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**Partnering for Success in the
21st Century**

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PUBLIC SCHOOLS

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Outline of Presentation

- Introduction
- School System Background
- Traditional and Contemporary STEM Education Models
- STEM Curricular and Co-Curricular Opportunities
- Conclusion
- References

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**The Impact of STEM Education
from a National Perspective**

STEM education will
“determine whether the U.S. will remain a
leader among nations
and whether we will be able to solve
immense challenges in such areas as
energy, health, environmental protection,
and national security.”

THE PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE
AND TECHNOLOGY, 2011, p. 33

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Introduction

Quality STEM education is an imperative priority for the United States and it must provide:

- a challenging curricula of STEM content disciplines
- enriched “cutting edge” experiences
- professional development and supportive resources

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Presentation's focus

THE DEVELOPMENT OF
SUCCESSFUL K-12 STEM
PROGRAMS IN A LARGE SUBURBAN
SCHOOL DISTRICT USING A
CONTEMPORARY MODEL THAT
ASSUMES INTERACTION AND
ENGAGEMENT FROM ALL SECTORS
OF A COMMUNITY

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Introduction cont'd

The Paradigm Shift in STEM Education

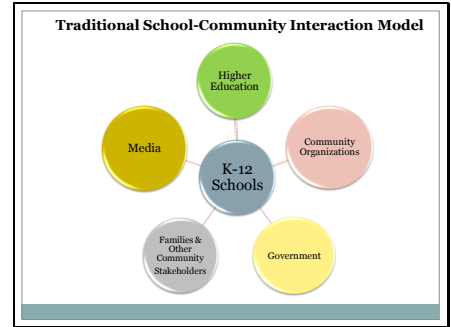
- From a sole- provide stance to a “new normal”
- Involvement of all stakeholders
 - P-20 educational levels
 - professional employed in STEM careers
 - government and industry
 - community workers and non-community workers
 - family involvement

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Anne Arundel County Public School System

- Among the 50 largest school systems in the country
- Approximately 75,000 students
- 113 Schools
 - 78 elementary schools
 - 19 middle schools
 - 12 high school
 - two charter schools, one early education center or one special educational center
- divided into twelve feeder systems

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Annapolis, Maryland

- Strategically located
 - Baltimore, Maryland – Washington, D.C. corridor
- Two major military installations
- Institutions of higher education
- STEM industries, businesses, and museums
- For-profit as well as non-profit organizations

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Contemporary School-Community Interaction Model

Silos of interdisciplinary study changed to trans-disciplinary STEM study

Professional development opportunities

- technology applications
- co-curricular instructional tools and applications

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Traditional and Contemporary STEM Education Models

Traditional model of STEM education

- STEM education was initiated from within the school system silos
- few outside entities offered support
- financial support was available
- school system had leadership role of STEM education
- community stakeholders' role was limited

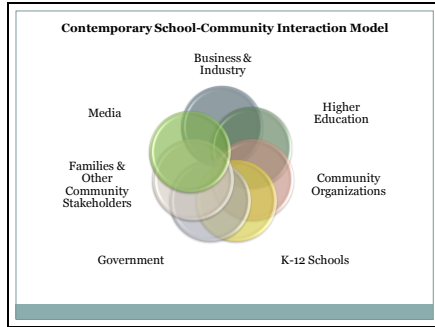
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Contemporary School-Community Interaction Model cont'd

STEM curriculum and assessments are aligned

All STEM stakeholders share in an equal collaborative partnership

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Additional Benefits of the Contemporary School-Community Interaction Model

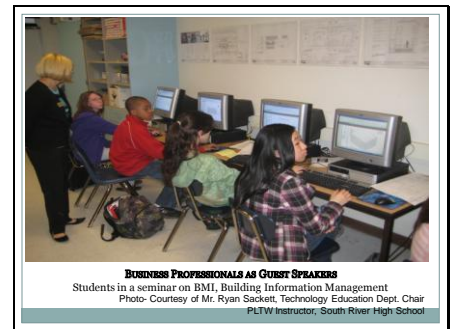
- Increased diversity among our stakeholders
- Developed rapport and communication among all families
- Improved STEM education district-wide
- Extended support from stakeholders to build models district-wide

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Benefits of the Contemporary School-Community Interaction Model

- Inundated with resources from various places
- Shared responsibility for STEM student learning
- Sustained win-win partnerships among the stakeholders

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Benefits of the Contemporary School-Community Interaction Model cont'd

- Improved STEM workforce pipeline
- Enhanced educational instruction
- New relationship formed among different community organizations
- Increased STEM career knowledge for families

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**Anne Arundel County Public Schools:
STEM Programs of Choice**

Advanced Studies and Programs Division

- STEM clubs are offered in four grade level clusters: K-2, 3-5, 6-8, and 9-12

Examples include:

- National Aeronautics and Space Administration (NASA)
- SEAPerch Underwater Robotics
- Underwater Remotely Operated Vehicle
- Mathematics, Engineering, Science Achievement (MESA)

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Anne Arundel County Public Schools:
STEM Programs of Choice cont'd

Additional STEM Offerings at every school

- Co-curricular
- Advanced Placement course offerings (high schools)

Examples include:

- Project Lead the Way (PLTW) engineering
- PLTW Gateway Engineering Program (middle schools)
- Project Based-Learning

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STEM Curricular and Co-curricular Opportunities

Quality STEM Community-based Experiences

- co-curricular activities
- job shadowing/internships
- panel discussions
- summer bridge/camps
- family nights
- special courses

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Anne Arundel County Public Schools:
Additional STEM Programs of Choice cont'd

Six magnet schools

- 3 International Baccalaureate Programme schools
- 1 BioMedical Allied Health high school magnet
- 2 STEM high school magnets

Twelve high schools

- Advanced Studies program courses in mathematics and science

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STEM Academic Competitions

Local and Regional Advanced STEM Clubs

- By Kids For Kids
- MESA
- Science Fair
- SkillsUSA
- 24 Game
- Destination Imagination
- SEAPerch Competition

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Anne Arundel County Public Schools:
Additional STEM Programs of Choice cont'd

Advanced Studies program courses in mathematics and science

- All 12 high schools

Engineering

- Military Service Academy
- Local community college

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The STEM Programs

The Division of Advanced Studies and Programs

- promotes and evaluates programs

STEM Magnet High Schools Curriculum

- reflects rigor
- supports the knowledge-based economy
- receives suggestions from community-based stakeholders

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The STEM Job Shadowing/Internships and Community Challenges

Outcomes:

- expose students to professional work environments
- enable students to conduct research
- provide students to collaborate with their mentors
- impact students' future decisions

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Conclusion

STEM education for the 21st century must be innovative, relevant, and rigorous. It must enable students to continue to see themselves as digital natives in this technology-rich, fast-paced world.

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Contemporary School-Community Interaction Model

- demonstrates how 1+1 can be greater than 2
- increases student and family engagement
- affects student achievement
- affects stakeholders' organizations
- targets collaborative work in the K-12 sector

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Conclusion cont'd

Anne Arundel County in Annapolis, Maryland is using the contemporary STEM education model to show how partnering leads to successful STEM education for all students.

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Future Steps

Program development will :

- include the formal evaluation of community-based programs
- look longitudinally at the retention rates of students in the STEM pipeline

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