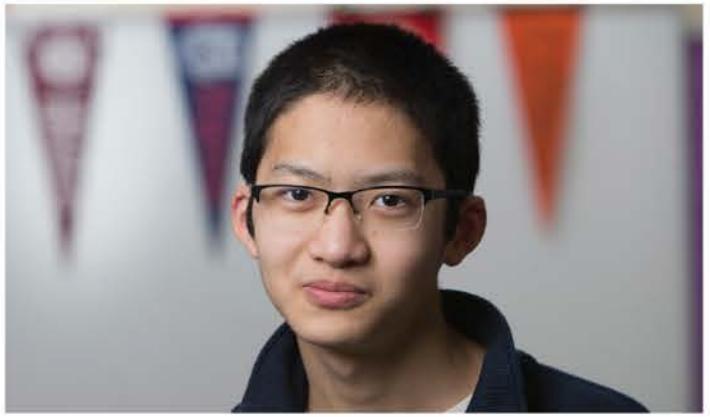


STEAM Formation

Expect great things.

Pittsburgh Public Schools

INVESTMENT
PROFESSIONAL LEARNING
STEAM
Expect great things.
COMMUNITY SCHOOLS
EQUITY

Why STEAM?

STEAM isn’t new

Acceleration is new

Digital

Exponential

Combinatorial

Expect great things.

A. K. (n.d.). *2016 Schools of the Future Conference*

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

STUDENT A

MATH

SCIENCE

ENGLISH

SOCIAL STUDIES

STUDENT B

CONTENT MASTERY

CRITICAL THINKING

COMMUNICATION

COLLABORATION

CREATIVITY

GLOBAL COMPETENCE

SELF-DIRECTION

Health
Art
Biology
History
Literature
Geometry

Real life.

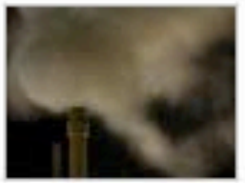
Discovery EDUCATION

National Academy of Engineering

The Grand Engineering Challenges

Advance health informatics

Advance personalized learning


Develop carbon sequestration methods

Engineer better medicines

Engineer the tools of scientific discovery

Enhance virtual reality

Make solar energy economical

Manage the nitrogen cycle

Prevent nuclear terror

Provide access to clean water

Provide energy from fusion

Restore and improve urban infrastructure

Reverse-engineer the brain

Secure cyberspace

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.

Expect great things.

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."

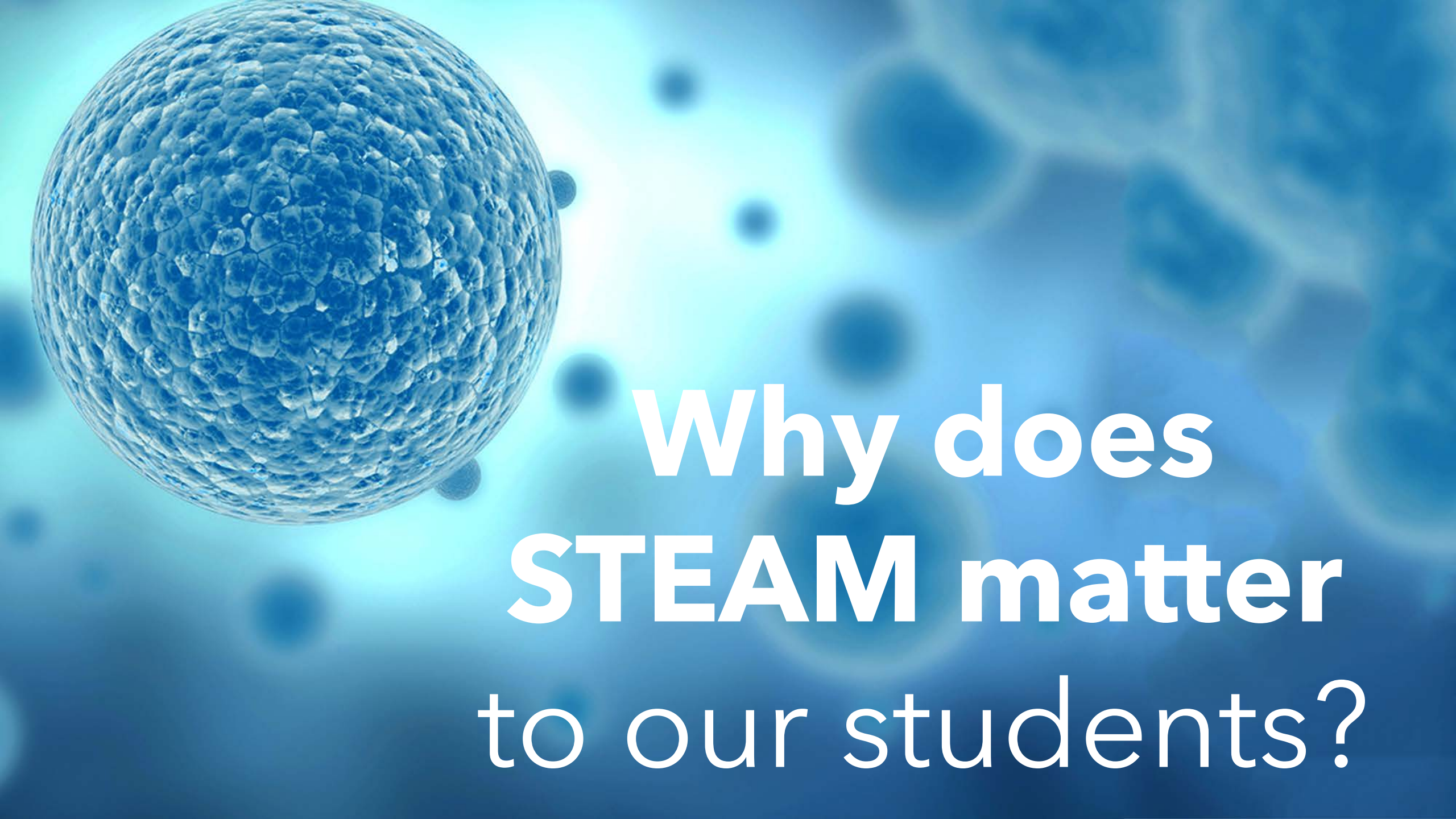
- *Pennsylvania Department of Education: Policy Office and Special Consultant to Secretary for STEM Education. (2016). Opportunities for PA to lead in computer science education.*

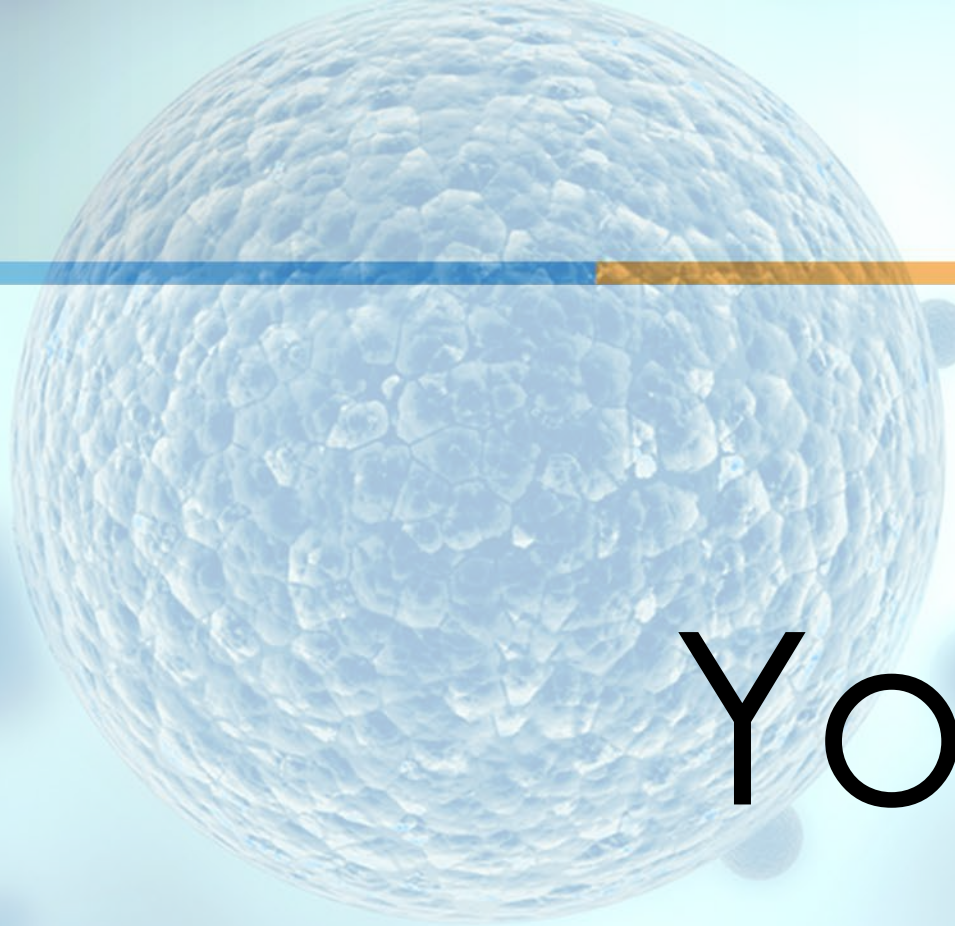
Expect great things.

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.

Expect great things.

Achievement Gap

Impoverished Background

ADD and ADHD

English Language Learner Needs

Reading Difficulties

504 Plans

Absences

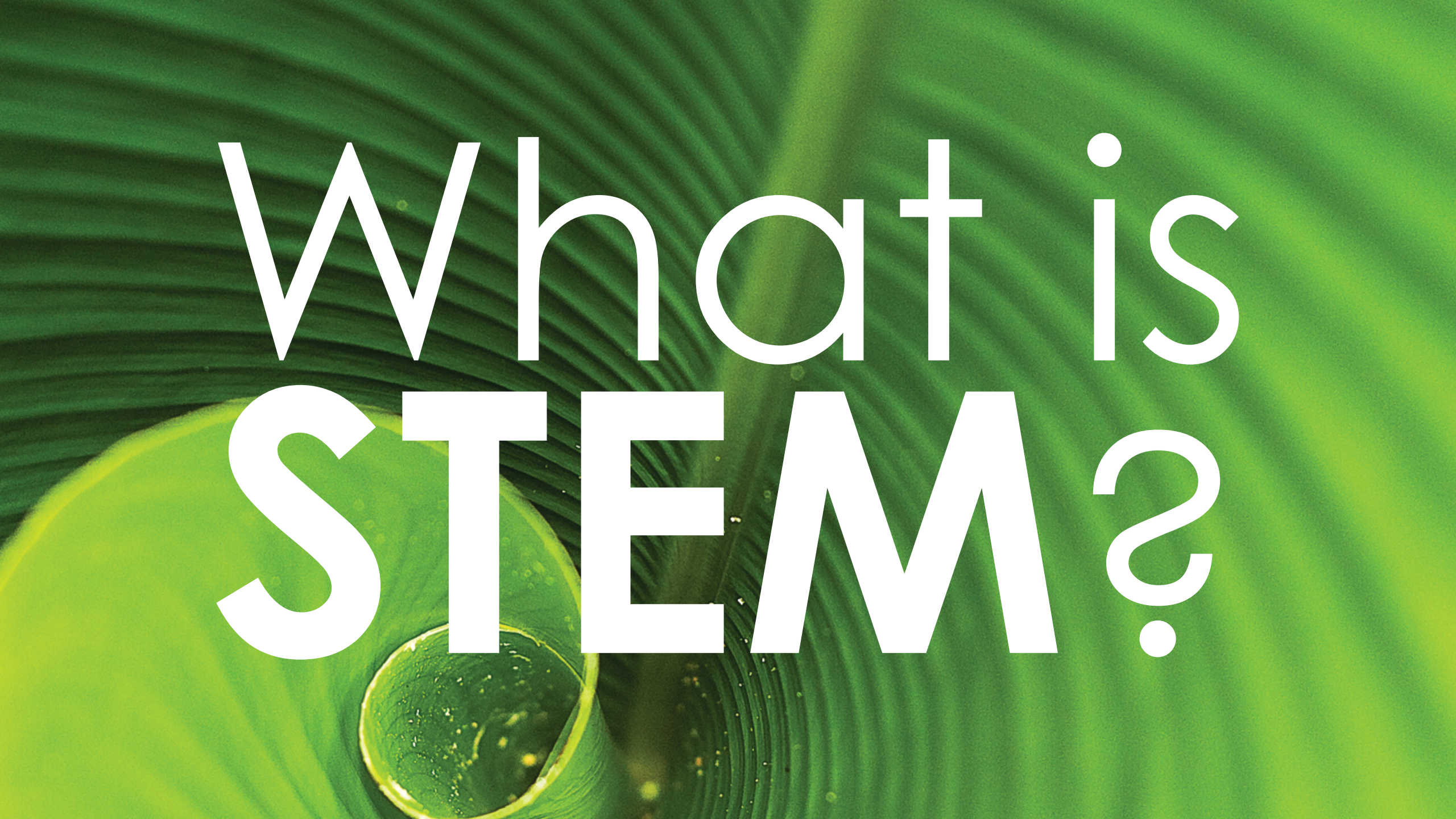
Boredom - Lack of Engagement

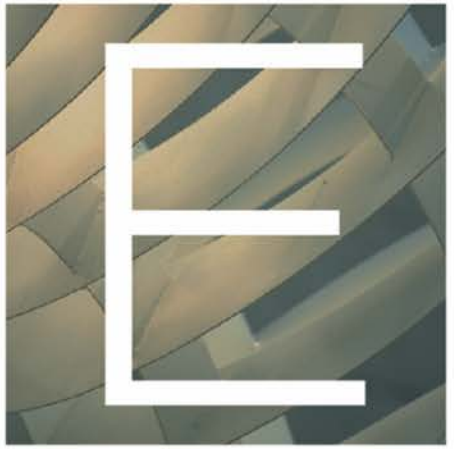
Gender Bias

Discovery EDUCATION™

Stop asking your children what they want to be when they grow up…

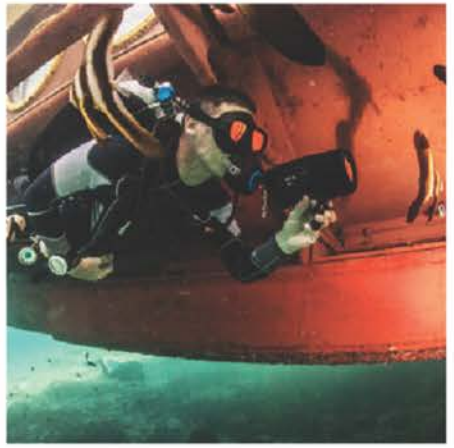
Start asking them what problems they want to solve!


What is
STEM?



It depends

who you ask.



at things.

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

Discovery EDUCATION | STEM

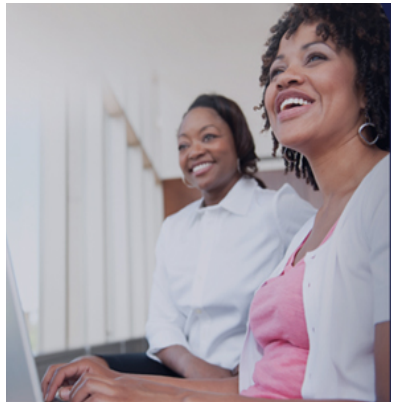
Expect great things.

Discovery
ANIMAL PLANET
SC
Discovery Science
diy network
HGTV
AHC
AMERICAN HEROES CHANNEL
Discovery EDUCATION
The leading global media company
225 countries & territories
3+ billion global viewers
45 languages
Innovation

Discovery EDUCATION | STEM

Global Leader in STEM Education

Discovery EDUCATION | PROFESSIONAL DEVELOPMENT



1

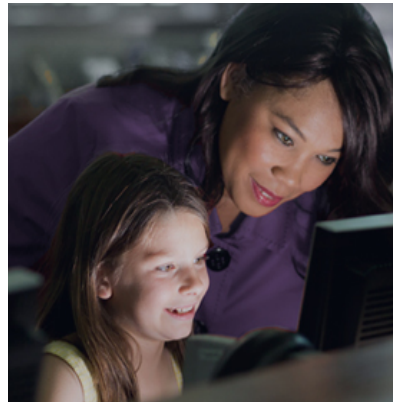
Shared Leadership Model

2

Continuous Improvement Cycle

3

Multiple Learning Opportunities Over Time



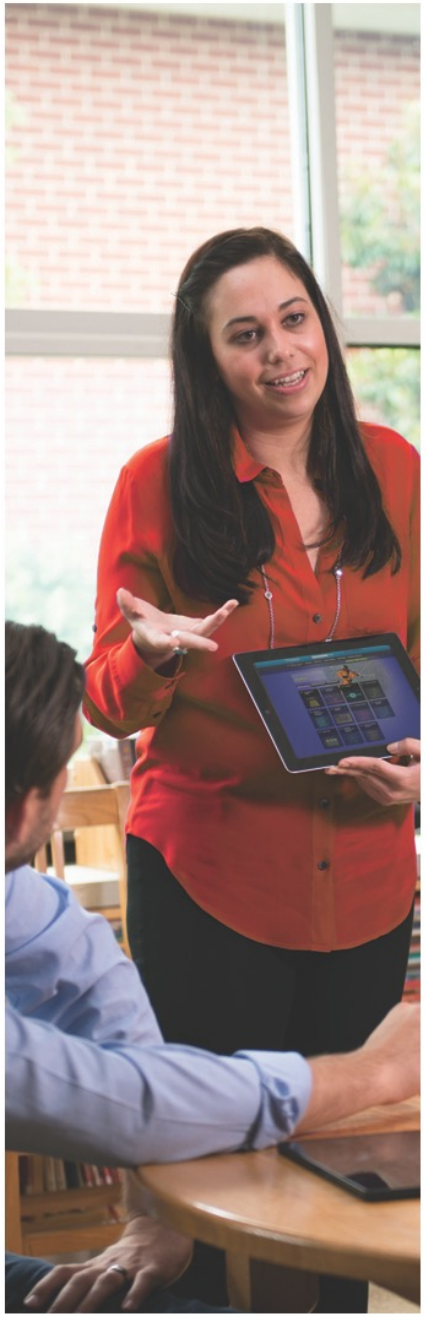
4

Job Embedded Instructional Support

5

Learning Labs

Expect great things.



Transforming practice. Transforming culture.

"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

- Expect great things.

STEM LEADER Corps

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

Expect great things.

Year One Outcomes

Discovery EDUCATION

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

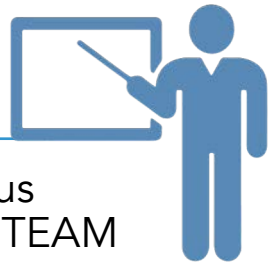
- Empower Teacher Leaders
- Begin to engage community
- Create an atmosphere for collaboration through a school-wide learning lab approach

Expect great things.

Year Two Outcomes

Discovery EDUCATION

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.

Year Three Outcomes

TEACHERS

- 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

STUDENTS

- 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

ADMINISTRATORS

- 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

Expect great things.

Discovery EDUCATION™ | STEM CONNECT

REAL CHALLENGES. REAL POSSIBILITIES

A cutting-edge interdisciplinary K-8 STEM resource.

Relatable, Real World Challenges	Across Subjects & Grades	4Cs STEM Skills Framework	Critical-Thinking & Literacy Focus	Career Connections

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

Expect great things.

Discovery EDUCATION

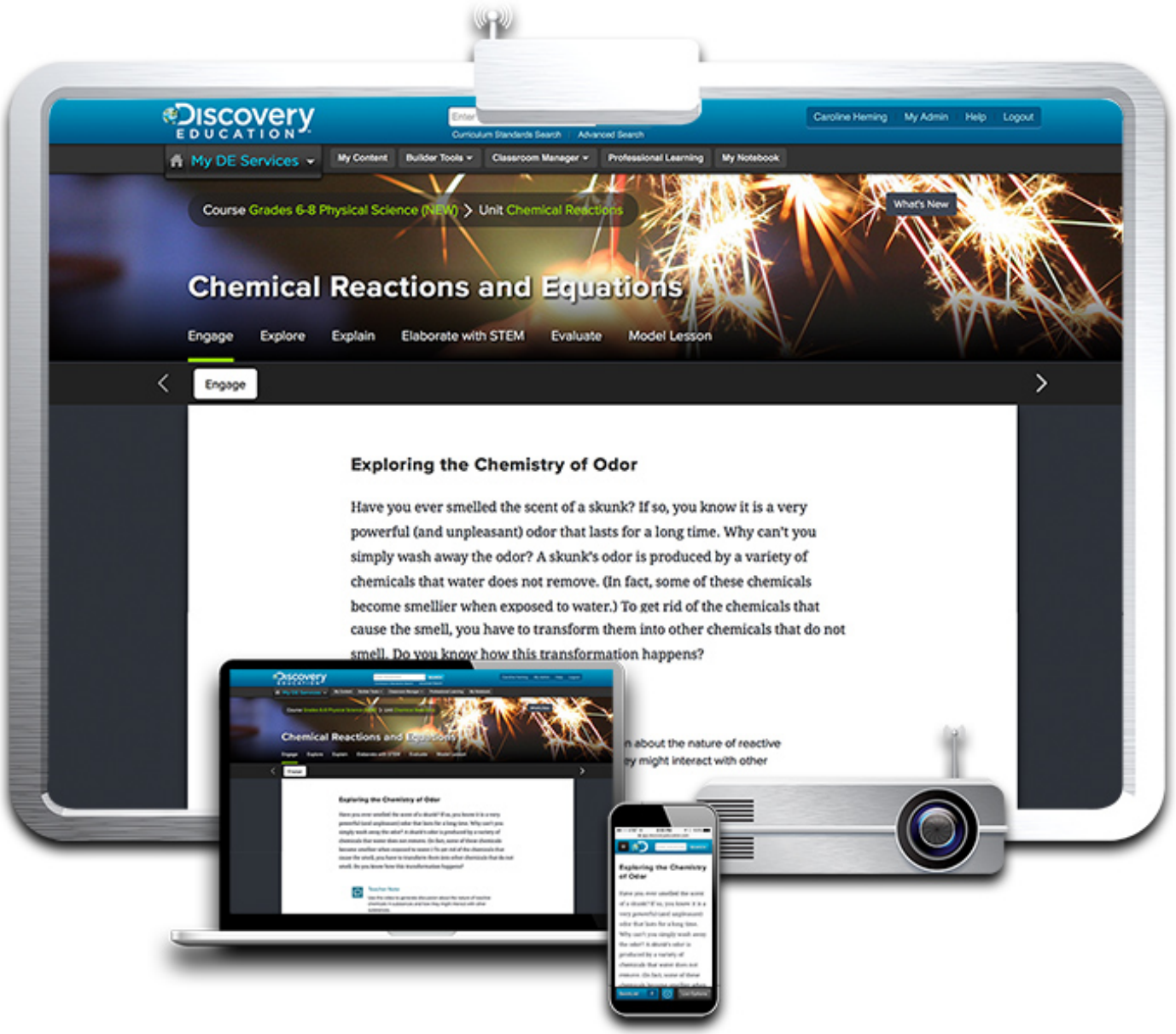
...hout the **WORLD**

Discovery EDUCATION | STEM

All **50** States

STEM Instructional Progression

Transformation Built On The 4 C's



Discovery EDUCATION | SCIENCE TECHBOOK

Discovery EDUCATION | COMMUNITY

Discovery EDUCATION | PROFESSIONAL DEVELOPMENT

Discovery EDUCATION | STEM CONNECT

Discovery EDUCATION | STREAMING PLUS

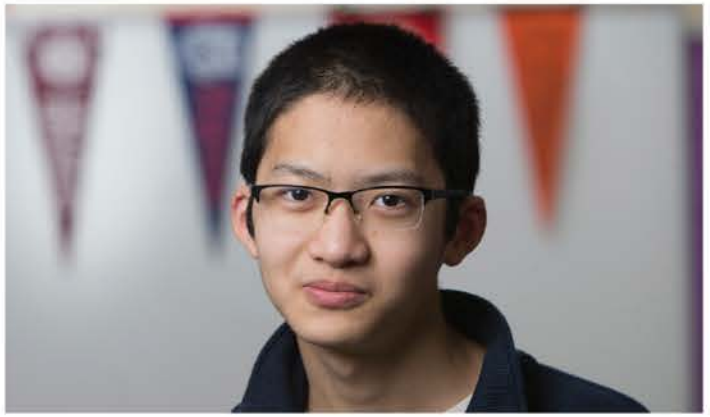
Expect great things.

Questions

Thank you

Minika Jenkins

Chief Academic Officer



A Plan to Address Instructional Gaps in Mathematics

Expect great things.

Pittsburgh Public Schools

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

CARNEGIE LEARNING

LONG + LIVE + MATH

Expect great things.

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

Expect great things