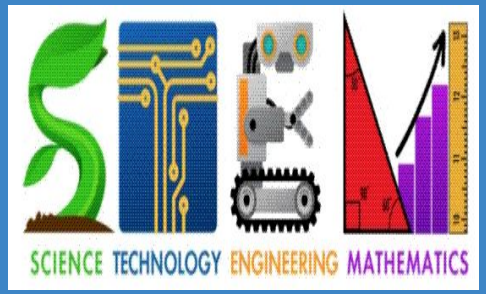
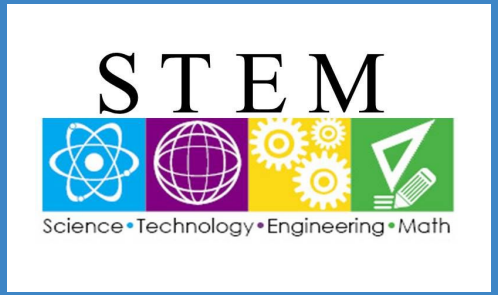
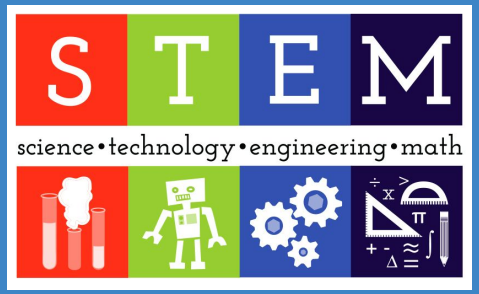
The Vision and Design of Elementary STEM/SPARK in Pennsbury







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Jamie Swanson - Science Coordinator K-12

Jessica Perfetto - Applied Engineering and Tech Ed Coordinator K-12


GLOW
Dr. V. Voltz
Research Notes
TOP SECRET!
s+ x=m+e+ -ale -be+e
-l+r
i=h


Distinguished
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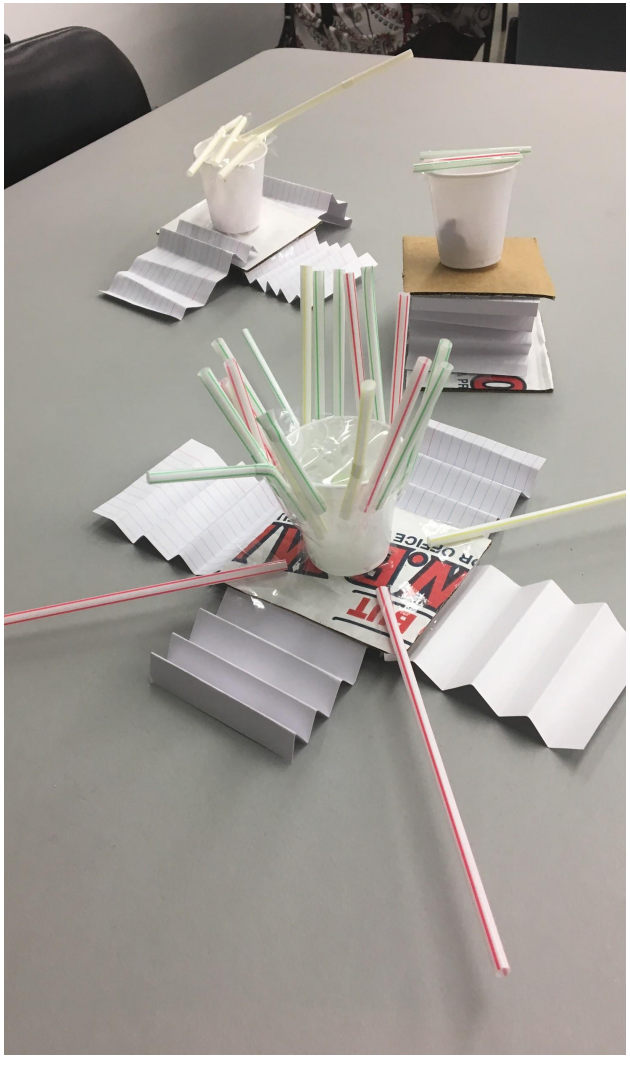
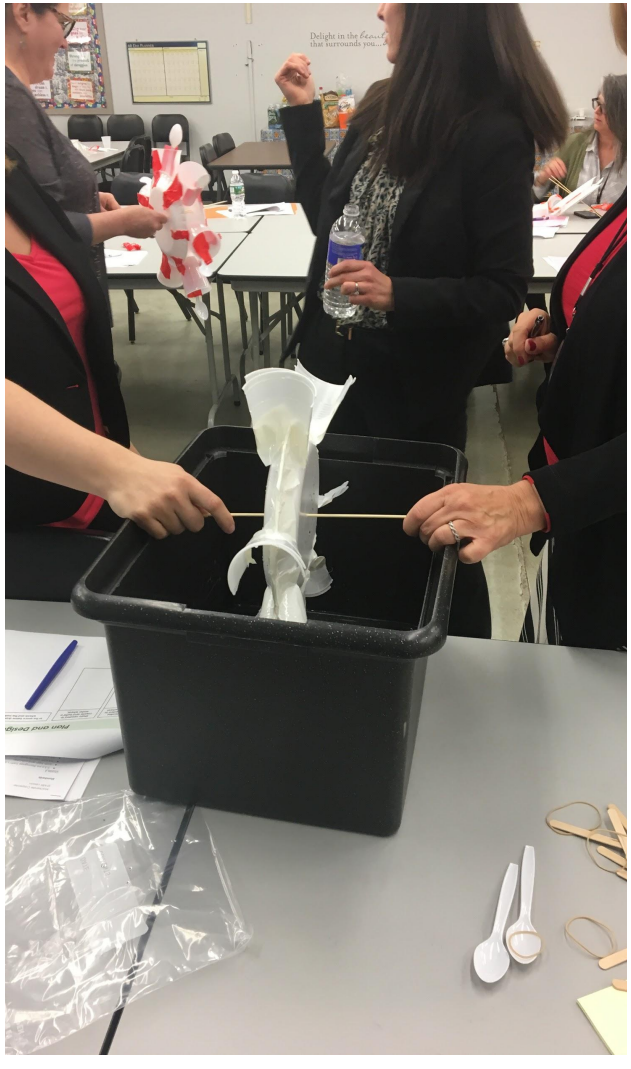




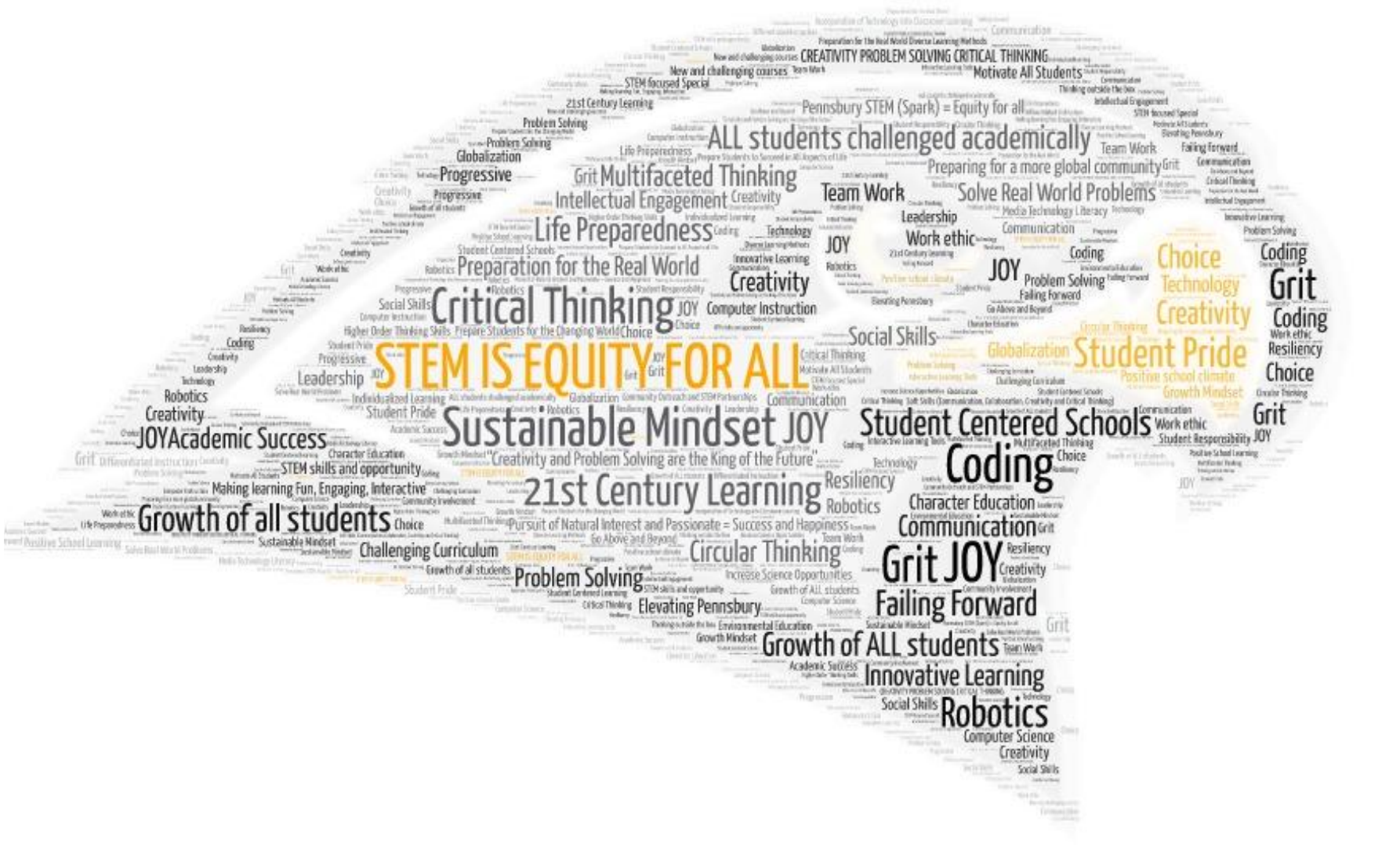
As a result of

The Pennsbury School District Comprehensive Community Survey:

WE ASKED.

YOU SPOKE.

WE LISTENED.


STEM IS EQUITY FOR ALL
Sustainable Mindset
Critical Thinking
Growth of all students
21st Century Learning
Coding
Student Centered Schools
Grit JOY
Failing Forward
Growth of ALL students
Innovative Learning
Robotics
Problem Solving
Circular Thinking
Communication
Character Education
Resiliency
Creativity
Computer Science
Social Skills
Elevating Pennsbury
Environmental Education
Increase Science Opportunities
Pursuit of Natural Interest and Passionate = Success and Happiness
"Creativity and Problem Solving are the King of the Future"
STEM skills and opportunity
Making learning Fun, Engaging, Interactive
Challenging Curriculum
JOYAcademic Success
Preparation for the Real World
Life Preparedness
Intellectual Engagement
Multifaceted Thinking
ALL students challenged academically
Preparing for a more global community
Solve Real World Problems
Team Work
Work ethic
Leadership
Media Technology Literacy
Pennsbury STEM (Spark) = Equity for all
CREATIVITY PROBLEM SOLVING CRITICAL THINKING
Motivate All Students
New and challenging courses
STEM focused Special
21st Century Learning
Problem Solving
Globalization
Progressive
Grit
Choice
Technology
Creativity
Coding
Grit
Coding
Work ethic
Resiliency
Choice
Grit
Student Pride
Positive school climate
Growth Mindset
Student Responsibility
JOY
Social Skills
Leadership
Robotics
Creativity
JOY
Individualized Learning
Student Pride
Character Education
Sustainable Mindset
Challenging Curriculum
Problem Solving
Elevating Pennsbury
Growth of ALL students
Innovative Learning
Robotics
Computer Science
Creativity
Social Skills

What is STEM in K-12 Education?

STEM is:

LITERACY - competence or knowledge in a specified area.

INTERDISCIPLINARY- blending learning through integration of subjects and rooted in anchors and standards.

TRANSDISCIPLINARY- authentic and relevant to the real world and application to problem solving

INQUIRY BASED- phenomena, question posing, design, testing, failing, problem solving

STEM is NOT:

STEM CELLS

All Projects

Makerspace

Scientific Method/ STEM Fair

Only for after school enrichment...

Elementary STEM: SPARK

STEM through Perseverance, Application, Resilience, and Kinetic Knowledge

PLTW Launch, Genius Hour, 21st Century Skills

Inspiring, Engaging, Empowering

- Tap into exploratory nature
- Engage students in learning that feels like play
- Encourage students to keep discovering
- Develops a design thinking mindset (Fail Forward)
- Begin the pathways of computer science, engineering, and biomedical science

Elementary STEM

PLTW: Launch

Robotics: Emergency Evac

Properties of Matter: Design/Test a Cooler

Pushes & Pulls

MILO, SUZI & ANGELINA

PLTW: Project Based Units of Study

K	• Spatial Sense & Coding • Floating & Sinking
1	• Animals & Algorithms • Pushes & Pulls
2	• Animal Adaptations • Needs & Wants
3	• Properties of Matter • Form & Function
4	• Computer Systems • Human Brain
5	• Robotic Automation & Challenge • Infection Detection & Simulation

THE ENGINEERING DESIGN PROCESS

DEFINE
the problem

IDENTIFY
constraints on your solution (e.g. time, money, materials) and criteria for success

BRAINSTORM
multiple solutions for the problem

SELECT
the most promising solution

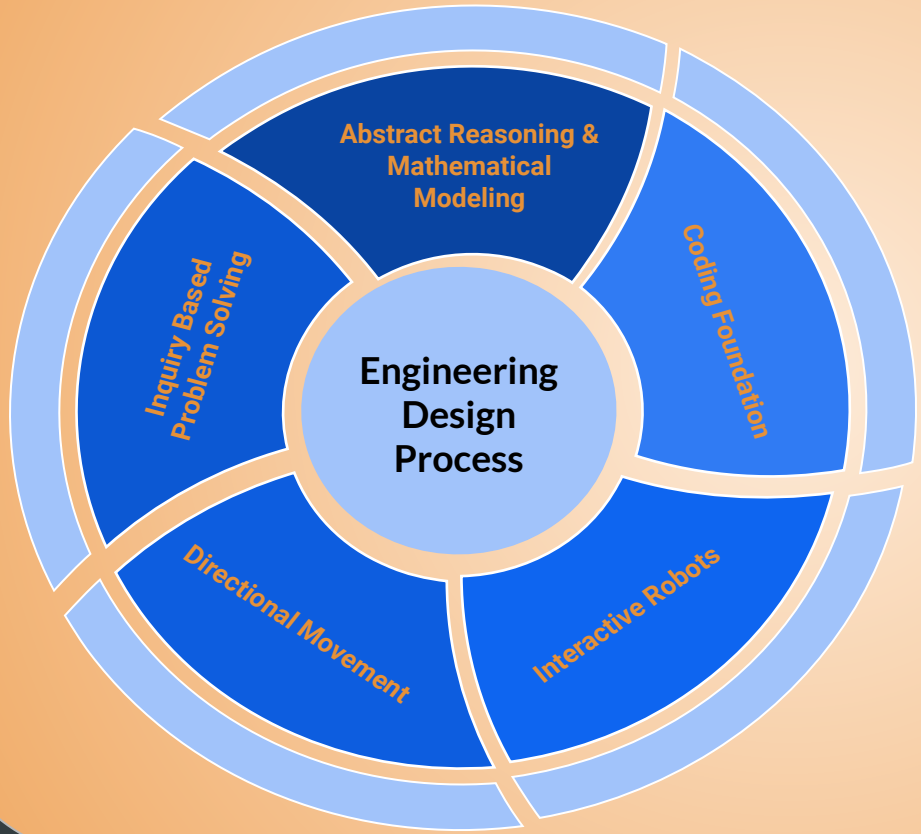
PROTOTYPE
your solution

TEST
and evaluate your prototype

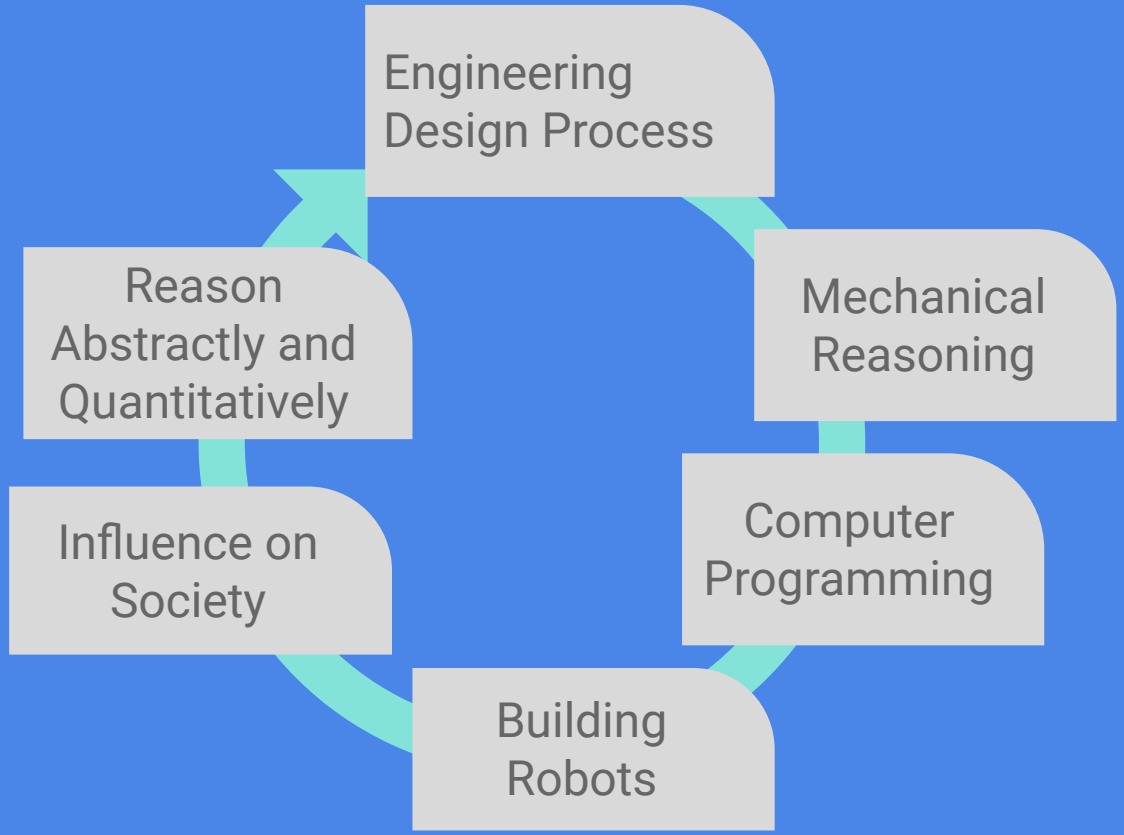
ITERATE
to improve your prototype

COMMUNICATE
your solution

Kindergarten Example: Spacial Space and Coding



Grade 5 Example: Robotics and Automation Challenge



> *Genius Hour isn't just a time for students to choose what they want to learn. It's time for them to find themselves in their creative work.*
>
> A.J. JULIANI

Genius Hour

Plan

Project

Curricular Connections

Second Steps

Literacy

Coding Transdisciplinary

Career Readiness

Community Outreach

WHY STEM, WHY NOW?