design includes flexible delivery, career clusters and pathways, academic and technical integration, learner credentialing based on competency attainment vs. seat time, customization to meet individual student and/or employer needs.

Indicator 8b. The instructional methods include authentic instruction and assessment, problem- and project-based learning, mentoring, and other practices that develop students' critical thinking skills.

Indicator 8c. Professional development for the faculty and staff addresses identified needs for program improvement.

C. Evidence of Effectiveness and Success

Standard 9: The program makes a measurable difference in learning for all program participants.

Indicator 9a. Learners demonstrate competency attainment in required academic, technical, and employability skills (Virginia's Workplace Readiness Skills), as evidenced by recognized standards-based assessments.

Indicator 9b. Learners are able to perform acquired skills as evidenced by licensure, certification, credentialing, proficiency tests, and/or other recognized assessments.

Indicator 9c. Students successfully transition into further education or training, the work force, or military service.

Indicator 9d. The gap in achievement among groups of students is narrowed.

Standard 10: The program exceeds identified performance goals.

Indicator 10a. Program data show that it exceeds local, state, and federal identified performance measures.

Standard 11: A systematic evaluation process ensures the program's continuous improvement.

Indicator 11a. The program evaluates learner and program performance using valid outcome measures.

Indicator 11b. The program solicits external stakeholders' feedback for program improvement.

Indicator 11c. The program solicits learner feedback to improve the program.

Indicator 11d. The program solicits staff feedback in identifying needs and assessing continuous improvements strategies.

Indicator 11e. Formative and summative information is collected and used to improve programs.

Standard 12: The whole program, the process, or significant elements of the program can be successfully implemented, adopted, or adapted in other educational settings.

Indicator 12a. The program has clear instructions and sufficient resources to ensure it can be replicated.

Indicator 12b. The program has sufficient documentation and specifies the conditions and resources needed for implementation.

Indicator 12c. The program's best practices are shared proactively and made available for duplication and adaptation in other settings.

Appendix C

Governor's Career and Technical Academy for Renewable Resources and Agricultural Sciences
Executive Summary

Partnership Members:	Halifax County Public Schools; Southern Virginia Higher Education Center; Virginia Polytechnic Institute and State University; WoodLINKS, Inc.; Morgan Lumber; Ontario Hardwood; J.M. Huber Corporation; Virginia Cooperative Extension; Danville Community College; Southside Virginia Community College; Halifax County Board of Supervisors; H&M Logging; Virginia Department of Forestry
Lead Entity:	Halifax County Public Schools
Fiscal Agent:	Halifax County Public Schools
Contact Person:	Dr. Melanie A. Stanley, Director of Academies, Halifax County Public Schools (434) 476-3107 mstanley@halifax.k12.va.us
Academy Location:	STEM Academy 315 South Main Street Halifax, VA 24558
Number of Students Served:	150 middle school students; 360 high school students; 60 students in summer programs. Also, 2,586 K-5 students will have the opportunity to tour the laboratory facilities and receive introductory materials related to the program.
Pathways:	Natural Resource Systems Biological Engineering and Technology
Academy Goals and Description:	Halifax County Public Schools (HCPS) is located in rural Southside Virginia in the heart of the wood and agricultural industries. Since this area is rich in forests, land, and timber resources, the Academy will provide students with opportunities to gain knowledge and hands-on experience in careers related to the wood and agricultural industries. This Governor's Career and Technical Academy proposes to meet state and regional strategic growth needs through the Engineering and Technology and the Natural Resource Systems career pathways. The major focus of the Academy is to address the management of forest lands, and the management and leadership of forest industry businesses by inspiring students with the qualities of creativity, innovation, and entrepreneurship. The programs and courses offered through the Governor's Career and Technical Academy for Renewable Resources

and Agricultural Sciences will range from biological applications in agriculture, biotechnology, and forestry to the production of manufactured goods made from wood. The foundation of the Academy will be the establishment of strong partnerships, including WoodLINKS, Inc., to provide students with opportunities for work-based learning experiences.

The focus of the Governor's Career and Technical Academy for Renewable Resources and Agricultural Sciences is to provide students with opportunities to gain the skills, knowledge, and aspirations to be successful in the agricultural and wood industries. Specifically, the goals of the Academy are to: 1) maximize opportunities to prepare students for targeted careers in the agricultural and wood industries; 2) raise student aspirations and attract more students to postsecondary education in the areas of agriculture and wood sciences; and 3) provide well-trained, highly skilled workers to meet the work force needs of existing businesses.

Highlights of the Academy:

- The program will have postsecondary components for students to receive occupational certifications and continue their education through a four-year degree program at Virginia Polytechnic Institute and State University.
- Three learning laboratories will support the educational structure of the Academy: 1) the Forest-Land Laboratory will be established at the Moorefield Estate; 2) the WoodLINKS, Inc. Training Laboratory will be developed at the Southern Virginia Higher Education Center; and 3) the Agricultural Biological Applications and Biotechnology Laboratory will be established at the STEM Academy facility.
- At the elementary level, students will use the laboratories as part of their science coursework and learning experiences.
- At the middle school level, the program will provide students with the foundational knowledge of agricultural science. Two agri-science courses will be offered through the career and technical program for students to gain the knowledge and basic skills related to renewable resources. Middle school students will use the three laboratories to conduct research and investigate the biological applications in agriculture.
- At the high school level, the basis of the program is the WoodLINKS, Inc., curriculum framework. This is an industry and education partnership that provides a national curriculum framework for wood sciences. The goals and objectives of this curriculum framework will be integrated into the courses offered.
- The dual enrollment courses will prepare students for employment in the wood industry, and/or create a seamless pathway to a four-year bachelor program in Wood Science or Forestry at Virginia Polytechnic Institute and State University.
- During the summers, students at all grade levels will have the opportunity to participate in summer programs that focus on agriculture and wood sciences.

Governor's Academy for Innovation, Technology and Engineering
Executive Summary

Partnership Members: New Horizons Regional Education Centers (NHREC); Greater Peninsula Public School Divisions: Gloucester County; Hampton City; Newport News City; Poquoson City; Williamsburg-James City County; York County; Thomas Nelson Community College (TNCC); Old Dominion University (ODU); Virginia Space Grant Consortium; Northrop Grumman Corporation; The Apprenticeship School of Northrop Grumman; Cooperating Hampton Roads Organization for Minorities in Engineering (CHROME); Peninsula Council for Workforce Development; Peninsula Workforce Investment Board; and Peninsula Technical Preparation

Lead Entity: New Horizons Regional Education Centers (NHREC)

Fiscal Agent: Hampton City Public Schools

Contact Person: Mr. J. Joseph Johnson, Executive Director
New Horizons Regional Education Centers
757-766-0000
jjohnson@nhrec.org

Academy Location: STEM Academy
520 Butler Farm Road
Hampton, VA 23666

Number Students Served: Seventh and eighth grades: 75-100 students; ninth and tenth grades: 150 students; eleventh and twelfth grades: approximately 180 students

Pathways: Electrical Engineering Technology
Mechanical Engineering Technology

Academy Goals and Description: The Governor's Academy for Innovation, Technology and Engineering (GAITE) will foster a vibrant economy for the Virginia Peninsula and the Commonwealth by creating a culture that educates and trains innovators and technologists necessary for businesses to remain competitive in a global economy. GAITE will direct its initial focus on the Science, Technology, Engineering, and Mathematics (STEM) career cluster with the development of career pathways in engineering technologies, particularly electrical engineering technology and mechanical engineering technology. For these two career pathways, GAITE will establish regional enrichment programs to include *Engineering Technology Exploratory Saturdays* (seventh and eighth grades) and an *Engineering Technology Summer Camp* (ninth and tenth grades). GAITE will also establish an *Academy for Engineering Technology* (eleventh and twelfth grades) within at least one high school in each of the six school

divisions in the Greater Peninsula area.

Under the facilitation of NHREC, the *Academy for Engineering Technology* will implement a unique Academy model that focuses on school division-based courses while utilizing regional courses at NHREC and the community colleges, as well as distance learning. GAITE's engineering technology curriculum will provide a seamless alignment from middle school to high school to college, emphasizing advanced academics (Algebra I in 8th grade, Algebra II by 11th grade, and four years of science) and college-level technical training. The instructional pedagogy will implement project-based, experiential and cooperative learning. GAITE implementation will be supported by regional and school team-based professional development.

Upon successful implementation of this initial effort, GAITE will be expanded to develop enrichment programs and Academy designs for other career clusters and pathways such as geospatial technologies, modeling and simulation, nanotechnology, biotechnology, and other fields of innovation, technology and engineering based upon the work force needs of the Greater Virginia Peninsula.

NHREC is the largest and oldest regional center in the state and will become the only one to operate both a Governor's School (The Governor's School for Science and Technology) and a Governor's Academy for Career and Technical Education (GAITE).

Highlights of the Academy:

- A regional partnership facilitated by a Regional Education Center to establish regional and divisional programs focused initially on Electrical Engineering Technology and Mechanical Engineering Technology.
- The Virginia Space Grant Consortium will design and facilitate enrichment programs to include *Engineering Technology Exploratory Saturdays* and *Engineering Technology Summer Camp.*
- *The Academy for Engineering Technology* curriculum (eleventh and twelfth grades) will be aligned with Thomas Nelson Community College's and Old Dominion University's Engineering Technology degree programs.
- *The Academy for Engineering Technology* will be based in the school divisions, and courses will be offered at divisional high schools, NHREC, TNCC, and/or through distance learning.
- Students will earn college credits and industry credentialing as well as participate in a senior-year internship, mentorship, or project learning experience.

Governor's Career and Technical Academy in Arlington
Executive Summary

Partnership Members:	Northern Virginia Community College and Arlington County Public Schools are co-lead partners for the Governor's Career and Technical Academy in Arlington. Partners include The American Service Center; Arlington Employment Center; Passport Nissan; Nortel Telecommunications; The American Youth Policy Forum; Viral Media Productions; and Virginia Polytechnic Institute and State University. Other supporters include The American Association of Community Colleges; Arlington Economic Development; DeVry University; Farrish of Fairfax; National Science Foundation; Nortel Telecommunications; Passport Chrysler; and Passport Infiniti
Lead Entity:	Northern Virginia Community College
Fiscal Agent:	Northern Virginia Community College
Contact Person:	Mr. Milan Hayward, Special Assistant for Career and Technical Education Northern Virginia Community College 4001 Wakefield Chapel Road Annandale, VA 22003 (703) 323-2263 mhayward@nvcc.edu
Academy Location:	The Arlington Career Center 816 South Walter Reed Drive Arlington, VA 22204
Number of Students Served:	At least 50 students will be served during the 2008-2009 academic year, while up to 600 will be served at full implementation in the 2012-2013 academic year.
Pathways:	Engineering and Technology Audio and Video Technology and Film (Health Sciences) Support Services Information and Support Services Facility and Mobile Equipment Maintenance
Academy Goals and Description:	The Governor's Career and Technical Academy in Arlington promises a unique, jointly administered Career and Technical Education (CTE) Center, offering area CTE students the option of a five-year high school diploma/two-year college degree program. The Academy will be located within the Arlington Career Center and will open its doors in the fall of 2008 as a part-day program. Students will participate in featured dual enrollment

CTE courses and supporting workplace activities, along with continued study at their respective home schools. Over the next several years, an increasing number of CTE and academic subjects will be offered until the Academy also offers full-day programs as a comprehensive school.

The Academy's science, technology, engineering and mathematics (STEM)-infused curriculum will initially feature programs within five pathways: Audio and Video Technology and Film; Engineering and Technology; Facility and Mobile Equipment Maintenance; (Health Science) Support Services; and Information Support and Services. Additional programs in other pathways will be added as the Academy develops, providing broader academic and employment opportunities for more students. Virginia Polytechnic Institute and State University will provide staff development in Integrative STEM Education, helping the Academy assimilate a cross-disciplinary pedagogy in STEM/CTE education.

Expected student outcomes include improved high school graduation rates and enrollment in postsecondary education, as well as the reduced need for remediation and an increase in college student retention, transfer, and graduation. Relevant preparation for employment will be a hallmark of the Academy. Improvement in these areas will be effected through increasing STEM and CTE academic integration, strengthening the five featured pathways, training staff and raising awareness in STEM education, and improving data collection for continuous program improvement. Students will learn subject matter as appropriate through discovery, analysis, inquiry-based research, and on-the-job experience.

Highlights of the Academy:

- The Governor's Academy will be a joint secondary/postsecondary institution.
- Students can earn a college degree at no cost one year after high school graduation.
- Dual enrollment opportunities will exist for grades 11, 12, and beyond.
- Cross disciplinary pedagogy informed by Virginia Polytechnic Institute and State University's I-STEM Education program will be the major focus of staff development for teachers.
- The flexible Academy model will incorporate several pathways beyond the initial five over time.
- Student job shadowing and internships will be available across a variety of disciplines.
- Required Stretch projects will introduce students to real work-related projects.
- Involved business partners will assist in keeping curriculum relevant.
- Summer college coursework will be available.

STEM for LIFE Governor's Academy
Executive Summary

Partnership Members:	Russell County Public Schools; Southwest Virginia Community College; The University of Virginia's College at Wise; Virginia Economic Development Program; Bostic, Tucker and Company; Virginia Coalfield Economic Development Authority; Appalachian Electric Power Company; Southwest Virginia Public Education Consortium; Town of Lebanon
Lead Entity:	Russell County Public Schools
Fiscal Agent:	Russell County Public Schools
Contact Person:	Dr. Lorraine C. Turner, Superintendent Russell County Public Schools 276-889-6518 lturner@russell.k12.va.us
Academy Location:	STEM for LIFE Governor's Academy P.O. Box 8 One School Board Drive Lebanon, Virginia 24266
Number Students Served:	284 sixth graders in 2008-2009, 284 seventh graders in 2009-2010, 319 eighth graders in 2010-2011, and 425 high school students taking dual enrollment courses from 2008 through 2012.
Pathways:	Science and Mathematics Engineering and Technology Information Support and Services
Academy Goals and Description:	Russell County Public Schools, in partnership with business, industry, higher education, and local government, has developed the Science, Technology, Engineering and Mathematics for Lifelong Initiatives for Education (STEM for LIFE) Governor's Career and Technical Academy. The Academy will provide opportunities for all students in grades six through twelve to learn about STEM careers that are available locally, regionally, and nationally. In addition, the Academy will develop the academic skills and competencies necessary to prepare students for the work force and postsecondary education in STEM fields. The Academy pathways emphasize both academic and hands-on experiences. To gain parental and other local support for the Academy and its goals, career awareness sessions for parents and community members will be held. It is the philosophy of the STEM for LIFE Academy that a team effort is essential to the success of this program and that ongoing communication is key to its sustainability.

It is the intent of the STEM for LIFE Academy founders to expand into the surrounding school divisions and to produce a pipeline through which all students in southwest Virginia school divisions have access to STEM opportunities.

Highlights of the Academy:

- STEM for LIFE will begin in the sixth grade with students enrolling in the Gateway to Technology sequence, the middle school component of Project Lead the Way, which includes courses in Design and Modeling and the Magic of Electrons. Keyboarding classes will also be required for two nine-week periods.
- All seventh-grade students will continue to develop keyboarding skills. They will enroll in the continuation of the Gateway to Technology sequence through courses in Science of Technology, Automation of Robotics, and Flight and Space.
- A summer program for students in grades seven, eight, and nine will afford students the opportunity to study in the STEM areas and work on an original project.
- Through the Kuder career assessment program, each student will be assessed, explore jobs that align with identified areas of interest, and complete a job interview planner.
- A transition plan for students entering high school will be in place for seventh- and eighth-grade students to assist in a successful high school transition.
- All high school students in the Academy will be required to complete a service-learning project in addition to the internship, mentoring or job shadowing experience.
- Parents will receive updates and projections about career preparation and opportunities which are available locally, regionally, and statewide.
- Dual enrollment courses will be offered through Southwest Virginia Community College either with instructors at the high school or through distance learning.
- Students who graduate from one of the STEM for LIFE Academy pathways will meet necessary requirements in mathematics, science, and career and technical education to qualify for Technical and Advanced Technical diplomas.
- Extensive professional development for all academic and career and technical education teachers, guidance counselors, and administrators responsible for aspects of the Academy began in the spring of 2008 and will continue throughout the first year of the Academy.

Stafford Academy for Technology
Executive Summary

Partnership Members:	Stafford County Public Schools; Germanna Community College; Diversified Educational Systems; Employment Resources, Inc.; Fredericksburg Regional Alliance; Fredericksburg Regional Chamber of Commerce; Free Lance-Star; GEICO; Hilldrup Companies; Mary Washington Hospital/Medicorp; Rappahannock Region Small Business Development Center; R.L. Williams, Ltd./Autodesk, Inc.; Spotsylvania Technology Center; Stafford County Economic Development; Stafford County Career and Technical Education Advisory Committee; Stafford Rotary; University of Mary Washington; Virginia Employment Commission; Weldon Cooper Center; Workforce Investment Board, Inc.
Lead Entity:	Stafford County Public Schools
Fiscal Agent:	Stafford County Public Schools
Contact Person:	Ms. Kathleen M. Burant Director of Career and Technical Education Stafford County Public Schools 31 Stafford Avenue Stafford, VA 22554 (540) 658-6672 burantkm@staffordschools.net
Academy Location:	Brooke Point High School North Stafford High School Stafford High School
Number of Students Served:	Maximum of 180 in Phase I
Pathways:	Network Systems Science and Engineering
Academy Goals and Description:	The Stafford Academy for Technology will be used as the catalyst to prepare students to meet both current and projected work force needs through an interdisciplinary course of study bringing science, technology, engineering, and mathematics together across all grade levels, K-16. The Academy will assure excellence by raising the aspirations of all students through: 1) the incorporation of workplace experiences as part of the school program; 2) the implementation of

industry assessments; 3) the application of concepts through hands-on learning experiences; 4) the alignment of programs of instruction to emerging job opportunities; and 5) the coordination of related efforts throughout a partnership network.

The Academy will open at three sites in Stafford County in the fall of 2008 with one site focusing on the Network Systems pathway and the other two sites on the Science and Engineering pathway. Access will be provided for students from all five Stafford County high schools. There is a substantial opportunity for dual enrollment coursework and career and technical integration as part of the Academy educational experience. The curriculum of the seven Stafford County middle schools will support and encourage enrollment in the Academy.

Highlights of the Academy:

- The Stafford Academy for Technology has a strong and growing partnership including representatives from business and industry, postsecondary educational institutions, work force and economic development groups, parents, and Stafford County Public Schools.
- A major component of the Academy is the integration of academics and career and technical education staff and curriculum.
- The Stafford Academy for Technology is building upon Project Lead the Way to give students pre-engineering curriculum at the middle and high school levels.
- FIRST Robotics, N-STAR projects and Legos™ will be incorporated into the middle school curriculum so that students will receive hands-on experience applying instructional technology and science and engineering concepts.
- Small learning communities will be a hallmark of the Academy to give students more personalized instruction.
- Required service learning experiences are incorporated into students' Academy experiences.
- The Stafford Academy for Technology will address the needs of special populations and nontraditional students in engineering and technology fields.
- The strong connection with business and industry partners will facilitate mentorships, job shadowing, cooperative education, and internships as early as the tenth grade.
- The two pathways will be the model for expanding the Academy concept to the development of a future STEM-based career and technical education center.

Fostering Innovation and Relevance through STEM and Trades (FIRST)
Executive Summary

Partnership Members:	The Pruden Center for Industry and Technology; Suffolk Economic Development; Tidewater Community College; Hampton Roads Research Partnership; Isle of Wight County Public Schools; Suffolk City Public Schools; Isle of Wight Chamber of Commerce; Isle of Wight Economic Development; Isle of Wight County Government; The Pruden Foundation; Sentara Obici Hospital; Starr Motor Company
Lead Entity:	The Pruden Center for Industry and Technology
Fiscal Agent:	City of Suffolk Public Schools
Contact Person:	Mr. Corey McCray, Director The Pruden Center for Industry and Technology (757) 925-5651 cormccray@prudencenter.net
Academy Location:	The Pruden Center for Industry and Technology 4169 Pruden Boulevard Suffolk, VA 23434
Number of Students Served:	Fifty students will be enrolled in the Engineering and Technology Pathway in the fall of 2008.
Pathways:	Engineering and Technology (Modeling and Simulation Support Specialist) Interactive Media (Geographic Information Systems - GIS)
Academy Goals and Description:	The program of study for the FIRST Academy includes two career pathways: Interactive Media with a specialization in Geographic Information Systems (GIS) and Engineering and Technology with a specialization in Modeling and Simulation. The Pruden Center will focus efforts for the 2008-2009 school year on implementing the Modeling and Simulation Support Specialist instructional program, as part of the Engineering and Technology career pathway. Implementation efforts for the 2009-2010 school year will focus on GIS, as part of the Interactive Media career pathway. Long-range plans include developing additional programs of study. The FIRST Academy instructional programs will focus on the integration of academics and Career and Technical Education (CTE),

enhanced career development/guidance services, work-based learning offerings, industry credential opportunities and transition agreements, thus creating a seamless transition to postsecondary education and/or high-demand, high-wage, high-skill employment.

The goals of the FIRST partnership are to:

1. Increase opportunities for students to receive rigorous academic instruction contextually as part of career and technical education program offerings.
2. Increase the emphasis on STEM career pathways.
3. Develop individualized high school plans to ensure course selections that are aligned with student postsecondary education and career aspirations.
4. Ensure that graduates complete a college and work readiness curriculum, minimally at the level of the Commonwealth Scholars Course of Study.
5. Ensure that graduates will qualify for the Advanced Technical or Technical Diplomas.
6. Incorporate Virginia's Workplace Readiness Skills.

Highlights of the Academy:

- Students completing the Engineering and Technology pathway will have the option of pursuing an Associate of Science degree in Modeling and Simulation Technology at Tidewater Community College. This degree prepares students to enter the work force, and/or transition to a baccalaureate program at Old Dominion University.
- Students completing the Interactive Media pathway will have the option of pursuing a Career Studies Certificate in Surveying and/or an Associate of Liberal Arts degree at Tidewater Community College, enabling them to transition to a baccalaureate program at Old Dominion University.
- FIRST Academy students will receive enhanced science, technology, engineering and mathematics (STEM) instruction through: contextual application/course integration, monthly STEM focus sessions, summer enrichment opportunities, career and technical student organizations (CTSO) activities and enhanced career planning/development.
- The FIRST Academy students will complete a project including a portfolio, presentation, research paper and project components.
- The design of the Modeling and Simulation Support Specialist I and II and GIS courses will support a variety of learning experiences such as project-based learning, simulations, and guest speaker presentations.
- The design of the Modeling and Simulation Support Specialist I and II and GIS courses will also support a variety of external workplace learning experiences such as Student Technical Internships (STIs), job-shadowing, and mentorships.

The Loudoun Governor's Career and Technical Academy
Executive Summary

Partnership Members:	Loudoun County Public Schools; Monroe Technology Center; Northern Virginia Community College; Shenandoah University; Virginia Polytechnic Institute and State University; George Washington University; REHAU; Fortessa, Inc.; Lockheed Martin; Metropolitan Washington Airports Authority; America Online, LLC; Loudoun County Economic Development, The Claude Moore Charitable Foundation; TELOS/Xacta Corporation; Hayes-Large Architects; Jerry's Automotive Group
Lead Entity:	Loudoun County Public Schools
Fiscal Agent:	Loudoun County Public Schools
Contact Person:	Ms. Shirley L. Bazdar Director of Career and Technical Education Loudoun County Public Schools 571-252-1070 shirley.bazdar@loudoun.k12.va.us
Academy Location:	The Loudoun Governor's Career and Technical Academy 715 Childrens Center Road, SW Leesburg, Virginia 20175
Number of Students Served:	One hundred twenty-five high school students will have the opportunity to enroll in the Academy for the 2008-2009 school year. Future plans are in place to expand and grow Academy programs.
Pathways:	Plant Systems Diagnostic Services Therapeutic Services Engineering and Technology Facility and Mobile Equipment Management
Academy Goals and Description:	The Loudoun Governor's Career and Technical Academy will provide rigorous academic content within its career and technical instruction, concentrating on five career pathways. Academic integration and STEM curriculum expansion will enhance student learning through curriculum enhancements and targeted staff development with concentrations on integrative applications of mathematics and science. Academic content integration will be facilitated by enrollment in the STEM certificate/degree program at Virginia Polytechnic Institute and State University for identified faculty. A cluster resource teacher will also be identified to assist with curriculum enhancement and

monitoring. Each of these tools will be used to connect and integrate academic content areas. Additionally, a partnership with the Loudoun Academy of Science program will enhance the academic rigor and create opportunities for future STEM education initiatives. Graduates of The Loudoun Governor's Career and Technical Academy will complete a college and work readiness curriculum meeting the Commonwealth Scholars course of study. High school diploma completion will include up to nine career and technical course credits that can be earned, including corresponding industry credentials. Academy graduates will meet the requirements for an Advanced Technical Diploma. Opportunities will be available within Academy programs for students to earn at least nine dual enrollment college credits. Academy programs will utilize Virginia's Workplace Readiness competencies. Advisory committee members will work with Academy students by offering seminars addressing topics such as life skills, background checks, or professional ethics and behaviors.

Highlights of the Academy:

- Dual enrollment opportunities will be available through Northern Virginia Community College and Virginia Polytechnic Institute and State University. Future dual enrollment opportunities will be made available through the George Washington University and Shenandoah University.
- Academy students will receive enhanced science, technology, engineering, and mathematics instruction via the staff development opportunities, curriculum enhancement, and partnerships with the Loudoun Academy of Science, as well as advisory and planning committee member participation.
- The Health Science cluster pathways contain two new and innovative pathway programs. Curriculum is currently being developed at the CTE Resource Center for these two pathways. The Medical Laboratory Technology and Radiology Technology pathway programs have been created through the support and partnership of the Claude Moore Charitable Foundation and the Inova Healthcare System.
- The Agriculture, Food and Natural Resources Plant Systems pathway is aligned with the global movement to develop more green technologies and practices to conserve and protect earth's natural resources.
- The Transportation, Distribution and Logistics Facility and Mobile Equipment Maintenance pathway will provide direct instruction in the development and maintenance of alternative fuels and hybrid vehicles.
- The Engineering and Technology pathway offers a digital visualization and animation program. This program prepares students to enter the evolving career fields of animation, gaming and software development, prototyping, and rendering.