

NORTH CAROLINA SCHOOL
OF SCIENCE AND MATHEMATICS



Virginia STEAM Presentation

October 12, 2011

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Items to Cover

- The Importance of STEM Education
- Helping Address the STEM Education Need in North Carolina: Information on North Carolina School of Science and Mathematics



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Why STEM Is So Important?

STEM and Economic Opportunity

- The STEM workforce accounts for more than 50% of the nation's sustained economic growth (U.S. Department of Labor, 2007).
- Between 2008-2018 careers in STEM related fields will increase by 18% (US Bureau of Labor and Statistics.)
- The top 10 degrees by median starting salary and mid-career salary are in STEM fields (Teaching Science, 2009).



Improving STEM Outcomes and Opportunities: The Need

- Less than 17% of post-secondary degrees awarded in the U.S. are in STEM related fields (National Science Foundation, 2006).
- Other Countries:
 - Japan = 64%
 - China = 52%
 - South Korea = 41%
 - Russia = 33%
 - UK = 26%



Improving STEM Outcomes and Opportunities: The Need

- A large segment of the STEM workforce is approaching retirement age.
- Greater difficulty in retaining immigrant skilled STEM professionals.
- Less than 30% of high school students are interested in STEM related majors (ACT).



Improving STEM Outcomes and Opportunities: The Need

- By many measures U.S. students are not performing as well in math and science as compared to students in many other countries:
 - *Trends in International Mathematics and Science Study (TIMSS 2007)*: U.S. ranks: 4th grade: 12th in math and 3rd in science; 8th grade: 28th in math and 17th in science; Final Year of HS: 19th in math and 16th in science.
 - *Programme Internationale for Student Assessment (PISA, 2009)*: U.S. ranks 31st in math and 23rd in science.



Improving STEM Outcomes and Opportunities: The Need

- 43% of students nationally are college ready in math based on ACT Exam
- 29% of students nationally are college ready in biology based on ACT Exam (ACT, 2010).
- Less than 10% of students nationally are taking AP math and science exams (College Board, 2010) .





North Carolina School of Science and Mathematics



North Carolina's High School

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NCSSM Mission

- NCSSM opened in 1980 in Durham, NC on the campus of the historic Watts Hospital
 - Governor Jim Hunt
 - Former Gov. Terry Sanford
 - Philanthropist Joseph M. Bryan
 - Academic John Ehle
 - Senator Kenneth Royall
- NCSSM was the first public residential high school focused on science and math in the world.



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NCSSM Mission

NCSSM's Legislative Purpose (Article 28: 116-232; 1985):

- To foster the educational development of North Carolina high school students who are academically talented in the areas of science and mathematics and show promise of exceptional development through participation in a residential educational setting emphasizing instruction in the areas of science and mathematics, to develop, evaluate, and disseminate experimental instructional programs; and to serve all schools of the State through research and outreach activities.



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NCSSM Mission

NCSSM's Mission (Draft, 2011):

The mission of the North Carolina School of Science and Mathematics, an intellectually stimulating, diverse, and collaborative community, is to:

- educate academically talented students to become state, national, and global leaders in science, technology, engineering, and mathematics,
- advance public education in North Carolina,
- and inspire innovation for the betterment of humankind,

through challenging residential and virtual programs driven by instructional excellence and the excitement of discovery.



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NCSSM Governance History

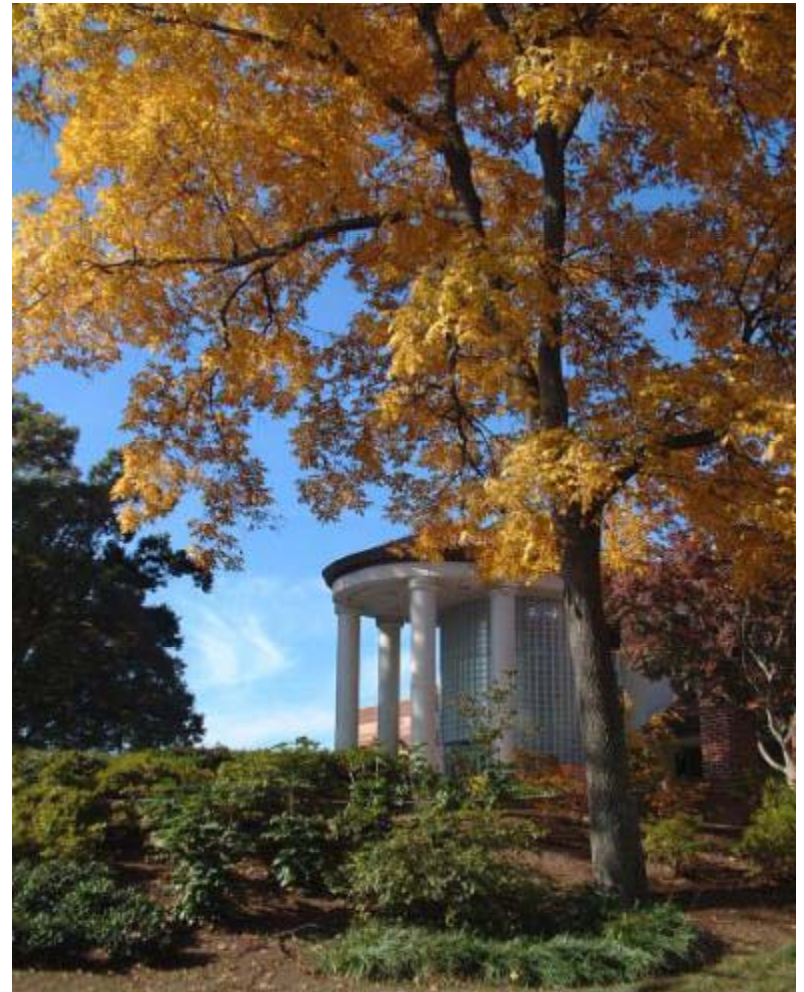
- **1978:** NCSSM established by legislation opened in 1980; 26 member Board of Trustees (15 members appointed by Governor); budget managed through Governor's office
- **1985:** NCSSM becomes an affiliate of the University of North Carolina; 25 member Board of Trustees (11 members appointed by UNC Board of Governors)
- **2007:** NCSSM becomes a Constituent Institution of the University of North Carolina; 27 member Board of Trustees (13 members appointed based on Congressional District)



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NCSSM Data

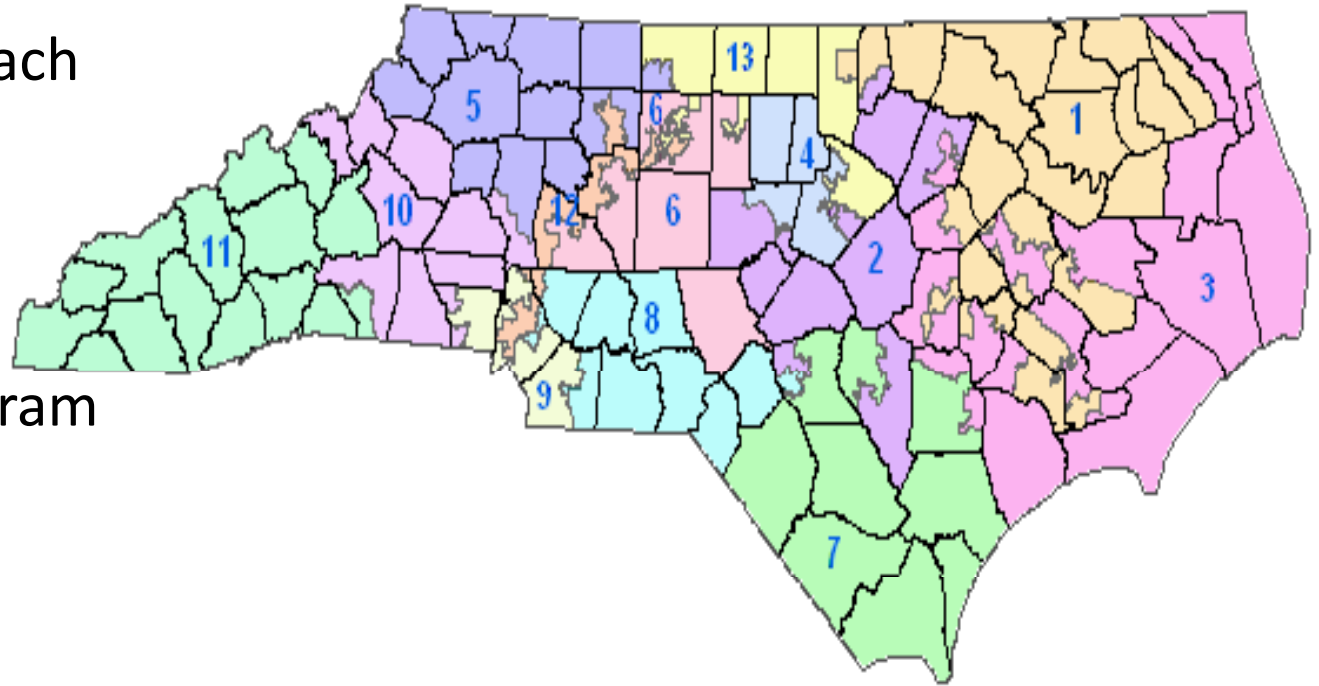
- 27 acre campus
- 470,000 sq. feet
- 6 residence halls
- FY 2011 Budget:
 - 93% state funded
 - \$18.6 million state approp.
 - \$1.4 million NCSSM Foundation



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NCSSM Services

- NCSSM serves students from each of N.C.'s 13 Congressional Districts
- Residential Program
- IVC and Online Programs
- Enrichment and PD



NCSSM Student Enrollment

Residential Enrollment (Grades 11-12):

- 2011-2012 = 680 students
- 2011-2012 = 1289 applicants for 350 11th grade spaces

Online and IVC Enrollment (Grades 11-12):

- 2011-2012 = 700 students



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NCSSM Profile 2010-11

- Mean SAT 1361
- Class took 575 AP exams; 57% were 5's, 96% scored 3 or better
- 3 of 4 AP Scholars for North Carolina over the past 2 years
- 12 students earned the top merit based scholarships at UNC-CH, NC State and Duke
- 2 of 4 winners in NASA's Conrad Spirit of Innovation Competition
- Semi-finalist in Siemens Competition in Math, Science and Technology
- Students performed 22,000 hours of community service in 2010-11



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NCSSM Academic Opportunities

- NCSSM provides students with outstanding opportunities for problem-based learning in college level, academic courses in math, science, applied sciences, and the humanities.
- NCSSM provides students with outstanding opportunities to apply their learning through research and mentorship.
- NCSSM provides students with outstanding opportunities to apply their learning through academic competitions and entrepreneurial activities.



The Residential Advantage

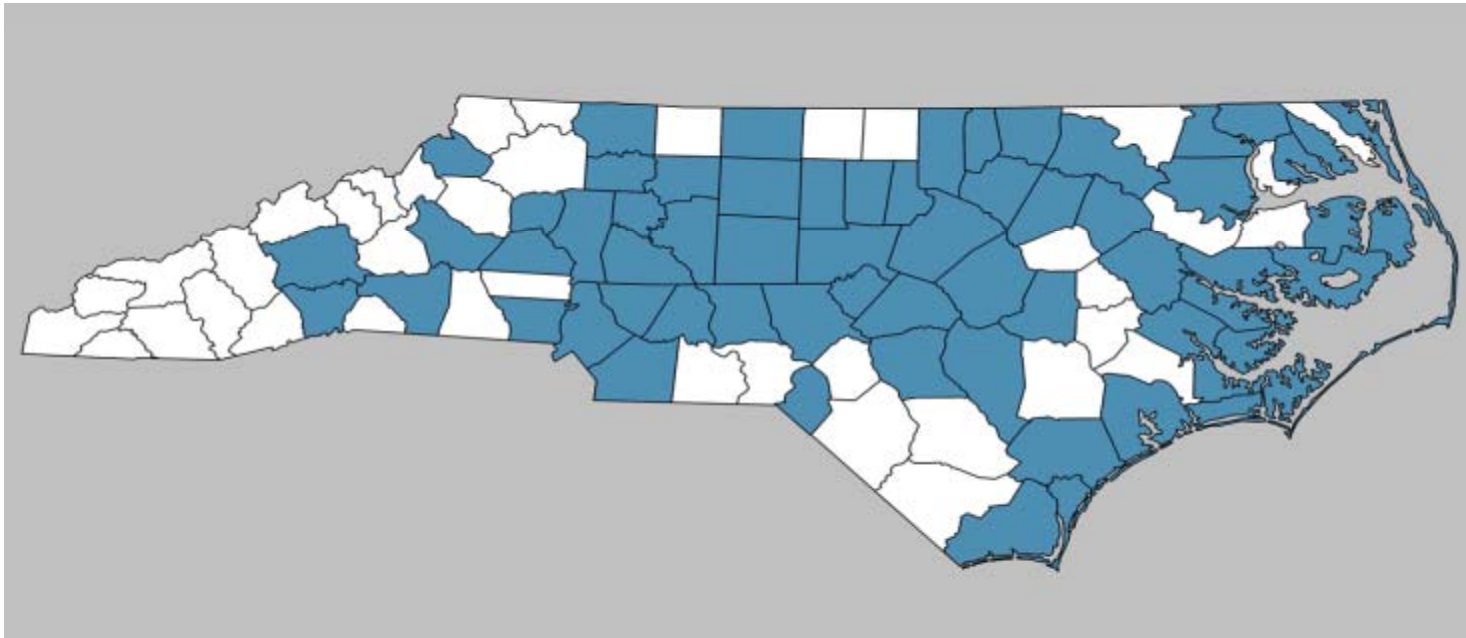
- Promotes personal responsibility
- Promotes and encourages collaboration far in excess of the typical school day
- Provides extensive leadership opportunities for students
- Promotes diversity and cultural understanding
- Prepares students socially for college



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NCSSM Outreach

- Largest provider of K-12 distance education programming in the state
- Interactive Video Conference Courses-for-credit to more than 500 part-time students in 29 schools across N.C. (2010-2011)
- *NCSSM Online* offers 18 honors courses to more than 180 N.C. students
- Academic enrichment programming to nearly 2,500 students at 45 schools across N.C. (2010-2011)
- Professional development to more than 4,000 N.C. educators since 1992



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Opportunities Lead to Results

- NCSSM students annually take home top awards at the most prestigious national and international science and math competitions:
 - Intel Talent Search
 - Siemens Competition
 - Conrad Spirit of Innovation Awards
 - National Science Olympiad
 - National Ocean Science Bowl
 - Physics Olympiad
 - USA Biology Olympiad
 - Singapore International Math and Science Competition



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Opportunities Lead to Results

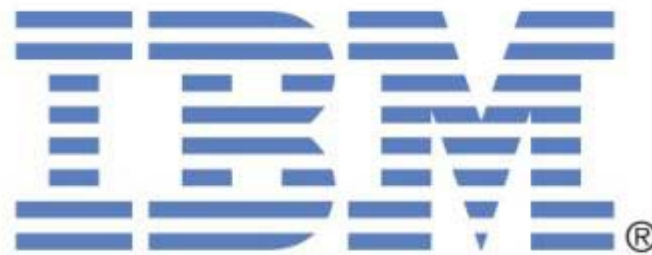
- Greater than 70% of NCSSM's 2011 graduates attend college in North Carolina.
- 57% of NCSSM graduates enter STEM related professions (four times the national average).
- NCSSM alumni volunteer over 140,000 hours of community service each year.
- Nearly 60% of NCSSM graduates live in North Carolina, generating an estimated economic impact of approximately \$500 million annually (NCSSM Economic Impact Study, 2010).



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Fueling North Carolina's Economy

NCSSM alumni are working at some of the top companies in North Carolina including:



NCSSM alumni are starting companies that will help drive North Carolina forward:





The video shows a woman in an orange shirt standing in front of a chalkboard. She is pointing to a diagram on the left side of the board. The diagram consists of a coordinate system with a vertical axis labeled 'P' and a horizontal axis labeled 't'. A curve is drawn in the first quadrant. To the right of the curve, the expression $\frac{\Delta P}{\Delta t}$ is written and circled. An arrow points from this circled expression to the handwritten text 'new data'. To the right of the woman, the differential equation $\frac{dP}{dt} = \sqrt{\quad ?}$ is written. Below this, the function $P(t)$ is written. The YouTube logo is visible in the bottom left corner of the video frame. The video player interface at the bottom shows a play button, a volume icon, a progress bar at 0:08 / 2:30, a CC icon, and a resolution indicator for 360p.

Watch the Video: <http://youtu.be/qrBGBg0hKhE>

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**More information:
www.ncssm.edu**

