Welcome

Transforming Science Learning:
Evaluating Lessons for Sensemaking
Using the NSTA Sensemaking Tool

August 10, 2022
7:00 PM ET
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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 Presenter

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

![NSTA Logo](https://my.nsta.org/collection/xb2BRjWKjLM_E)

## Web Seminar 5-25-22 TSL Evaluating Lessons Using the NSTA Sensemaking Tool Collection

### Resources in “Web Seminar 5-25-22 TSL Evaluating Lessons Using the NSTA Sensemaking Tool” Collection

<table>
<thead>
<tr>
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<tr>
<td>1 A Framework for K-12 Science Education (pdf)</td>
<td>Web Page</td>
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<td>3 NGSS Lesson Screener</td>
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<td>5 Making Making in the Science Classroom: All Students, 2018</td>
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</tbody>
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[https://my.nsta.org/collection/xb2BRjWKjLM_E](https://my.nsta.org/collection/xb2BRjWKjLM_E)
Our Community Norms

- We come prepared to work toward a common goal.
- We share our own thinking to help us all learn.
- We critique the ideas we are working with, not the people we are working with.
- 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.

From [OpenSciEd Classroom Norms](https://www.nsta.org)
Breakout Room Norms

Participating in Small Group Discussions (Breakout Rooms)

- Camera on and microphone on, or
- Microphone on, or
- Chat window
Building Community

What’s your superpower?
Goals for Today’s Web Seminar

● Become familiar with the Single-Point Rubric for Sensemaking Lessons (aka **Sensemaking Tool**)

● Gain experience using the Sensemaking Tool to evaluate lessons for sensemaking

● Consider how the Sensemaking Tool can be used to
  ○ choose lessons (critical consumer);
  ○ revise or create lessons for personal use; and
  ○ revise or create lessons for wider use.
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**
## Continuum of Science Instruction

<table>
<thead>
<tr>
<th>Information Frame</th>
<th>Sensemaking Frame</th>
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<tr>
<td>Teacher is focused on disseminating information.</td>
<td>Teacher is focused on developing conceptual understanding.</td>
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<td>Students are focused on knowing information.</td>
<td>Students are focused on understanding something.</td>
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<tr>
<td>Science is portrayed as a body of established facts.</td>
<td>Science is portrayed as a way to make sense of something.</td>
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<tr>
<td>Assessments are focused on “right” answers.</td>
<td>Assessments are focused on use of evidence to support conclusions/generalizations.</td>
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**Knowing about...**

**Figuring out...**

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

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

**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.

*Knowing about...*  
*Figuring out...* 

From: Cynthia Passmore, NSTA Virtual PD, Nov. 15, 2014
Sensemaking Tool

Single-Point Rubric for Sensemaking Lessons

Mastery of discrete facts or pieces of science content

Less Like

Phenomena & Student Questions

What questions are students trying to answer/what problem are they trying to solve?

More Like

“Knowledge in use” or science used to explain or predict phenomena or design solutions to problems.

Suggestions for Improvement

Evidence Criteria Met/Partially Met

STUDENTS experience the phenomenon, share questions about the phenomenon and try to answer a class-identified question about a phenomenon.

OR

STUDENTS identify a problem to be solved, share questions (about criteria/constraints), and design a solution to the problem. (Lesson may target only parts of the engineering design process.)

TEACHERS provided guidance needed to elicit student questions and connect students’ prior knowledge and personal experiences to the phenomenon or problem.
**Sensemaking Tool**

**Alone Zone**
Study the Sensemaking Tool (layout, categories, text, symbols, etc.).

- Be prepared to share observations.
- Record questions that arise.

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<table>
<thead>
<tr>
<th>Phenomena &amp; Student Questions</th>
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<td>What questions are students trying to answer/what problem are they trying to solve?</td>
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| TEACHERS provided guidance needed to elicit student questions and connect students’ prior knowledge and personal experiences to the phenomenon or problem. | |

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**Resource #3 (Google doc)**
**Resource #4 (PDF file)**
Sensemaking Tool Observations

Small Group

● Post three observations on Jamboard frame 1 (one observation per sticky note). *Links will be dropped shortly.*

● Put a check mark next to at least one observation someone noticed that you also noticed (multiple people can mark the same observation).

● Circle at least one observation someone noticed that you did not (multiple people can circle the same observation).

Please do not post questions yet.
### Jamboard Links

<table>
<thead>
<tr>
<th>Region</th>
<th>East 1</th>
<th>West 1</th>
<th>East 2</th>
<th>West 2</th>
</tr>
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<tbody>
<tr>
<td>Central 1</td>
<td><img src="https://jamboard.google.com/d/1sN84jm51oSFE2qfjSRHKl4KJ5LBhv1D_vKOrGBAQAV4/edit?usp=sharing" alt="Central 1" /></td>
<td><img src="https://jamboard.google.com/d/1DAyx6dm6j2H0VWu7RJYNEM-GnBcpCFGilvL_uCykk0U/edit?usp=sharing" alt="West 1" /></td>
<td><img src="https://jamboard.google.com/d/1ncf2NXx5Loa0CVZY-DQs6u6ffYDxV5qAyTJVIAU0qo/edit?usp=sharing" alt="East 2" /></td>
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### Mountain 1

- ![Mountain 1](https://jamboard.google.com/d/11X-93-hzGq7OJUundggQzaf-8510qW0Hs7C0YER8EM/edit?usp=ssharing)

### Mountain 2

- ![Mountain 2](https://jamboard.google.com/d/11X-93-hzGq7OJUundggQzaf-8510qW0Hs7C0YER8EM/edit?usp=ssharing)
## Evaluating Lessons for Sensemaking

### Single-Point Rubric for Sensemaking Lessons

#### Phenomena & Student Questions
*What questions are students trying to answer/what problem are they trying to solve?*

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<td>TEACHERS provided guidance needed to elicit student questions and connect students’ prior knowledge and personal experiences to the phenomenon or problem.</td>
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Evaluating Lessons for Sensemaking

Single-Point Rubric for Sensemaking Lessons

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<tr>
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<th>“Knowledge in use” or science used to explain or predict phenomena or design solutions to problems.</th>
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</thead>
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<tr>
<td>Less Like</td>
<td>More Like</td>
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### Phenomena & Student Questions

*What questions are students trying to answer/what problem are they trying to solve?*

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</tr>
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<td>TEACHERS provided guidance and support</td>
<td></td>
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</table>

**What students are doing**

**What teachers are doing**
Evaluating Sensemaking Lessons

Mastery of discrete facts or pieces of science content

Less Like

“Knowledge in use” or science used to explain or predict phenomena or design solutions to problems.

More Like

Phenomena & Student Questions
What questions are students trying to answer/what problem are they trying to solve?

Make Sense of Science Ideas
What part of the how or why of the phenomenon can students explain?

The focus is on individual student engagement in science and engineering practices and/or teacher-led whole group interactions.

Less Like

Students engage in science and engineering practices collaboratively to make sense of a needed science idea(s)

More Like

Use Science and Engineering Practices
What are students doing?

Student Ideas
How are students moving their science thinking forward together?
Phenomenon-driven, Three-dimensional Lesson Screener

NGSS Lesson Screener
A Quick Look at Potential NGSS Lesson Design for Instruction and Assessment

The lesson is designed to engage all students in making sense of phenomena and/or designing solutions to problems through student performances that integrate the three dimensions of the NGSS.

A. Explaining Phenomena or Designing Solutions: The lesson focuses on supporting students to make sense of a phenomenon or design solutions to a problem.

B. Three Dimensions: The lesson helps students develop and use multiple grade-appropriate elements of the science and engineering practices (SEPs), disciplinary core ideas (DCIs), and crosscutting concepts (CCCs), which are deliberately selected to aid student sense-making of phenomena or designing of solutions.

C. Integrating the Three Dimensions for Instruction and Assessment: The lesson requires student performances that integrate elements of the SEPs, CCCs, and DCIs to make sense of phenomena or design solutions to problems, and the lesson elicits student artifacts that show direct, observable evidence of three-dimensional learning.

D. Relevance and Authenticity: The lesson motivates student sense-making or problem-solving by taking advantage of student questions and prior experiences in the context of the students’ home, neighborhood, and community as appropriate.

E. Student Ideas: The lesson provides opportunities for students to express, clarify, justify, interpret, and represent their ideas (i.e., making thinking visible) and to respond to peer and teacher feedback.

F. Building on Students’ Prior Knowledge: The lesson identifies and builds on students’ prior learning in all three dimensions in a way that is explicit to both the teacher and the students.
Criterion A. Explaining Phenomenon

Criterion A. The lesson focuses on supporting students to make sense of a phenomenon or design solutions to a problem.

<table>
<thead>
<tr>
<th>Explaining Phenomena or Designing Solutions</th>
<th>NGSS designed lessons will look <em>less</em> like this:</th>
<th>NGSS designed lessons will look <em>more</em> like this:</th>
</tr>
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<tr>
<td>NGSS designed lessons will look <em>less</em> like this:</td>
<td>Explaining phenomena and designing solutions are not a part of student learning or are presented separately from “learning time” (i.e. used only as a “hook” or engagement tool; used only for enrichment or reward after learning; only loosely connected to a DCI).</td>
<td>The purpose and focus of the lesson are to support students in making sense of phenomena and/or designing solutions to problems. The entire lesson drives toward this goal.</td>
</tr>
<tr>
<td>The focus is only on getting the “right” answer to explain the phenomenon</td>
<td>Student sense-making of phenomena or designing of solutions is used as a window into student understanding of all three dimensions of the NGSS.</td>
<td>Lessons work together in a coherent storyline to help students make sense of phenomena.</td>
</tr>
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<td>A different, new, or unrelated phenomenon is used to start every lesson.</td>
<td>Lessons work together in a coherent storyline to help students make sense of phenomena.</td>
<td>Students get direct (preferably firsthand, or through media representations) experience with a phenomenon or problem that is relevant to them and is developmentally appropriate.</td>
</tr>
<tr>
<td>Teachers tell students about an interesting phenomenon or problem in the world.</td>
<td>Lessons work together in a coherent storyline to help students make sense of phenomena.</td>
<td>The development of science ideas is anchored in explaining phenomena or designing solutions to problems.</td>
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<tr>
<td>Phenomena are brought into the lesson after students develop the science ideas so students can apply what they learned.</td>
<td>Lessons work together in a coherent storyline to help students make sense of phenomena.</td>
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Criterion A. Explaining Phenomenon

The lesson focuses on supporting students to make sense of a phenomenon or design solutions to a problem.

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Less Like                                                                                                          More Like

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<td>Phenomena are brought into the lesson after students develop the science ideas so students can apply what they learned.</td>
<td>The development of science ideas is interwoven with the phenomenon or design of problems.</td>
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Focus on Criteria A, B and E

Criterion A. The lesson focuses on supporting students to make sense of a phenomenon or design solutions to a problem.

Criterion B. The lesson helps students develop and use multiple grade-appropriate elements of the SEPs, DCIs, and CCCs, which are deliberately selected to aid student sense-making of phenomena or designing of solutions.

Design for Sensemaking

- Phenomenon (Problem)
- Science and Engineering Practices
- Student Ideas
- Science Ideas
- Crosscutting Concepts
Design for Sensemaking

- Students experience a **phenomenon**;
- 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.
NSTA Daily Do Lesson (Grade 1)

Elements of the three dimensions targeted by the lesson developer shown in the table below.

Why aren’t the sounds the same?_NGSS Table

Phenomenon: Rubber bands of different thicknesses (stretched the same length) make different sounds when plucked.

<table>
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<tr>
<th>Science and Engineering Practices</th>
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<th>Crosscutting Concepts</th>
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</thead>
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<tr>
<td><strong>Analyzing and Interpreting Data</strong></td>
<td><strong>PS4.A: Wave Properties</strong></td>
<td><strong>Patterns</strong></td>
</tr>
<tr>
<td>● Use observations (firsthand or from media) to describe patterns and/or relationships in the natural and designed world in order to answer scientific questions and solve problems.</td>
<td>● Sound can make matter vibrate, and vibrating matter can make sound.</td>
<td>● Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.</td>
</tr>
<tr>
<td>● Compare predictions (based on prior experiences) to what occurred (observable events).</td>
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This lesson could be one in a series of lessons building toward:

1-PS4-1. Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. (Clarification Statement: Examples of vibrating materials that make sound could include tuning forks and plucking a stretched string. Examples of how sound can make matter vibrate could include holding a piece of paper near a speaker making a sound and holding an object near a vibrating tuning fork.)
NSTA Daily Do Lesson (Grade 1)

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A third-point reference is a document based on contemporary research that educators can use to drive decisions about what students should know and be able to do at different grade levels (bands), serve as a common ground from which to communicate with other educators, and/or reach consensus.
# Make Sense of Science Ideas

**Mastery of discrete facts or pieces of science content**

---

**“Knowledge in use” or science used to explain or predict phenomena or design solutions to problems.**

---

## Make Sense of Science Ideas

*What part of the how or why of the phenomenon can students explain?*

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<tr>
<th>Suggestions for Improvement</th>
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</table>
| STUDENTS make sense of targeted elements of **disciplinary core ideas** (or parts of ideas) and/or *crosscutting concepts* they need to explain how or why the phenomenon occurs.  
Note any scientific inaccuracies identified in the **Suggestions for Improvement** with clear guidance to correct. | |
| TEACHERS have guidance to help move students’ thinking about **disciplinary core ideas** deeper and may include questions to ask students (that don’t give away “aha!” moments) and talk moves to support students in building understanding or reaching consensus.  
*Crosscutting concepts may be leveraged to help students think about the phenomenon. | |
## Make Sense of Science Ideas

### Targeted K-2 disciplinary core idea element:

*vibrating matter can make sound*
Make Sense of Science Ideas

<table>
<thead>
<tr>
<th>PS3: Energy</th>
<th>Grades K–2</th>
<th>Grades 3–5</th>
<th>Grades 6–8</th>
<th>Grades 9–12</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS3.A: Definitions of Energy</td>
<td>N/A</td>
<td>The faster a given object is moving, the more energy it possesses. (4-PS3-1)</td>
<td>Motion energy is properly called kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed. (MS-PS3-1)</td>
<td>Energy is a quantitative property of a system that depends on the motion and interactions of matter and radiation within that system. That there is a single quantity called energy is due to the fact that a system’s total energy is conserved, even as, within the system, energy is continually transferred from one object to another and between its various possible forms. (HS-PS3-1), (HS-PS3-2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Energy can be moved from place to place by moving objects or through sound, light, or electric currents. (4-PS3-2), (4-PS3-3)</td>
<td>A system of objects may also contain stored (potential) energy, depending on their relative positions. (MS-PS3-2)</td>
<td>At the macroscopic scale, energy manifests itself in multiple ways, such as in motion, sound, light, and thermal energy. (HS-PS3-2), (HS-PS3-3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Temperature is not a measure of energy; the relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter present. MS-PS3-3), (MS-PS3-4)</td>
<td>These relationships are better understood at the microscopic scale, at which all of the different manifestations of energy can be modeled as a combination of energy associated with the motion of particles and energy associated with the configuration (relative position of the particles). In some cases the relative position energy can be thought of as stored in fields (which mediate interactions between particles). This last concept includes radiation, a phenomenon in which energy stored in fields moves across space. (HS-PS3-2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The term “heat” as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. (secondary to MS-PS1-4)</td>
<td>“Electrical energy” may mean energy stored in a battery or energy transmitted by electric currents. (secondary to HS-PS2-5)</td>
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N/A = Not applicable for this grade range

Targeted K-2 disciplinary core idea element:

**vibrating matter can make sound**
NSTA Daily Do Lesson (Grade 1)

Why Aren’t the Sounds the Same?

Lesson Plan

Why Aren’t the Sounds the Same?

Resource #8 (NSTA website)
Resource #9 (PDF file)

Resource #10
Make Sense of Science Ideas

Alone Zone

● Read the lesson *Why aren’t the sounds the same?*

● Record evidence of opportunities for students to **Make Sense of** the targeted **Science Idea**.

● Record of evidence of teacher guidance that supports students to **Make Sense of** the targeted **Science Idea**.

● Think about if the evidence you have gathered is sufficient to deem the criteria for this critical aspect of sensemaking “met”. 
Evidence

What counts as evidence?

I can point to it in the lesson, highlight it, or quote it directly from what is written.
Make Sense of Science Ideas

Small Group - Part 1 (Breakout Rooms)
● Share evidence of
  ○ opportunities for students to Make Sense of the targeted Science Idea, and
  ○ teacher guidance that supports students to Make Sense of the targeted Science Idea.
● Reach consensus on whether this critical aspect of sensemaking is met or partially met.

Please do not post your findings in the chat window when we return to the main room.
Our Community Norms

- We come prepared to work toward a common goal.
- We share our own thinking to help us all learn.
- We critique the ideas we are working with, not the people we are working with.
- 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.

From OpenSciEd Classroom Norms
Small Group - Part 2

● Post your group’s claim - **met** or **partially met** - and why the gathered evidence supports this claim on the Padlet board. **One post per group.** *Link will be dropped shortly.*

● Review at least one other group’s post on the Padlet board and share:
  ○ agreement (thumbs up) or disagreement (thumbs down) with the claim.
  ○ Why your group agrees or disagrees with the claim: We agree/disagree because…

● Return to your own group’s post and add to or revise your initial thinking: Now we think…because…
● Post your group’s claim - met or partially met - and why the gathered evidence supports this claim on the Padlet board. **One post per group.**

● Review at least one other group’s post on the Padlet board and share:

  ○ agreement (thumbs up) or disagreement (thumbs down) with the claim.
  
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● Return to your own group’s post and add to or revise your initial thinking: **Now we think…because…**
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- We critique the *ideas* we are working with, not the *people* we are working with.
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From *OpenSciEd Classroom Norms*
Does the evidence gathered support a claim that the lesson reflects this critical aspect of sensemaking?

A. Criteria Met
B. Criteria Partially Met
# Make Sense of Science Ideas

**What part of the how or why of the phenomenon can students explain?**

<table>
<thead>
<tr>
<th>Suggestions for Improvement</th>
<th>Evidence Criteria Met/Partially Met</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make sure this is part of a sequence of lessons where students revisit/need to apply the idea that matter needs to be moving up and down or back and forth repeatedly (vibrating) to make sound.</td>
<td>PS4.A: Wave Properties</td>
</tr>
<tr>
<td>Ask students to create a model to show (explain) why the rubber bands make different sounds.</td>
<td><strong>Sound can make matter vibrate, and vibrating matter can make sound.</strong></td>
</tr>
<tr>
<td>Consider providing a template for the model: Left side: Show rubber-band box making no sound. Right side: Show rubber-band box making sound.</td>
<td>Patterns</td>
</tr>
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<td>This moves students with intentionality toward the targeted science idea – the students have to think more deeply about the idea that the not moving rubber bands are making no sound and the moving rubber bands are making a sound.</td>
<td>Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.</td>
</tr>
<tr>
<td>Students don’t need to describe the mechanism of why the sounds are different, instead represent the differences in the ways each of the three rubber bands moves.</td>
<td>Partially Met:</td>
</tr>
<tr>
<td>STUDENTS make sense of disciplinary core ideas (or parts of ideas) and/or <em>crosscutting concepts</em> they need to explain how or why the phenomenon occurs. Note any scientific inaccuracies identified in the Suggestions for Improvement with clear guidance to correct.</td>
<td>- Students (asked to) notice the pattern that when the rubber band is not moving there is no sound. Rubber band needs to be moving to make sound.</td>
</tr>
<tr>
<td></td>
<td>- BUT the focus of the lesson is on the pattern between the thickness of the rubber band and the highness/lowness of the sound it makes when plucked and not the targeted science idea.</td>
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</tbody>
</table>
### Phenomenon & Student Questions

**Mastery of discrete facts or pieces of science content**

<table>
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<tr>
<th>Less Like</th>
<th>More Like</th>
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#### Phenomena & Student Questions

*What questions are students trying to answer/what problem are they trying to solve?*

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<td>TEACHERS provided guidance needed to elicit student questions and connect students’ prior knowledge and personal experiences to the phenomenon or problem.</td>
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Phenomenon & Student Questions

Rubber Band Box

What are you thinking?

1. I think the thin rubber bands make the lowest sound.
2. I think the thick rubber bands make the lowest sound.
3. I think the thickness does not matter.

Evidence Criteria Met/Partially Met

| STUDENTS experience the phenomenon, share questions about the phenomenon and try to answer a class-identified question about a phenomenon. |
| Rubber bands of different thicknesses (stretched the same length) make different sounds when plucked. |
| OR |
| STUDENTS identify a problem to be solved, share questions (about criteria/constraints), and design a solution to the problem. (Lesson may target only parts of the engineering design process.) |
| TEACHERS provided guidance needed to elicit student questions and connect students’ prior knowledge and personal experiences to the phenomenon or problem. |

Uncovering Student Ideas in Primary Science

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Alone Zone
Consider the use of the formative assessment probe *Rubber Band Box* in the context of the Daily Do lesson *Why aren’t the sounds the same?*

How does (might) the *Rubber Band Box* serve to:

- generate a *class-identified* question about the phenomenon
- bring out students’ prior knowledge and personal experiences about the phenomenon
Alone Zone
Consider the use of the formative assessment probe Rubber Band Box in the context of the Daily Do lesson Why aren’t the sounds the same?

How does (might) the Rubber Band Box serve to:

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## Phenomenon & Student Questions

*What phenomena are students trying to answer/what problem are they trying to solve?*

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<td>Rubber bands of different thicknesses (stretched the same amount) make different sounds when plucked.</td>
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<tr>
<td>Partially met:</td>
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<td>- Formative assessment probe is used to generate student questions (Am I right? Did I pick the student with the right answer?) This is the class-identified question that creates the need in students to investigate.</td>
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<tr>
<td>- Students given the opportunity to play with the rubber-band box (experience the phenomenon) and make observations</td>
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Alone Zone
Consider the use of the formative assessment probe *Rubber Band Box* in the context of the Daily Do lesson *Why aren’t the sounds the same?*

How does (might) the *Rubber Band Box* serve to:

- generate a *class-identified* question about the phenomenon
- bring out students’ prior knowledge and personal experiences about the phenomenon
Phenomenon & Student Questions

Small Group
What suggestions might you provide to create an opportunity for all students to connect their prior knowledge/personal experiences to the phenomenon?
Post your initial thinking on your assigned Jamboard frame 2.
Jamboard Links

**West 1**  
https://jamboard.google.com/d/1DAyx6dm6j2HQVWu7RJYNEM-GnBcpCFGiiLvL_uCykk0U/edit?usp=sharing

**West 2**  
https://jamboard.google.com/d/1ncf2NXx5Loa0CVZY-DQs6u6ffYDxV5qAYtJZVIAU9oq/edit?usp=sharing

**Central 1**  
https://jamboard.google.com/d/1sN84jm510sFE2qfISRHKl4KJ5LBry1D_vkOrGBPAAV4/edit?usp=sharing

**Central 2**  
https://jamboard.google.com/d/1AeVYXT9CAvmasZMWGEDs_Xs5vgJcck-ljT87XTg2M/edit?usp=sharing

**Mountain 1**  
https://jamboard.google.com/d/11X-93-hzGq7OJUundggQzaf-851oqW0Hs7C0YER8EM/edit?usp=s haring

**Mountain 2**  
https://jamboard.google.com/d/1zyH9aBp2r4ItLDDLxdehi7ig_Sqr7uG7RJNnr x-pBYEi/edit?usp=sharing

**East 1**  
https://jamboard.google.com/d/1_NsoH_uAlAhHXXZZKAoBSqOZEAx1nxv-agQ0fAo0Ks/edit?usp=sharing

**East 2**  
https://jamboard.google.com/d/1Dq4yczUeclHOOtaAYcXVIIP5WT1GaqVVo04JGW T21PU/edit?usp=sharing

**East 3**  
https://jamboard.google.com/d/10uYXMUOme8d2-4Zkra1uc7iYOfcAtSCW09xt1CFiWry/edit?usp=sharing

**East 4**  
https://jamboard.google.com/d/1XwevvwhYVFiz6PinmfUC-K8sp_V8eA60wiXVlp1Nw/edit?usp=sharing
## Phenomenon & Student Questions

**What questions are students trying to answer/what problem are they trying to solve?**

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| Consider providing students the opportunity to share their ideas about sound. For example, ask students to make sounds. Ask them ways to describe the sounds the students made (e.g., loud, soft, high, low, stop-and-start, continuous) and record. Then ask them as a class to try making sounds that are loud, then soft, then stop-and-start, etc. | Teacher guidance provided:  
  - how to administer the formative assessment probe (links to a video)  
  - to give students time to play with the instrument and make observations  
  - offers prompts you might ask students to get them to share their ideas /think more deeply about what they are observing. |
| When moving from group to group, the teacher could ask if the students can get the rubber band box to make the different kinds of sounds the class described. | TEACHERS provided guidance needed to elicit student questions and connect students’ prior knowledge and personal experiences to the phenomenon or problem. |
| To help connect students’ personal experience, ask students if making sounds with the rubber band box reminds them of something they have experienced before (make sure to ask what the connection is if it isn’t clear). |                                                                                                 |
How might you use the Sensemaking Tool?

Mentimeter Voting Link
https://www.menti.com/sjp1oicn9i

Presentation Link
https://www.mentimeter.com/app/presentation/655b101bb721f9395c7771617a75c02c/123c0e39df31
Thank Today’s Presenter

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NSTA Standards Implementation Specialist
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We value your feedback!

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

Your completed survey confirms your attendance which allows us to award you a certificate of participation.
Collection of Resources

This collection includes the slides (as PDF), handouts and other resources.

Link to the collection:
https://my.nsta.org/collection/xb2BRjWKjLM_E
NSTA Web Seminars

**Book Beat Live!** Time to Get Ready for the Solar Eclipse
Double-Header
**August 17, 7:00 PM ET**

**Science Update:** Seeing the Unseeable: Imaging Black Holes with the Event Horizon Telescope
**August 25, 7:00 PM ET**

**Science Update:** Earthquakes: What’s Shakin?
**September 15, 7:00 PM ET**

**FA22:** Lab Safety Considerations for Pre-Service Elementary Science/STEM Teachers
**September 19, 7:00 PM ET**

**Book Beat Live!** Uniting Scientific Discovery with Engineering Design: Discovery Engineering in Biology: Case Studies for Grades 6-12
**September 21, 7:00 PM ET**

https://my.nsta.org/webseminars
https://www.nsta.org/conferences-and-events
NSTA Opportunities: Web Seminar Series

Fall 2022: Prioritizing Relationships and Equity: Leveraging Student Ideas to Accelerate Learning

Web Seminar Series
- Tue Aug 09, 2022 | 7:00 PM - 8:30 PM Eastern | Zoom Online Meeting
- Tue Aug 16, 2022 | 7:00 PM - 8:30 PM Eastern | Zoom Online Meeting
- Tue Aug 23, 2022 | 7:00 PM - 8:30 PM Eastern | Zoom Online Meeting
- Tue Aug 30, 2022 | 7:00 PM - 8:30 PM Eastern | Zoom Online Meeting

https://www.nsta.org/webseminars
Thanks to the NSTA Virtual Learning Team

National Science Teaching Association
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  Holly Hereau, Instructional Materials and Professional Learning Specialist
  Emilee Clemens, Project Specialist
  Eddie Hausknecht, Sr. Mgr. Web Development
  Don Boonstra, Technical Coordinator

This concludes today’s program.