Lesson Plan Template

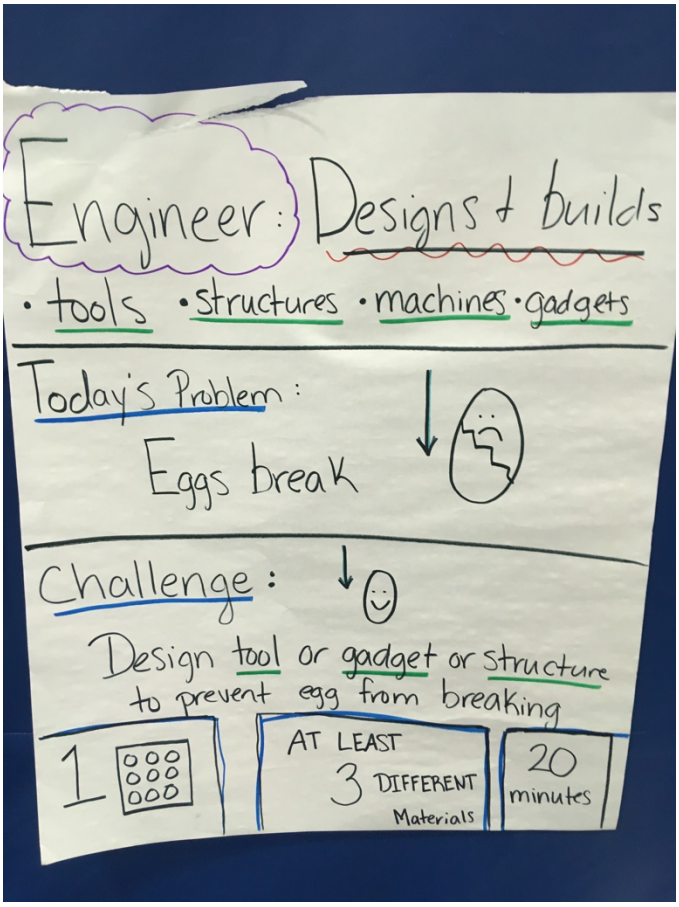
Grade: K-6	**Subject:** Science- Engineering/Technology
Materials: Straws, bubble wrap, marshmallows, plastic bags, rubber bands, plastic tub, tablecloth, tape, scissors, table, chair	**Technology Needed:**
Instructional Strategies: ☐ **Direct instruction** ☐ Guided practice ☐ Socratic Seminar ☐ Learning Centers ☐ Lecture ☐ Technology integration ☐ Other (list) ☐ Peer teaching/collaboration/ cooperative learning ☐ Visuals/Graphic organizers ☐ PBL ☐ **Discussion/Debate** ☐ Modeling	**Guided Practices and Concrete Application:** ☐ Large group activity ☐ Independent activity ☐ **Pairing/collaboration** ☐ Simulations/Scenarios ☐ Other (list) Explain: ☐ **Hands-on** ☐ Technology integration ☐ Imitation/Repeat/Mimic
Standard(s) 3-ET1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem	**Differentiation** **Below Proficiency:** I will be pairing the younger kids with those above so they can witness what the older kids are doing and thinking as the older kids explain what they are thinking. **Above Proficiency:** Those above proficiency (in this case the older kids) will be able to thrive as they will naturally take a leadership position in the groupings that I will divide out. From what I've observed with this group of learners the older kids generally do a great job of including the younger kids into the group activities, and I expect this will happen again. **Approaching/Emerging Proficiency:** The learners in the middle will get the opportunity to look up to the older kids and see the ways in which they are working and help out the younger kids as well and be a role model for them. **Modalities/Learning Preferences:** This is going to be very hands on for those tactile/kinesthetic learners. The verbal learners will be able to listen to the instructions and the visual learners will have graphics and checklists of what is expected.
Objective(s) By the end of the lesson the students will understand what an engineer does by building and designing their own technology as small groups to keep an egg from breaking after it is dropped from a particular height. **Bloom's Taxonomy Cognitive Level:** Apply	
Classroom Management- (grouping(s), movement/transitions, etc.) Split them up based on age when you put them into groups. For example, if you have 2 sixth graders put them in different groups. Try to get a wide range of ages in each group. When you're explaining/having a discussion have them sit in a group on the floor (probably in the middle of the circle would be best). The way that they can either plan or get their materials first means should keep them from crowding the material table but be prepared for a pile up at the material table. Spread out the materials as much as possible and have them form a line along the way. When we're testing different egg structures have them leave their egg and structure at the table to keep them from being distracted when we're testing other groups.	**Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.)** They need to have their masks on at all times during this activity due to the closeness of the students to each other.

Minutes	Procedures
5	**Set-up/Prep:** • Set out all materials necessary as listed above • Have tarp/tablecloth/tub to drop eggs into incase of a big mess. • Have a checklist of procedures • Organize the class into groups of 5- there should be 4 groups. Make sure that there is a good mix of ages in each group- each group should have at least one younger student and at least one older student. •
2	**Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)** Today we are all going to become engineers. I'd like for you to take a moment to think about what you think of when you hear the word engineer. *Count to 4 to give them some time to think* Would anyone be willing to share what they think of when they hear the word engineer? Say: An engineer is someone who designs and builds different machines, tools, structures, or gadgets depending on what is needed. Today, you are going to be a team of engineers trying to solve a problem.
4	**Explain: (concepts, procedures, vocabulary, etc.)**

	Alright, engineers let's get started. I have a bunch of eggs right here. What happens when an egg gets dropped? *Let them answer- It breaks!* Like this? *Drop an egg in the bucket* That's right it breaks. Here's your challenge. Each team today is going to get the opportunity to figure out some way to keep an egg from breaking when it is dropped from a 6 ft. height. You will be working with the group that I will assign shortly. If you look over here, you can see the different materials that will be available to you. As a team you will get the chance to brainstorm how you're going to accomplish this challenge. Each team will get a piece of paper where you can sketch out your design plan before implementing it. Once you have a plan designed you will be able to begin construction on your structure/design. You will all get 15 minutes (change this amount depending on how the groups appear to be doing or how much time you have) to construct your design before we test them out. Here's the catch- there is a limit to how much of each material you can use. Each team can only use one small square of bubble wrap and one piece of foam. You can use as many straws and as much tape as you need to complete your structure. These particular amounts are written down on the table of materials in case you forget. (Write these amounts down by each pile on the table). Does anyone have any questions before we get started? *Answer questions accordingly* *Split them up into teams* Now, one of the best things about working in a team is coming up with a fun team name. On this piece of paper (have a stack of them by you- the piece of paper is attached at the bottom of this lesson plan) you will have the space to write everyone's names on the paper and your team name. When I say go, I would like one representative from each team come and get a piece of paper from me for your names and plan. Once you have the paper you and your team can get started. It's up to you if you want to get the materials first or if you want to start with your design plan. Thumbs up if you're ready to get started. *look for thumbs up* Okay- go!
20-30	**Explore: (independent, concreate practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)** Help direct traffic as the teams head to their tables/areas to work and get their materials. As they are working walk around and confer with the groups on what their plans are. Ask questions such as: • Why are you doing it that way? • What is your thought process behind this part? • Can you explain to me how your design is going to work? After teams are done building, bring everyone together to test the designs. Drop the eggs from a set height (*I'm envisioning designating the tallest person in the room- probably an adult- dropping the egg from as high up as they can reach. If this height isn't enough maybe have an adult stand on a chair to drop it.)*
3	**Review (wrap up and transition to next activity):** Bring everyone back together and have a little discussion about what they did. Ask questions such as: How were you like an engineer today? What were some challenges that your groups faced? Did your plan work the way that you thought it would? If you could make any changes to your design what would you do differently? Do you think engineers get it right the first time they design and try something? I'm positive they have to try over and over to get something just right. Today, you guys were just like engineers because you guys tried something that you designed and thought about ways that you could make it better. You may have kept the egg from breaking, but I'm sure you also thought of ways to improve your design. I'm really proud of you guys for not giving up, just like engineers! -gather design plans for assessment/documentation and direct everyone to clean up their area by bringing the materials back to the main table and throwing away any garbage/scraps.

Formative Assessment: (linked to objectives) **Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc.** Observe the students as they are working in groups. Look for the ways in which they are working together or notice any power struggles that	**Summative Assessment (linked back to objectives)** **End of lesson:** Make note of which structures succeeded and didn't. More importantly than whether or not the egg survived or not your questions at the end will show you how their brains are continuing to brainstorm beyond

might be happening. Also look to see if anyone is getting easily frustrated when things aren't working very well. Ask questions similar to those that are listed in the Explore section to check for understanding. **Consideration for Back-up Plan:**	what they built. **If applicable- overall unit, chapter, concept, etc.:**
Reflection (What went well? What did the students learn? How do you know? What changes would you make?):	



Names:	**Team Name:**

Design Plan: