Welcome

NSTA Topic Study:
Assessing Three-Dimensional Learning:
Using the Critical Aspects of
Sensemaking to Design Assessments
Meaningful to Both Teachers and Students

Web Seminar 1
October 11, 2022
7:00 PM ET
The National Science Teaching Association strongly supports diversity, equity and inclusion in the classroom, and in all of our programs. We are committed to providing a welcoming, safe, productive, harassment-free environment for all participants of our events and programs, regardless of their gender, gender identity, sexual orientation, ability, ethnicity, race, color, age, marital status, veteran status, socioeconomic status or religion.

We ask that all attendees be mindful of their surroundings and of their fellow participants. All participants are expected to exercise consideration and respect in their speech and actions, and to refrain from demeaning, discriminatory, or harassing behavior and speech.

NSTA does not allow promotion of other products in our chats during web seminars. We ask that attendees keep the conversation on topic, use positive language and remain courteous of others throughout the event, and allow everyone time to participate in the chat.
Meet Today’s Presenters

Holly Hereau
NSTA Instructional Materials and Professional Learning Specialist
hhereau@nsta.org

Kate Soriano
NSTA Standards Implementation Specialist
ksoriano@nsta.org
@katesor1027
Collection of Resources

Fall 2022 Topic Study: Assessing Three-Dimensional Learning Collection

Resources in “Fall 2022 Topic Study: Assessing Three-Dimensional Learning” Collection

<table>
<thead>
<tr>
<th>Title</th>
<th>Resource Type</th>
<th>Open in Library</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Framework for K-12 Science Education (pdf)</td>
<td>Web Page</td>
<td></td>
</tr>
<tr>
<td>NSTA Quick-Reference Guide to the NGSS</td>
<td>Web Page</td>
<td></td>
</tr>
</tbody>
</table>

https://my.nsta.org/collection/LLRd09oqGe0_E
Learning Community Norms for Discussion

- We come prepared to work toward a common goal.
- We share our own thinking to help us all learn.
- We use evidence to support our ideas, ask for evidence from others, and suggest ways to get additional evidence.
- We are open to changing our minds.
Meet Our Learning Community

1. Open the participant window

2. Hover the cursor over your name. Select More and choose Rename.

3. Rename yourself using the following scheme. You may only choose one grade band for today.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Naming Scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-2</td>
<td>EE_Name</td>
</tr>
<tr>
<td>3-5</td>
<td>UE_Name</td>
</tr>
<tr>
<td>6-8</td>
<td>MS_Name</td>
</tr>
<tr>
<td>9-12</td>
<td>HS_Name</td>
</tr>
</tbody>
</table>
Learning Targets

- Gain experience evaluating and revising existing assessment tasks for sensemaking and accessibility to the task.
- Recognize characteristics of questions that elicit student responses for targeted elements of the three dimensions.
- Identify multiple opportunities within a lesson, lesson set and unit to formatively assess students’ understanding (and skill) of the targeted elements of the three dimensions.
What is your vision for student learning and performance in science?

Alone Zone (independent thinking time)
Reflect on the question above. Consider the following questions to guide your reflection.

● What do you want your students to know and be able to do?
● What take-aways do you want your students to have about the process and/or nature of science?
What is your vision for student learning and performance in science?

Small Group

- Choose two ideas to post on the Jamboard (one idea per sticky note). Do **NOT** post on **BLUE** sticky notes.
- When posting slows, group similar ideas together.
- Label each group using a **BLUE** sticky note. It is OK if multiple labels are placed on the same group of posts.
## Our Vision and Values

<table>
<thead>
<tr>
<th>Grade</th>
<th>Jamboard Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-2</td>
<td><img src="https://jamboard.google.com/d/1yl-VY8aK9UvuXihwRSEzqJ7-FTsVYID-J07t1BDzpso/edit?usp=sharing" alt="K-2 Link" /></td>
</tr>
<tr>
<td>3-5</td>
<td><img src="https://jamboard.google.com/d/1XycRgl6hEnIN1yzA55ttp4VCIsjtUirW8JM5K82kteg/edit?usp=sharing" alt="3-5 Link" /></td>
</tr>
<tr>
<td>6-8</td>
<td><img src="https://jamboard.google.com/d/1m7TTXsTuqo4EkQ6MnktvNzAb7s-gmhMhm3yJLgZpgY/edit?usp=sharing" alt="6-8 Link" /></td>
</tr>
<tr>
<td>9-12</td>
<td><img src="https://jamboard.google.com/d/13Idqu-vOLTn1PgNNVXJEbcgA1q8W0Vu7Nu_2ZzeAZS8/edit?usp=sharing" alt="9-12 Link" /></td>
</tr>
</tbody>
</table>
If you asked students, “What do you think it takes to be successful in science?” how might they answer based on their experiences with science assessments in school?

Share your thinking in the chat window.
How and what we choose to assess signals to students what we value about science learning.
Unit 7.3: Metabolic Reactions

**Phenomenon:** Bears survive an extended period of low activity (hibernation) without eating, drinking or eliminating waste.

**Purpose:** Use as summative assessment at the end of the module/unit
Putting the Bear Task in Context

Students begin the unit on metabolic reactions in the human body by exploring a real case study of M’Kenna, a middle-school student, who reported some alarming symptoms to her doctor. Her symptoms included an inability to concentrate, headaches, stomach issues when she eats, and a lack of energy for everyday activities and sports that she used to play regularly. She also reported noticeable weight loss over the past few months, in spite of consuming what appeared to be a healthy diet. Her case sparks questions and ideas for investigations around trying to figure out which pathways and processes in M’Kenna’s body might be functioning differently than a healthy system and why.

Through this work of figuring out what is causing M’Kenna’s symptoms, the class discovers what happens to the food we eat after it enters our bodies and how M’Kenna’s different symptoms are connected.
Putting the Bear Task in Context

Targeted Science Ideas (Disciplinary Core Ideas)

**LS1.A: Structure and Function.** In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions.

**LS1.B: Growth and Development of Organisms.** The growth of an animal is controlled by genetic factors, food intake, and interactions with other organisms, and each species has a typical adult size range.

**LS1.C: Organization for Matter and Energy Flow in Organisms.** Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy.

**PS3.D Energy in Chemical Processes and Everyday Life.** Cellular respiration in plants and animals involves chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials.
Our Vision and Values

Alone Zone

Read the Modified Brown Bear Hibernation Task and note how this task signals what we (as educators) value about science learning.

Please do not share in the chat window at this time.

Resource #7
Science Instructional Shifts

Shift 1.

**Explain phenomena** and **design solutions** to problems

Shift 2.

**Doing science** (three-dimensional learning)

Shift 3.

**Coherent learning progressions** over time

Resource #2 (pages 2-3)

Resource #1
Continuum of Science Instruction

Information Frame
• Teacher is focused on disseminating information.
• Students are focused on knowing information.
• Science is portrayed as a body of established facts.
• Assessments are focused on “right” answers.

Knowing about...

Sensemaking Frame
• Teacher is focused on developing conceptual understanding.
• Students are focused on understanding something.
• Science is portrayed as a way to make sense of something.
• Assessments are focused on use of evidence to support conclusions/generalizations.

Figuring out...
Continuum of Science Instruction

Information Frame
- Teacher is focused on disseminating information.
- Students are focused on knowing information.
- Science is portrayed as a body of established facts.
- Assessments are focused on "right" answers.

Knowing about..

Sensemaking Frame
- Teacher is focused on developing conceptual understanding.
- Students are focused on understanding something.
- Science is portrayed as a way to make sense of something.
- Assessments are focused on use of evidence to support conclusions/generalizations.

Figuring out…

From: Cynthia Passmore, NSTA Virtual PD, Nov. 15, 2014
Continuum of Science Instruction

https://youtu.be/37_MTXgBMZ8
Continuum of Science Instruction
Design for Sensemaking: Instructional Tasks

- Students experience a **phenomenon** or problem;
- engage in **science and engineering practices** and
- **share ideas** to develop or apply the
- **science ideas** and **crosscutting concepts** needed to explain how or why the phenomenon occurs.
● Students are figuring something out (phenomenon)

● Students need to apply science ideas — grade-appropriate element(s) of disciplinary core idea(s) — and crosscutting concepts to figure something out

● Students are actively trying to figure something out (engaged in grade-appropriate elements of science and engineering practices)

● Students have access to the task (equity)
- Students are figuring something out (phenomenon)
- Students need to apply science ideas — grade-appropriate element(s) of disciplinary core idea(s) — and crosscutting concepts to figure something out
- Students are actively trying to figure something out (engaged in grade-appropriate elements of science and engineering practices)
- Students have access to the task (equity)
Natural phenomena are **observable events** that occur in the universe and that **we can use our science knowledge to explain or predict**.

The goal of building knowledge in science is to develop general ideas, based on evidence, that can explain and predict phenomena.
The Role of Phenomena in Three-Dimensional Learning

As you watch the video, capture features of phenomena and the ways in which phenomena are used in instruction.

https://youtu.be/Jyiv1Lc0dng
The Role of Phenomena in Three-Dimensional Learning

Using Phenomena in NGSS-Designed Instruction
An Interview with Brian Reiser
The Role of Phenomena in Three-Dimensional Learning

Process of figuring out phenomena makes learning more meaningful for students

- Help students connect science ideas to what is happening in the world
- Use phenomena as the starting point to raise questions to motivate building ideas we (teacher and students) need to understand/explain the phenomenon
- Students return to the phenomenon as we make progress and develop more sophisticated understandings
Unit 7.3: Metabolic Reactions

Phenomenon: Bears survive an extended period of low activity (hibernation) without eating, drinking or eliminating waste.

Purpose: Use as summative assessment at end of the module/unit

Resource #7
The Role of Phenomena in Three-Dimensional Learning

Alone Zone
Return to the Bear Task.

- How is this phenomenon scenario like phenomena used to kick off a unit or lesson?
- How is it different?

Be ready to share your initial thinking in the chat window.

Resource #7
Phenomena and problems that support a wide range of diverse learners prioritize these features:

- Central
- Specific
- Relevant
- Compelling
- Comprehensible
Phenomenon/Problem Checklist for Assessment Tasks

<table>
<thead>
<tr>
<th>Evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presented as <strong>puzzling and intriguing</strong> and part of the scenario is a compelling question or observation that needs to be explained.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>If data is being used it is <strong>real or well-crafted, grade appropriate data.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The scenario <strong>uses as many words as needed</strong> to convey the phenomenon but <strong>excludes unnecessary words</strong> and effectively uses at least two modalities to present information.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenomenon is explainable <strong>using the grade-appropriate</strong> disciplinary core ideas (DCIs), science and engineering practices (SEPs) and crosscutting concepts (CCGs).</td>
</tr>
</tbody>
</table>
Applying the Phenomenon Checklist to the Bear Task

**Unit 7.3: Metabolic Reactions**

**Phenomenon:** Bears survive an extended period of low activity without eating, drinking or eliminating waste (hibernation).

**Purpose:** Use as summative assessment at end of the module/unit

---

**Modified Brown Bear Hibernation Task**

Each winter brown bears in North America spend an average of 5 months inside of dens in a low activity state known as hibernation. During this time, they experience drastic body changes. They also do not eat, drink, defecate (poop), or urinate (pee) during this time. It is a wonder that the bears can survive each winter in this state without performing these essential body functions.

**Average Stats for an Adult Male Brown Bear**

<table>
<thead>
<tr>
<th>Fall - October Going into Hibernation</th>
<th>March - May Coming out of Hibernation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Temperature</td>
<td>100°F - 101°F</td>
</tr>
<tr>
<td>Breathing Rate &amp; Heart Rate</td>
<td>Normal</td>
</tr>
<tr>
<td>Heart Rate</td>
<td>40-50 beats per min</td>
</tr>
<tr>
<td>Weight</td>
<td>about 450 pounds</td>
</tr>
<tr>
<td>Body Fat Percentage</td>
<td>30%</td>
</tr>
</tbody>
</table>

Above: This is bear 409, nicknamed ‘Badrovac’ from Katmai National Park in Alaska. The first picture was taken on June 29, and the second picture was taken on September 30.

Resource #7
### Phenomenon/Problem Checklist for Assessment

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presents students with real world observations and based on at least one specific instance.</td>
<td></td>
</tr>
<tr>
<td>Evidence:</td>
<td></td>
</tr>
<tr>
<td>Presented as puzzling and intriguing and part of the scenario is a compelling question or observation that needs to be explained.</td>
<td></td>
</tr>
<tr>
<td>Evidence:</td>
<td></td>
</tr>
<tr>
<td>If data is being used it is real or well-crafted, grade appropriate data.</td>
<td></td>
</tr>
<tr>
<td>Evidence:</td>
<td></td>
</tr>
<tr>
<td>The scenario uses as many words as needed to convey the phenomenon but excludes unnecessary words and effectively uses at least two modalities to present information.</td>
<td></td>
</tr>
<tr>
<td>Evidence:</td>
<td></td>
</tr>
<tr>
<td>Phenomenon is explainable using the grade-appropriate disciplinary core ideas (DCLs), science and engineering practices (SEPs) and crosscutting concepts (CCCs).</td>
<td></td>
</tr>
<tr>
<td>Evidence:</td>
<td></td>
</tr>
</tbody>
</table>

**Small Group** (Breakout Rooms)

Analyze the phenomenon scenario for the Bear Task using the **Phenomenon Checklist** (first four criteria only).

Record evidence for each of the four criteria indicated.

Use the **Task Annotation Project in Science: Phenomena** (resource #9) as a third-point reference to help move the group to consensus.

[https://docs.google.com/document/d/1TscpqYu1rX-vLe0rVEn2hN_Y-i5IDzIln4RSaKfA9mg/edit?usp=sharing](https://docs.google.com/document/d/1TscpqYu1rX-vLe0rVEn2hN_Y-i5IDzIln4RSaKfA9mg/edit?usp=sharing)
### Applying the Phenomenon Checklist to the Bear Task

| ✔ | Presents students with **real world** observations and based on at least one **specific instances**.  
**Evidence:** Presents pictures of a bear, Beadnose, before and after hibernation and measurements (body temperature, body fat percentage, etc.) before, during and after hibernation. |
| ✔ | Presented as **puzzlingling and intriguing** and part of the scenario is a **compelling question or observation that needs to be explained**.  
**Evidence:** Beadnose lost 200 pounds **while sleeping** (hibernating) over the winter months. How?! |
| ✔ | If data is being used it is **real or well-crafted, grade appropriate data**.  
**Evidence:** Data may or may not be real, but it is similar to published information about changes undergo during hibernation. |
| ✔ | The scenario **uses as many words as needed** to convey the phenomenon but excludes unnecessary words and effectively uses **at least two modalities** to present information.  
**Evidence:** Information presented through pictures; the pictures are supported with just enough text to describe what students are looking at (no extraneous information). Measurements collected are presented in a data table; these data support the information shared in the paragraph at the top of the page about Beadnose. |
| | Phenomenon is explainable using the **grade-appropriate** disciplinary core ideas (DCIs), science and engineering practices (SEPs) and crosscutting concepts (CCCs).  
**Evidence:** |
Students need to be able to communicate what they know and are able to do using multiple means (modalities).

The assessment task needs to **present** the phenomenon/problem scenario to students using multiple modalities.
Applying the Phenomenon Checklist to the Bear Task

- Presents students with real world observations and based on at least on specific instances.
  **Evidence:** Presents pictures of a bear, Beadnose, before and after hibernation and measurements (body temperature, body fat percentage, etc.) before, during and after hibernation.

- Presented as puzzling and intriguing and part of the scenario is a compelling question or observation that needs to be explained.
  **Evidence:** Beadnose lost 200 pounds while sleeping (hibernating) over the winter months. How?!

- If data is being used it is real or well-crafted, grade appropriate data
  **Evidence:** Data may or may not be real, but it is similar to published information about changes undergone during hibernation.

- The scenario uses as many words as needed to convey the phenomenon but excludes unnecessary words and effectively uses at least two modalities to present information.
  **Evidence:** Information presented through pictures; the pictures are supported with just enough text to describe what students are looking at (no extraneous information). The “before” and “after” pictures of Beadnose are reversed. Measurements collected are presented in a data table; these data support the information shared in the paragraph at the top of the page about Beadnose.

- Phenomenon is explainable using the grade-appropriate disciplinary core ideas (DCIs), science and engineering practices (SEPs) and crosscutting concepts (CCCs).
  **Evidence:** Students apply the idea that the bear’s body can use stored fat and convert it to energy that their cells need through chemical reactions.
### Equitable Access Look Fors on the Phenomenon Checklist

<table>
<thead>
<tr>
<th>Phenomenon/Problem Checklist for Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Presents students with <strong>real world</strong> observations and based on at least one <strong>specific instance.</strong></td>
</tr>
<tr>
<td><strong>Evidence:</strong></td>
</tr>
<tr>
<td>□ Presented as <strong>puzzling and intriguing</strong> and part of the scenario is a <strong>compelling question or observation that needs to be explained.</strong></td>
</tr>
<tr>
<td><strong>Evidence:</strong></td>
</tr>
<tr>
<td>□ If data is being used it is <strong>real or well-crafted, grade appropriate data.</strong></td>
</tr>
<tr>
<td><strong>Evidence:</strong></td>
</tr>
<tr>
<td>□ The scenario <strong>uses as many words as needed</strong> to convey the phenomenon but <strong>excludes unnecessary words</strong> and effectively uses at least two modalities to present information.</td>
</tr>
<tr>
<td><strong>Evidence:</strong></td>
</tr>
<tr>
<td>□ Phenomenon is explainable using the <strong>grade-appropriate disciplinary core ideas (DCIs)</strong>, science and engineering practices (SEPs) and crosscutting concepts (CCCs).</td>
</tr>
<tr>
<td><strong>Evidence:</strong></td>
</tr>
</tbody>
</table>

---

**Resource #10**

**Equity in three-dimensional science assessments**

- **Assessments should be relevant, authentic, and meaningful to students.**
  - Supporting women, and particularly those who traditionally have fallen outside of science, many assessments should result in students thinking from a wide range of students. To do this, tasks must be compelling to the students engaging in the assessment. Like assessments should be:
    - Inarily either cultural and historical interactions and experiences of students, and
    - Include three forms of knowledge as assets to be leveraged rather than excluded.

- **Assessments can be empowering.**
  - Tasks that provide students with **choices** about how to engage and what to focus on in the task. If assessments and the work they engage and students need to do something similar to what they know can both student success and interest in learning. Lessons learned from assessments should be used to inform and expand the ways in which students engage in the classroom and beyond.

- **Assessments must allow students to make their thinking visible.**
  - The foundation of three-dimensional science standards is using evidence and assessing reasoning to make sense of the world. Assessments designed to meet student progress through the standards must provide all students with ways to show how they think about science and engineering practices. This requires students to demonstrate learning that intentionally reveal **musts of students' current understanding** as well as thinking how student responses are interpreted through both formal and informal feedback mechanisms in culturally important ways.
### Equitable Access Look Fors on the Phenomenon Checklist

<table>
<thead>
<tr>
<th>Phenomenon/Problem Checklist for Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Presents students with <strong>real world</strong> observations and based on at least one specific instance.</td>
</tr>
<tr>
<td><strong>Evidence:</strong></td>
</tr>
<tr>
<td>☐ Presented as <strong>puzzling and intriguing</strong> and part of the scenario is a compelling question or observation that needs to be explained.</td>
</tr>
<tr>
<td><strong>Evidence:</strong></td>
</tr>
<tr>
<td>☐ If data is being used it is <strong>real or well-crafted, grade appropriate</strong> data.</td>
</tr>
<tr>
<td><strong>Evidence:</strong></td>
</tr>
<tr>
<td>☐ The scenario <strong>uses as many words as needed</strong> to convey the phenomenon but <strong>excludes unnecessary words</strong> and effectively uses <strong>at least two modalities</strong> to present information.</td>
</tr>
<tr>
<td><strong>Evidence:</strong></td>
</tr>
<tr>
<td>☐ Phenomenon is explainable using the <strong>grade-appropriate</strong> disciplinary core ideas (DCIs), science and engineering practices (SEPs) and crosscutting concepts (CCCs).</td>
</tr>
<tr>
<td><strong>Evidence:</strong></td>
</tr>
</tbody>
</table>

**Alone Zone**

Read the **Task Annotation Project in Science: Equity** Resource #10

Which criteria on the Phenomenon Checklist are connected to providing all students equitable access to an assessment task?
Which criteria on the **Phenomenon Checklist** are connected to providing *all* students equitable access to an assessment task?

<table>
<thead>
<tr>
<th>Phenomenon/Problem Checklist for Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>C</strong></td>
</tr>
<tr>
<td><strong>D</strong></td>
</tr>
</tbody>
</table>
Equitable Access Look Fors on the Phenomenon Checklist

<table>
<thead>
<tr>
<th>Phenomenon/Problem Checklist for Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐  Presents students with <strong>real world</strong> observations and based on at least one specific instance.</td>
</tr>
<tr>
<td>Evidence:</td>
</tr>
<tr>
<td>☐  Presented as <strong>puzzling and intriguing</strong> and part of the scenario is a compelling question or observation that needs to be explained.</td>
</tr>
<tr>
<td>Evidence:</td>
</tr>
<tr>
<td>☐  If data is being used it is <strong>real or well-crafted, grade appropriate data</strong>.</td>
</tr>
<tr>
<td>Evidence:</td>
</tr>
<tr>
<td>☐  The scenario uses <strong>as many words as needed</strong> to convey the phenomenon but excludes unnecessary words and <strong>effectively uses at least two modalities</strong> to present information.</td>
</tr>
<tr>
<td>Evidence:</td>
</tr>
<tr>
<td>☐  Phenomenon is explainable <strong>using the grade-appropriate</strong> disciplinary core ideas (DCIs), science and engineering practices (SEPs) and crosscutting concepts (CCGs).</td>
</tr>
<tr>
<td>Evidence:</td>
</tr>
</tbody>
</table>

Alone Zone
Read the Task Annotation Project in Science: Equity

**Resource #10**

Which **criteria on the Phenomenon Checklist are connected to providing all students equitable access to an assessment task?**
Reflecting on the Role of Phenomena on Assessment Tasks

The Achieve Task Annotation Project in Science (TAPS) determined

“..phenomena and problems are not only important, but perhaps the most critical predictor of whether a task can meaningfully elicit three-dimensional performances from all students.”
End-of-Unit Assessment Task by Grade Band

**Little Dancer Task**
Grade Band K-2
Phenomenon Scenario Resource #12
Task Resource #13

**Oil Spill Task**
Grade Band 3-5
Phenomena Scenario Resource #14
Task Resource #15

**Sea Turtle Task**
Grade Band 6-8
Resource #16

**Swallows Task**
Grade Band 9-12
Resource #17
Applying the Phenomenon Checklist to Assessment Tasks

Try applying the Phenomenon Checklist to an assessment task in your grade band.

We’ll share our thinking via the collection on Saturday, October 15, 2022.

Resource #11
Phenomenon/Problem Checklist for Assessment Tasks
Questions
Thanks to Today’s Presenters…

Holly Hereau
NSTA Instructional Materials and Professional Learning Specialist
hhereau@nsta.org

Kate Soriano
NSTA Standards Implementation Specialist
ksoriano@nsta.org
@katesor1027
Thank You for Participating!

https://www.nsta.org
Post-program Survey – coming up!

We value your feedback!

The post-program survey link will be shared after the recording is stopped at the end of the program.

Your completed survey confirms your attendance which allows us to award you a certificate of participation and attendance.
This collection includes the slides (as PDF), handouts and other resources.

Link to the collection: https://my.nsta.org/collection/LLRd09oqGe0_E
NSTA Opportunities: Web Seminars

**Web Seminar:** Fall 2022: Developing a Competitive Application for the Shell Science Lab Regional Challenge
**October 17, 7:00 PM ET**

**Science Update:** Getting Ready for Two Spectacular Solar Eclipses in North America
**October 20, 7:00 PM ET**

**Web Seminar:** NSTA Teacher Awards – Recognizing Excellence Rewarded
**October 27, 7:00 PM ET**

**Science Update:** NOAA - Observing and Understanding Earth Systems
**November 3, 7:00 PM ET**

**Web Seminar:** Fall 2022: Developing a Competitive Application for Shell Teaching Awards
**November 7, 7:00 PM ET**

**Transforming Science Learning:** Leading the Implementation of High-Quality Instructional Materials to Enact Standards: Practical Guidance From the Field
**November 7, 7:00 PM ET**

[https://www.nsta.org/webseminars](https://www.nsta.org/webseminars)
This concludes today's program.