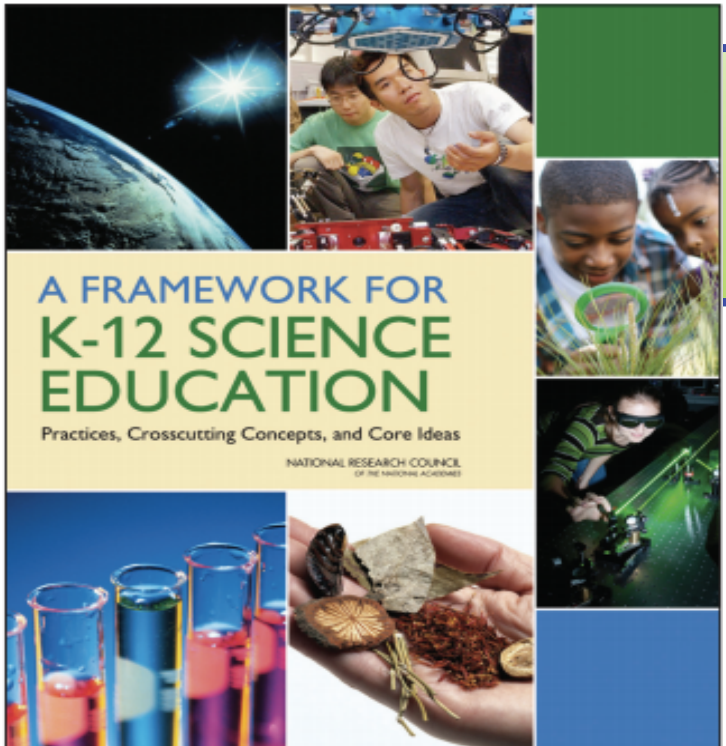

Michigan –
An NGSS Lead State Partner

NEXT GENERATION
SCIENCE
STANDARDS
For States, By States

Next Generation Science Standards 101 - An Introduction to Science Instruction for the 21st Century

MICHIGAN SCIENCE TEACHERS ASSOCIATION

Michigan Mathematics and Science Centers Network

MICHIGAN STEM PARTNERSHIP

MICHIGAN Department of Education

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NEXT GENERATION SCIENCE STANDARDS

If you *must* leave now:

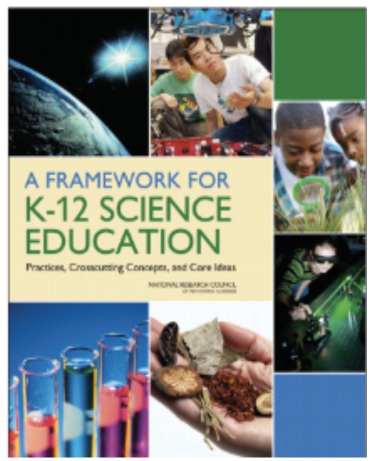
- The science isn't changing; what's changing is how we will assess student learning, and how we are asking students to demonstrate knowledge.
- First realistic opportunity for full state-level assessment: SY 2016-17
- 2013-16: Transition period and planned implementation
- Be mindful and deliberate, but not scared or jittery.

Building on the Past; Preparing for the Future

1990s

1990s-2009

Phase I



1/2010 - 7/2011

Phase II

NEXT GENERATION SCIENCE STANDARDS

For States, By States

7/2011 – March 2013

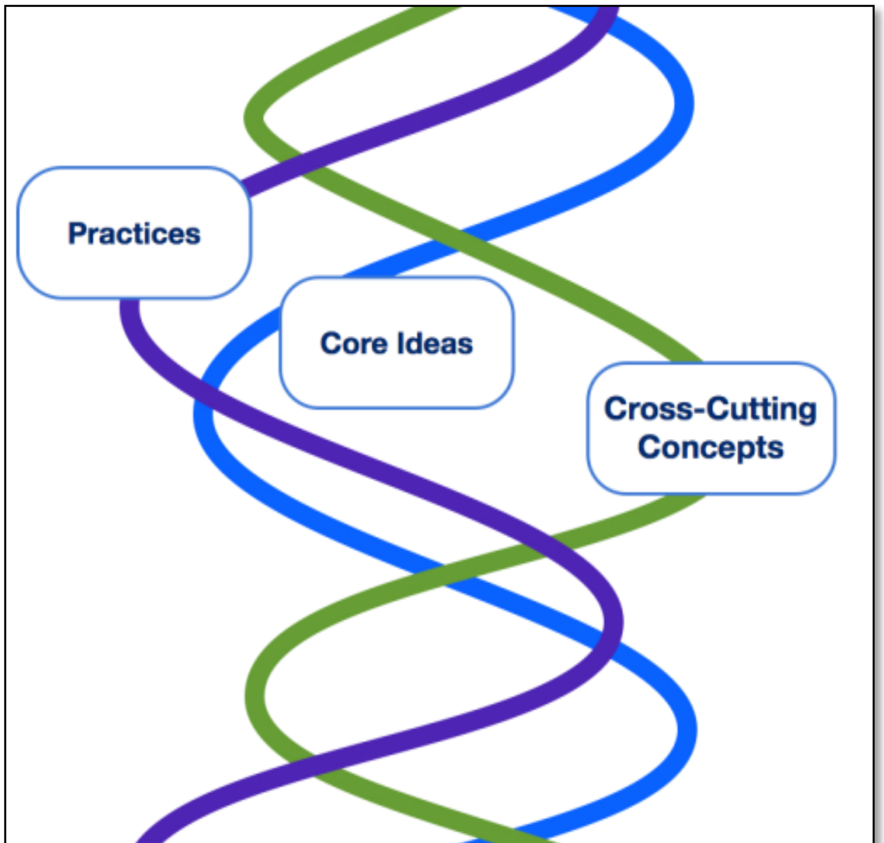
MICHIGAN Department of Education

Why Now?

- Our understanding of how young brains learn has changed
  - fMRI identifies parts of the brain that become active using different stimuli / instructional strategies
    - Reach – Reflect – Recode
  - Identified instructional strategies that increase student achievement significantly
    - Identify similarities/differences
    - Vocabulary strategies
    - Constructing models / graphic organizers

NEXT GENERATION SCIENCE STANDARDS

Three Dimensions Intertwined



- The NGSS are written as Performance Expectations
- NGSS will require contextual application of the three dimensions by students.

NEXT GENERATION SCIENCE STANDARDS
For States, By States

MICHIGAN Department of Education

NGSS is Different

- Standards are expressed as performance expectations
- Combine practices, core ideas, and crosscutting concepts into single statement of ***what is to be assessed.***
- They are not instructional strategies or objectives for a lesson

NEXT GENERATION SCIENCE STANDARDS

“Knowledge in Use”

- Use Science and Engineering Practices to help students learn how to “think like scientists”
- Demonstrate that they can transfer understanding to new situations
- Recognize how science knowledge fits into the big picture / across disciplines using Cross Cutting Concepts
- Content is not new, how we ask students to show their understanding is revolutionary!

NEXT GENERATION SCIENCE STANDARDS

Conceptual Focus of NGSS

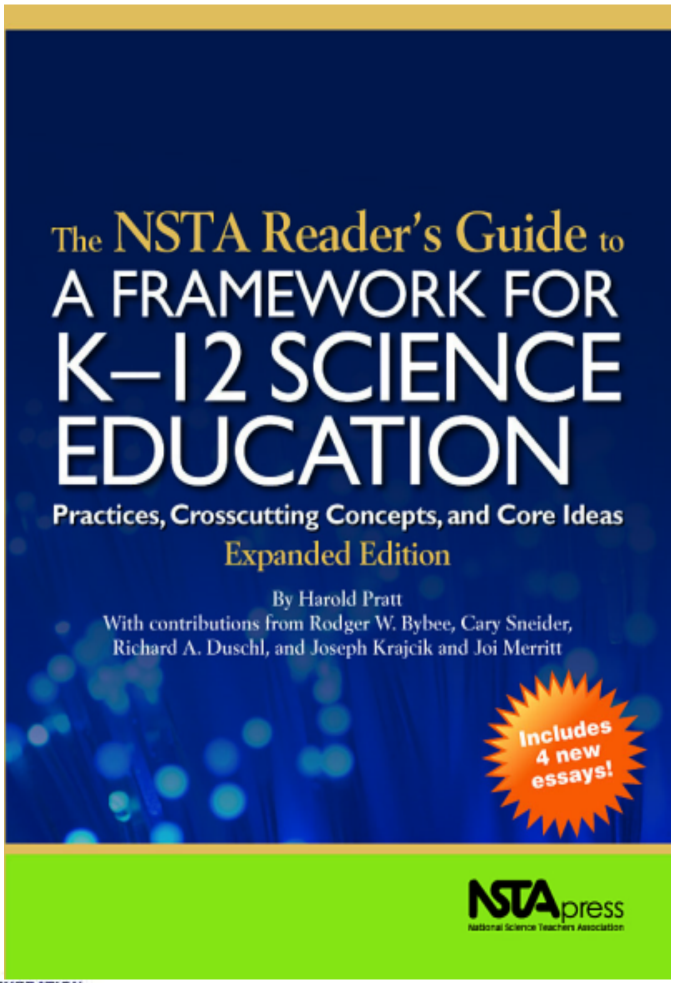
1. K-12 Science education should reflect the **interconnected nature** of science as it is practiced and experienced in the **real world**.
2. The Next Generation Science Standards are student performance expectations – **NOT curriculum**.
3. The science **concepts build coherently** from K-12 in defined learning progressions.
4. The NGSS focus on **deeper understanding** of content as well as **application** of content.
5. Science and Engineering are **integrated** in the NGSS from K–12.
6. The NGSS and **Common Core State Standards** (ELA/Literacy and Mathematics) are **aligned**.

NEXT GENERATION SCIENCE STANDARDS For States, By States

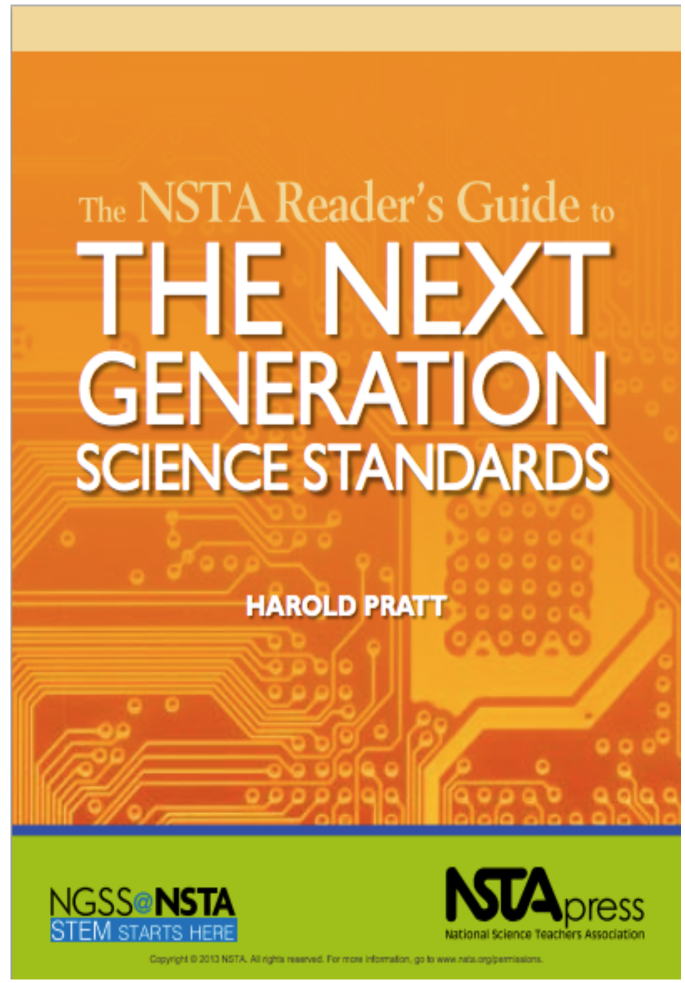
MICHIGAN Department of Education

www.nextgenscience.org
Web Access to All NGSS Documents

Supporting Publications



$7.96 / NSTA Members



$8.76 / NSTA Members

Three Dimensions

K.OTE Organisms and Their Environments

K.OTE Organisms and Their Environments

Students who demonstrate understanding can:

a. **Use observations and information to classify living things as plants or animals based on what they need to survive.** [Clarification Statement: To survive and grow, animals need food, water, and air. Plants need water, light, and air to live and grow.]

b. **Use observations to describe how plants and animals depend on the air, land, and water where they live to meet their needs, and they in turn, can change their environment.** [Clarification Statement: Examples of how plants and animals change their environment could include ants making anthills, plant roots breaking concrete, or beavers building dams.]

c. **Use observations and information to identify patterns in how animals get their food.** [Clarification Statement: Animals get their food by various means. Some animals eat plants, some eat other animals, and some eat both.]

d. **Provide evidence that humans' uses of natural resources can affect the world around them, and share solutions that reduce human impact.** [Clarification Statement: Examples of how humans' uses of natural resources can affect the world include cutting trees for lumber and paper products or discarding plastic bags and other waste that affects animal habitats. Humans can reduce their impact by recycling and avoiding littering.]

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices

Planning and Carrying Out Investigations
Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.
- Make observations to collect data which can be used to make comparisons. (a)

Analyzing and Interpreting Data
Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.
- Use and share pictures, drawings and/or writings of observations. (c)
- Use observations to describe patterns and relationships in order to answer scientific questions and solve problems. (b),(c),(d)

Obtaining, Evaluating, and Communicating Information
Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.
- Read and comprehend grade-appropriate texts and use other media to acquire scientific information. (d)
- Critique and communicate information with others in oral and/or written forms using models, drawings, writing, or numbers. (d)

Disciplinary Core Ideas

LS1.C: Organization for Matter and Energy Flow in Organisms
- All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (a),(c)

ESS2.E: Biogeology
- Plants and animals (including humans) depend on the land, water, and air to live and grow. They in turn can change their environment (e.g., the shape of land, the flow of water). (b)

ESS3.A: Natural Resources
- Living things need water, air, and resources from the land, and they try to live in places that have the things they need. Humans use natural resources for everything they do: for example, they use soil and water to grow food, wood to burn to provide heat or to build shelters, and materials such as iron or copper extracted from the earth to make cooking pans. (a),(d)

ESS3.C: Human Impacts on Earth Systems
- Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things—for example, by reducing trash through reuse and recycling. (d)

Crosscutting Concepts

Patterns
Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence. (a),(c)

Connections to Engineering, Technology, and Applications of Science

Influence of Engineering, Technology, and Science on Society and the Natural World
Every human-made product is designed by applying some knowledge of the natural world and is built by using natural materials. Therefore, taking natural materials to make things impacts the environment. (d)

Connections to other DCIs in this grade-level: **K.WEA**

Articulation of DCIs across grade-levels: **4.PSE, 4.E, 5.MEE, 5.ESI**

Common Core State Standards Connections: [Note: these connections will be made more explicit and complete in future draft releases]

ELA –

RI.K.2 With prompting and support, identify the main topic and retell key details of a text.

W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.

SL.K.1 Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.

SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

Mathematics –

MP.3 Construct viable arguments and critique the reasoning of others.

MP.7 Look for and make use of structure.

K.CC.6 Compare numbers.

K.MD.3 Classify objects and count the number of objects in each category.

NEXT GENERATION SCIENCE STANDARDS

NGSS Science and Engineering Practices

- Asking questions (science) and defining problems (engineering)
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematical and computational thinking
- Constructing explanations (science) and designing solutions (engineering)
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

NEXT GENERATION SCIENCE STANDARDS For States, By States

MICHIGAN Department of Education

Crosscutting Concepts

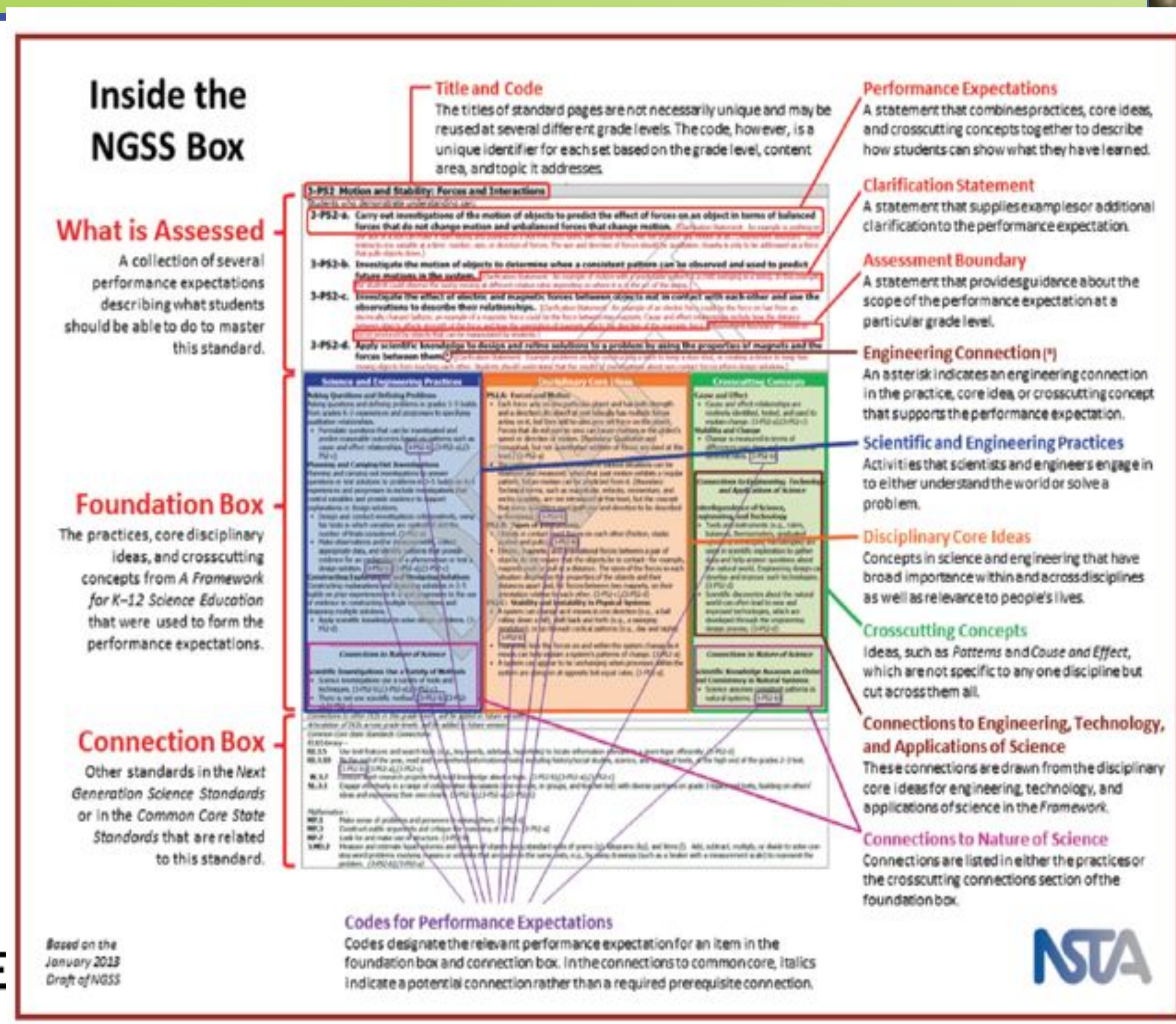
- Patterns
- Cause and effect
- Scale, proportion, and quantity
- Systems and system models
- Energy and matter
- Structure and function
- Stability and change

Framework 4-1

NEXT GENERATION SCIENCE STANDARDS

MICHIGAN Department of Education

How to Read an NGSS Standard



NEXT GENERATION SCIENCE STANDARDS For States, By States

MICHIGAN Department of Education

K.PS1 Matter and Its Interactions

How to read the standards »
Go back to search results
Related Content »

Go to the NGSS Survey

Views: Disable Popups / Black and white / Practices and Core Ideas / Practices and Crosscutting Concepts / PDF

Students who demonstrate understanding can:

K-PS1-a. **Design and conduct an investigation of different kinds of materials to describe their observable properties and classify the materials based on the patterns observed.** [Clarification Statement: Observations are qualitative only and could include relative length, weight, color, texture, and hardness. Patterns include the similar properties that different materials share.]

K-PS1-b. **Design and conduct investigations to test the idea that some materials can be a solid or liquid depending on temperature.** *[Assessment Boundary: Only a qualitative description of temperature should be used such as hot, cool, and warm.]*

K.PS1-c. **Ask questions, based on observations, to classify different objects by their use and to identify whether they occur naturally or are human-made.*** [Clarification Statement: Patterns include the similar characteristics of objects that determine whether they occur naturally or are human-made.]

The performance expectations above were developed using the following elements from the NRC document *A Framework for K- 12 Science Education*:

Science and Engineering Practices

Asking Questions and Defining Problems
Asking questions and defining problems in grades K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested.

- Ask questions based on observations of the natural and/or designed world. (K-PS1-c)

Planning and Carrying Out Investigations
Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.

- With guidance, design and conduct investigations in collaboration with peers. (K-PS1-a),(K-PS1-b)
- Make direct or indirect observations and/or measurements to collect data which can be used to make comparisons. (K-PS1-a),(K-PS1-b)

- -

Connections to the Nature of Science

Science Knowledge is based on empirical evidence

- Scientists look for patterns and order when making observations about the world.(K-PS1-a),(K-PS1-b),(K-PS1-c)

Disciplinary Core Ideas

PS1.A: Structure and Properties of Matter

- Different kinds of matter exist (e.g., wood, metal, water) and many of them can be either solid or liquid, depending on temperature. (K-PS1-a),(K-PS1-b)
- Matter can be described and classified by its observable properties (e.g., visual, aural, textural), by its uses, and by whether it occurs naturally or is manufactured. (K-PS1-a),(K-PS1-c)

Crosscutting Concepts

Patterns

- Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence. (K-PS1-a),(K-PS1-c)

Cause and Effect

- Events have causes that generate observable patterns. (K-PS1-b)
- Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS1-b)

- -

Connections to Engineering, Technology, and Applications of Science

Influence of Engineering, Technology, and Science on Society and the Natural World

- People depend on various technologies in their lives; human life would be very different without technology. (K-PS1-c)
- Every human-made product is designed by applying some knowledge of the natural world and is built by using materials derived from the natural world, even when the materials are not themselves natural—for example, spoons made from refined metals. (K-PS1-c)

questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.

- With guidance, design and conduct investigations in collaboration with peers. (K-PS1-a),(K-PS1-b)
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Connections to other DCIs in this grade-level: will be added in future version.

Articulation of DCIs across grade-levels: will be added in future version.

Common Core State Standards Connections:

ELA/Literacy -

RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-PS1-c)

W.K.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (K-PS1-c)

SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-PS1-c)

Mathematics -

MP.3 Construct viable arguments and critique the reasoning of others. (K-PS1-b)

K.MD.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-PS1-a),(K-PS1-b)

K.MD.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. (K-PS1-a),(K- PS1-b)

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice, Disciplinary Core Idea, or Crosscutting Concept.

Table Talk: Compare and Contrast

GLCES L.OL.06.51	NGSS MS-LS2-f
Classify producers, consumers, and decomposers based on their source of food (the source of energy and building materials).	Develop and use a model to support explanations about the transfer of matter and energy into and out of ecosystems and among organisms.

Let's Do Some Table Talk!

The moon does not fall to the earth because

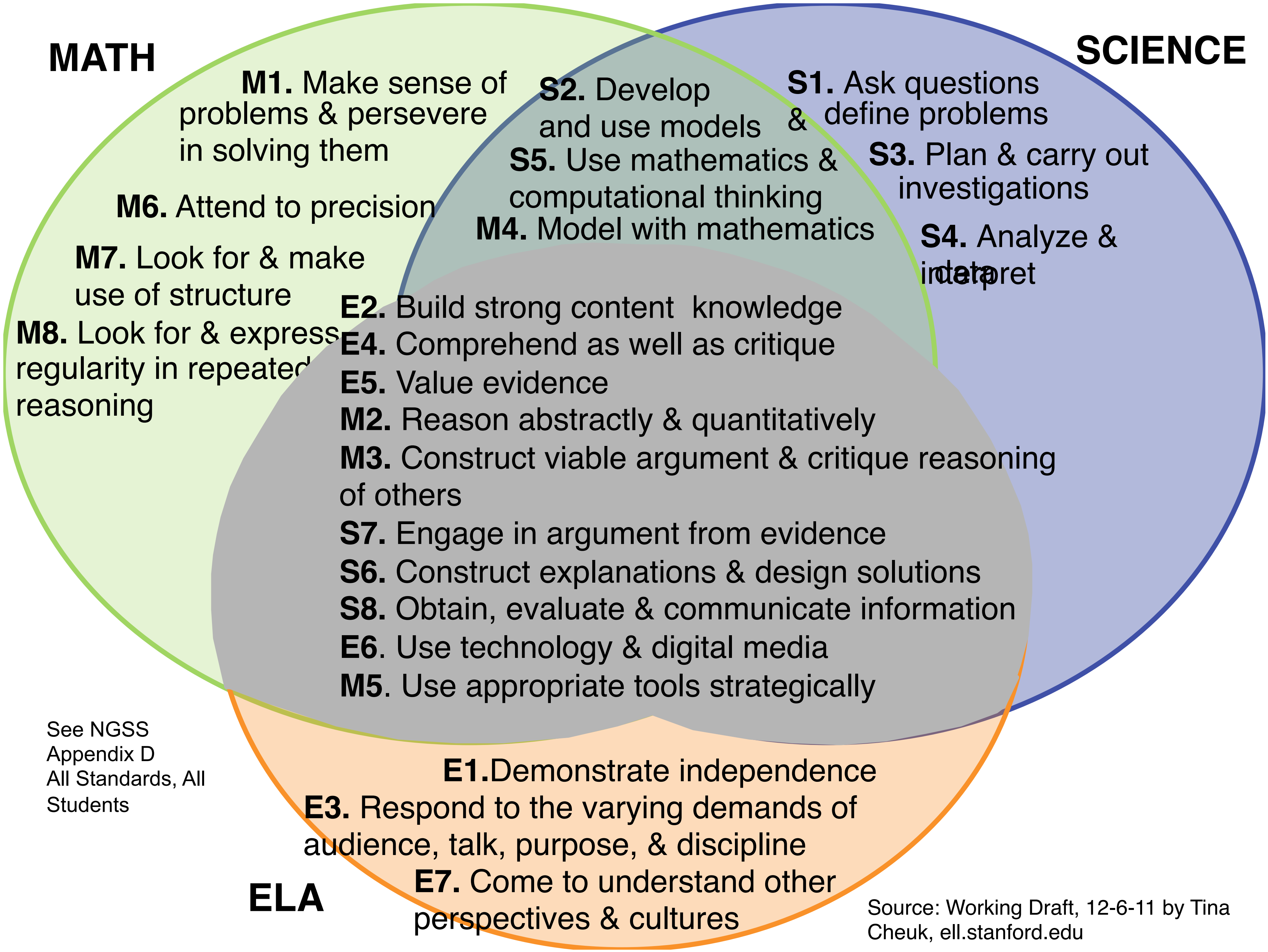
a) **it does not interact with the Earth.**
b) **the net force on it is zero.**
c) **it is beyond the main pull of the earth's gravity.**
d) **it is always moving away from the Earth.**
e) **All of the above.**
f) **None of the above.**

NEXT GENERATION SCIENCE STANDARDS

A Modeling Opportunity?

Develop and use a model to support the way the gravitational interaction allows moons to orbit planets.

NEXT GENERATION SCIENCE STANDARDS



See NGSS Appendix D All Standards, All Students

Source: Working Draft, 12-6-11 by Tina Cheuk, ell.stanford.edu

Implications for Instruction and Assessment

- Get to know the NGSS and the Framework
- Implement the practices; identify content that will change / will not change
- Focus Energy – look for leverage, endurance, essential for next grade
  - Identify instructional implications of the performance expectations
  - Build strong K-12 progressions
  - Integrate using crosscutting concepts and practices
- Develop Common Assessments
- Develop State Assessment Systems that reflect instruction and report at the practice and topic levels.

NEXT GENERATION SCIENCE STANDARDS

MICHIGAN Department of Education

Michigan NGSS Development Timeline

- Lead State Meeting (Achieve, Sept. 2011)
- ***MI Internal Review*** Team reviews first draft (Nov./Dec. 2011)
- Lead States meet with Writers (Early January 2012)
- Critical Stakeholders, All States, Leads (Jan. – Feb.)
- ***Public Draft; MI State Review Meetings; State Report (May)***
- Lead States Implementation Planning (Nov. 2011 - Ongoing)
- All State Review; ***MI Internal Review (Summer, Fall)***
- ***2nd Public Draft (Jan. 2013)***
- Final Draft; ***MI Internal Review (Feb. 2013)***
- Final State Report (Feb. 2013)
- ***NGSS Released for Adoption (Late March 2013)***
- Lead State Adoption Planning (Jan.- March 2013)
- Michigan State Rollout (Tuesday, May 28th, 2013)

NEXT GENERATION SCIENCE STANDARDS

Transitioning to NGSS

- Current state science assessment at Fall 5, Fall 8, Spring 11
- Beginning in 2015, science assessment at Spring 4, Spring 7, Spring 11
- Anticipate 3-4 year transition to full implementation of NGSS

- Available ~ April 26th:
  - Articulation to other DCIs in Grade Level/Grade Bands
  - Articulation to DCIs at Other Grade Level/Grade Bands
  - Connections to Common Core Standards

NEXT GENERATION SCIENCE STANDARDS For States, By States

MICHIGAN Department of Education

NGSS Information, MDE Contacts

- Official NGSS Site www.nextgenscience.org
- MDE NGSS Page Shortcut
  www.michigan.gov/ngss

  http://michigan.gov/mde/0,4615,7-140-28753_38684_28760-277001--,00.html
- Susan Codere, NGSS Project Coordinator
  CodereS@michigan.gov
- Megan Schrauben, Integrated Education Consultant
  SchraubenM1@michigan.gov

NEXT GENERATION SCIENCE STANDARDS For States, By States

MICHIGAN Department of Education

Proposed/Possible NGSS Assessment Timeline

- NGSS released for state adoption (Late March 2013)
- Anticipated SBE Adoption (May 2013)
- Rollout Late May 2013
- Spring – Fall 2013 Develop and refine transition plans; focus on overarching practices and crosscutting concepts as they fit within current curricular plans; develop assessment claims and targets.
- SY 2013-14 Formalize transition plans, curriculum alignment plans; provide professional development to support transition. Begin planned implementation. Review assessment claims and targets.

NEXT GENERATION SCIENCE STANDARDS

Proposed/Possible NGSS Assessment Timeline

- SY 2014-15 and 2015-16 Continue planned implementation; provide professional development to support transition. Develop model formative and summative assessment tools and performance tasks.
- SY 2016-17 Full K-12 implementation; first realistic opportunity for full state-level assessment of new standards.
- Assessment could begin to focus on portions of NGSS on earlier assessments based on transition plan.

For More Information

Next Generation Science Standards website
http://www.nextgenscience.org/

Common Core State Standards Initiative website
www.corestandards.org

Michigan's Mission Possible: Get ALL Adolescents Literate and Learning
http://www.missionliteracy.com/

NEXT GENERATION SCIENCE STANDARDS

Questions?

?

NEXT GENERATION SCIENCE STANDARDS

What's next?

BREAK TIME!

(15 minutes)

Performance Expectations

Shayna had a small bottle of Bromine gas. The bottle was closed with a cork. She tied a string to the cork, and then placed the bottle inside a larger bottle. She sealed the large bottle shut (Figure 1). Next, Shayna opened the small bottle by pulling the string connected to the cork. Figure 2 shows what happened after the cork of the small bottle was opened.

1. Draw a model that shows what is happening in this experiment.
2. Explain in writing what is happening in your model.

Figure 1

Figure 2

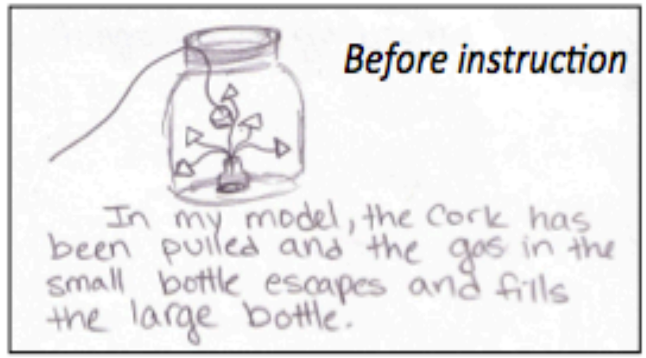
NEXT GENERATION SCIENCE STANDARDS

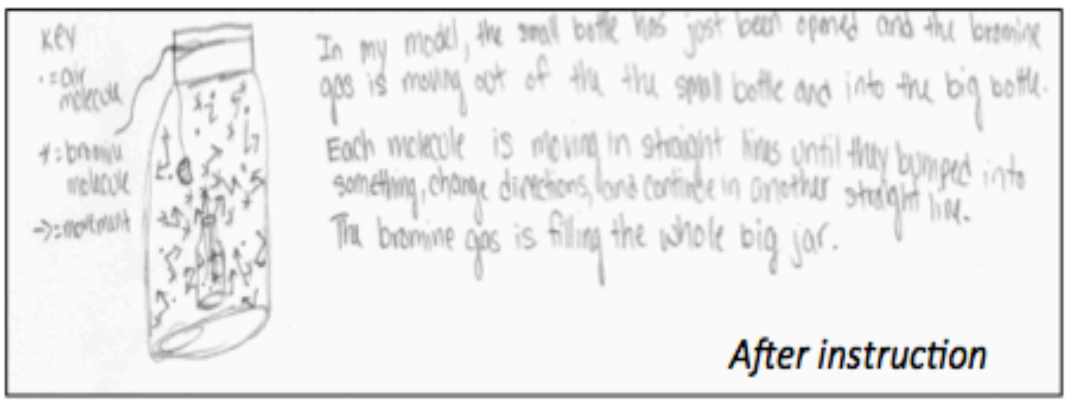
Performance Expectations

Example modeling responses

Figure 1

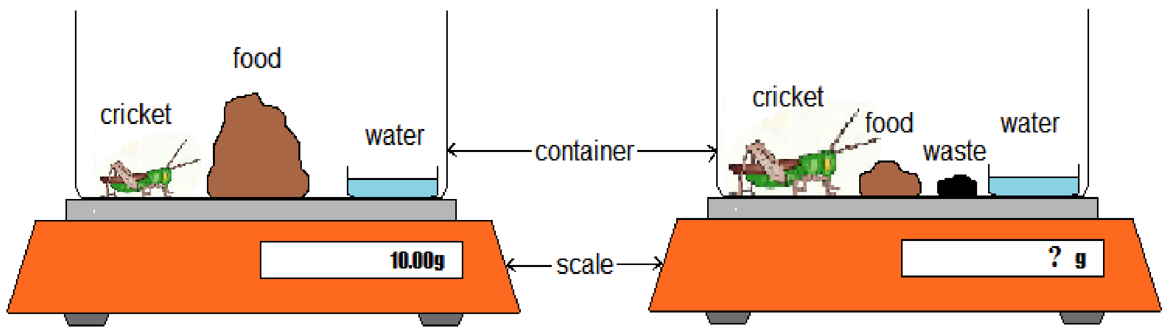
Figure 2





What Might Assessment Look Like? Pretest Question

1. The following is an experiment regarding animal growth.



Before

After

What is your prediction of the outcome of this experiment? Suppose we put a cricket in a container with plenty of food and make sure that it always has the same amount of water. Nothing can get in or out of the container except gases and water vapour. At the beginning of the experiment, the container with cricket, water, and food weighs exactly 10 g.

At the end of the experiment, the cricket has eaten some of the food and gotten bigger. Some of the cricket's waste (feces or poop) is also in the container. How much would you expect the container (with cricket, food, water, and waste) to weigh?

a. More than 10 g.
b. Still exactly 10 g.
c. Less than 10 g.

Explain the reason for your prediction.

NEXT GENERATION SCIENCE STANDARDS

Pretest Question

2. When a girl breathes, she breathes in air that has more oxygen, and she breathes out air that has more carbon dioxide. Where in her body does the carbon dioxide come from? Answer True or False.

True False Some of the carbon dioxide comes from the girl's LUNGS.

True False Some of the carbon dioxide comes from the girl's HANDS.

True False Some of the carbon dioxide comes from the girl's BRAIN.

Explain how the carbon dioxide is produced in the girl's lungs, hands, and/or brain. Explain where the carbon atoms in the carbon dioxide come from if you can.

NEXT GENERATION SCIENCE STANDARDS

Sample Activity – Investigating Mealworms Eating Food (Thanks to Andy Anderson!)

- What happens when mealworms eat food?
- Prediction
- Data Analysis

NEXT GENERATION SCIENCE STANDARDS

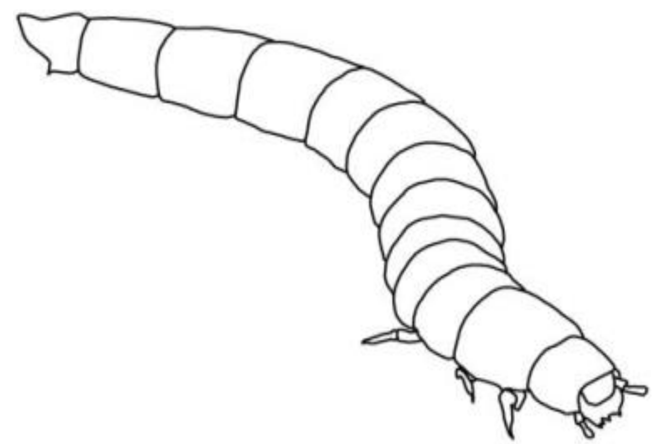
Making Predictions

Predicting mass changes

- What materials will gain and lose mass when mealworms grow and move?
- How are the mass changes connected with The Movement Question: Where are atoms moving?
- Use arrows on the worksheet to show your ideas

Predicting BTB changes

- How will mealworms growing and moving change BTB?
- How are the BTB changes connected to The Carbon Question: What is happening to carbon atoms?
- Explain your ideas on the worksheet.



NEXT GENERATION SCIENCE STANDARDS

Planning the Investigation

- How will you measure mass changes?
- How will you observe changes in the color of BTB?

Let’s do the investigation!

- What mass changes do you observe?
- What changes in BTB do you observe?

NEXT GENERATION SCIENCE STANDARDS

Comparing Group Results

Results for mass changes

- What patterns are there in measurements made by all the groups?
- Do the patterns match your predictions?

Results for BTB changes

- What patterns are there in observations made by all the groups?
- Do the patterns match your predictions?

BTB Results for Ms. Angle's Class

Day 1	Day 2
start BTB color	**end BTB color**
green	yellow
green	yellow
green	yellow
green	yellow
green	yellow
green	yellow

How do your results compare with the results from Ms. Angle's Class?

Weight Results for Ms. Angle's Class

Initial Mass Potato (g)	Initial Mass Worms (g)	Final Mass Potato (g)	Final Mass Worms (g)	Change in Potato Mass (g)	Change In Worm Mass (g)
10.58	15.87	10.10	16.07	-0.48	0.20
9.87	16.61	9.35	17.05	-0.52	0.44
11.57	15.41	10.94	15.65	-0.63	0.24
9.35	17.05	8.89	17.35	-0.46	0.30
13.59	14.77	12.88	15.01	-0.71	0.24
9.20	14.50	8.79	14.99	-0.41	0.49
Average change in weight =				**-0.54**	**+0.32**

How do your results compare with the results for Ms. Angle's class?

Explaining Group Results

Explaining results for mass changes

- How are the mass changes connected with The Movement Question: Where are atoms moving?
- What **unanswered** questions do you have?

Explaining results for BTB changes

- How are the BTB questions connected to The Carbon Question: What is happening to carbon atoms?
- What **unanswered** questions do you have?

- What did we learn about the Chemical Energy Question?
- What **unanswered** questions do you have?

NEXT GENERATION SCIENCE STANDARDS

NGSS Alignment

DCI	CCC	SEP
MS.Matter and Energy in Organisms and Ecosystems MS-LS1.C MS-LS2.A MS-LS2.B PS.3.D HS.Matter and Energy in Organisms and Ecosystems HS.LS1.C HS.LS2.B	MS.Matter and Energy in Organisms and Ecosystems Cause and Effect Energy and Matter HS.Matter and Energy in Organisms and Ecosystems Systems and Systems Models Energy and Matter	MS./ HS. Matter and Energy in Organisms and Ecosystems Asking Questions and Defining Problems Developing and Using Models Planning and Carrying Out Investigations Analyzing and Interpreting Data Constructing Explanations and Designing Solutions Engaging in Argument from Evidence

Pretest:

In which direction will I spin when I flip-over the spinning tire?

a) in the same direction that the tire was spinning before it was flipped

b) in the opposite direction that the tire was spinning before it was flipped

c) I will not spin.

d) I will not spin, but I will flip-over onto my head.

NEXT GENERATION SCIENCE STANDARDS

Lesson:

In the absence of external torques,
the total angular momentum
of an isolated system
is conserved.

Posttest:

In which direction will I spin when I flip-over the spinning tire?

a) in the same direction that the tire was spinning before it was flipped

b) in the opposite direction that the tire was spinning before it was flipped

c) I will not spin.

d) I will not spin, but I will flip-over onto my head.

Sample Activity – "Systems and Scale" Powers of Ten

- How many of you have ever heard the term "system"? In what context was the term used?
  - Examples?

NEXT GENERATION SCIENCE STANDARDS

– "Systems and Scale" Powers of Ten

- How many of you have ever heard the term "scale"? In what context was that term used?
  - Examples?

Sample Activity – "Systems and Scales"

- We are going to construct a model that will illustrate the concepts of systems and scales.
  - Strip of adding machine tape
  - Poster putty or tape
  - Meter stick
  - Cards of everyday items
  - Instructions:
    - Affix your strip to the wall with tape
    - Using a marker, make a mark every 10 cm
    - Label your marks from 10^{-10} to 10^{5}
    - Working with a group, place the items in your pack at the approximate places they belong based on size. Use poster putty.

NEXT GENERATION SCIENCE STANDARDS

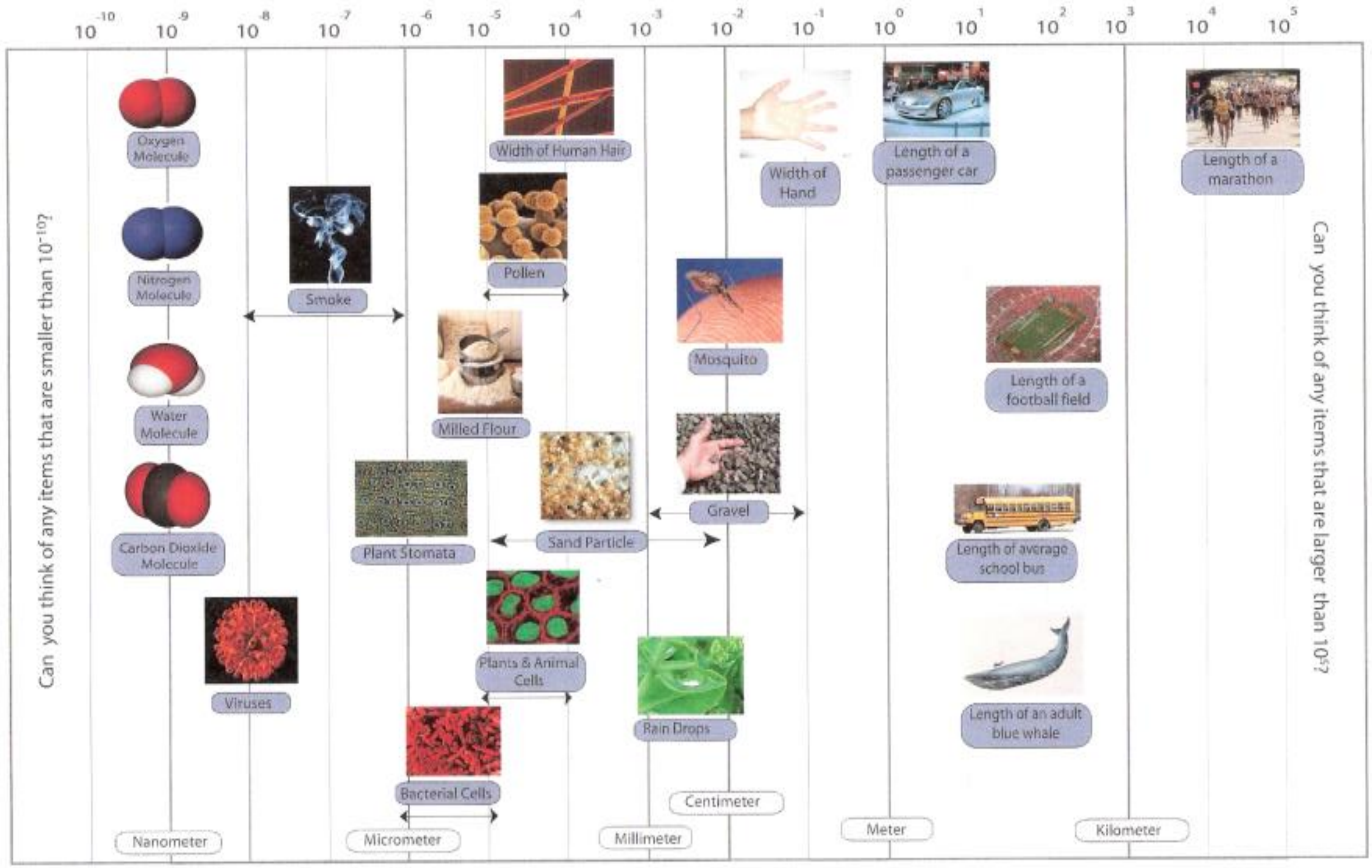
Sample Activity – "Systems and Scale"

- Compare group results
- Are some items easier to locate on the scale than others? Why do you think that's so?
  - Where on the scale would you show the boundary at which items change from large-scale (so big you can't see them all at once) to macroscopic (able to be seen in its entirety)
  - Between macroscopic and microscopic?
  - Between microscopic and atomic/molecular?

NEXT GENERATION SCIENCE STANDARDS

Comparing Powers of Ten

(Measures in Meters)



STANDARDS

NGSS Alignment – "Systems and Scales"

DCI	CCC	SEP
Storylines in Grades 3,5, MS, HS Structure and Properties of Matter Earth Systems Space Systems Structure and Function of Ecosystems	Systems and Systems Models Scale Proportion and Quantity	Asking Questions and Defining Problems Developing and Using Models Planning and Carrying Out Investigations Analyzing and Interpreting Data Constructing Explanations and Designing Solutions Engaging in Argument from Evidence

Group Activity

- Assemble in Grade Groups
- Examine a “Sample” Standard
- Discuss the following questions:
  - What do students need to know in preparation for this set of standards?
  - What do you already do that supports the disciplinary core ideas?
  - What do teachers need to do to prep for these performance expectations?
  - How might students demonstrate mastery of these performance expectations?

NEXT GENERATION SCIENCE STANDARDS