

Sadie Levy

Engineering: LAP 2

Guest Teacher: Dan Levy

1. Content: Describe **what** it is you will teach. What is the content?
 - a. In this lesson, my father will come in to teach more about design in engineering. In the first lesson we went over the design process and drew the cycle of it on the board. Although our main project throughout this unit will be to create a boat, I think it is very important to have occasional guests in the classroom to change up the usual routine, and to reach students in a new way. My dad, Dan Levy, will focus on how design is meant for a *purpose*. Structures and buildings are created with a specific purpose in mind. He will focus on human traffic in a space, how much something costs, and the materials used.
2. Learning Goal(s): Describe what specifically students will **know** and **be able to do** after the experience of this class.
 - a. SWBAT practice expected STAR behavior with a guest.
 - b. SWBAT work in groups to design their own part of a school building.
 - c. Students will understand that there are purposes to the buildings and structures that are designed.
 - d. Students will understand that money, material, human foot traffic, and space available are all factors that go into creating a structure.
3. Rationale: Explain how the content and learning goal(s) relate to your Curriculum Unit Plan learning goals.
 - a. The main overarching goals of this CUP is to understand what an engineer does and the design process. Both of these notions will be concretized throughout the unit, including this lesson with Dan. Although not directly tied into our project of creating boats, designing an imaginary school based on principals of space, money, and material, students are practicing their engineering skills of thinking critically, thoughtfully, and executing these ideas in a group setting. Additional to the work they're producing, receiving a lesson from someone besides the usual teachers can be an important change of pace for hearing something from a new voice and in a new style. Especially since my dad is in the science field generally, hearing from someone who practices these ways of thinking on the daily will show students their application.
4. Assessment: Describe **how** you and your students will know they have reached your learning goals.
 - a. Students will be assessed on their active participation in the lesson - are they raising their hands, showing curiosity, and asking relevant questions? Students will also be assessed on their ability to work in a group well together and create something collaboratively. I will be taking notes on student behavior throughout

the group-work part and making note of their ability to listen, build off of each other's ideas and be kind (on a notebook I walk around with). Students will also be assessed on the group papers they create and present. After my dad's small lecture/talk, students should be keeping in mind space, material, and cost when making their designs. Their creations should reflect some of these expectations.

5. Personalization and equity: Describe how you will provide for individual student strengths and needs. How will you and your lesson consider the needs of each student and scaffold learning? How specifically will ELL students and students with learning disabilities gain access and be supported?

a. A huge part of engaging students is making the learning exciting, and I think having a guest in the classroom will make the content very exciting, and the project itself is engaging. Additionally, I will try and write things down as best I can while Dan is presenting for students who may need to see the words written down additional to hear them (ELLs). As he mentions vocabulary, *engineering*, *architect*, *blueprint*, etc. I will write them down on the board or the Elmo (depending on what is easier at the time). The groups will also be created with student needs and working styles in mind. Most of the lesson will be spent on the designing in groups and drawing their ideas, so my hope is that this will engage students in meaningful ways, their voices can be heard, and their ideas can be represented through drawing, as opposed to words. This will highlight more than just those student voices who are proficient in writing.

6. Activity description and agenda

a. Describe the activities that will help your students understand the content of your class lesson by creating an agenda with time frames for your class. Be prepared to explain why you think each activity will help students on the path toward understanding.

time	teacher does	student does
2-5 minutes	Introduce my dad: He's a doctor but was trained in biology and knows a lot about engineering and why things work!	
15-20	Dad does presentation (he shows pictures of blueprints and The Leaning Tower of Piza, talks about why things are built the way they are). Size, cost, human traffic patterns are among the purposes he touches on.	Students participate and ask questions as he goes.

5 minutes	Dan introduces project: Each group has an area of focus related to a school building (the structure of the building, the blueprint, the playground, one classroom). I create the groups for them to split into.	
20-25 minutes	Time allotted for students to work on their given part of the school-creation. Teacher floats around checking in on groups, guiding their inquiry.	Students work in groups (listening, collaborating, building off of each other's ideas) to sketch and draw with markers an idea for their given part of the school building they need to focus on.

b. What particular challenges, in terms of student learning or implementing planned activity, do you anticipate and how will you address them?

- i. Since this lesson is not entirely planned by me and there is only so much control over the outcomes and the way the class is run, I am concerned that there will not be a clear focus for the class. As I teach more and more I realize the importance of having clear standards and making sure the students know what's expected of them. When talking to my dad before the lesson, I can see where I get my ambitious teaching notions from! I feel like his ideas are clear for him and are the product of a lifetime of thinking critically about structure and the relationship of space and people, but I am trying to encourage him to think of what are the exact few factors that he wants the students to take away. They simply are not developmentally at a place to mull over several factors. I think it will help the ELL and students with IEPs especially if there are very clear factors to consider. Personally, I would set it up in a more structured way, but I also think it's important for the students to have a variety of teaching styles so I am glad that the lesson will be something I can't expect, and regardless, I'm sure they will get something out of designing collaboratively.

7. List the Massachusetts Learning Standards this lesson addresses.

- a. Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.
 - i. Follow agreed-upon rules for discussions.
 - ii. Build on other's talk in conversations by linking their comments to the remarks of others.
 - iii. Ask for clarification and further explanation as needed about the topics and texts under discussion.

- b. 2-PS1-2. Test different materials and analyze the data obtained to determine which materials have the properties that are best suited for an intended purpose.

8. Reflection

- a. In light of all areas of planning, but especially in terms of your stated purpose and learning goals, in what ways was the activity(ies) successful? How do you know? In what ways was it not successful? How might the activity be planned differently another time?
- b. What did you learn from the experience of this lesson that will inform your next LAP?

This lesson was a lot of fun! The students enjoyed having a guest and I think it helped with their overall engagement. As expected, I did feel like the expectations were a little unclear, but I tried to step in as necessary and reel students back in. Usually this would involve me physically asking students to embody what he was saying more. For example, my dad was talking about the tile of their classroom floor in an abstract way as an example, so I asked to interrupt and had the students literally touch the tile (because why not, it was right there in front of them) and then tell me what they noticed about it and why they thought this would be a good material for their classroom floor. Even though there were a few times this happened, I think it was helpful for the students to have two different point of views and it was cool to co-teach with my dad.

Also, I tried to warn my dad that their attention spans were very short and I felt like he pushed their attention spans in a way that was not conducive to a lot of student learning, but I did try some different methods to encourage learning. While he was speaking, because I wasn't teaching, I could go up to students more quietly and ask them how they could listen better instead of saying it loudly like I would if I were teaching. I talked with Prince out in the hall during the lesson and encouraged him to stand if he felt like he needed to. I think talking with him was helpful. I noticed later he was wriggling around a lot and I looked at him and he said "I think I need to stand." Since he is the youngest in the class, I think I do need to remind myself and him that he has options! I see him benefiting well from knowing the expectations but also knowing the options. Maybe Prince and I can develop some different places he can stand and sit together. Because I was not the main teacher during this lesson, but still felt responsible for their learning, I was able to go around and jot down some notes on their contributions and learning which was very helpful! I wish I could do this more fluidly when I am teaching. If I take over for Mary when she leaves, I may look into bloomz (the app that Kate E. told us about).

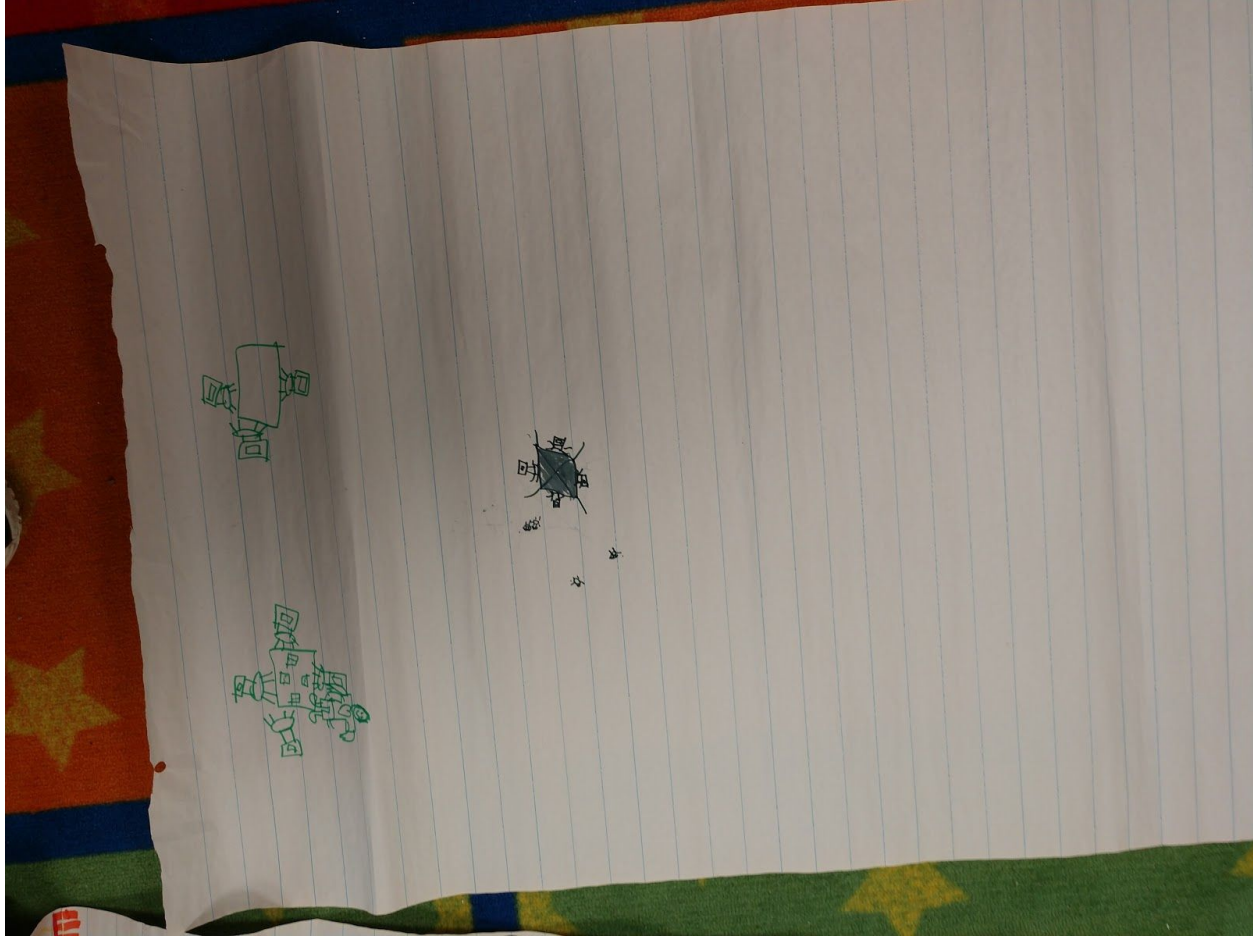
Pertaining to content and acquired knowledge, I think most students by the end understood the basic idea that structures are created with a purpose in mind. In the end I did not enforce that students label their drawings because they were deep in the drawing and I didn't want the labeling to deter anyone from participating. It was really exciting seeing Mario so excited about designing a building. (Of course, he made it chicken shaped), but giving him the freedom to draw within guidelines was exciting to see inside his thinking process a little more.

Continuing on from this lesson, I think it will be helpful to reference back to when we create our boats. Although right now the main purpose is to create something that can hold the

most amount of weight for the longest time, but it may end up being that a challenge will arise - to create a boat that makes sense for its purpose. In this case, I will have to develop my back story a little more and require students to think about its purpose. They will certainly need to think about appropriate materials to use for the purpose of holding weight which will be a great way to build off of this lesson.







Above are displayed some student work. The largest defining factor of the actual art/design they produced was how well their group could work together. There was one group that ended much larger than the others because two melded together I think, but they worked great together! It seemed without fighting, they were able to all delegate roles and be excited. They didn't do much planning, but seemed to be respectful of each other's ideas. This was the playground crew (their area of design may have also influenced how well they could work together because they were excited about the playground).

Another group ended up designing their own buildings. Their task was to create the external shape of the building. My dad was working with them mostly, and it seemed they ultimately each came up with their own idea, but they were careful and creative in their thinking. Mario wanted to make chicken-shaped building, but then decided against it on his own terms because he thought it was too silly, but he put a gym on the roof! Sara also incorporated a gym in hers. Clearly they were thinking about design in our school and how they wish they could have a space in their own school for gym.

The one group that essentially had nothing to show for their thinking was Chino, Keziah, and Nathaniel (from Mrs. Halloran's class because they got split up). They were all very engaged in the learning and excited about their individual ideas but were getting stuck on minor

details like how to draw the chairs and what the desks should look like. I heard all of their ideas and they were very thoughtful, so I think it would behoove our class to talk about the importance of compromise when working in a group. I also need to talk with Keziah about group work. She works so well independently - focused, perseveres, doesn't disturb others, etc., but she absolutely hates working in groups. She's gotten better at just going with it, but I think talking with her at a time that isn't at the same time as the group work is happening would encourage and help her see more of the value in it.