Please sit by those that teach the same grade/topic you teach

- Look for signs on each of the tables ☺

Next Generation Science Standards

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KEEP
CALM
AND
TEACH
ON

Current update

- NGSS is on the agenda for an upcoming meeting of the State Board of Education
- All signs say it is a “go”

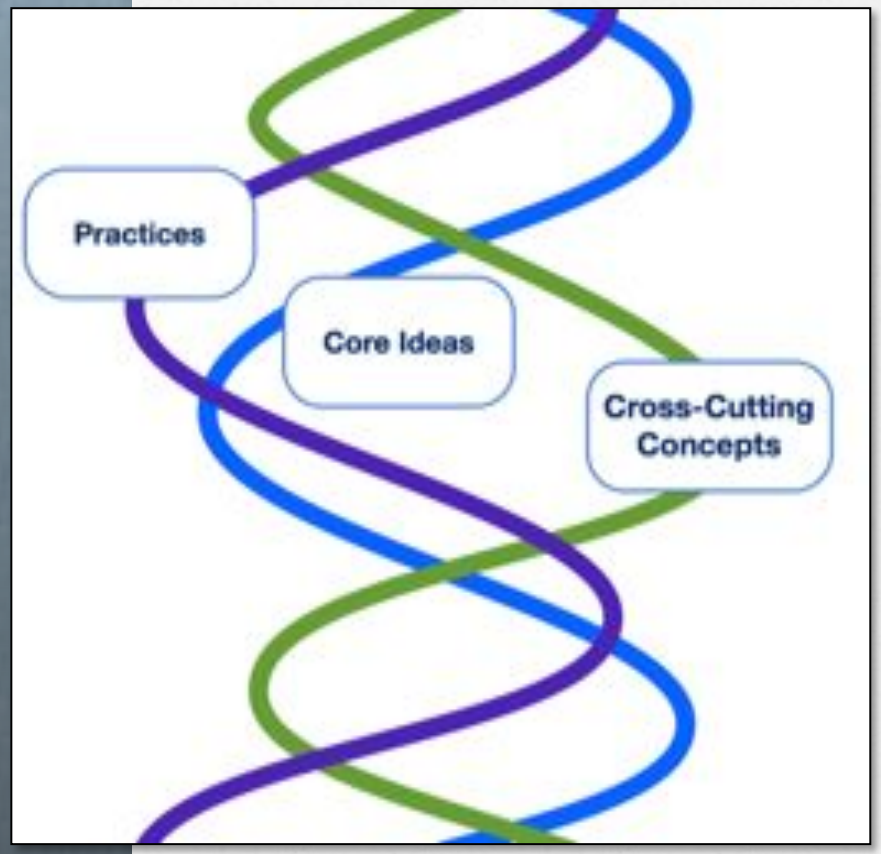
So what does that mean for me?

- The next two years will be transitional (possibly longer)…everything takes longer than expected.
- The assessments wouldn't be ready for a little while.
- This gives us time to be patient and deliberate and really think about implementation.

Battle Creek Math Science Kits for K-7

- BCMSC will be adapting the kits and they will provide training on them.

Three Dimensions Intertwined



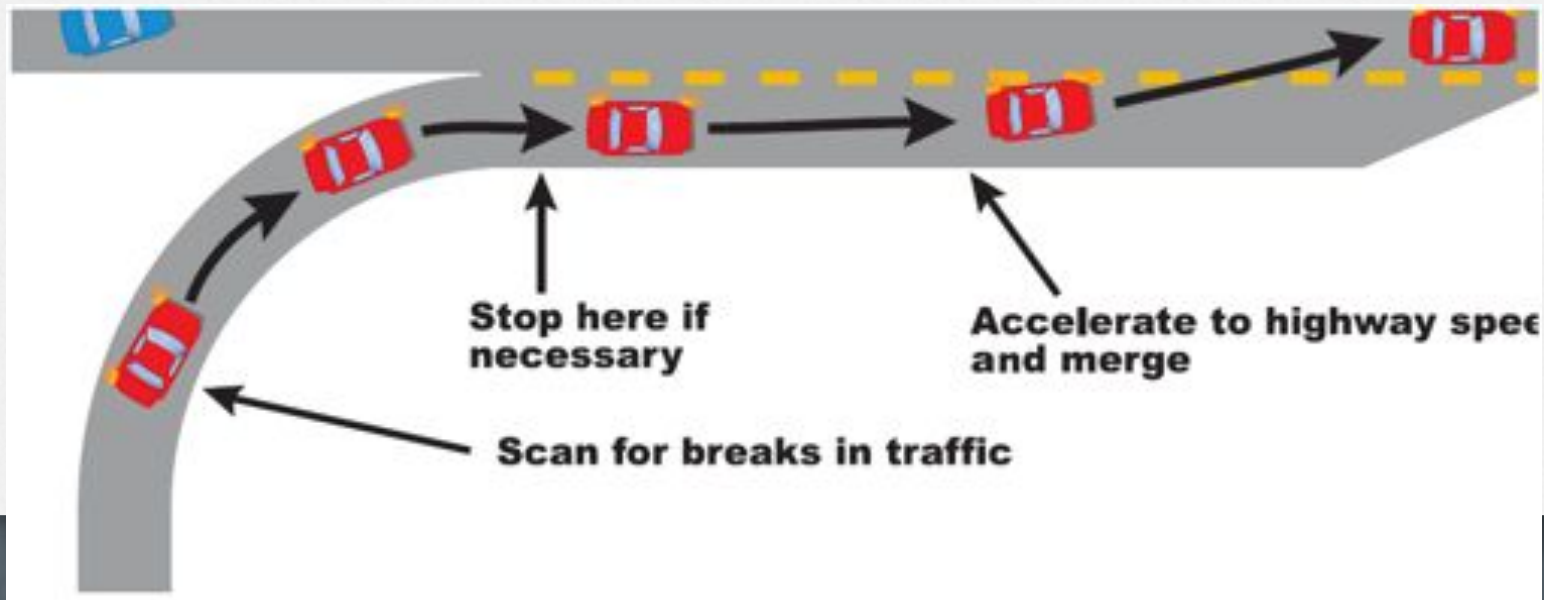
- The NGSS are written as Performance Expectations
- NGSS will require contextual application of the three dimensions by students.

NEXT GENERATION SCIENCE STANDARDS
For States, By States

MICHIGAN Department of Education

Starting with the Practices

- Now is the time to start thinking about including more of the practices in your teaching so you can "merge" with the NGSS in a slow, comfortable way.



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

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Now is the time to think…

- What am I already doing?
- What do these look like in my classroom?

- Walk around to each of the large posters around the room, and add a sticky note that says how (or if) you are currently doing each of the practices.

Adapting by Grade Level

- For each of the practices, NGSS offers specific suggestions for K-2, 3-5, 6-8, and 9-12.
- Many of the practices change as the ma skills grow more sophisticated.

Asking questions (science) and defining problems (engineering)

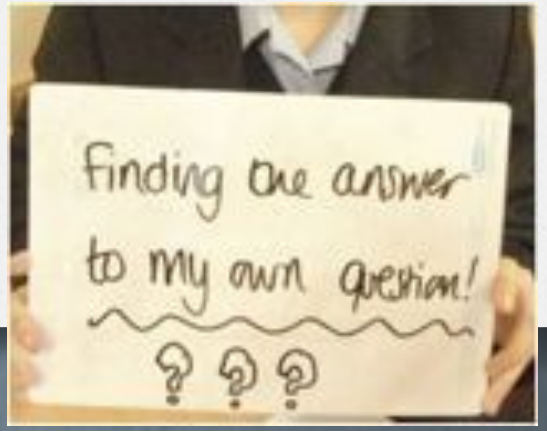
- Answers to questions are supported by empirical evidence
- Students at any grade level should be able to ask questions of each other about:
  - the text they read,
  - their observations, and
  - the conclusions they draw from their models or scientific investigations.
- Questions lead to other practices
- For engineering, they should ask questions to
  - define the problem to be solved and
  - to elicit ideas that lead to the constraints and specifications

Developing and using models

- Modeling can begin in the earliest grades, with students' models progressing
  - concrete "pictures" and/or physical scale models (e.g., a toy car)
  - more abstract representations of relevant relationships in later grades, such as a diagram representing forces on a particular object in a system. (NRC Framework, 2012, p. 58)

Planning and carrying out investigations

- Students should have opportunities to plan and carry out several different kinds of investigations during their K-12 years.
  - Investigations structured by the teacher
  - Investigations that emerge from students' own questions. (NRC Framework, 2012, p. 61)



Analyzing and interpreting data

- Presenting and analyzing data
  to help reveal any patterns and relationships and that allows results to be communicated to others.
- Organize and interpret data through tabulating, graphing, or statistical analysis.
- Bringing out the meaning of data—and their relevance—so that they may be used as evidence. (NRC Framework, 2012, p. 61-62)

Using mathematical and computational thinking

- Students use mathematics to represent physical variables and their relationships, and to make quantitative predictions.
  - Use computers and digital laboratory tools
  - Approximate solutions
  - Identify meaningful patterns
  - Observing, measuring, recording, and processing data.
  - Using and developing new simulations
  - "Mathematics is a tool that is key to understanding

Constructing explanations (science) and designing solutions (engineering)

- Construct explanations that show relationships between variables
- Demonstrate understanding by developing their own explanations of phenomena
  - based on observations they have made or models they have developed,
  - engages them in an essential part of the process by which conceptual change can occur.
- In engineering, the goal is a design rather than an explanation. The design shows a systematic process of defining a problem, then testing and improving solutions. (NRC Framework, 2012, p. 68-69)

Engaging in argument from evidence

- Students are expected to listen to, compare and evaluate competing ideas and methods based on scientific merits
- In that spirit, students should argue for the
  explanations they construct,
  defend their interpretations of the
  associated data, and
  advocate for the designs
  they propose.

(NRC Framework, 2012, p. 73)

Obtaining, evaluating, and communicating information

- Any education in science and engineering needs to develop students' ability to read and produce domain-specific text.
- Requires the ability to
  - Read, interpret and produce scientific / technical text
  - Become a critical consumer of science information
  - Recognize ideas, sources of error, inference
  - Ability to communicate information accurately

    (NRC Framework, 2012, p. 76)

Let's try it…

Adapting your lesson activity…

- Take a lesson you already use in the classroom.
- Highlight some places where you can add in or change things to include some of these practices.
- Which of the practices are you already doing in this lesson?

- Do your own, and then share with a neighbor

Which of the practices…

- Which practices do you feel pretty comfortable with?
- Which practices are you already doing?
- Which practices make you uncomfortable?
- Which practices would require more help/ professional development to fit in?


Questions, comments, concerns?

www.nextgenscience.org

Web Access to All NGSS Documents