A person's hands are shown holding a pencil over a document. A large teal circle is overlaid on the center of the image, containing the main text. The background is a blurred image of a person's hands and a document. The text is in a bold, sans-serif font, with the words "Principles to Action" in italics. The teal circle is surrounded by several smaller colored circles (yellow, orange, red, white) and icons (a puzzle piece, a lightbulb, and a thumbs up).

**Connecting the
Principles to Action to
the NGSS Science &
Engineering Practices**



● Connecting the *Principles to Action* to the NGSS Science & Engineering Practices

2

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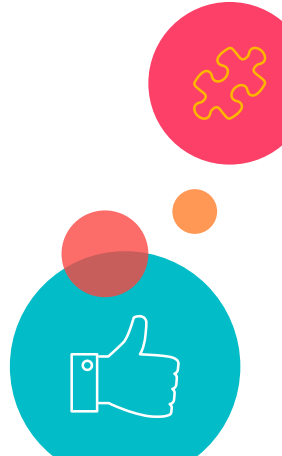
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Session Objectives

3

Today, we get to...

- ❑ Make connections between the *Principles to Action* (NCTM) and the NGSS Science and Engineering Practices
- ❑ Engage in hands-on science in order to experience the Science & Engineering Practices
- ❑ Begin to think about my approach for integrating math and science integration for the 2018-2019 school year





What are the *Principles to Action* and the NGSS⁴ Science and Engineering Practices?

Read the descriptions of either NCTM's *Principles to Action* Effective Mathematics Teaching Practices **OR** the NGSS Science and Engineering Practices.

Share what you learned with your colleagues at your table.



Card Sort

5

With your group, sort the cards in any way that makes sense to you.

As you sort, think about what you are noticing and what it means for the integration of math and science instruction.








Session Objectives

6

Today, we get to...

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-  Engage in hands-on science in order to experience the Science & Engineering Practices
-  Begin to think about my approach for integrating math and science integration for the 2018-2019 school year



Boat Building Contest

7

With your team, use the aluminum foil to make a boat that you believe will hold the most number of pennies in a contest.

The only material you can use to make your boat is the aluminum foil. No tape, paper, or any other materials!

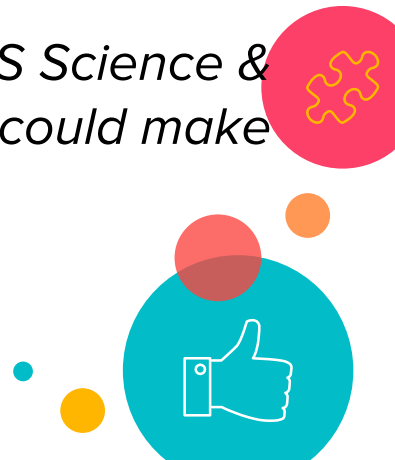


Boat Building Contest

Your group has 5 minutes to test as many times as possible.

Record each trial on the chart paper around the room.

As you work, think about how you are engaging in the NGSS Science & Engineering Practices as well as the math connections you could make to your grade level.



Boat Building Contest

9

As a group, create a poster that captures the following:

1. How did this hands-on activity engage you as a learner in the 8 Mathematics Teaching Practices from *Principles to Action*?
2. How did this hands-on activity engage you as a learner in the 8 NGSS Science & Engineering Practices?
3. What other scientific concepts (NGSS DCI's) could you address through this activity?
4. For the grade levels represented at your table, what would this activity look like and sound like?

Gallery Walk

Take a few minutes and look at the thoughts of other groups.

What do you notice is similar between groups and what did you notice is different?





Session Objectives

11

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Action Planning

12



**Math &
Science
Integration**

Create a Circle Map that includes your ideas for what integration of math and science can look like and sound like in your instruction. Include all your ideas - this is a “brain dump” of thoughts.



Session Objectives

13

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- Begin to think about my approach for integrating math and science integration for the 2018-2019 school year



Resources

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Principles to Actions: Ensuring Mathematical Success for All. NCTM, National Council of Teachers of Mathematics, 2014.

NextGen Science Standards, Science and Engineering Practices, nextgenscience.org, 2013.

Boat Building Lesson - National Oceanic and Atmospheric Association, http://www.noaa.gov/sites/default/files/atoms/files/BoatBuilding_Handout.pdf

