

## NGSS Look-Fors for Secondary Administrators

Dr. Susan Holveck - Secondary Science TOSA, President-elect OSTA  
Britten Clark-Huyck - Science teacher / Corvallis High School, OSTA Region  
2 board member

---

---

---

---

---

---

---

---

### 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?

---

---

---

---

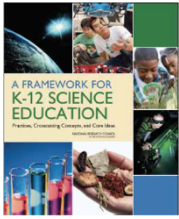
---

---

---

---

## 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	

---

---

---

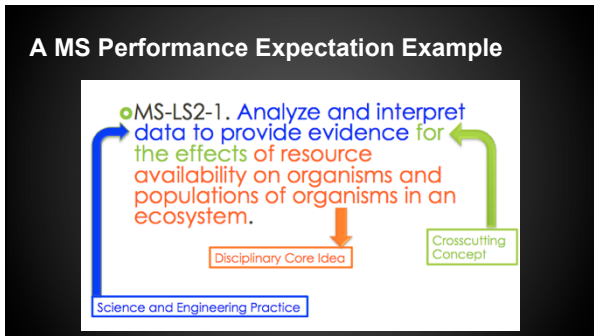
---

---

---

---

---



---

---

---

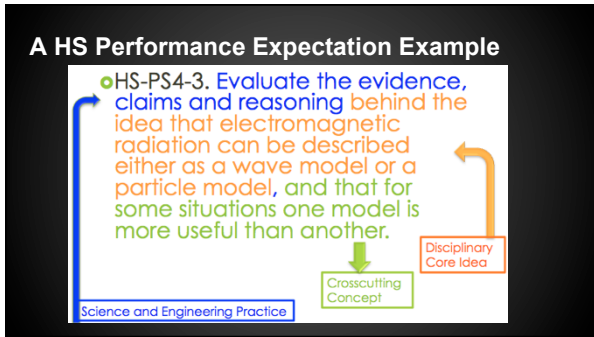
---

---

---

---

---



---

---

---

---

---

---

---

---

**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?

---

---

---

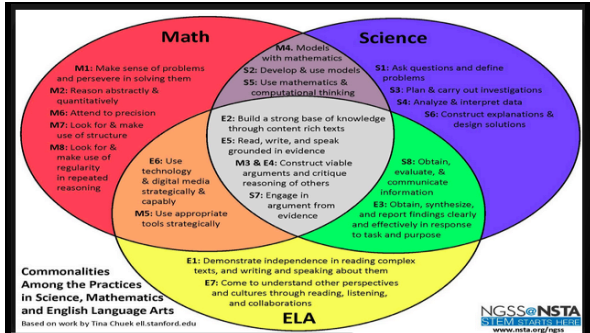
---

---

---

---

---




---

---

---

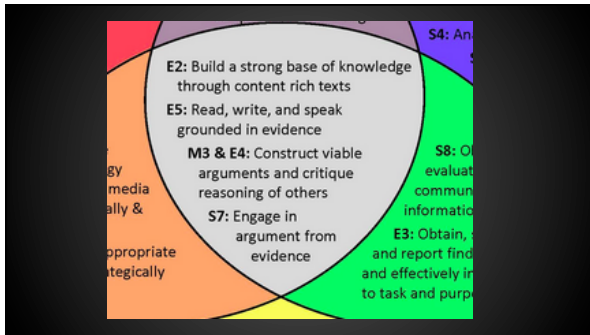
---

---

---

---

---




---

---

---

---

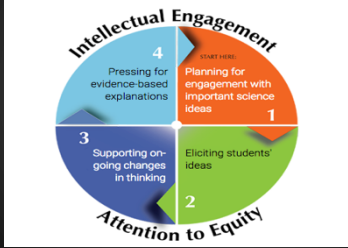
---

---

---

---

So what should you be looking for in your classrooms?




---

---

---

---

---

---

---

---

Intersecting with other district initiatives

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




---

---

---

---

---

---

---

---

AVID

Subject \_\_\_\_\_ Date \_\_\_\_\_ Teacher \_\_\_\_\_ Grade \_\_\_\_\_

Content Classroom Observation Tool  
WICOR Walkthrough  
Instructional Techniques and Learning Strategies

Writing to learn	Inquiry	Collaboration	Organization	Reading
<input type="checkbox"/> Focused <input type="checkbox"/> Cornell notes <input type="checkbox"/> w/questions in left margin & summary at end <input type="checkbox"/> pre-writing activities/quick writes to develop thinking <input type="checkbox"/> learning logs, summaries, reflections, interactive notebooks <input type="checkbox"/> graphic organizers <input type="checkbox"/> writing process <input type="checkbox"/> AVID writing curriculum <input type="checkbox"/> note taking <input type="checkbox"/> other	<input type="checkbox"/> academic task analyzed and expectations articulated <input type="checkbox"/> information processed and connections made <input type="checkbox"/> info synthesized into new understandings <input type="checkbox"/> information evaluated; hypothesis made <input type="checkbox"/> application of learning <input type="checkbox"/> questions asked to seek clarification or additional information <input type="checkbox"/> problem solving <input type="checkbox"/> questions to self-regulate <input type="checkbox"/> other	<input type="checkbox"/> strong sense of mutual respect and support <input type="checkbox"/> products created and/or problems solved together <input type="checkbox"/> rigorous academic discourse <input type="checkbox"/> challenge one another to think deeply about the task at hand <input type="checkbox"/> focus on the content and build on each other's thoughts <input type="checkbox"/> Socratic questioning or Seminar or Philosophical Chairs <input type="checkbox"/> jigsaw activities <input type="checkbox"/> collaborative research <input type="checkbox"/> room configuration <input type="checkbox"/> think pair share, table talk, shoulder partners <input type="checkbox"/> other	<input type="checkbox"/> organized binders <input type="checkbox"/> up-to-date planners for assignments, homework, in and out of school activities, and long-term projects <input type="checkbox"/> tools to track progress and grades in core classes <input type="checkbox"/> developed 4 or 6 year plans for HS courses <input type="checkbox"/> graphic organizers <input type="checkbox"/> other	<input type="checkbox"/> pre-reading activities, KWL, vocabulary mapping <input type="checkbox"/> "mark the text;" numbering, highlighting, underlining, circling (Interacting with Text) <input type="checkbox"/> Cornell notes, SQ3R, concept mapping, reciprocal teaching (Interacting with Text) <input type="checkbox"/> metacognitive discussions (Beyond the Text) <input type="checkbox"/> summarize and reflect (Beyond the Text) <input type="checkbox"/> other

---

---

---

---

---

---

---

---

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?

Observation Form	
Teacher: _____	
Student(s): _____	
What is the teacher doing and saying?	What are the students doing and saying?

---

---

---

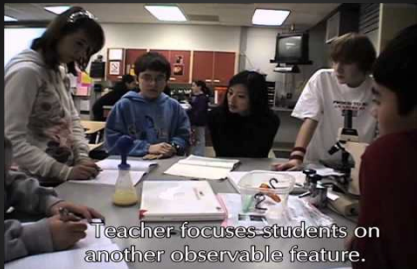
---

---

---

---

---



Teacher focuses students on another observable feature.

"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

---

---

---

---

---

---

---

---

---

---

---

---

<b>DOMAIN 1: Planning and Preparation</b> <b>1a Demonstrating Knowledge of Content and Pedagogy</b> • Content knowledge • Pedagogical relationships • Content pedagogy <b>1b Demonstrating Knowledge of Students</b> • Child development • Learning process • Special needs • Student skills, knowledge and preferences • Learning and cultural heritage <b>1c Setting Instructional Outcomes</b> • Feasibility for student learning • For classroom • To extend content knowledge • For students <b>1d Designing Coherent Instruction</b> • Learning activities • Instructional materials and resources • Instructional groups <b>1e Designing Student Assessments</b> • Congruence with outcomes • Criteria and standards • Formative assessments • Use for planning	<b>DOMAIN 2: The Classroom Environment</b> <b>2a Creating an Environment of Respect and Rapport</b> • Teacher interaction with students • Student interaction with students <b>2b Establishing a Culture for Learning</b> • Expectations for learning and achievement • Student pride in work • Appearance of content <b>2c Managing Classroom Procedures</b> • Expectations for learning and achievement • Student pride in work • Instructional groups • Resources • Materials and supplies • Time management skills <b>2d Managing Student Behavior</b> • Supervision of classroom and paraprofessionals • Expectations • Monitoring behavior • Response to misbehavior <b>2e Organizing Physical Space</b> • Safe and comfortable • Management of materials and resources
<b>DOMAIN 4: Professional Responsibilities</b> <b>4a Reflecting on Teaching</b> • Accuracy • Use to inform teaching <b>4b Maintaining Accurate Records</b> • Student completion of assignments • Student progress in learning • Non-instructional records <b>4c Communicating with Families</b> • About instructional program • About individual students • Equipment of teacher in instructional program <b>4d Participating in a Professional Community</b> • Participation in school or district • Participation in school projects • Attendance at activities of professional nature • Service to school <b>4e Growing and Developing Professionally</b> • Advancement of content knowledge • Pedagogical skill • Responsiveness to feedback from colleagues • Service to the profession <b>4f Showing Professionalism</b> • Congruence with outcomes • Service to students • Advocacy • Decision making • Compliance with educational regulation	<b>DOMAIN 3: Instruction</b> <b>3a Communicating With Students</b> • Expectations for learning • Clarity and precision • Explanation of content • Oral and/or written language <b>3b Using Questioning and Discussion Techniques</b> • Student participation • Discussion techniques • Student participation <b>3c Engaging Students in Learning</b> • Activities and assignments • Student groups • Instructional materials and resources • Structure and pacing <b>3d Using Assessment in Instruction</b> • Assessment criteria • Monitoring of student learning • Feedback to students • Student self-assessment and monitoring <b>3e Demonstrating Flexibility and Responsiveness</b> • Lesson adjustments • Response to students • Persistence

---

---

---

---

---

---

---

---

---

---

---

---

**DOMAIN 1: Planning and Preparation**  
**1a Demonstrating Knowledge of Content and Pedagogy**

When evaluating a science teacher using Domain 1 (specifically aspects of 1c) these are considerations:

- The teacher is familiar with national, state, district, and school content standards and uses those standards in planning.
- The teacher demonstrates familiarity with best practices research and applies it to lesson design

**1c Designing Student Assessments**  
 • Congruence with outcomes • Criteria and standards  
 • Formative assessments • Use for planning

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.

**3e Demonstrating Flexibility and Responsiveness**

- Feedback to students
- Student self assessment and monitoring
- 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.

**4f Showing Professionalism**

- Receptivity to feedback from colleagues
- Service to the profession
- 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?

**3a Using Questioning and Discussion Techniques**

Look For:

- Quality of questions
- Student responses
- Student participation

What do you observe/teacher doing?

---

**3e Helping Students on Learning**

Look For:

- Feedback and engagement
- Student progress
- Student self-assessment
- Lesson adjustment
- Persistence and energy

What do you observe/teacher doing?

---

---

---

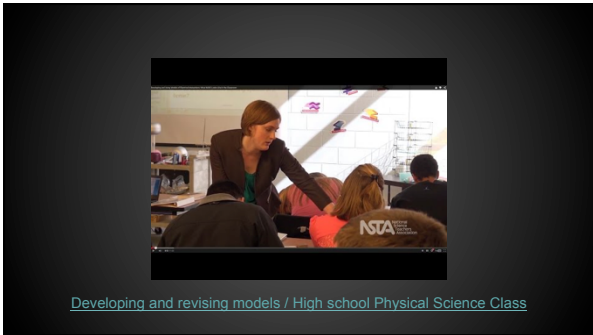
---

---

---

---

---



---

---

---

---

---

---

---

---

**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

---

---

---

---

---

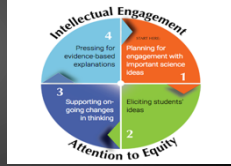
---

---

---

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.




---

---

---

---

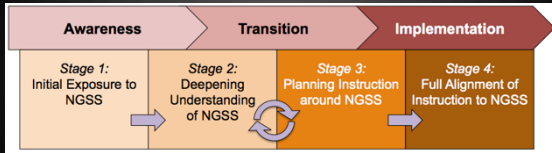
---

---

---

---

### The shift will not happen all at once



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

---

---

---

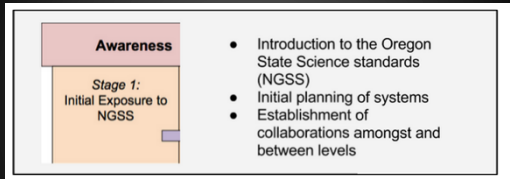
---

---

---

---

---




---

---

---

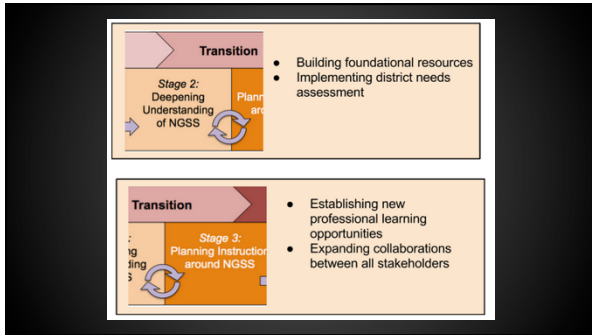
---

---

---

---

---




---

---

---

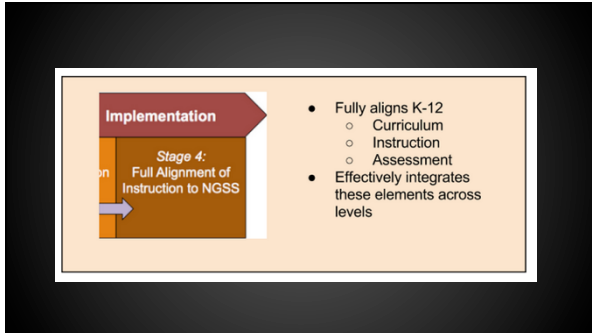
---

---

---

---

---




---

---

---

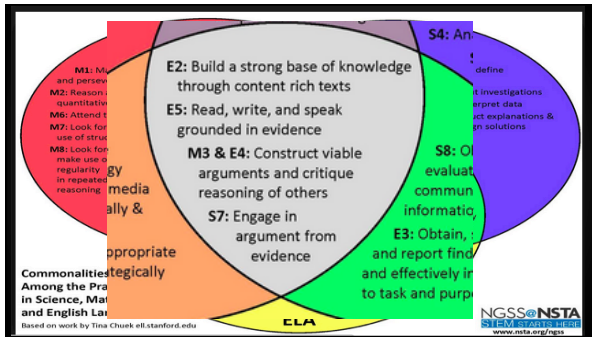
---

---

---

---

---




---

---

---

---

---


---

---

---

## Resources



- [NGSS Performance Expectations](#)
- [NGSS Classroom Tasks](#)
- [Ambitious Science Teaching](#)



FREE Next Generation Science Standards App

Put the science standards in your pocket. Provided in partnership with the National Science Teachers Association.

Available on:



Apple Android

---

---

---

---

---

---

---

## Questions



---

---

---

---

---

---

---