Sadie Levy /// Round 3 Bridge-Building /// 3.25.19

**Background and context**

This lesson is the 4th lesson in a bridge-building unit we are doing in preparation for our field trip to go see Theater Works' play about Rosie Revere the Engineer. We spent last week acquainting ourselves with our Lab Report books for this experiment with a simple guiding question of "How can Rosie build a sturdy and stable bridge out of toothpicks and marshmallows?" Students are all paired off and have had several days to build, with 2 building sessions after a mini-lesson I did on the importance of triangles. They are aware that using the triangle as a shape to build with can make things stronger.

**Learning Focus**

In this lesson we will be watching a few of the student's bridge tests to see what we can improve on, and learn that not only does the shape you're building with matter, but the shape of the bridge itself. After we watch the student videos, I will do a demonstration with paper and cardboard to demonstrate that stronger materials are not the only factor that go into making stronger bridges. Students will learn that both *truss bridges* and *arch bridges* are two types of bridge that are very strong, stable, and use triangles in their foundation to stay strong, but are not necessarily triangularly shaped.

**Learning-centered Goals**

1) Students will understand that shape plays a bigger role in making these bridges sturdy and stable, than material.
2) Students will understand that the force put on a bridge cannot be held by one part of the bridge, but rather needs to be spread out so the bridge can hold a lot of weight.
    a) Students will understand that an arch shape helps spread the force out instead of having it in one place.
3) Students will understand that ***compression*** is when a triangle spreads the force so that it is squeezed and the bridge does not sag.
4) Students will understand that a ***truss*** bridge or an ***arch*** bridge would be a great model to create something out of marshmallows and toothpicks that does not require a cable.

**Practice-centered Goals**

1) Students will be able to listen to and build off of one another's ideas.
2) Students will be able to actively participate in the creation of a class bridge, based on and using the vocabulary we will have just learned (truss bridge, compression, deck, tower, anchor)
3) I will use wait time consistently so that I know all students are listening to me.
4) I will use my "Who Sticks" as needed if the same students are participating.
5) I will be sure to be vocal about students I am looking for to give clicks for, and make that clear at the beginning of the lesson. (Students who are both listening *and* participating).

**Learning-centered Inquiry**

1. Is there evidence that students are applying their knowledge of the design cycle in our classroom conversations?

2. Is there evidence that students understand the vocabulary words around parts of a bridge? (Deck, towers, anchors)

3. Is there evidence that students understand new vocabulary words regarding forces and bridge types? (Compression, truss, arch)

4. How do you see students applying their knowledge of bridges, force, and shape to create a bridge together as a class?

**Practice-centered Inquiry**

1. When students get antsy, am I responding in a way that is conducive to both their learning and the overall classes learning?

2. Are the examples of effective use of my wait time?

3. Where am I being consistent/inconsistent in my use of clicks and noticing STAR behavior? (I especially look for listening and participating. Am I reminding my students that those are the two main things I'm concerned about?)