NGSS Look-Fors for Secondary Administrators

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Where we were….. 2009 Science Standards- Motion and Forces

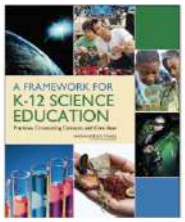
MS. Identify and describe types of motion and forces qualitatively to the laws of motion and gravitation

HS. Apply the laws of motion and gravitation to describe the interaction of forces acting on an object and the resultant motion.

Take a look at NGSS Performance Expectations for Motion and Stability: Interactions and Forces

- What do you notice?

A Framework for K-12 Education



Three-Dimensions:

- **Scientific and Engineering Practices**
- **Crosscutting Concepts**
- **Disciplinary Core Ideas**

Scientific and Engineering Practices

1. Asking questions (for science) and defining problems (for engineering)
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 (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

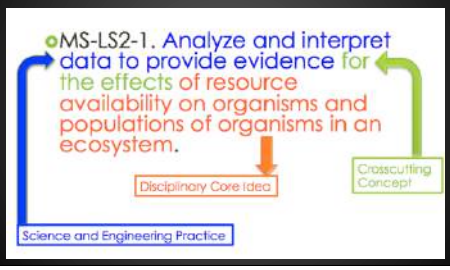
Cross Cutting Concepts

1. Patterns
2. Cause and effect: Mechanism and explanation
3. Scale, proportion, and quantity
4. Systems and system models
5. Energy and matter: Flows, cycles, and conservation
6. Structure and function
7. Stability and change

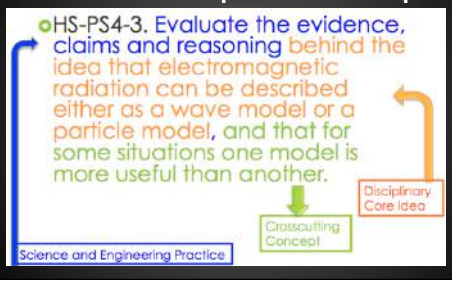
Disciplinary Core Ideas

Life Science	Physical Science
LS1: From Molecules to Organisms: Structures and Processes	PS1: Matter and Its Interactions
LS2: Ecosystems: Interactions, Energy, and Dynamics	PS2: Motion and Stability: Forces and Interactions
LS3: Heredity: Inheritance and Variation of Traits	PS3: Energy
LS4: Biological Evolution: Unity and Diversity	PS4: Waves and Their Applications in Technologies for Information Transfer
Earth & Space Science	**Engineering & Technology**
ESS1: Earth's Place in the Universe	ETS1: Engineering Design
ESS2: Earth's Systems	ETS2: Links Among Engineering, Technology, Science, and Society
ESS3: Earth and Human Activity	

A MS Performance Expectation Example



A HS Performance Expectation Example



In the MS PEs that you have:

Look at MS-PS2-1: Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.

- What is the Scientific Practice?
- What is the Disciplinary Core Idea?
- What is the Cross-cutting Concept?

In the MS PEs that you have

Look at MS-PS2-1: Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.

- What is the Scientific Practice?
- What is the Disciplinary Core Idea?
- What is the Cross-cutting Concept?

In the HS PEs that you have:

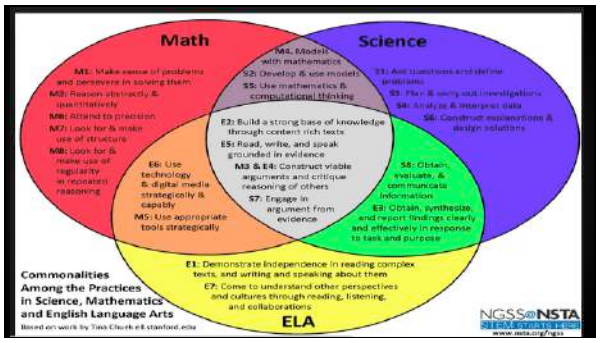
Look at HS-PS2-5: Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.

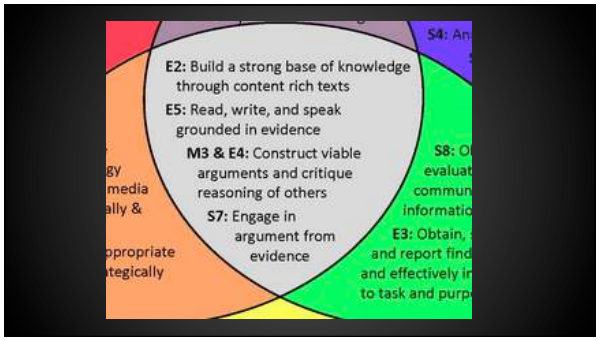
- What is the Scientific Practice?
- What is the Disciplinary Core Idea?
- What is the Cross-Cutting Concept?

In the HS PEs that you have:

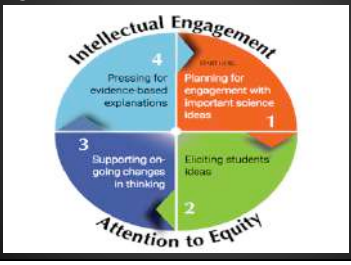
Look at HS-PS2-5: Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.

- What is the Scientific Practice?
- What is the Disciplinary Core Idea?
- What is the Cross-Cutting Concept?



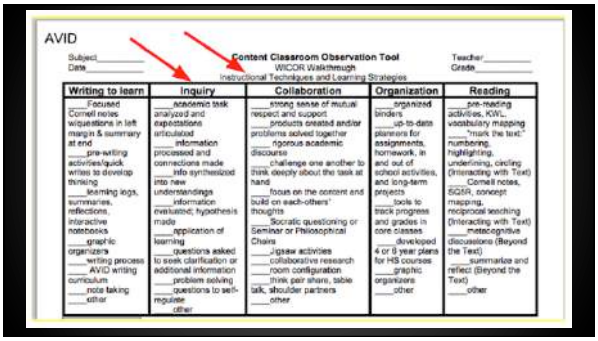


So what should you being looking for in your classrooms?



Intersecting with other district initiatives

We have already talked about commonalities with Common Core, what about AVID?



Using the AVID WICOR tool you will make observations of the instructional techniques and learning strategies in the following science classrooms

Life science:
Supporting ongoing changes in student thinking

Life science:
Using evidence to revise models

We are going to watch a video clip of secondary classrooms teaching NGSS

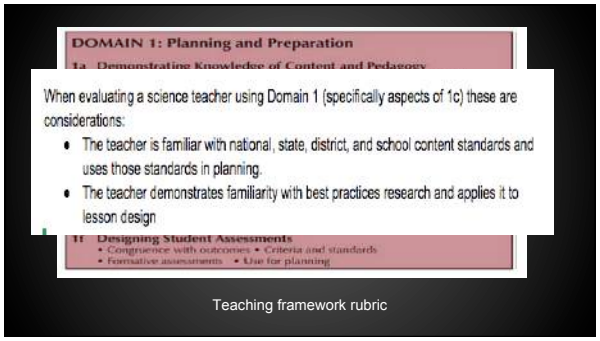
What do you notice?

- What is the teacher doing and saying?
- What are the students doing and saying?

"sense making talk" around investigations / Middle school

Teacher Evaluation

- Many different ways this is done in Oregon
- Let's look at just one
  - The Danielson Model - Effective Teaching Practices



Teaching framework rubric

DOMAIN 3: Instruction

3a Communicating With Students
• Expectations for learning • Directions and procedures
• Explanations of content

When evaluating a science teacher using Domain 3 (specifically aspects of 3a & 3c) the following is a consideration:

- The teacher is organized, knows the required learning targets (performance expectations in the case of NGSS) and effectively communicates objectives to students.

• Feedback to students
• Student self-assessment and monitoring

3e Demonstrating Flexibility and Responsiveness
• Lesson adjustment • Response to students
• Persistence

DOMAIN 4: Professional Responsibilities

When evaluating a science teacher using Domain 4 (specifically aspects of 4d & 4e) these are considerations:

- The teacher supports building and district instructional priorities through increased knowledge and changes in teaching practices.
- The teacher contributes to the professional community through involvement in projects and activities that require collaboration.
- The teacher pursues professional growth opportunities to learn about and apply best practices for facilitating student learning.

• Receptivity to feedback from colleagues • Service to the profession

4f Showing Professionalism
• Integrity/ethical conduct • Service to students • Advocacy
• Decision-making • Compliance with school/district regulation

Using the evaluation system we just shared..

Let's see how the teacher in this video does for one domain - Domain 3: Instruction.

What do you notice?

Developing and revising models / High school Physical Science Class

Why does instruction need to change?

Because what we want students to be able to do is changing….

- Let's look at a sample NGSS classroom assessment for middle school - Ocean Waves
- What do you notice?

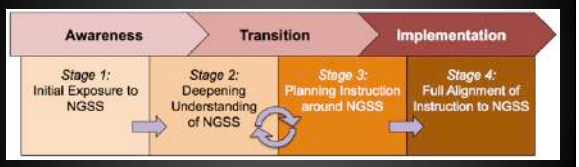
Date for new ODE NGSS assessment

- Moved up a year to 2017-2018
- A year earlier than recommended by the Science Content Panel

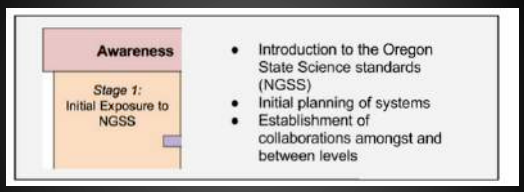
A classroom will look significantly different when teachers are teaching NGSS than a traditional methodology.

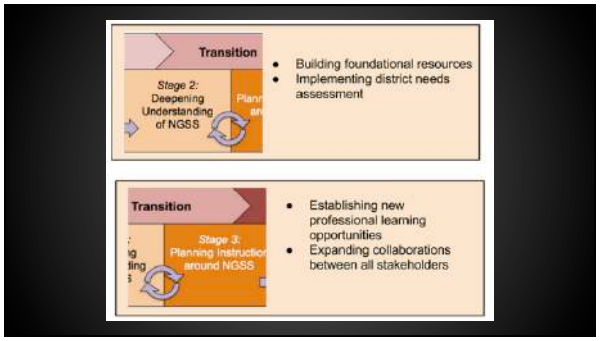
Administrators need to be able to recognize those shifts and support teachers so they can make those shifts.

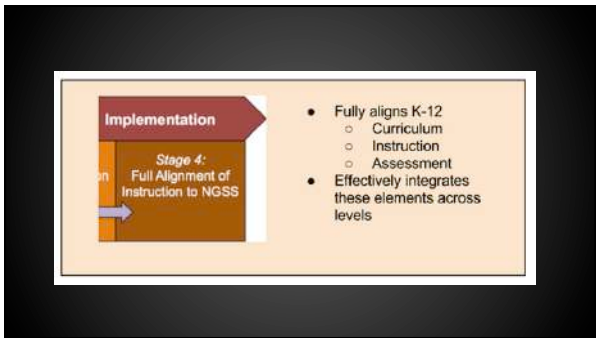
The shift will not happen all at once

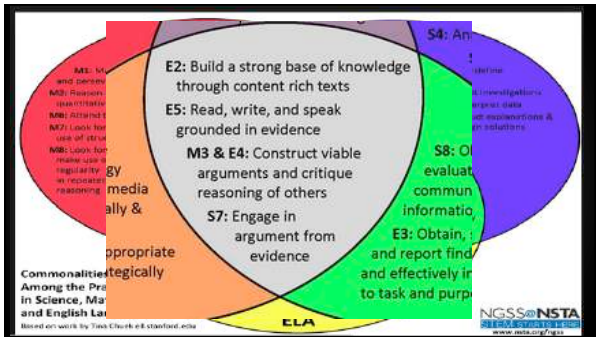


NGSS Implementation pathway model:
https://sites.google.com/site/ngsssd/home/ngss-implementation-pathway




Transition
Stage 2: Deepening Understanding of NGSS
Building foundational resources
Implementing district needs assessment
Transition
Stage 3: Planning instruction around NGSS
Establishing new professional learning opportunities
Expanding collaborations between all stakeholders


Implementation
Stage 4: Full Alignment of Instruction to NGSS
Fully aligns K-12
Curriculum
Instruction
Assessment
Effectively integrates these elements across levels


E2: Build a strong base of knowledge through content rich texts
E5: Read, write, and speak grounded in evidence
M3 & E4: Construct viable arguments and critique reasoning of others
S7: Engage in argument from evidence
S4: An
S8: Ob
E3: Obtain,
and report find
and effectively in
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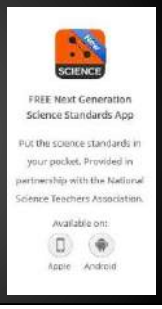
NGSSNSTA

Resources

- NGSS Performance Expectations
- NGSS Classroom Tasks
- Ambitious Science Teaching



Questions