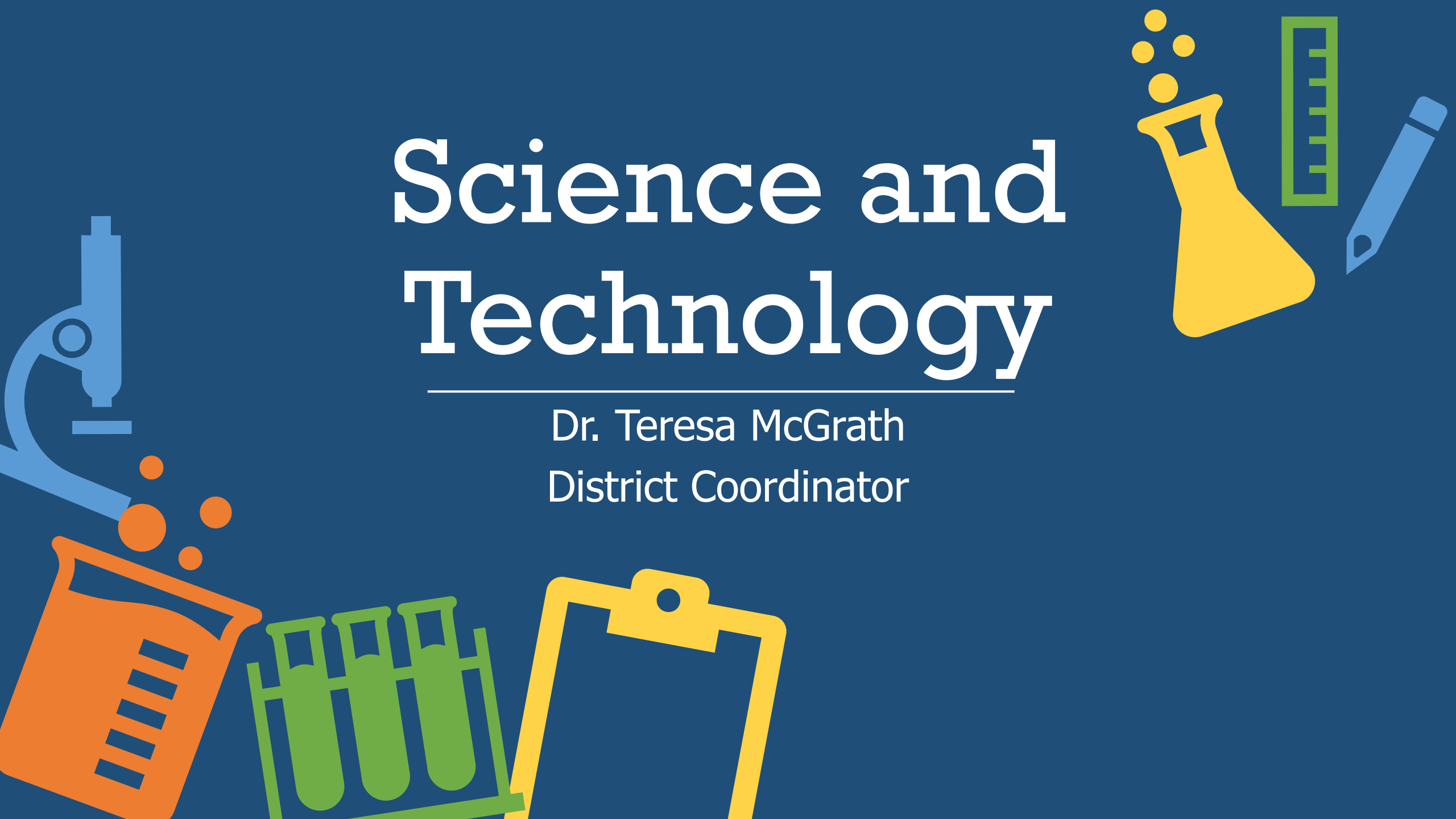


# Science and Technology

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Dr. Teresa McGrath  
District Coordinator



# Presentation Overview

- Looking Back
- Looking Ahead
  - District Goals/Science Department Goals



# Looking Back



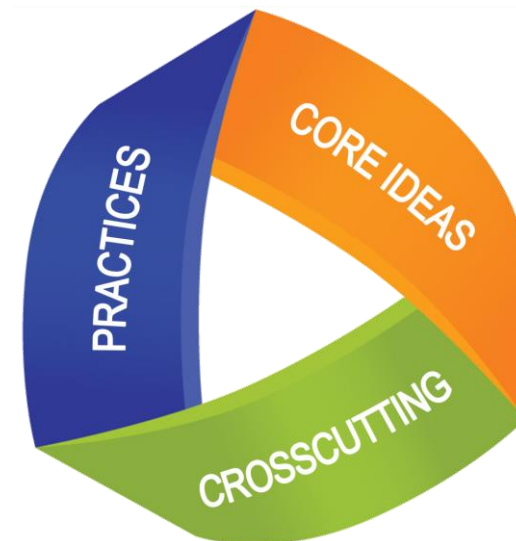
- Pause in rollout of Grades 4 & 5, Project Lead the Way
- Closer look at course catalog and prerequisites at Secondary School to support students
- Examine focus on implementation of new standards
  - Where are the teachers in their understanding of NYSSLs?
  - Where are the students in their preparation for inquiry learning?



# Looking Ahead



- Review of District Priorities and Science & Technology alignment
- Engage with PLTW at the elementary schools and Secondary School
- Incorporate New York State Science Learning Standards K-12
- Create collaborative content teams 6-12



# Science & Technology Path Forward

- Department Goals aligned with District Goals
- Project Lead the Way
- New York State Science Learning Standards
- Teacher Professional Development
- After-School Enrichment Program
- Science Courses, Prerequisites and Pathways
- AIS Support
- Science Research Program
- Extra-Curricular Clubs
- Facilities Updates
- Technology Courses, PLTW Pathway

# District Goals

- Priority Area 1: Connections
  - Strengthen the quality of the relationships throughout the organization.



# Science Department Goal

- Priority Area 1: Connections
  - Teachers will support students in the classroom by
    - Creating engaging lessons that use a combination of student-centered instruction, inquiry, experimentation, and traditional methods of instruction
    - Increasing the use of on-the-spot assessment methods to address student struggles quickly and ensure test readiness
    - Providing opportunities for connections with students by working with students both individually and in small groups.



# Project Lead the Way

Implementation in three grade levels this school year

2<sup>nd</sup>-Properties of Matter

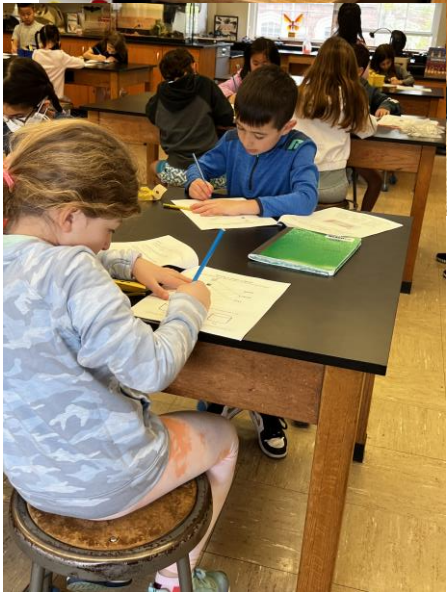
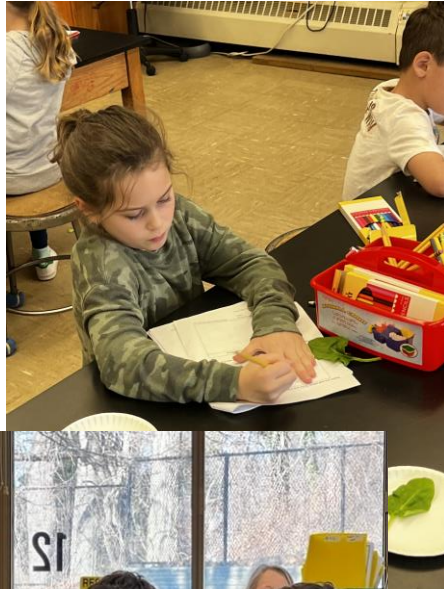
3<sup>rd</sup>- Force and Interactions

4<sup>th</sup>- Collisions (new this year)





# Second Grade, Properties of Matter



- Young Inventors
  - Ice Pop design
- Color and Texture
  - Classification
- States of Matter
  - Reversible vs. irreversible changes
- The Heat is On
  - Make observations
  - Measure temperature
  - Analyze results
    - Conductors and insulators

# Third Grade Forces and Interactions



- Introduction to forces
  - Forces, simple machines, wheel and axle
- Simple machines
  - Inclined planes, levers, pulleys
- Forces and interactions in compound machines
- Magnetic interactions
  - Predict and test
  - Magnetic poles
  - Magnetic attraction



# Fourth Grade PLTW Unit: Collisions



- Energy
  - Egg crash
- Potential and kinetic energy
  - PhET simulation Energy Skate Park: Basics
- Speed and energy
  - Pendulum and vehicle construction
- Energy transfer in collisions
  - Relationship between the speed of an object and the energy of the object

# Fifth grade Rollout 2022-2023: Automation and Robotics

- Introduction to robotics
- Create a toy
  - Collaborative work
  - Engineering skills
- Inputs and outputs
  - Motor, bumper switch, touch LED, color sensor, controller
- Build a robot
  - Move blocks across the floor



# District Goals

- Priority Area 2: Enhancing Professional Practice
  - Create a robust professional growth plan for each individual in our organization.



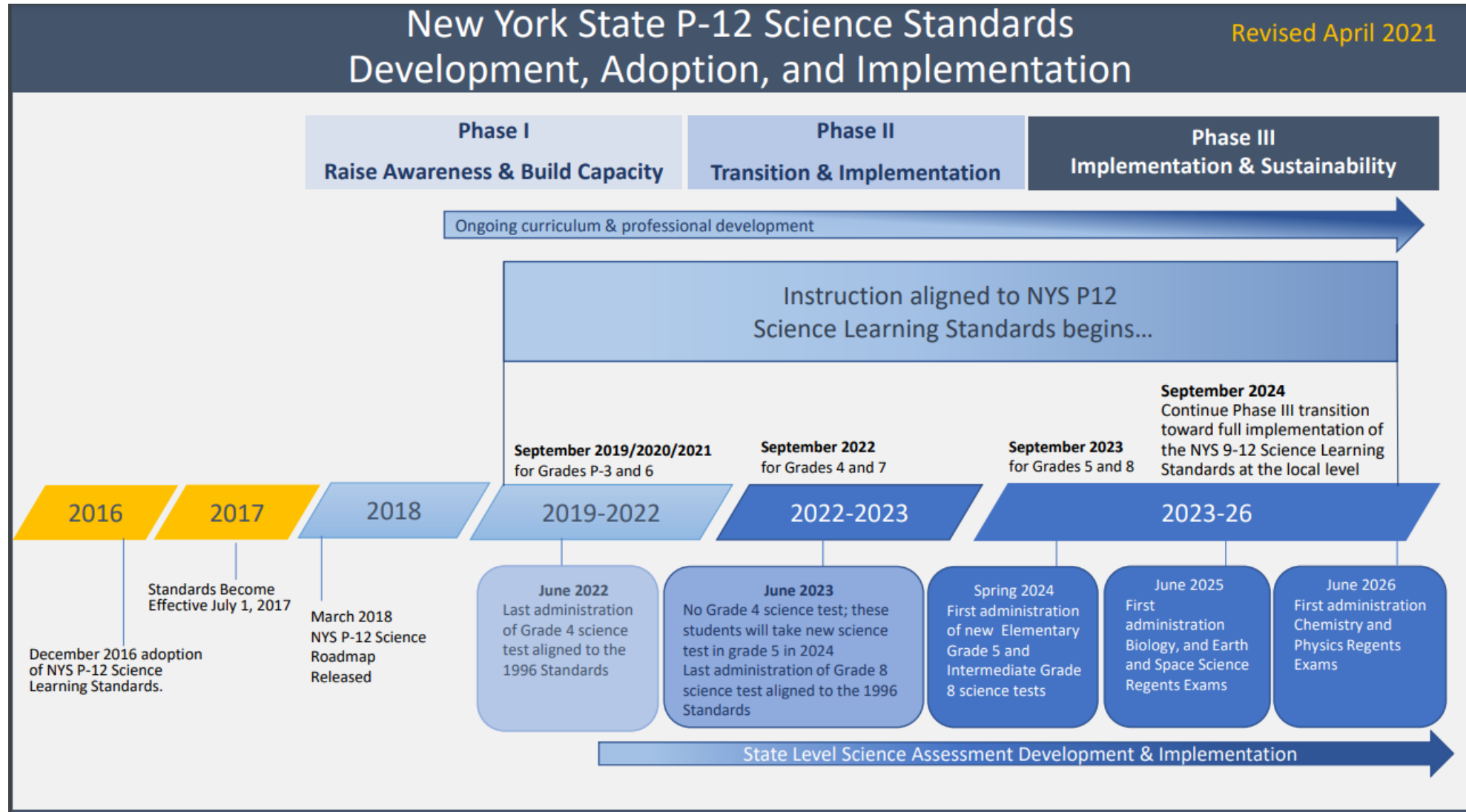
# Science Department Goal

- Priority Area 2: Enhancing Professional Practice
  - Teachers will be given opportunities to work in collaboration with each other to plan lessons, units, and common assessments
  - Professional Development opportunities will be sought to assist in the integration and implementation of NYSSLs into each content





# New York State Science Learning Standards



# Teacher Training

n a s s a u  
**BOCES**

Board of Cooperative Educational Services





# District Goals

- Priority Area 3: Student Inclusivity, Opportunities, and Support
  - Foster a learning environment in which each student is engaged and encouraged to define their unique pathway, aligned to their individual goals.



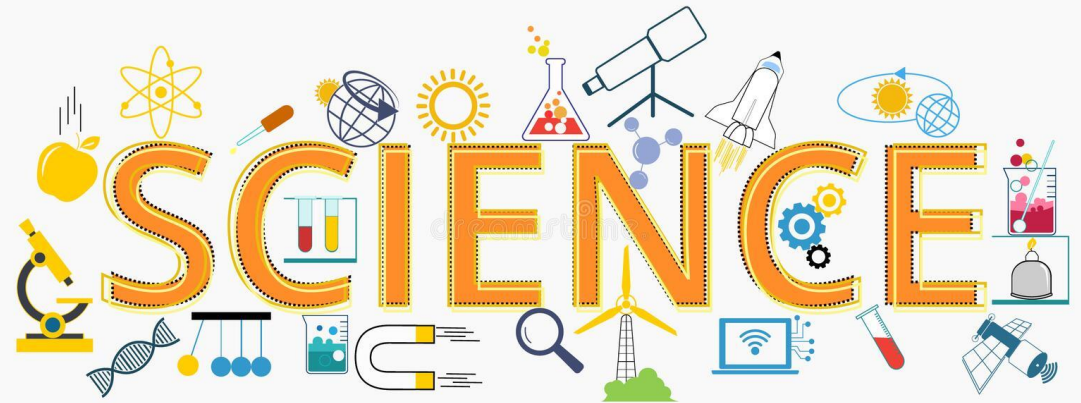
# Science Department Goal

- Priority Area 3: Student Inclusivity, Opportunities, and Support
  - Teachers in grades 7 and 8 will foster growth in students from underrepresented student populations with the goal of helping students meet requirements for honors classes.
    - Students will also be encouraged to apply for Introduction to Science Research.



# After School Enrichment Program

- Available to grades 5 and 6
- Interest based, open to every student
- Increased sections to accommodate requests
- Maximized student seating in each section without compromising integrity
- Started this week!



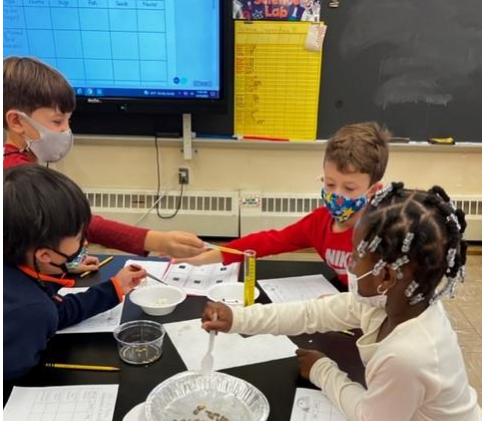


# Elementary Science - SR





# Elementary Science - MP



# Science & Technology Courses

at the Secondary School

\*Aerospace Engineering offered 22-23 for the last time as 3<sup>rd</sup> Engineering course in Grade 11.

\*Principles of Engineering not being offered 22-23, but will resume in 23-24 as 3<sup>rd</sup> Engineering course in Grade 11.

Science 7  
[Earth Science 7  
Honors]  
Technology 7

Seventh Grade

Living Environment  
Living Environment  
Honors  
[LEAPES]  
Technology 8

Eighth Grade

Earth Science  
Earth Science Honors  
[ESCAPES]  
[AP Biology]  
Introduction to  
Engineering  
Introduction to Science  
Research

Ninth Grade

Applied Chemistry  
Chemistry  
Chemistry Honors  
[AP Chemistry]  
Aerospace  
Engineering

Tenth Grade

Applied Physics  
Physics  
AP Physics I  
Electives\*  
\*Aerospace Engineering  
\*Principles of Engineering

Eleventh Grade

AP Physics II  
AP Physics C  
AP Environmental Science  
AP Biology  
AP Chemistry  
Electives  
Computer Integrated  
Manufacturing

Other Opportunities

## Electives

Physical & Social  
Impacts of  
Natural Hazards  
Anatomy &  
Physiology  
Marine  
Biology  
Criminalistics  
Astronomy



# Traditional Science Pathway

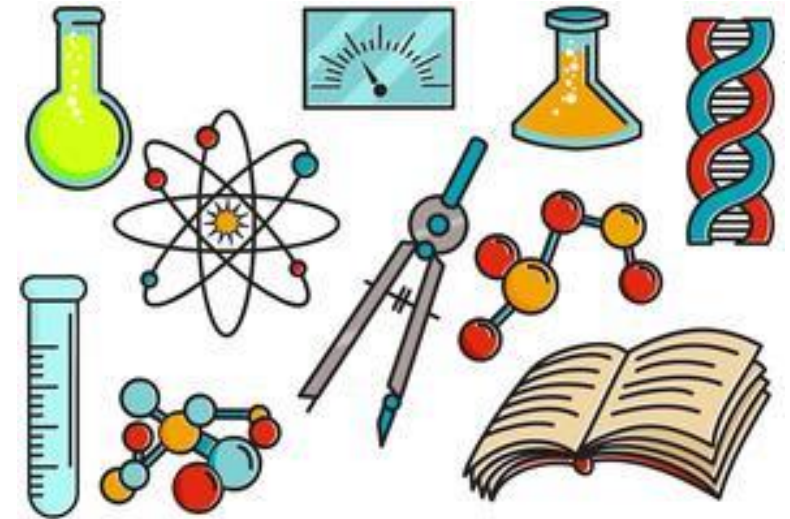


- Appropriate for most students
  - Science 7
  - Living Environment (every student is accelerated into a high school Regents course in 8<sup>th</sup> grade, Honors sections offered)
  - Earth Science (Honors sections offered)
  - Chemistry (Honors sections offered to those who meet math prerequisite)
  - Physics (AP Physics I offered as Honors option)
  - AP course or Electives



# AP<sup>®</sup> Science Intensive Pathway

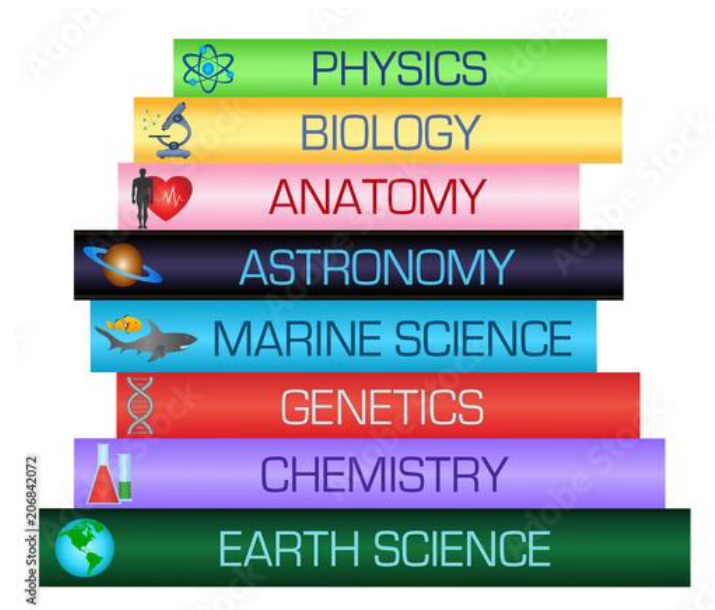
- Appropriate for about 10% of our students, must be highly motivated with exceptional organizational and study skills
  - \*Must be double accelerated in Math to meet course prerequisites
  - Earth Science 7 Honors
  - LEAPES (Living Environment Honors/AP<sup>®</sup> Environmental Science)
  - AP<sup>®</sup> Biology
  - AP<sup>®</sup> Chemistry
  - AP<sup>®</sup> Physics I
  - AP<sup>®</sup> Physics C or AP<sup>®</sup> Physics II





# Academic Support

- Secondary School X classes
  - Living Environment
  - Earth Science
  - Chemistry
  - Physics
- Peer Tutoring
  - Offered through the Science Honor Society
  - Students are matched according to subject and availability



# Science Research

Three separate experiences for students to engage in their own research

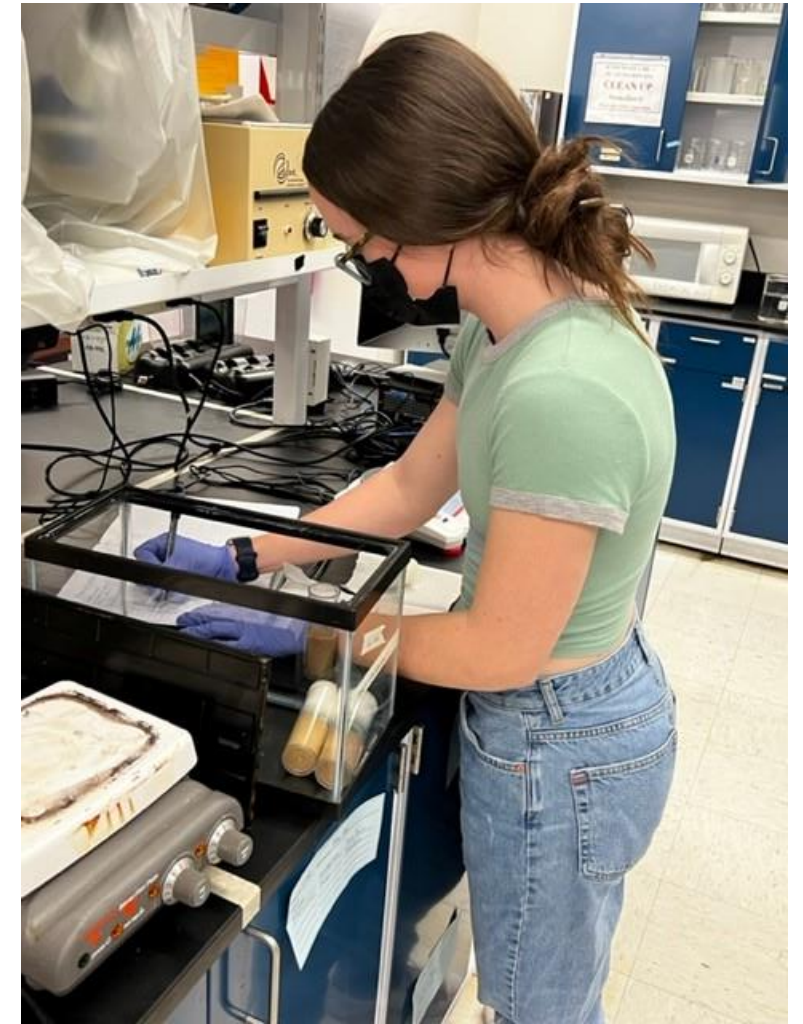
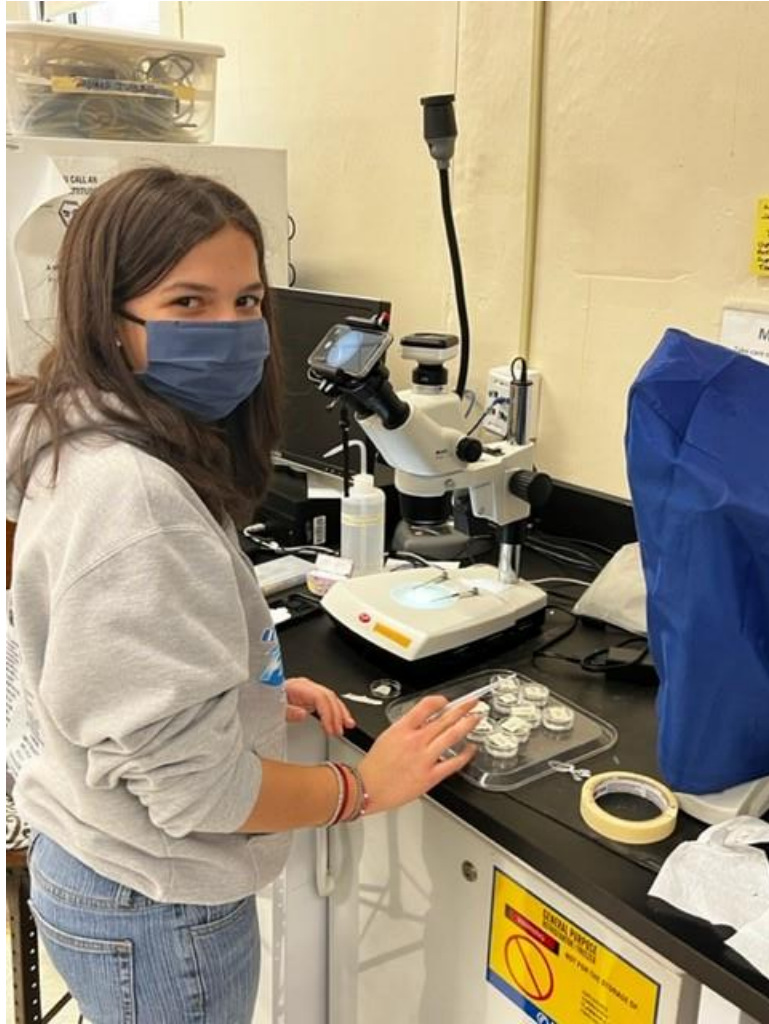
Introduction to Science Research

Advanced Research I & II

STS Prep



# Introduction to Research



# Science & Technology Clubs

Extra Curricular Offerings at the Secondary School

Merit Based  
Open to 11<sup>th</sup> and  
12<sup>th</sup> grade students  
Science Average =  
4.0

Science Honor Society

Interest Based  
Open to students in  
9-12

Engineering Club

Interest based  
Open to students in  
9-12  
Partners with Planet  
Manhasset

Green Club

Currently running 3  
teams  
Grades 10-12  
one team has  
moved on to State  
Competition 3/18-  
3/19

Senior Science Olympiad

Currently running 3  
teams  
Grades 7-9  
One team  
competing in State  
Competition  
TOMORROW!

Junior Science Olympiad

Physics Bowl  
Physics Olympiad  
Chemistry Olympiad

Other Opportunities



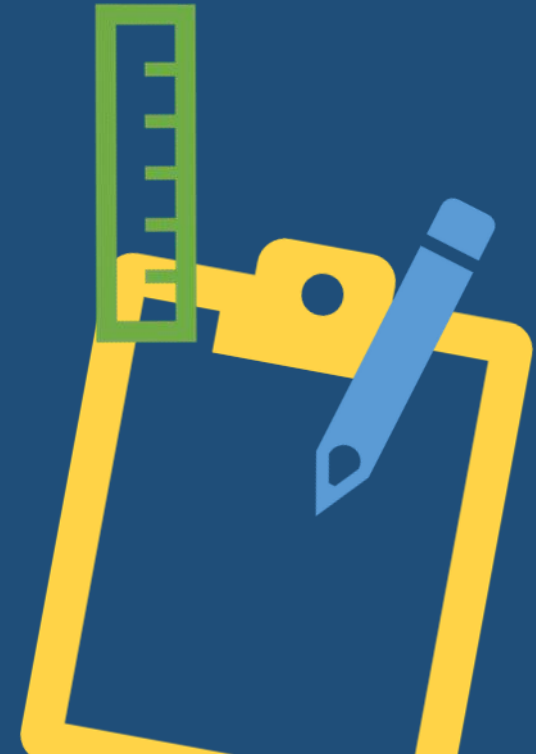
# District Goals

- Priority Area 4: Facilities
  - Develop a short and long-term capital projects plan



# Science Department Facilities

- Technology Suite
  - Moved middle school technology adjacent to high school technology, Summer 2021
  - Greater access to equipment and outdoors
  - Collaborative setting for both teachers and students
- Made possible because of the generosity of The Tower Foundation
  - CNC Machines
  - Laser Cutter
  - Plasma Cutter
  - Safety measures
- The Tower Foundation provided \$50,000 for electrical support and infrastructure costs involved with the move.





# Puzzle Party, 8<sup>th</sup> grade PLTW unit



- Students designed 3-D puzzles in the Puzzle Cube unit using TINKERCAD software
- Constructed their puzzle out of wood blocks
- Challenged classmates, teachers, administrators, and Board members to solve

# PLTW Engineering at Manhasset



- Introduction to Engineering\*
  - Aerospace Engineering<sup>+</sup>
  - Principles of Engineering\*
  - Computer Integrated Manufacturing\*
- 
- \*Identifies courses that are eligible for RIT college credit
  - <sup>+</sup>Identifies course that is eligible for credit from select colleges through PLTW website



# Thank you for your support

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[@terimcg77-Twitter](https://twitter.com/terimcg77)

