STEAM Formation

Expect great things.
INVESTMENT

PROFESSIONAL LEARNING

COMMUNITY SCHOOLS

EQUITY
Why STEAM?
STEAM isn’t new
Acceleration is new

Digital

Exponential

Combinatorial
21st Century Survival Skills by Tony Wagner

• Critical Thinking and Problem Solving
• Collaboration and Leadership
• Agility and Adaptability
• Initiative and Entrepreneurialism
• Effective and Oral Communication
• Accessing and Analyzing Information
• Curiosity and Imagination
Real life.
National Academy of Engineering

The Grand Engineering Challenges

- Advance health informatics
- Engineer better medicines
- Make solar energy economical
- Provide access to clean water
- Reverse-engineer the brain

- Advance personalized learning
- Engineer the tools of scientific discovery
- Manage the nitrogen cycle
- Provide energy from fusion

- Develop carbon sequestration methods
- Enhance virtual reality
- Prevent nuclear terror
- Restore and improve urban infrastructure

Expect great things.
What does the data show?
CAREERS

US Department of Labor estimates 8.6 million NEW STEAM jobs were *unfilled* in 2018.
65% OF JOBS OUR STUDENTS WILL HAVE DON’T EXIST TODAY

Big Data Architect
IOS Developer
Cloud Services Specialist
Data Scientist
INTRODUCING Amazon Go
CAREERS in Pennsylvania

• By 2024, there will be 1 million STEM related job opportunities in Pennsylvania

• In 2016 there were approx. 17,000 unfilled computer science & software jobs in PA

• In 2014, PA had only 2,820 computer science graduates and only 1 in 5 were women

• In 2015, 40% of PA Students displayed college/career readiness. Only 10% of African-American students displayed college/career readiness.
STEAM in Pittsburgh

- Pittsburgh is ranked as the 3rd best US city for STEM jobs
- Apple, Google, Uber and other leaders in STEM have opened offices with thousands of STEM jobs in Pittsburgh
- African American men ages 18-64 in Pittsburgh are underrepresented in 13 of the region’s 20 major industries, including areas like financial services and utilities
- Pittsburgh has seen a rise in high-tech business services, with 2,400 new jobs in engineering and 3,900 in systems design
“However, many students do not have access to the resources to develop their interest in STEM and STEM careers.”

- Pennsylvania Department of Education: Policy Office and Special Consultant to Secretary for STEM Education. (2016). Opportunities for PA to lead in computer science education.
What is STEAM?

STEAM is a **culture**, not a class.
Why does STEAM matter to our students?
You can’t be...
what you can’t see.
Achievement Gap

Impoverished Background
ADD and ADHD
English Language Learner Needs
Reading Difficulties
504 Plans
Absences
Boredom - Lack of Engagement
Gender Bias
Stop asking your children what they want to be when they grow up…

Start asking them what problems they want to solve!
What is STEM?
It depends who you ask.
STEAM Learning

In a STEM learning environment, powerful critical thinking and exploration practices commonly used in science, technology, engineering and math classrooms will be drawn across disciplines and connected by a common or transdisciplinary theme, allowing students to:

STEM Learners:

• Ask deep real world questions
• Collaborate with their peers
• Arrive at meaningful conclusions
• Explore STEM careers
The leading global media company
225 countries & territories
3+ billion global viewers
45 languages
Innovation
Global Leader in STEM Education
1. Shared Leadership Model
2. Continuous Improvement Cycle
3. Multiple Learning Opportunities Over Time
4. Job Embedded Instructional Support
5. Learning Labs
“Educators need more than 80 hours of high quality professional development over a two-year period to change their practice. They need 160 hours of focused professional development over a three-year period to change the culture.”

Supovitz & Turner
A three-year system for professional learning and leadership designed to build and sustain a culture of STEAM teaching and learning.

- 56 Schools
- 56 Campus Administrative Teams
- 224 STEAM Teacher Leaders
- 224 STEAM Learning Lab Classrooms
- 1 PPS Exec Leadership Team
Year One Outcomes

**TEACHERS**
- Create STEAM-based instructional strategies
- Move from teacher-directed to student-driven
- Drive students engagement through the use of interdisciplinary learning
- Strengthen teacher leadership strategies

**STUDENTS**
- Engage in STEAM-based activities
- Make Real World content ties
- Become content creators, not consumers

**ADMINISTRATORS**
- Empower Teacher Leaders
- Begin to engage community
- Create an atmosphere for collaboration through a school-wide learning lab approach
Year Two Outcomes

TEACHERS
• Build rigorous standards-based STEAM learning activities
• Deliver instructional strategies tying content to STEAM careers and the real world
• Measure Creativity, Critical Thinking, Collaboration and Communication
• Offer learning lab environment and culture into practice

STUDENTS
• Engage and achieve through relevant real-world content
• Investigate of STEAM problems in the local community
  • Productively communicate understanding through STEAM-based assessments

ADMINISTRATORS
• Communicate STEAM vision to community
• Support teacher leadership with learning lab access for all
• Establish a STEAM leadership group
• Support implementation of inquiry-based instructional strategies

Expect great things.
<table>
<thead>
<tr>
<th>TEACHERS</th>
<th>STUDENTS</th>
<th>ADMINISTRATORS</th>
</tr>
</thead>
</table>
| • Increase opportunities for learning lab access and peer coaching  
  • Standards-based STEAM experiences through a transdisciplinary Approach  
  • Connect STEAM skills to future careers possibilities  
  • Increase student discourse and the development of student led inquiries | • Positive attitudes and interest in STEAM  
  • Greater confidence, hard work and perseverance when faced with challenging STEAM tasks  
  • Increase ability to explain thinking through critical discourse | • Establish STEAM metrics to determine growth  
  • Develop communication strategies and a STEAM “Story” to share  
  • Develop structures to support data-driven, cross-curricular collaboration and Transdisciplinary professional learning |
REAL CHALLENGES. REAL POSSIBILITIES

A cutting-edge interdisciplinary K-8 STEM resource.

<table>
<thead>
<tr>
<th>Relatable, Real World Challenges</th>
<th>Across Subjects &amp; Grades</th>
<th>4Cs STEM Skills Framework</th>
<th>Critical-Thinking &amp; Literacy Focus</th>
<th>Career Connections</th>
</tr>
</thead>
</table>

A supplemental K-8 resource designed to enhance core curriculum and bring STEAM solution seeking skills to life in your classrooms. 🌟
Questions

Thank you
Minika Jenkins
Chief Academic Officer
A Plan to Address Instructional Gaps in Mathematics
Developing Instructional Leaders in Mathematics at “Scale”
Supporting Mathematics Instruction Beyond the Classroom

• Building capacity and content knowledge with
  • School-based staff
  • School-based leaders
  • School-based administrators
  • District support staff
Partnership with CARNEGIE LEARNING

• Focused, Sustained Professional Learning
  • Improve student learning outcomes
  • Work with school-based leadership teams
  • Build and strengthen district leadership teams around evidenced-based best practices
  • Building capacity through content and pedagogical training
The Research Behind CARNEGIE LEARNING

• Research-Proven by a RAND Corporation “Gold Standard”
• Top-Rated by EdReports.org
• ESSA-approved
Questions

Thank you
Minika Jenkins
Chief Academic Officer