



# Next Generation Science in the Howard County Public School System

PTA Presidents, HCPSS  
December 7, 2016

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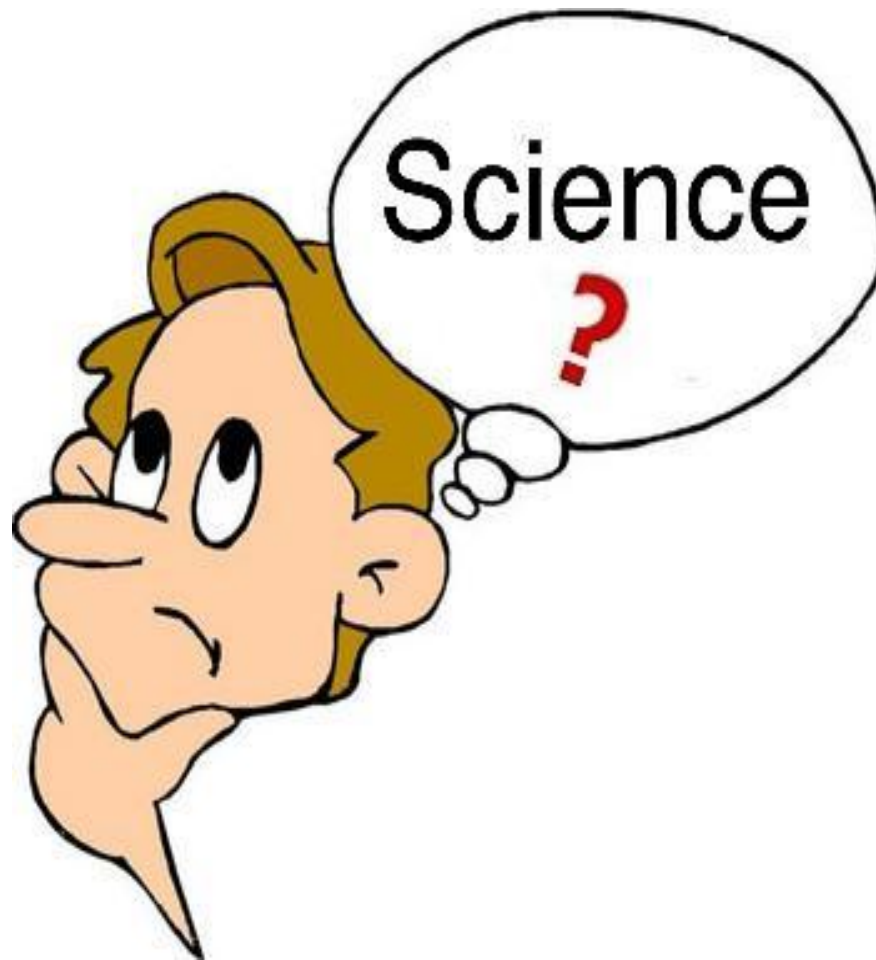
*Science, engineering, and technology permeate nearly every facet of modern life, and they also hold the key to meeting many of humanity's most pressing current and future challenges.*

National Research Council,  
*Framework for K12 Science Education, 2012*

# Session Outcomes

*By the end of this presentation, participants will have:*

1. Reviewed the Next Generation Science Standards (NGSS) and the related instructional shifts.
2. Explored revisions to the HCPSS Science Programs in support of NGSS.
3. Reviewed the updates to state assessment in science.





A way of thinking



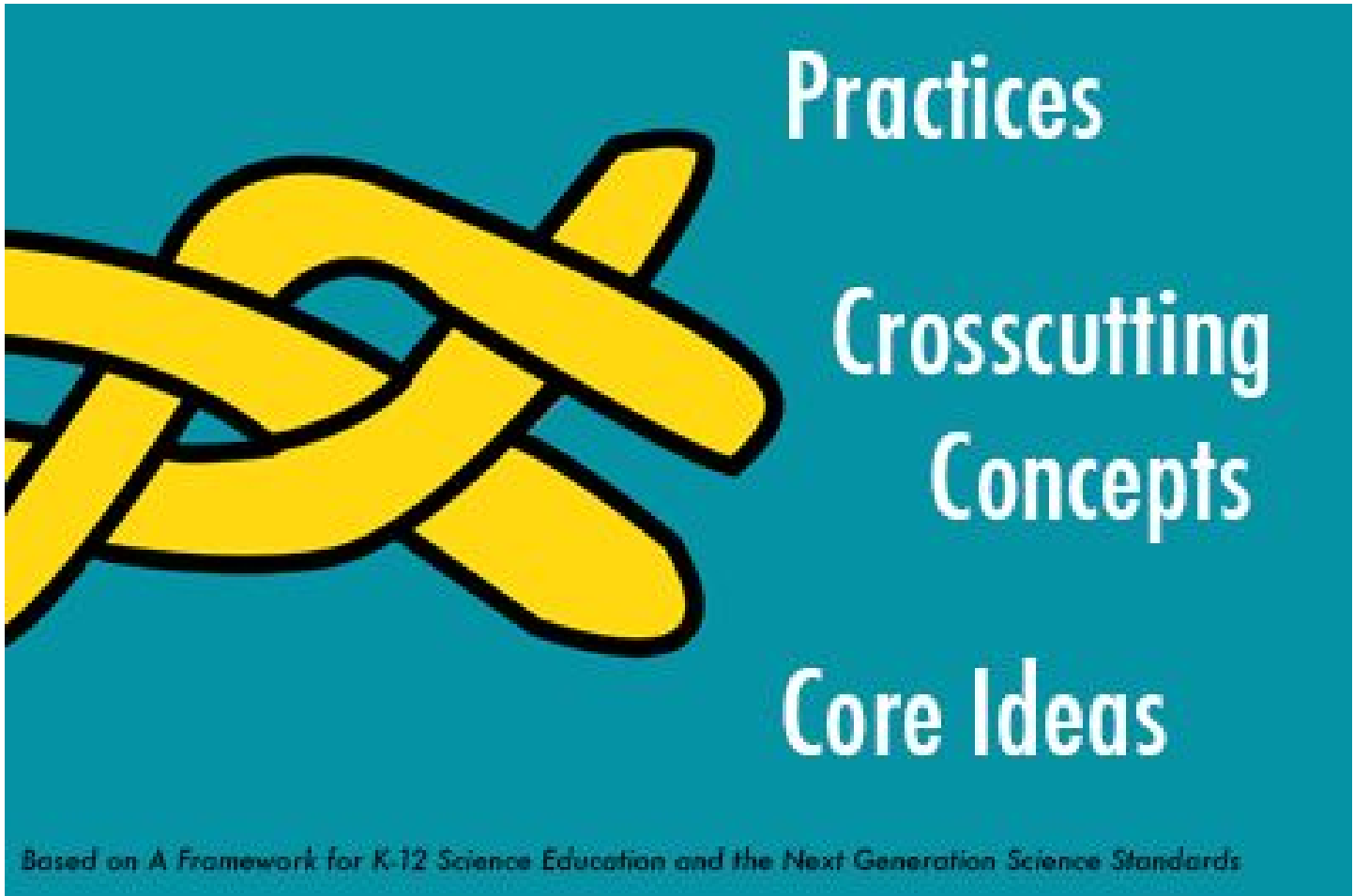
A collection of facts





**NEXT GENERATION**  
**SCIENCE**  
**STANDARDS**

**MARYLAND SCIENCE**  
**STANDARDS**



Practices

Crosscutting  
Concepts

Core Ideas

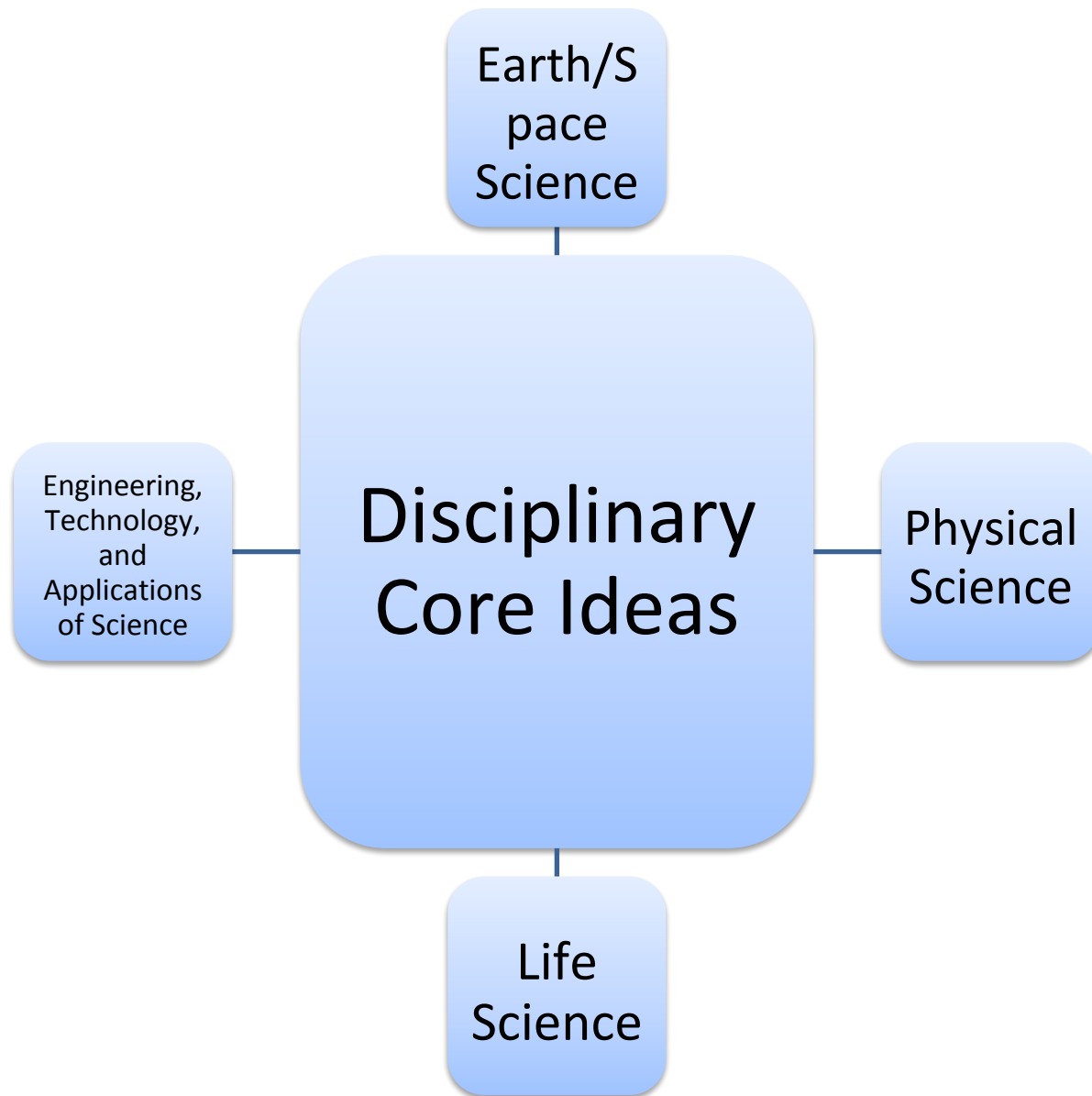
Based on A Framework for K-12 Science Education and the Next Generation Science Standards



# Science and Engineering Practices

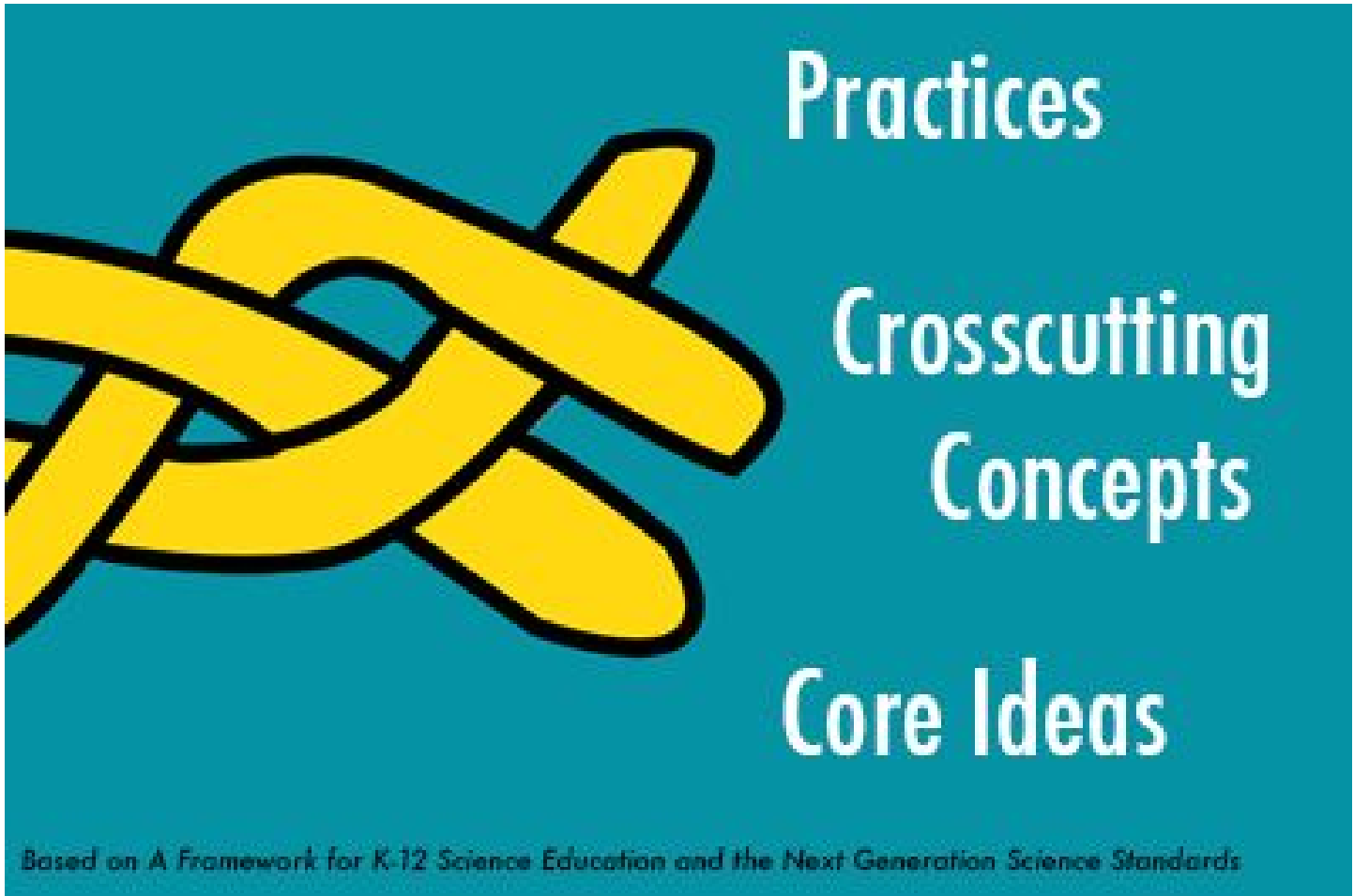
## Students are engaged in:

1. Asking questions and defining problems
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations and designing solutions
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information



# Cross Cutting Concepts

1. Patterns
2. Cause and Effect: Mechanism and Explanation
3. Scale, Proportion, and Quantity
4. Systems and System Models
5. Energy and Matter: Flow, Cycles, and Conservation
6. Structure and Function
7. Stability and Change



Practices

Crosscutting  
Concepts

Core Ideas

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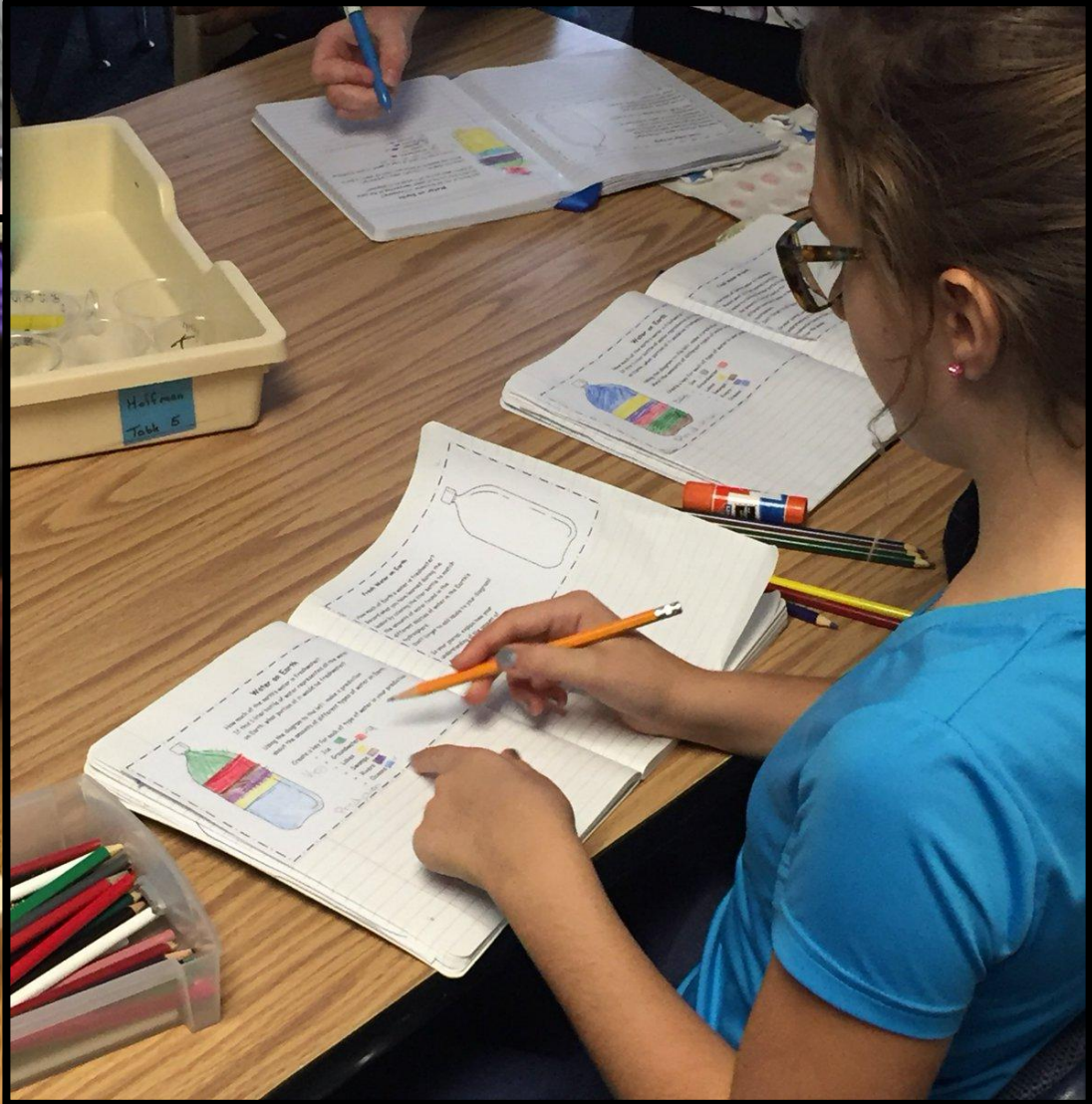
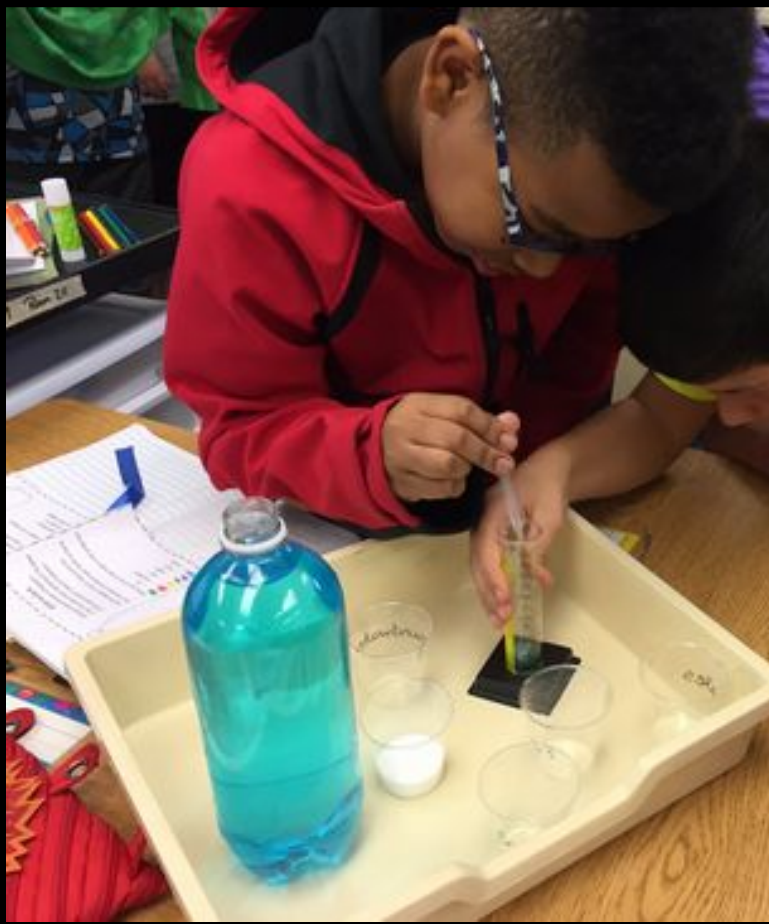
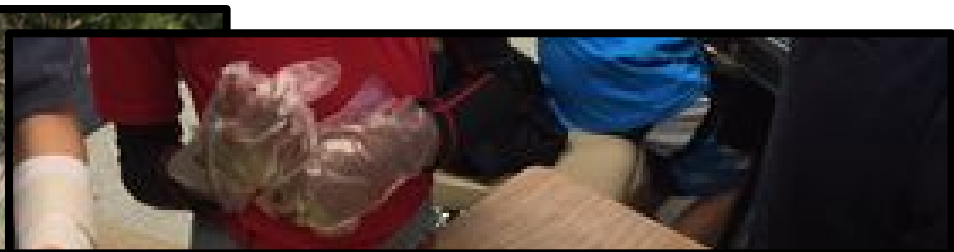
# Next Generation Science Instruction

...must involve less:	...must involve more:
Rote memorization of facts and terminology	Contextualized learning of facts and terminology
Learning of ideas disconnected from questions about phenomena	Systems thinking and modeling to explain phenomena in context
Teachers providing information to the whole class	Students conducting investigations, solving problems, and engaging in discussions with teacher facilitation
Teachers posing questions with only one right answer	Students discussing open-ended questions and using evidence to generate and support claims
Students reading textbooks and answering questions	Students using multiple and varied textual sources
Preplanned, “cookbook” laboratories	Multiple investigations driven by student questions that collectively lead to understanding
Worksheets	Student writing of journals, reports, presentations, etc.
Oversimplification of activities for students perceived to be less scientifically “able”	Supports to engage all students in sophisticated science practice

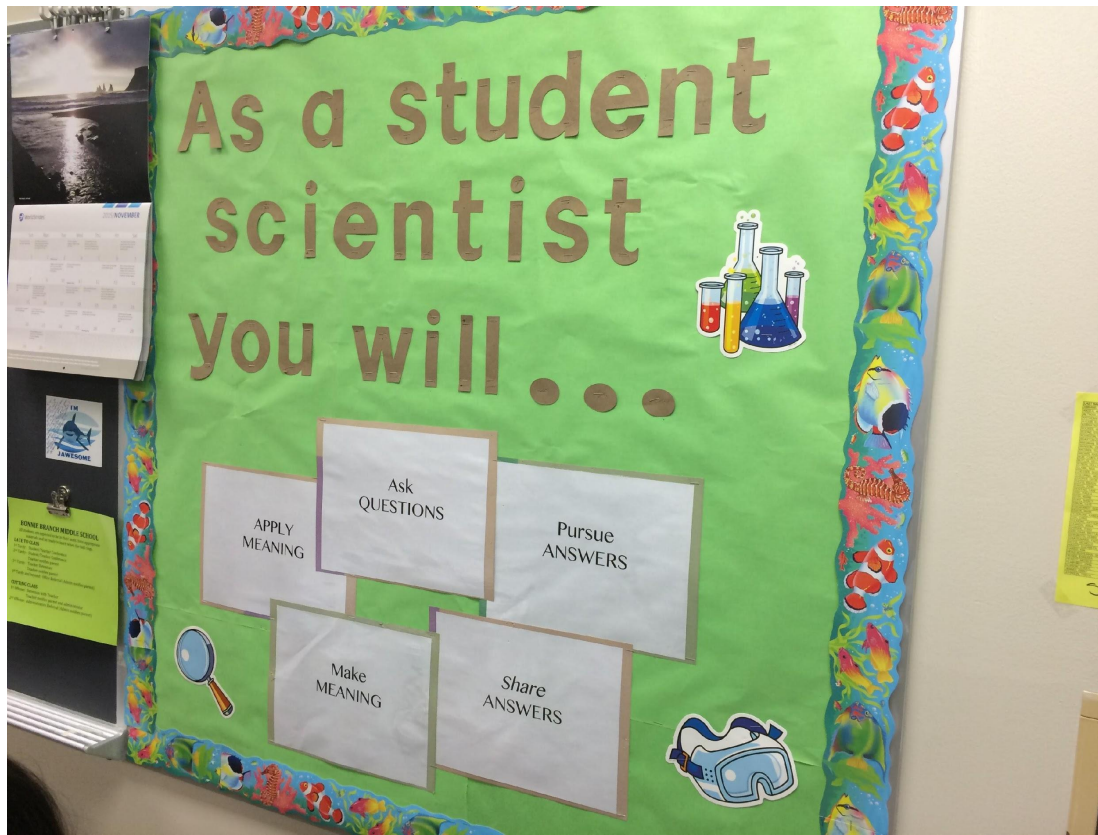


# NGSS IN HCPSS ELEMENTARY SCHOOLS



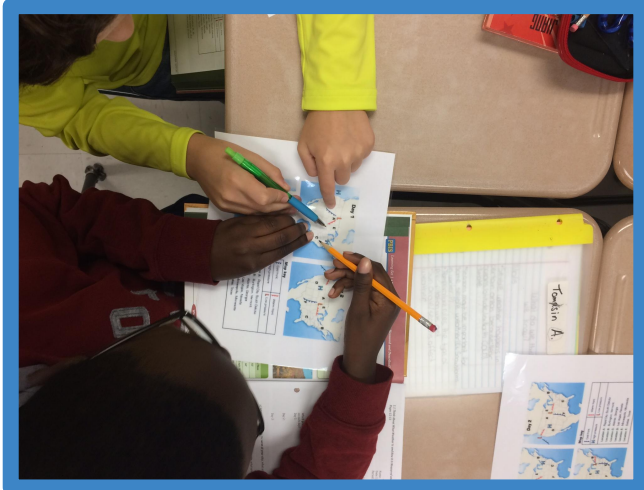
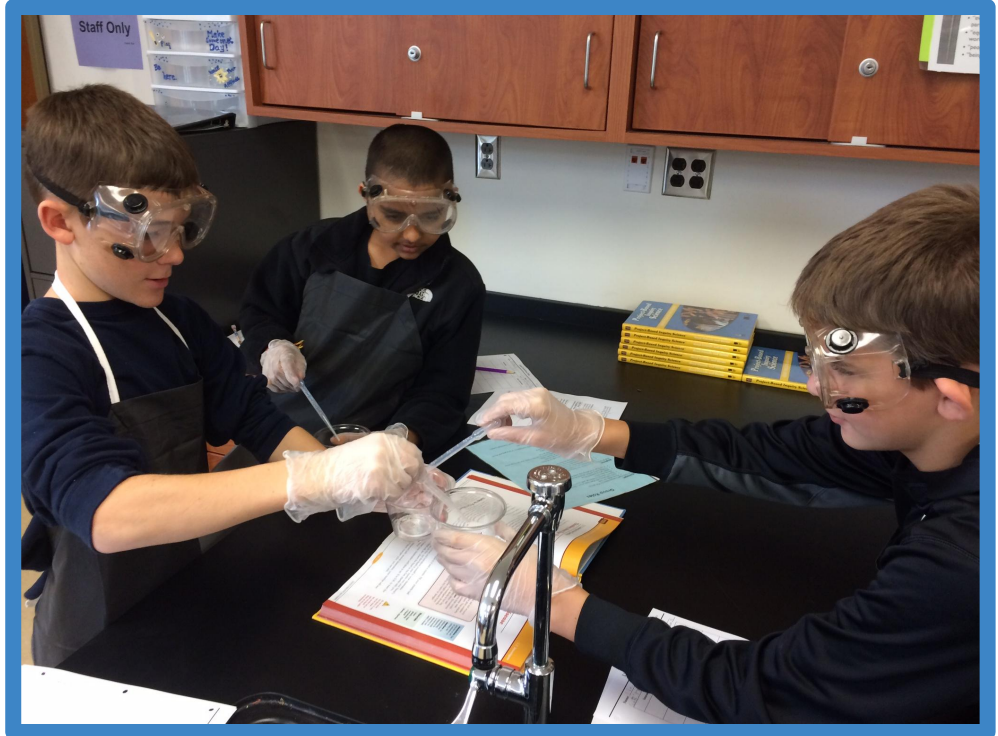






# NGSS IN HCPSS SECONDARY SCHOOLS

Wishart







# NGSS AND ASSESSMENT

Science MSA

Biology HSA

# Maryland Integrated Science Assessment (MISA)



# Current MISA Plan from MSDE

- Multi-disciplinary
- Emphasis on **SEPs and CCCs** within multiple science disciplines.
- Spring administration of MISA will occur in **grades 5 and 8.**
- School systems have latitude for HS administration time.

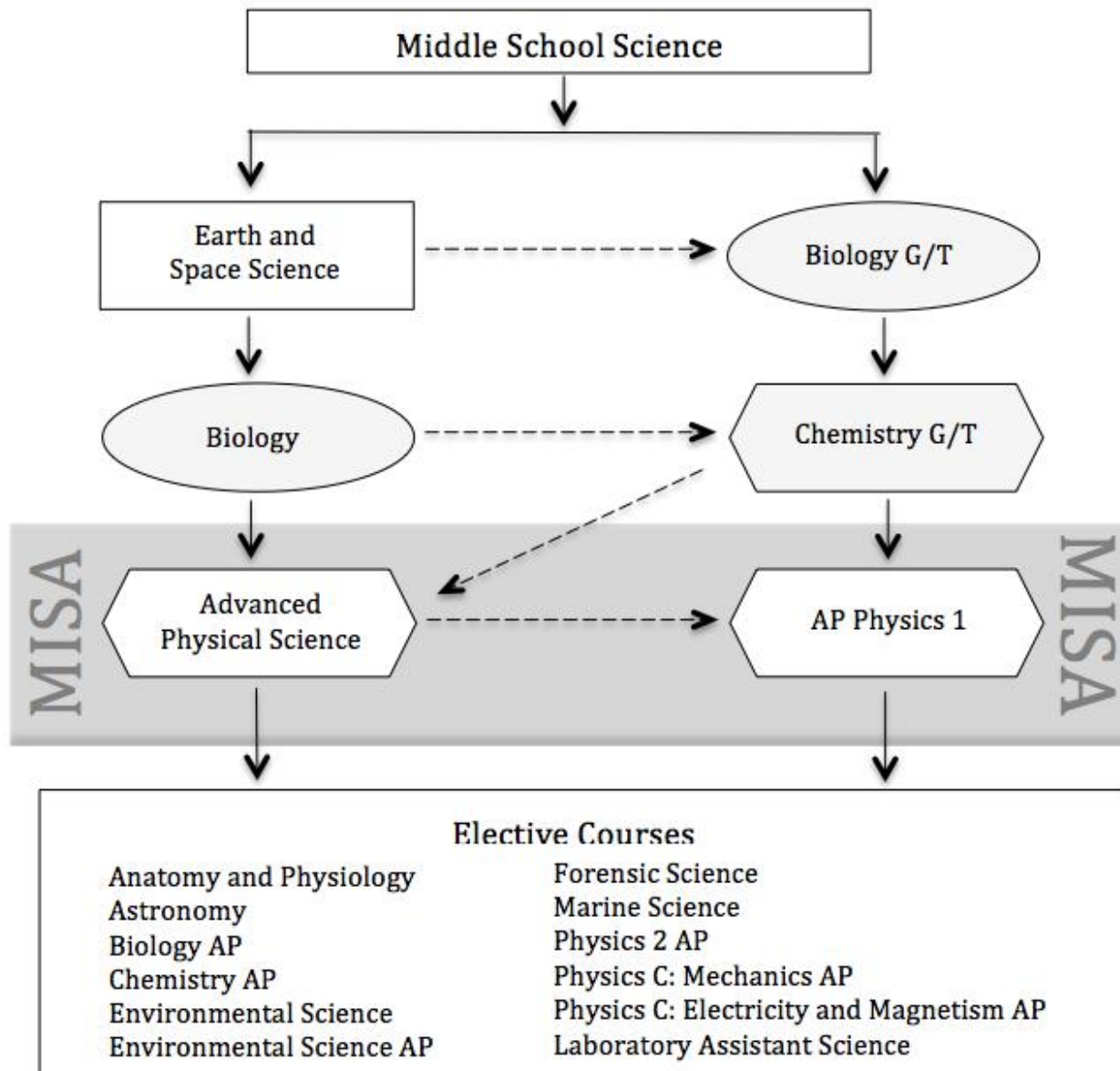
# MISA Implementation Timeline (ES/MS)

- **2016-17**
  - MISA in grades 5 and 8 (no fault, pending waiver).
- **2017-18**
  - MISA in grades 5 and 8 (no fault, pending waiver).
- **2018-19**
  - MISA grades 5 and 8 reported to meet federal requirements.

# MISA Implementation Timeline (HS)

- **2016-17**
  - Biology HSA (participation is a graduation requirement).
- **2017-19**
  - HS MISA field/operational testing (no fault, pending waiver).
- **2019-20**
  - HS MISA reported to meet federal requirements.





# www.nextgenscience.org



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GET TO KNOW THE STANDARDS - FIND TOOLS AND RESOURCES - SEARCH THE STANDARDS -

**Improving Science Education Through Three-Dimensional Learning**

**QUICK SEARCH** [ADVANCED SEARCH](#)

**KEYWORD SEARCH** **BY CROSSCUTTING CONCEPT**

Input Search Term(s) - Any -

**BY PRACTICE** **BY DISCIPLINARY CORE IDEA**

- Any - - Any -

**BY GRADE**

- Any -

**SEARCH**

Reset

# Questions?



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