Lesson Plan Template - Adapted for LSEE 313 - Spring 2023

Lesson Title: Stable vs Unstable Structures

Your Name: Halle Root	
Grade Level: 1st	**Discipline domain:** Engineering, Technology, and Applications of Science

Unit Snapshot: (Where does this lesson fit into a larger teaching cycle/unit?)
Energy unit

What should the students already know?

- What a structure is.
- Understand the concept of stable versus unstable.

What should they know at the end?

- How shapes create different levels of stability.
- The components of what make up a structure.

Big Idea/Key Concepts:

- What makes structures stable?
- How can you increase stability?
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Describe your lesson in 1 sentence:
Direct hands-on experience to understand what makes a structure stable versus unstable.

Next Generation Science Standard
ETS1.B: Developing Possible Solutions
Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.
Structure and Function
The shape and stability of structures of natural and designed objects are related to their function(s).

Learning Objective(s) *(Students will be able to… Students will understand…)*:
Students will be able to identify a stable versus non stable structure as well as understand what composes a structure.

Academic Language and Key Vocabulary *(School based language of tasks/thinking processes/content (ie: acute angle, community, igneous rocks, etc.): paying attention to words like compare, infer, predict- for example. Be sure to name and define with a simple definition)*

- Structure : the arrangement of parts or objects
- Stable: not likely to fall
- Unstable : likely to fall
- Balanced : equal
- Predict : aa guess to an outcome

Differentiation (Modifications/Supports/Extensions): ● Physical Disabilities: for those who can't play on the play structure or make shapes in the activity, I would bring blocks/cards for the student to stack and learn how to make a stable structure OR I would have them be my helper if they were wanting to yell out shapes for their classmates to make! ● Autism: for a student who doesn't necessarily want to interact closely with their peers I could have them again use blocks or cards to create structures or let them explore the playground independently or with an aide ahead of time so they don't become overstimulated.	
Materials: ● A notebook for each student to write observations ● A writing utensil ● Posters with STABLE and UNSTABLE written on them for classroom activity at the end. ● A list of safe shapes and poses for the students to make.	
Learning Activities/Teaching Strategies - Write as a procedure - Include Timing **Be sure to explicitly list teacher actions and student actions.**	
5 E Instructional Model or Learning Cycle or Flow learning **Stage I: Awaken Enthusiasm** - (10 minutes) I would take the class out to the playground and instruct them to play a game of shapes! In four small groups, depending on class size, I would have them try and create shapes with their classmates! For example, a pyramid, a circle, a triangle, etc and mention trying to make them as STRONG or STABLE as possible. - I want to start this way because kids love getting out of the classroom and being able to use a loose structured game to get their minds thinking about what makes a shape stronger versus weaker. **Stage II: Focus Attention** - (5 minutes) I would use an attention grabber to gather the class together around the swing set. I would have the	

students line up and I would put them in pairs of two by saying something like “penguins + otters” groups. - I really don’t like numbering students 1/2 or A/B, I feel like the kids in groups 1 or A always end up saying they are better than the others. After they are paired I will ask them to write in their notebook to PREDICT based on the game they just played to recall what makes shapes STABLE and what they think makes the swing set STABLE.

Stage III: Direct Experience

- (5-10 minutes) Next I would let them play freely across the entire play structure. Prompting them throughout their play to question why the swing set doesn’t fall when they swing or why the slides don’t fall down.
- A couple minutes into the free play I would start giving hints to shapes that are stronger than others and having the students find those shapes within the play structure. I would also start asking students guiding questions like, “what if you took that beam away, what can you predict would happen?”

Stage X: Share Inspiration

- (10-15 minutes) Take the students back to the classroom and ask them to recall the activity where they got to create shapes together. I will place a poster that says STABLE and UNSTABLE on opposite sides of the classroom. When I name off a shape they can go to the side of the classroom that they agree with. They can discuss with each other why they agree with why the shape was stable or unstable and share with the class, especially if there are opposing thoughts.
- After that I will let students share their own experiences and why they think some are stronger than others. From there I will explain why some structures are explicitly stronger than others while students share.

Formative Assessment- *Ongoing throughout Lesson*: checking in with each group to check what is being obtained, stage X activity on stable versus unstable structures to assess their knowledge.

Summative Assessment - *End of Lesson or End of Unit*: a quiz on what structures are stable versus unstable.

Appendix

- No handouts needed.
- Only requirement is the stable and unstable posters for the formative assessment.
- I used the week 1 slides to reference flow learning.

UPDATED 02/14/2023 - JO