

NGSS Interim Assessments

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Session Outline

- How the assessments should support the vision and key shifts of NGSS and CT's proposed NGSS assessment system
- 3-D Interim Assessments Guided by Coherence, Shared Models of Learning, and Attention to Equity STEM Teaching Tool Micro-Dive
- Our Key Takeaways Important in our Learning about Interim Assessment
- Statewide Initiatives to Support Interim Assessment
- Example of Interim Assessments Embedded in Secondary (Grade 7) Curriculum
- Example of Interim Assessments Embedded in Elementary (Grades PreK-6) Curriculum



NGSS Assessments: Supporting the Vision and Key Shifts

- Less memorizing of factual knowledge and more sense making
- Use of real-world phenomena that engage students in problem solving
- 3-Dimensional science learning that integrates the SEPs, DCIs and CCCs
- Equitable opportunities for all students



Proposed System of NGSS Assessments

The goal is to provide useful information for a variety of purposes and audiences.

Formative Assessment Resources*: Process used every day by teachers to monitor student learning in the classroom and help make ongoing instructional adjustments to better meet student needs. **VOLUNTARY**

Local Assessment Resources*: Assessment resources, including PD supports, used to support ongoing instruction. Developed from a variety of sources including local CT school districts. **VOLUNTARY**

Interim Assessments*: Assessments administered at the end of units or grades to evaluate the learning of groups of students to inform curriculum and instruction at the local level. **VOLUNTARY**

State Summative Assessments: Assessments given at the end of learning (Grades 5, 8 and 11) to track student performance and inform decisions about curriculum, instruction, professional development, and policy for a variety of stakeholders. **MANDATED BY FEDERAL AND STATE LAW**

Greater frequency of use
More useful to students and teachers



* Formative and local/interim assessment resources will come from a variety of sources and be shared by districts and states around the country.

3-D Interim Assessments Guided by Coherence, Shared Models of Learning, and Attention to Equity STEM Teaching Tool Micro-Dive

Considering the following questions, take 5-7 mins to read the STT:

- What might be most important to think about related to interim assessments?
- What ideas or resources might support your work? How?

Small group discussion/Large group share out

3-D Interim Assessments Guided by Coherence, Shared Models of Learning, and Attention to Equity



What is the Issue?

It is widely recognized that the paradigm shift for science education identified in A Framework for K-12 Science Education necessitates a significant redesign of science assessments if visions of the Framework are to be met. Further, the NGSS writers and assessment experts put forth a vision for assessments that included a range of strategies intended to answer different, but complementary questions for supporting classroom instruction and providing insight into science curriculum and instruction across multiple levels within the educational system (e.g., classroom, district, state). Specifically, a system of NGSS assessments has been proposed that starts from the "bottom up" at the classroom level, potentially integrated into instructional units, to help teachers make ongoing vertically adjustments with the aim of moving toward vertically coherent assessments at the local (e.g., district-level) and state-levels. To date, however, while resources and guidance have begun to emerge to support the development of classroom-level assessments and state collaborative efforts are attending to the need for state-level summative assessments, little emphasis has been placed on interim assessments as a clarification is provided here for how teachers and leaders can think about interim assessments as a valuable part of a more balanced and comprehensive NGSS assessment system. Additionally, strategies for taking advantage of available interim assessment resources are also provided to begin to address this challenge.

Todd Campbell¹, Jonathan Hall,
Peter McLaren, Jeff Greig,
Sean Elkins, John Duffy, Holly Hollander

Why It Matters To You

- Teachers need assessment resources that can provide them insight into the extent to which their instruction is supporting student learning. Interim assessments can provide needed information that can be examined with other teachers and leaders within the same district to support targeted approaches for improving future instruction.
- Local Leaders (school and district), in collaboration with teachers, can use interim assessments to improve instructional or curriculum choices as aggregated data across classrooms and across schools are examined.
- Development of interim assessments might be shared across districts to better leverage scarce resources.
- Results from interim assessments might be incorporated with those from large-scale state assessments to provide better profiles of student learning.

¹ National Research Council. 2014. Developing Assessments for the Next Generation Science Standards. Washington, DC: The National Academies Press. ² National Academies of Sciences, Engineering, and Medicine. 2017. Designing Student Learning Science: Integrating Assessment and Instruction in the Classroom. Washington, DC: The National Academies Press. <https://doi.org/10.17232/conference-2017-0001>.



Our Key Takeaways Important in our Learning about Interim Assessment

- To date, little emphasis has been placed on interim assessments (IAs).
- IAs can provide needed information that can be examined with other teachers and leaders within the same district to support targeted approaches for improving future instruction.
- IAs are common classroom assessments administered by groups of teachers . . . can be used to elicit insight into students' facility with 3Ds in explaining phenomena or solving problems. Can provide information to individual teachers . . . can [also] be meaningfully aggregated to provide information at broader levels.



Our Key Takeaways Important in our Learning about Interim Assessment Cont.

- NOT as practice for assessments, [instead] as a bridge to help students connect what they are learning daily with opportunities they'll have to engage in and demonstrate learning on summative assessments
- Issues to Consider: What coherent shared model of learning guides curriculum, instruction, and interim assessments
- Equity: Assessments should focus on relevant phenomena or problems to elicit explanations or solutions that are relatable to the intended audience and draw on student and community interests and expertise



NGSS Interim Assessments

Released on **October 15**

Same item clusters as in 2019

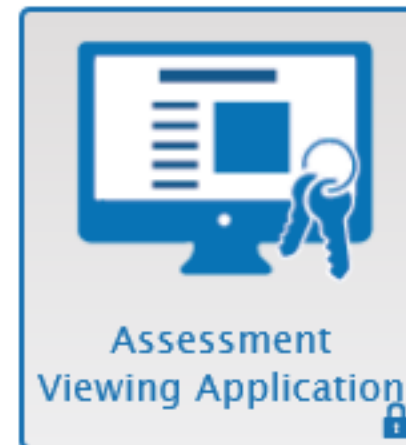
(will be administered individually instead of in pairs)

Grade	No. of Item Clusters
3-5	14
6-8	20
High School	20

Educators can access NGSS interims in the Assessment Viewing Application through the web portal: <https://ct.portal.airast.org>

Resources available:

- [Next Generation Science Standards \(NGSS\) Interim Assessment Webinar](#)
[Next Generation Science Standards \(NGSS\) Interim Assessment Webinar – Slides \[PPTX\]](#)
Updated November 6, 2018
- [Next Generation Science Standards Interim Assessment Quick Guide \[PDF\]](#)



Using NGSS Interim Assessments in the Classroom:

<https://www.youtube.com/watch?v=nrp9bSf2L7E&t=8s>



Considerations Prior to Using NGSS Interim Assessments

What purpose(s) will the NGSS interim assessments serve in my classroom, school or district?

Where do the NGSS interim assessments fit into my curriculum?

In which ways do the interims complement and support individualized and group instruction?

How will the results of the NGSS interim assessments be used?



Using the NGSS Interims to Inform Teacher Learning

NGSS Interim Assessments allow **teachers to see** what three-dimensional science assessment looks like and how it is different from traditional assessments.

Ask teachers to respond to the items and think about what students need to be able to do to be successful.



Some Questions for Teachers to Consider

Have teachers complete an NGSS interim item and then discuss the following questions:

- What is this item measuring?
- How challenging is the item (easy, moderate, or difficult)?
- What science practices do students use to answer the questions?
- What key concepts do students need to apply in answering the questions?
- How might the language used, information presented and/or manipulation skills present challenges for my students?



Using the NGSS Interims to Inform Student Learning

NGSS Interim Assessments allow teachers to **check student progress** throughout the year, gaining access to information that can be used to improve instruction and **help students meet the challenges** of “three-dimensional” standards.



NGSS Interim Assessment Results

First Stop in AIRWays – the Dashboard



High School Science: Structures and Processes in Living Organisms	Unassigned	1	0/21
High School Science: Changes in Earth's Climate	Unassigned	1	2/17
High School Science: Earth's History and Systems	Spring	3	3/20
High School Science: Earth's History and Systems	Unassigned	7	5/20
High School Science: Earth's History and Systems	Winter	4	3/20

Breakdown of student performance by scoring assertion

Student	Total Items	Total Items																							
Item Number		1	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10	1-11	1-12	1-13	2	2-1	2-2	2-3	2-4	2-5	2-6	2-7	2-8	
Max Points	13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	1	1	1	1	1	1	1	1	1
Everyone	4.2	0.57	0.57	0.31	0.29	0.71	0.14	0.12	0.12	0.08	0.06	0.53	0.37	0.33	2.88	0.33	0.41	0.2	0.41	0.31	0.67	0.51	0.04		
Sample Student	8	1	1	1	1	1	0	0	0	0	0	1	1	1	6	1	1	1	1	0	1	1	0		

Scoring assertions indicate specific student performances included in an interim assessment item.



NGSS Interim Assessment Results

Results can be reviewed for each scoring assertion for groups of students or by individual student.

Item & Score	Rubric & Resources
	Outcome
in the solar	✘
surface	✔
	✘
	✘
	✘
	✘

Scoring Assertion	Outcome
1. The student correctly identifies the change in amplitude recorded in the simulation, providing some evidence of student ability to observe and summarize how waves change in different media.	✘



Looking at the Results

- Were there items/assertions on which most students struggled or did well on?
- Were there trends in student responses based on particular types of items/questions?
- Based on their performance, what types of instruction would benefit students?



Local Assessment Resources in Science (LARS)

Goal: To help school districts in CT share locally-developed NGSS assessment resources.

Two Types of Resources:

- Student assessments (Grades K-12)
- Teacher professional learning



Anyone will be able to submit resources to be considered for sharing.

Submitted resources will go through a review process to ensure they are of high quality.



LARS: Student Assessment Review Process

Initial Submission of Resource



Science Task Prescreen



Question	Yes	No
1. Is there a phenomenon or problem driving the task?	<input type="checkbox"/>	<input type="checkbox"/>
2. Can the majority of the task be answered without using information provided by the task scenario?	<input type="checkbox"/>	<input type="checkbox"/>
3. Can significant portions of the task be answered successfully by using rote knowledge (e.g., definitions, prescriptive or memorized procedure)?	<input type="checkbox"/>	<input type="checkbox"/>
4. Does the majority of the task require students to use reasoning to successfully complete the task?	<input type="checkbox"/>	<input type="checkbox"/>
5. Does the task require students to use some understanding of disciplinary core ideas to successfully complete the task?	<input type="checkbox"/>	<input type="checkbox"/>
6. Do students have to use at least one science and engineering practice to successfully complete the task?	<input type="checkbox"/>	<input type="checkbox"/>
7. Are the dimensions assessed separately in the majority of the task?	<input type="checkbox"/>	<input type="checkbox"/>
8. Is the task coherent and comprehensible from the student perspective?	<input type="checkbox"/>	<input type="checkbox"/>

In-Depth Assessment Task Review

- Phenomena and/or Problem
- Alignment to 3D Performance Expectation(s)
- Scientific Accuracy
- Fair and Equitable to All Students
- Scoring Guidance and Teacher Supports

Feedback will be provided to the submitter.



Pilot Testing
Scoring and Collection of Student Work



Release to Public Web Site

We hope to make some resources available this winter.

Based on your assessment needs and the task purpose recorder about this task moving forward (choose one):

- Warrants further review.
- Should not be used.



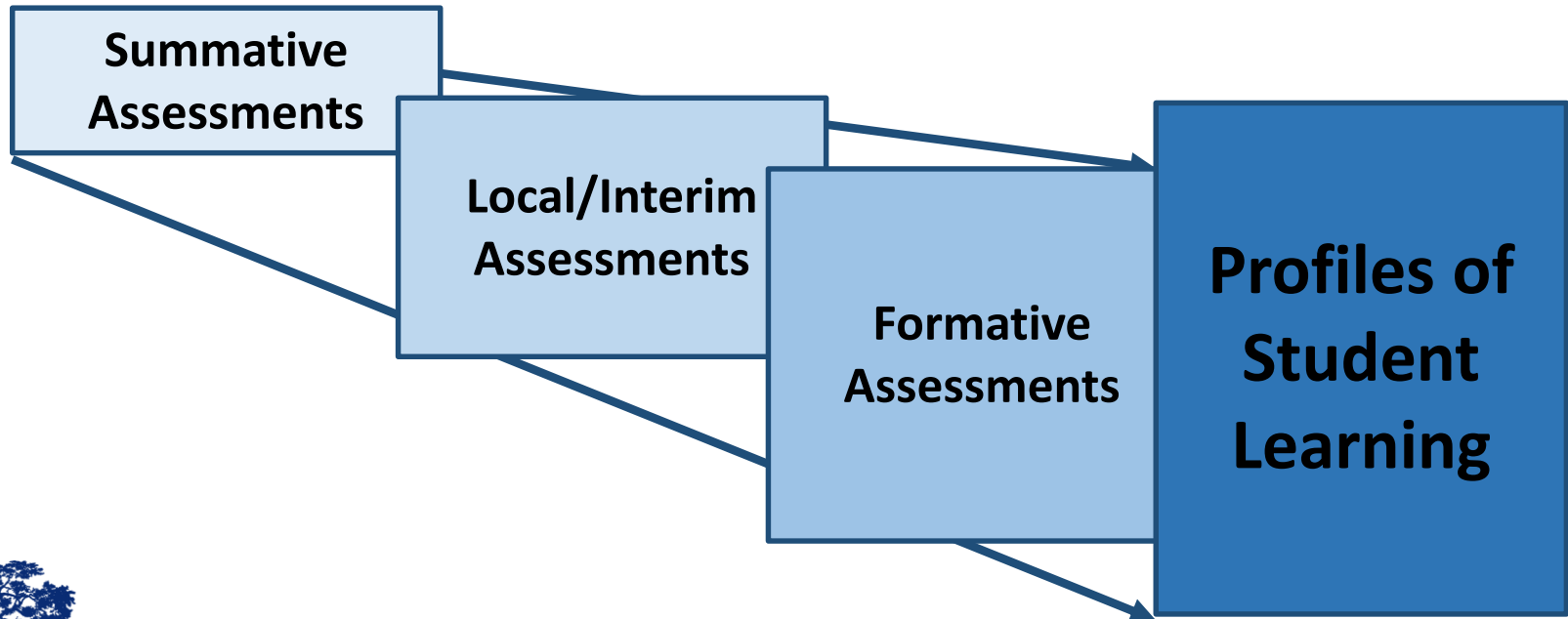
https://www.nextgenscience.org/sites/default/files/resource/files/Achieve%20Task%20PreScreener_Final_9.21.18.pdf



LARS Contact: Jeff Greig (jeff.greig@ct.gov)

Final Thought

In drawing any conclusions or making any decisions about student learning, **always use multiple sources of evidence**, including results from formative, local/interim, and summative assessments.



Southington's Assessment Journey

Grade 7, Life Science Unit example

Disruptions In Ecosystems

American Museum of Natural History

The Lawrence Hall of Science

NSF Funded

Achieve endorsed for assessments



First Step – Claim, Evidence, Reasoning (CER)

- Bye Bye Birdie part 1 from Data Nuggets (<http://datanuggets.org/>)
 - Data Nuggets are free classroom activities, co-designed by scientists and teachers, designed to bring contemporary research and authentic data into the classroom. Data Nuggets include a connection to the scientist behind the data and the true story of their research. Each activity gives students practice working with “messy data” and interpreting quantitative information. Scoring rubric is provided to teachers.
- Student work was analyzed in grade level team and teachers zeroed in on student struggles to identify evidence and connect evidence to their claim (falling into the 3-5 grade band on the Engaging in argument from evidence progressions) but teachers found it difficult to hone in on student weaknesses.



Name _____

Name _____

DATA *Nugget*

Bye bye birdie? Part I

Featured scientist: Richard Holmes from the Hubbard Brook Experimental Forest

Research Background:

The Hubbard Brook Experimental Forest is an area where scientists have collected ecological data for many years. It is located in the White Mountains of New Hampshire, and data collected in this forest helps uncover trends that happen over long periods of time. It is important to collect data on ecosystems over time because these patterns could be missed with shorter experiments.

Each spring, Hubbard Brook comes alive with the arrival of migratory birds. Many migrate from the tropics to take advantage of the abundant insects and the long summer days of northern areas, which are beneficial when raising young. **Avian ecologists** are scientists who study the ecology of birds. They have been keeping records on the birds that live in the experimental forest for over 40 years. These data are important because they represent one of the longest bird studies ever conducted!

Richard is an avian ecologist who began this study early in his career as a scientist. He was interested in how bird populations were responding to long-term environmental changes in Hubbard Brook. Every summer since 1969, Richard has taken his team of trained scientists, students, and technicians into the field to count the number of birds that are in the forest and identify which species are present. Richard's team monitors



Male Black-throated Blue Warbler feeding nestlings. Nests of this species are built typically less than one meter above ground in a shrub such as hobblebush. Photo by N. Rodenhouse.

Data Nuggets developed by Michigan State University fellows in the NSF BEACON and GK-12 programs

populations of over 30 different bird species. They sun rises and travel to the far reaches of the forest, count all the birds they find. The team has been tra by sight, but also by their calls. Team members are bird is by hearing its call! The scientists record the different study areas, each of which are 10 hectare 19 football fields. Each of the four study areas cont arranged along **transects** that run east to west thr parallel routes along which the measurements are approximately 500 meters from the next. At certain stands and records all birds seen or heard during a the distance the birds are from the observer. The e season. By looking at bird abundance data, Richar trends that reveal how avian populations change o

Scientific Question: How has the total number of bi Experimental Forest changed over time?

Scientific Data:

Use the data below to answer the scientific que

Year	Total number of birds counted / study area
1969	158
1970	163
1971	212
1972	214
1973	192
1974	161
1975	201
1976	194
1977	187
1978	149
1979	147
1980	131
1981	117
1982	124
1983	118
1984	89
1985	116
1986	91
1987	85
1988	113
1989	101
1990	133
1991	120
1992	130

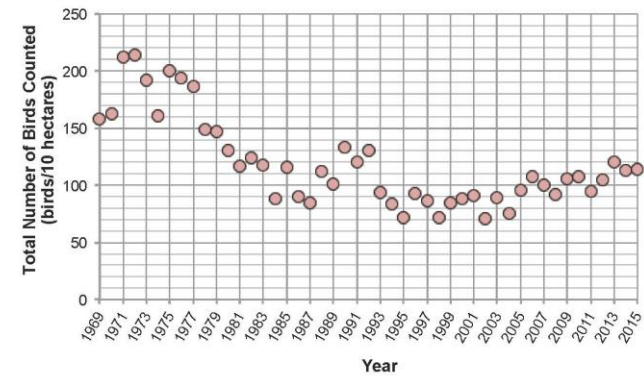
Year
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015

What data will you graph to answer the question?

Independent variable: _____

Dependent variable: _____

Below is a graph of the data: Identify any changes, trends, or differences you see in your graph. Draw arrows pointing out what you see, and write one sentence describing what you see next to each arrow.



Interpret the data:

Make a claim that answers the scientific question.

Data Nuggets developed by Michigan State University fellows in the NSF BEACON and GK-12 programs



Original Bye Bye Birdie Assessment

Given a scientific question, data table and graph students were asked:

- Identify any changes, trends, or differences you see in your graph. Draw arrows pointing out what you see, and write one sentence describing what you see next to each arrow.
- Interpret the data: Make a claim that answers the scientific question
- What evidence was used to write your claim? Reference specific parts of the tables or graph.
- Explain your reasoning and why the evidence supports your claim.



Revised Assessment

- Identify *one change* and *one trend* you see in the graph. Draw arrows pointing out what you see, and write one sentence describing what you see next to each arrow.
- Make a claim that answers the scientific question.
- Describe how evidence from the table supports your claim.
- Describe how evidence from the graph supports your claim.
- Use the table and/or graph to predict how many birds will be counted in the year you graduate from high school, 2025. Explain how you used the data to make your prediction.



CER Scaffolding in Disruptions Unit

- Question: Record the question “What effect does a large population of deer have on an ecosystem?”
- **Evidence:** Examine information and data from the reading.
- Science Concepts: List any science concepts that are connected to the evidence and might help answer the question.
- Scientific Reasoning: Describe the scientific reasoning that connects the evidence and science concepts to the question you are trying to answer.
- Claim: Based on the evidence of patterns in the data and on your scientific reasoning, state your claim about the effect of a large population of deer on an ecosystem



CER Rubric Developed for Grades 6-8

- The rubric to evaluate CERs provided consistency but limited SEP and CCC information
- Our emphasis the past two years has been on NGSS instruction with the CERs our primary assessment tool
- This year teachers have recognized the need to zero in on specific SEPs and CCCs
- And the need for 3-D assessments to measure student progress in SEPs and CCCs



Ongoing Assessment Work

- We began this year with discussions about what are we really measuring and where are our students struggling (SEPs and CCCs)
- We used appendices [F \(SEPs\)](#) and [G \(CCCs\)](#) to focus our assessments on Practices and cross cutting concepts.
- We revised the Bye Bye Birdie assessment and rubric to measure student abilities to analyze and interpret data, and identify patterns
- Teachers began identifying other assessments ([CT Interims](#), [SNAP](#), [NextGenAssessment/Concord](#)) that best fit our curriculum units



Ongoing Assessment Work – Use of CT Interims

Grade 6 – Thermal Energy

MS Matter and Its Interactions Item 1 (Tea Kettle) - Using Models, Cause and Effect

Grade 7 – Growth in Living Things

MS Matter and Its Interactions Item 2 (Chemical Reaction) – Analyzing Data, Systems

Grade 8 – Forces and Motion

MS Forces, Interactions and Energy Item 1 (block and string) – Analyzing data plan investigations



Ongoing Assessment Work

- We recognize the importance of reviewing student work (big lift – time consuming)
- We recognize the importance of the assessments “fitting” our curriculum – measuring practices and cross-cutting concepts consistent with our curriculum
- We will administer an interim assessment, all students in a grade level within a window of time, during each unit of study, by the midpoint of the unit – to allow time for the results to inform our instruction
- We’re using some readily available, some modified and some of our own via Canvas.



Winchester Public Schools Assessment Journey

A PreK-6 District

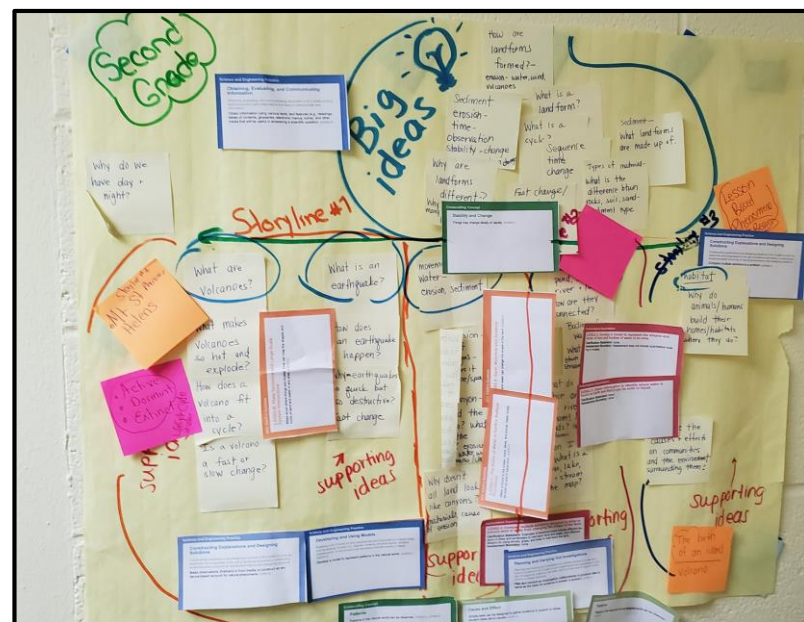




At Beginning Stages

Step 1: Teaching Science in Elementary Schools

- Professional Development
- Three Dimensional Instruction
- Unit Development/Revision



At Beginning Stages

Step 2: Designing a NGSS Assessment System



Formative Assessment - Progress

Track

Question	Source of Evidence
What We Figured Out	

Source: Open SciEd



Formative Assessment

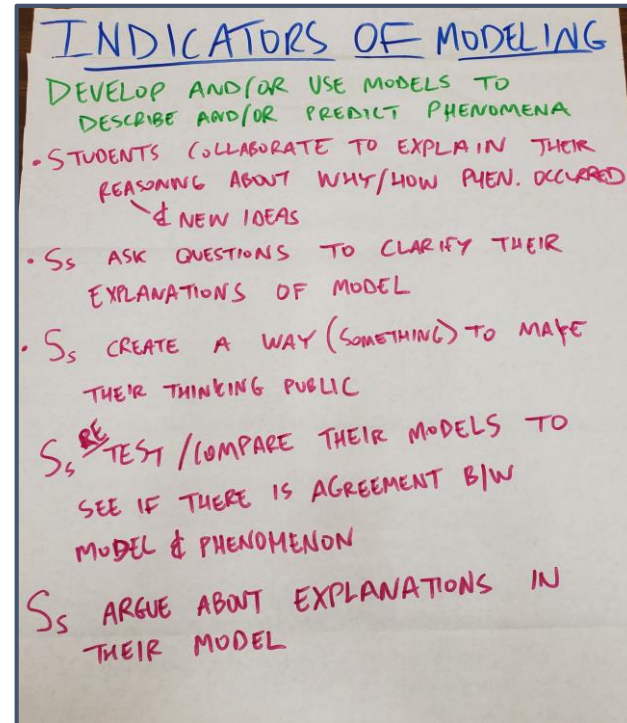
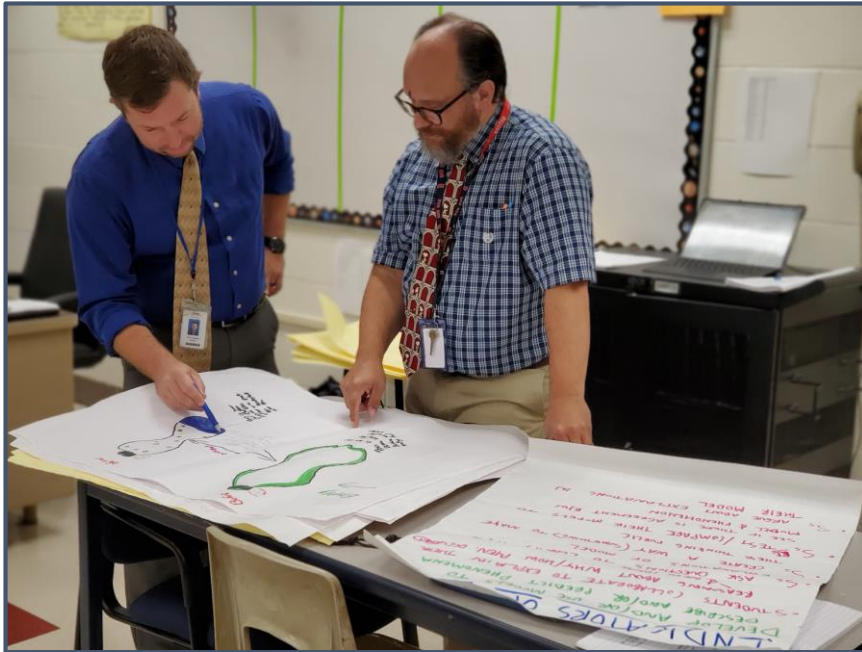


0/30/19
It's important to conserve fresh water because we did a Picta graph for all the water on earth the salt was 97% frozen fresh was 2% and the actual fresh water was 1%. Think about it there are 7 billion people on earth and 1% of fresh water is ~~available~~ available. Where going to run out sooner or later unless we do something, in fact there are already people on earth that have no water. If we run out the plants will die the animals will die, and all the people on earth will die. That's why it's important to conserve the little bit of water we have left.

We can conserve water by not leaving the faucet on and for companies to reuse water instead of throwing it out.



Developing Rubrics for SEP



Interim Assessments



Locating the Lighthouse

Grade Level: 4

Phenomena: Coastal Erosion

Science & Engineering Practices:
-Asking Questions and -Defining
Problems Analyzing and Interpreting
Data

Crosscutting Concepts: Cause
and Effect

Source 3: Photographs of Lighthouses

Lighthouse in city north of Jasmine
"Cap-des-Rosiers Lighthouse" is licensed under Creative Commons Attribution-Share Alike 2.0 Generic license.

Lighthouse in city south of Jasmine

Source 4: Climate Data (Temperature and Precipitation)

Average High/Low Temperatures by Seasons
Degrees in Fahrenheit

Northern City

	Winter	Spring	Summer	Fall
High	32	48	67	54
Low	18	22	51	40

Southern City

	Winter	Spring	Summer	Fall
High	54	68	85	75
Low	35	46	68	45



Interim Assessments



Kentucky Through Course Tasks - 5th Grade

Interim	Phenomena	CCC	SEP
Anna's Sunglasses	Monthly Variation of Day Length Throughout Year	Cause and Effect	Using Mathematics and Computational Thinking, Constructing Explanations and Designing Solutions
More Mantise's	Populations Within Ecosystems	Systems, System Models	Developing and Using Models, Engaging in Argument from Evidence
Matter Models	Evaporation of Water	Patterns, Cause and Effect	Developing and Using Models, Constructing Explanations and Designing Solutions

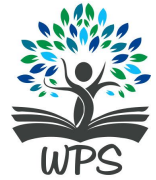


Interim Assessments



The screenshot shows a web browser displaying the Connecticut State Department of Education (CSDE) Comprehensive Assessment Program Portal. The page has a blue header with the CSDE logo and the text "CONNECTICUT STATE DEPARTMENT OF EDUCATION COMPREHENSIVE ASSESSMENT PROGRAM PORTAL". Below the header, there are several navigation tabs: Home, Get Started, Resources, FAQs, and Supported Browsers. A "Register for email updates" link is also present. The main content area is divided into three columns. The left column contains a vertical stack of buttons for "Students & Families", "Smarter Balanced Assessment", "NGSS Assessment", "Alternate Assessment System", "Connecticut SAT School Day", "English Language Proficiency Assessment", and "Technology Resources". The middle column is titled "Recent Announcements" and contains three bullet points with dates: "The Test Information Distribution Engine (TIDE) will be down for maintenance beginning September 11th and will return online September 19th." (Added August 27, 2019), "The Connecticut Alternate Assessment Eligibility Form replaced the Learner Characteristics Inventory during the 2019-20 school year and will be used by Connecticut Teachers Administering the Alternate Assessment and Planning and Placement Teams to determine eligibility for student participation in Connecticut's Alternate Assessment System. To get more information, please access the General Information & Connecticut Alternate Assessment Eligibility Form portal page." (Added August 21, 2019), and "The Secure Browsers for the 2019—2020 school year are now available for download on the Secure Browsers page of the portal. The new version of the secure browser is required for all 2019-2020 online test administrations." (Added August 15, 2019). The right column is titled "Welcome!" and contains a paragraph of text: "Welcome to the Connecticut Comprehensive Assessment Program Portal. This site provides access to resources for the Smarter Balanced Assessments in Mathematics and English Language Arts, the Next Generation Science Standards (NGSS) Assessment, the Connecticut Alternate Assessment (CTAA), and the Connecticut Alternate Science Assessment (CTAS)." Below this text are several buttons: "Important Dates", "Secure Browsers", "Practice & Training Tests", "NGSS Sample Items", "Contact Us", and "CSDE Student". The browser's address bar shows "ct.portal.airast.org". The Windows taskbar at the bottom shows the search bar and several application icons.





Recap

- **Unit development/revision in process**
- **Using interim assessments that have been already created**
- **Interims occur within unit of study**
- **Interim administered to all students in a grade level at a specific date and time**
- **Teachers in grade level come together to analyze and discuss results of interims**



Thank You

Contact Information

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