# SCIENCE CURRICULUM WORK UPDATE

2024–2025

# Science Curriculum Mapping 2024

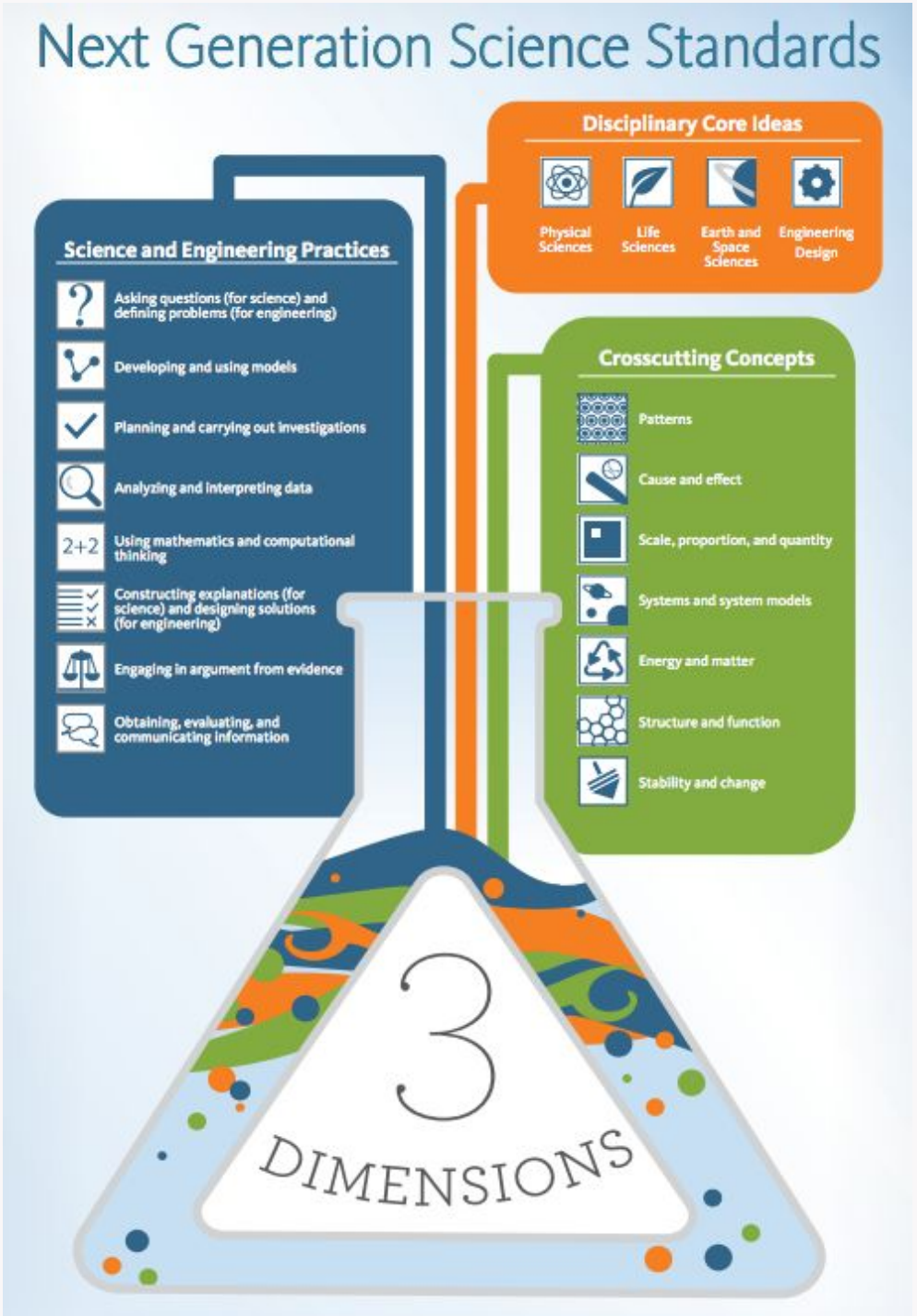
| | H | I | J | |
|---|---|---|---|---|
| | 6 | 6th Grade STEM | 7 | 7th Grac |
| | **Title/Phenomena/Question:** SEP Review<br>How can we be safe in the lab?<br><br>What skills do science use to learn about the world around us?<br><br>What skills do engineers use to design solutions to real-world problems? | **Title/Phenomena/Question:** Where are positive and negative charges seen every day in the world around us?<br>What factors affect the strength of an electromagnet? | **Title/Phenomena/Question:** Review of Experimental Design using "Raft Rally" | **Title/Phenomena/Que**<br>dogs of the same spec<br>behave so differently?<br>When humans control<br>ethical concerns could |
| | **Unit Description:** Students will be learning:<br>**Safety in the lab**<br>**Science lab equipment**<br>**Collaborative groups**<br>**Science discourse**<br>**EP's (1-8)** | **Unit Description: Students will engage through the process of making magnetic slime. We will work through exploration and inquiry builds to answer: Where are negative charges are seen every day in the world around us? What factors affect the strength of an electromagnet?** | **Unit Description: (SEP) Experimental Design** Students will review writing a hypothesis and identifying variables using an experimental design diagram. Students will collect data for their penny raft, graph the data, and complete their first Science Talk discussion of the year. | **Unit Description: Stu**<br>**themelves to explore**<br>**focussing on artificia**<br>**investigating how do**<br>**species can all look a**<br>**differently than one a**<br>**students will artificial**<br>**their ideal dog breed**<br>**avoiding as many ge**<br>**statistically possible.** |
| | **Standards Addressed:** | **Standards Addressed:** MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. | **Standards Addressed:** | **Standards Addressed**<br>and synthesize informa<br>technologies that have<br>humans influence the i<br>traits in organisms. |

# WHAT DO WE CURRENTLY DO?

We examined our current practices, identified areas for improvement, and discussed changes.

# NEXT GENERATION SCIENCE STANDARDS (NGSS)

As students move through the science program, the sophistication of student thinking should increase.



# TRANSFER GOALS

- Describe how learning will be applied to new and varied contexts over time.
- Give broader relevance and purpose to learning.
- Should be small in number but big in scope.
- In science, we look for students to transfer their understanding, knowledge, and skills to explain, ask questions, and understand novel phenomena.

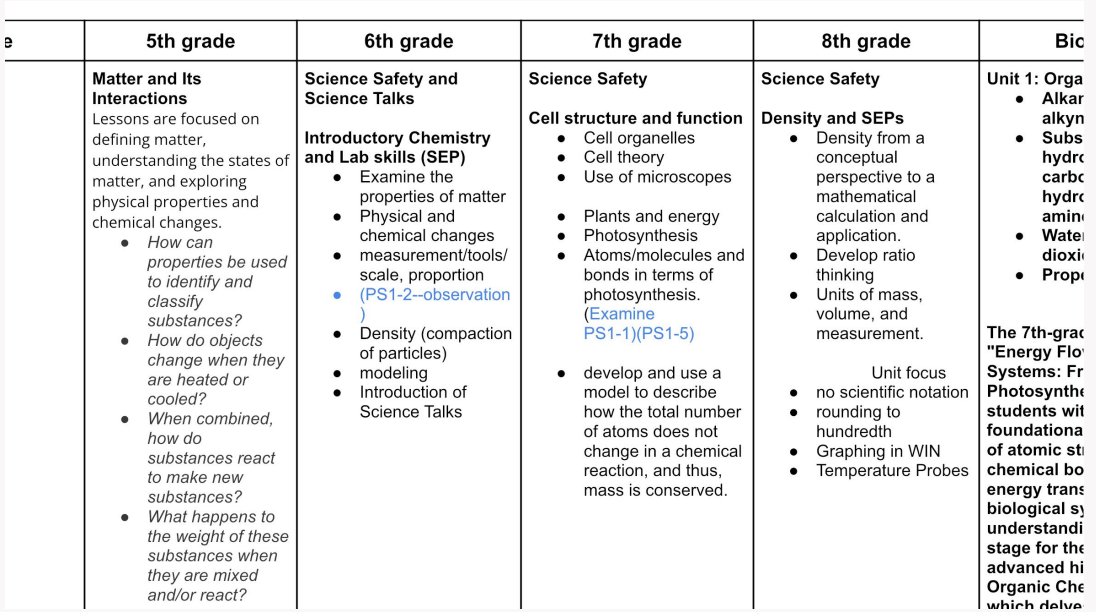
# NFPS PreK-12 SCIENCE TRANSFER GOALS (DRAFT)

**Students will use their learning to:**

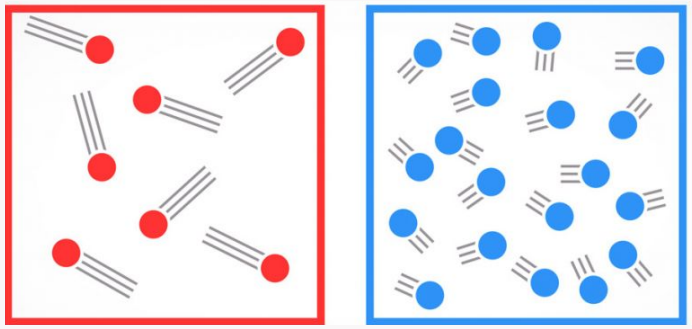
- Question and seek answers as they make sense of real-world phenomena.
- Model phenomena from multiple perspectives for understanding and communication to others.
- Collect and analyze data in order to derive meaning and support or refute an argument or claim.
- Engage in innovative thinking and design processes that can lead to solutions for complex problems in our world.

# WE RESTRUCTURED WHAT WE DO

We followed the students' learning journey to develop a concept map grounded in standards, following student understanding, and promoting the transfer of knowledge to novel situations.



| e | 5th grade | 6th grade | 7th grade | 8th grade | Bic |
|---|---|---|---|---|---|
| | **Matter and Its Interactions**<br>Lessons are focused on defining matter, understanding the states of matter, and exploring physical properties and chemical changes.<br>• *How can properties be used to identify and classify substances?*<br>• *How do objects change when they are heated or cooled?*<br>• *When combined, how do substances react to make new substances?*<br>• *What happens to the weight of these substances when they are mixed and/or react?* | **Science Safety and Science Talks**<br><br>**Introductory Chemistry and Lab skills (SEP)**<br>• Examine the properties of matter<br>• Physical and chemical changes<br>• measurement/tools/ scale, proportion<br>• (PS1-2--observation )<br>• Density (compaction of particles)<br>• modeling<br>• Introduction of Science Talks | **Science Safety**<br><br>**Cell structure and function**<br>• Cell organelles<br>• Cell theory<br>• Use of microscopes<br><br>• Plants and energy<br>• Photosynthesis<br>• Atoms/molecules and bonds in terms of photosynthesis. (Examine PS1-1)(PS1-5)<br><br>• develop and use a model to describe how the total number of atoms does not change in a chemical reaction, and thus, mass is conserved. | **Science Safety**<br><br>**Density and SEPs**<br>• Density from a conceptual perspective to a mathematical calculation and application.<br>• Develop ratio thinking<br>• Units of mass, volume, and measurement.<br><br>Unit focus<br>• no scientific notation<br>• rounding to hundredth<br>• Graphing in WIN<br>• Temperature Probes | **Unit 1: Orga**<br>• **Alkar alkyn**<br>• **Subs hydr carb hydr amin**<br>• **Wate dioxi**<br>• **Prop**<br><br>**The 7th-grad "Energy Flo Systems: Fr Photosynthe students wit foundationa of atomic st chemical bo energy trans biological sy understandi stage for the advanced hi Organic Che which delve** |



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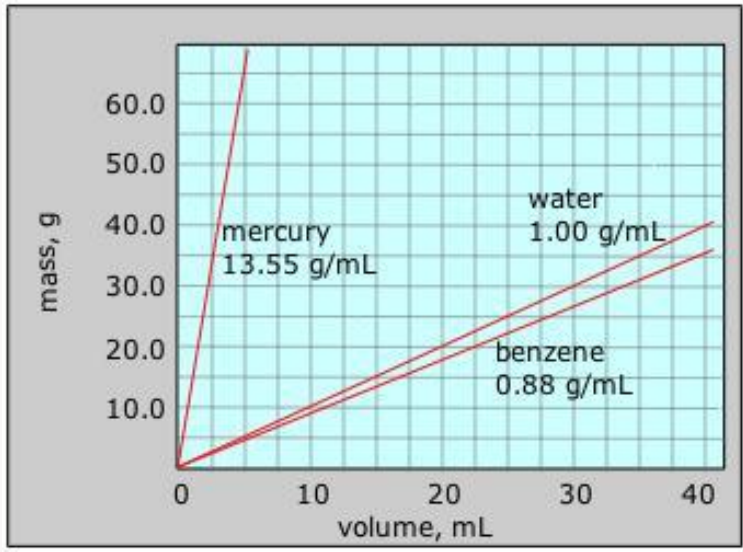


## CLASSROOM OBSERVATION AND DISCUSSION

- We are using observation of student learning to inform our curriculum development so that it follows how students learn.
- We are using modeling strategies to develop students' understanding of phenomena using macroscopic, sub-microscopic, and symbolic models.

# INTEGRATING NGSS DESIGN STANDARDS INTO STEAM

MS-NGSS Content standards and Science and Engineering Practices (SEPs) are aligned in science classes and STEAM in grades 6, 7, and 8. This allows students to extend their learning to include engineering design.

| **Unit Title:** Who Let the Dogs Out:? Artificial Selection | **Curriculum Area:** Science | |
|---|---|---|
| **Course:** 7 STEAM | **Grade:** 7 | **Time:** |

**Overview / Storyline:** Students will challenge themselves to explore the genetics, focussing on artificial selection by inv
the same species can all look and behave so differently than one another. In conclusion students will artificially select g
dog breed with the goal of avoiding as many genetic issues as statistically possible.

**About the Student:**

**STAGE ONE: INTENDED OUTCOMES**

**Standards**

*This curriculum is aligned with:*

**Priority Content Standards**
MS-LS4-5 Gather and synthesize information about technologies that have changed the way humans

**Transfer Goal(s)**

*Students will use their learning to …*

- Question and seek answers as they make sense of real-world phenomena.
- Model phenomena from multiple perspectives for understanding and communication to
- Engage in innovative thinking and design processes that can lead to solutions for compl
  world.

**Meaning**

| Enduring Understandings (EUs) | Essential Questions (EQs) |
|---|---|
| *Students will understand that* | • How is it that dogs of the same s |

| **Course** | **Grade: 7** | **Time:** |
|---|---|---|

**Overview / Storyline:**
In this unit, students will understand that reproduction is the process that produces the next generation of species and the tra
This unit includes an understanding of the transfer of genetic information through sexual and asexual reproduction. Student
thinking of how a set of twins look so different to determine how traits are passed down. Students will also compare traits of
inquire how traits are passed from parent to offspring. A study of how both forms of reproduction allows for survival is discus
will also complete a webquest to research environmental and inherited factors and how both play a role. Learners engage ir
modeling activity creating a "monster" using mendelian genetics and punnett squares with an extension that leads to pairing
another "monster" to produce offspring. Students will include analysis of dominant and recessive genes to explain why their
different. Using their knowledge of inheritance, they will solve a baby-swap mystery using punnett squares as their evidence
up the unit by using their acquired knowledge to explain how the set of twins look so different using a scientific model.

**About the Student:**

**STAGE ONE: INTENDED OUTCOMES**

**Standards**

*This curriculum is aligned with:*

**Priority Content Standards**
MS LS 1 - 5
Construct a scientific explanation based on evidence for how

**Transfer Goal(s)**

*Students will use their learning to …*

**Meaning**

| Enduring Understandings (EUs) | Essential Questions (EQs) |
|---|---|
| *Students will understand that …* | *Students will keep considering…* |
| | How are traits passed from parent to offspring |

# TEAMWORK

Our Science Teachers, K-5 and 6-12 Science Curriculum and Instruction Leaders, and  Curriculum Link Leaders are all working together to write a student-centered, vertically articulated curriculum for teaching and learning under the direction and guidance of the Assistant Superintendent.