Kacey Legare
Teaching and Learning III: Engineering CUP
How do engineers make choices about problems, solutions, and materials?

I. Title and brief description: Give a title and short description. What, briefly, will students be doing in this unit of study?
- This unit is going to be an engineering project focused around building "bridges" made from paper and other materials between two textbooks using the Engineering Design Process. In this unit, students will be practicing their engineering skills such as collaboration, thinking of solutions to real-life problems, designing models, building prototypes to test, choosing appropriate materials, redesigning and improving based off of tests through the collaborative project. Students will engage with a video and a read-aloud to think about choosing materials and engineering bridges for the project. Exploration and investigation of the problem through physical testing and familiarizing of the materials will allow students to act as engineers to make group decisions regarding their bridge to be the most successful at holding pennies. By using designs and redesigns, students can show their learning through change and show improvement. Students will also practice recording information and categorizing materials to make strategic decisions regarding design and materials. Lastly, students will practice reflection by rating their group performance and focusing on themselves and their own participation. Focusing on how we can problem solve as a group and collaborate towards a common goal through the Engineering Design Process will give my students a background to solve many other problems across disciplines.

II. Big Idea/Essential Question: Explain your "big idea" and/or essential question.
- **How do engineers make choices about problems, solutions, and materials?**
- I chose this as an essential question because it will allow students to think about what engineers consider when making their decisions around problem solving. They can access this question across curriculum and disciplines as well as beyond the activities I will have them complete in school. This question requires students to think about what is most important to consider and what is not as well as what is feasible within the constraints given. By tying in hands-on and experimental aspects, students can discover their learning and problem solve themselves in real time. Collaboration around a common goal is another skill that engineers must internalize and my students can practice how to make and decide upon group decisions. Students will connect back to this essential question throughout all the lessons while following the EDP and can build an idea around how engineers make critical and intentional decisions to solve problems in teams.

III. Learning Goals: Explain what learning goals you have set for students' investigation of the big idea/essential question. Consider the following areas:

a. Development of content understanding (key concepts and ideas)
- The most important learning goals of this unit are as follows:
  - SWBAT identify and elaborate the steps of the Engineering Design Process
  - SWBAT apply the EDP to the bridge building project.
  - SWBAT test materials and determine suitability for different tasks.
  - SWBAT practice recording data in a chart.
  - SWBAT improve upon prior designs and ideas in order to be more successful.
  - SWBAT self-reflect on their cooperation and collaboration efforts.

- SWBAT connect to PLTW "structure and function" lessons with the project.

These learning goals focus on connecting students with content standards through meaningful and intentional application of collaborative skills, social emotional skills, and metacognitive skills.

b. Enabling students to experience the power of their minds and their capacities as learners and doers (powerful learning)
   - Students will have experiences the power of their minds by persevering through a long project such as this one. Perseverance is a life-long skill and is applied in school by the ability to keep trying and working through complicated problems without giving up or getting discouraged. My students are used to this because it is also a Mathematical Practice standard. We practice perseverance in many disciplines. On the anchor chart with the Engineering Design Process, I also included some statements about what engineers do. (See Appendix A). These statements reflect the collaboration skills and perseverance needed to be successful in this project. Students are powerful learners when they embody the engineering principles in this way and have the freedom to explore materials and test out ideas without judgement.

c. Development of intellectual and academic habits of mind, work, and discourse, including habits of independent or collaborative thinking and doing typical of readers, writers, speakers, creators, researchers and thinkers in the discipline (ways of knowing and academic literacy)
   - Students develop many academic habits of mind. They practice many of the skills needed to be good engineers. They act as engineers through collaboration. This is shown when they work with their one partner for every lesson. They must use each other to complete the written work, the designing process, the construction and testing of their models, and there is even a reflection on collaboration skills at the conclusion of the unit. Students practice this skill needed to work in any team or group which they will need in school and in their careers. Additionally, students act as engineers when they persevere. By seeking out improvements and redesigning and rethinking ideas over and over, students practice being resilient. They must keep trying different ideas until something works. This skill is threaded throughout math and science consistently. Lastly, students must also be creative and flexible. They must be able to take in new ideas and change their minds. There is no failure in projects like this one. There is so much opportunity for creativity and deviance that no one should not be able to find some success. Students must be able to communicate their ideas and be flexible to changing their minds about what may be the best decision for their bridge designs. By the end of the unit, students will have changed their designs and materials multiple times. They will be free to choose a final material and fold any way they wish for their final test. This requires collaboration, perseverance, and flexibility.

d. Literacy development, including capabilities of proficient readers, writers, and speakers in the particular discipline
   - Literacy is incorporated into this unit in numerous ways. First, we have done some readings prior to the official start of the unit. We read Rosie Revere Engineer, Iggy Peck Architect, and Ada Twist Scientist books which the students love dearly. I also included reading, writing, speaking, and listening to every lesson. Students must communicate clearly with their partners to make decisions and construct models and

designs. Students are also required to reflect and write briefly throughout their packets (See Appendix B). Students practice these skills in a nonthreatening way where failure is celebrated as a chance to try again doing something new through collaboration and trust with their partners and class as a whole.

e. Development of trust and the classroom as a learning community
   - This unit is extremely impactful for building a classroom community. Students have to engage with each other in partners for every step of the process. Collaboration was a guiding principle in this lesson, and has traces in every lesson plan. Students work in strategic partnerships to build upon trust and collaboration within the class. Students will have a chance to work with new students they may not have had much chance to yet this year. Through successes and failures, students will have to rely on their partner's for success. It is crucial that students collaborate and work together in this project. Also, the competitive classroom will help us build a community of active and intentional learning. Although competition can be destructive or harmful, it can also be fun and engaging if done carefully. This project can bring us together as a diverse community which we need to collaborate with to enrich our collective experiences including our learning.

IV. <u>Personal, social, and cultural factors (yourself, your students, and learning)</u>

a. What assumptions are you making about why your plan will connect to your Main South students? How are you taking into account any differences in your socioeconomic, cultural, or racial background, gender, personality, approach to learning, or view of the world?
   - I am assuming that my students have some recollection about engineers and engineering from previous grades, from STEM special, or from background experiences. I recognize that girls and women in STEM often feelinadaquate and uninterested. I made sure to carefully plan my groupings to allow all my students, especially those whose identities are not usually reflected in STEM and engineering to be honored. Students have read books about characters who look like them studying to be engineers and scientists. They all received a copy of the book <u>Hidden Figures</u> recently as well so they have those women to look up to as well.

     As far as different personalities and learning styles, I am assuming all my students will enjoy a hands-on project which is different than most independent book work and writing we do. Students will have to practice collaboration skills which can be difficult and uncomfortable if students don't get along or cannot find common ground on ideas. Nevertheless, this project is good practice for those skills. Also, I have incorporated hands-on kinesthetic learning, writing, drawing for visual learners, and other aspects of learning through technology and listening/speaking.

b. Please think about (and write about, if appropriate) whether and how in this plan you might position and empower students to "read the world" and act in it in support of equity and social justice.
   - This unit empowers my students to see themselves as engineers. My class of 16 is all students of color. As mentioned above, these lessons empower my students to own their identities and see themselves as successful in STEM. They will learn the skills necessary to solve problems, be creative, collaborate, and find solutions. These skills are all transferable to the real world. These skills allow my students to see themselves as agents capable of making change. If you can persevere and solve problems creatively, you can make the world a better place.

V. Rationale: Your rationale should clearly show your careful consideration of a full range of factors in planning your unit to ensure equitable support and meaningful, authentic, and substantial learning for all students, taking into account:

a. Learning goals: Explain why your big idea/essential question and your learning goals are important for your discipline and meaningful for your students.

- Being an Engineer is important for my students because it allows them to think about the processes and skills needed to be a problem solver. The learning goals guide the students through the EDP which is the process for problem solving complex issues as well. In STEM, engineering and creatively and collaboratively solving problems is an essential skill. In this unit, students practice being able to choose from different options for the same problem. Being able to make decisions based off of appropriateness or effectiveness is a skill that we will develop and strengthen in this unit.

b. Curriculum standards: Explain how the big idea/essential question connects to the Guiding Principles in the MA curriculum frameworks. Identify which learning standards are addressed and how.

Science and Technology Engineering Standards

- **2.K-2-ETS1-3.** Analyze data from tests of two objects designed to solve the same design problem to compare the strengths and weaknesses of how each object performs.
    - Data can include observations and be either qualitative or quantitative.

Additional Standards

- **2.W.7.** Participate in shared research and writing projects (e.g. read a number of books on a single topic to produce a report; record science observations).
- **2.W.8.** Recall information from experiences or gather information from provided sources to answer a question.
- **2.W.10.** Write routinely for a range of tasks, purposes, and audiences.
- **2.SL.1.** Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.
    - a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
    - b. Build on others' talk in conversations by linking their comments to the remarks of others.
    - c. Ask for clarification and further explanation as needed about the topics and texts under discussion.
- **2.SL.4.** Tell a story, recount an experience, or explain how to solve a mathematical problem with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences and using appropriate vocabulary.
- **2.SL.6.** Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.
- **2.L.1.** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking; retain and further develop language skills learned in previous grades.
- **2.L.2.** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

- **2.L.3.** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **2.L.6.** Use words and phrases acquired through conversations, activities in the grade 2 curriculum, reading and being read to, and responding to texts, including using adjectives and adverbs to describe.
- **2.MD.9.** Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Organize and record the data on a line plot (dot plot) where the horizontal scale is marked off in whole-number units.
- **2.MD.10.** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems,11 using information presented in a bar graph.

c. Students' backgrounds and readiness: What strengths, capacities, and interests, in terms of their content understanding (prior knowledge), academic and literacy development, personal and cultural abilities, and development as a learning community, are you taking into account in planning this unit?
   - My students have had prior experiences with engineering and the EDP. They go to STEM as a special once a week. They have done Project Lead the Way in prior grades as well as with Jen. We have read literature that connects engineering and science for elementary school students. We were also able to provide them with a LEGO engineering kit prior to the start of this unit. I know my students are young but I do not need to start from scratch. They have many experiences and familiarities with the ideas surrounding engineering. Problem solving is a school-wide skill. Collaboration and perseverance are as well. My students can apply those skills they already have to the work we will be doing in this unit.

d. Student needs: What particular needs of your students—academic, social, personal, language (ELLs)—have you taken into account in planning the unit? What will they need to be able to do in order to meet the learning goals?
   - I have considered the fact that of my 16 students, all but one is an ELL student. My lessons incorporate hands-on learning, kinesthetic learning, collaboration, communication, speaking and listening skills, and visual/pictorial learning. While there is a writing component, it is not heavy, and the vocabulary will be defined together and explored as a class. I frequently provide visual images and sentence stems in my assessments to allow all ym students to access and produce meaningful answers without English being the barrier to showing their learning. I have included videos as engagements, as well as made an anchor chart (Appendix A) for students to refer to throughout the unit.

e. Research- and evidence-based powerful learning practices: Explain how research and ideas about powerful learning have informed your plan.
   - I know that children learn through exploring material and making discoveries on their own. Whenever possible, I try to incorporate collaborative learning into my lessons. In this unit, I can allow students to work in pairs and build ideas off of each other. They can use their classmates as resources and funds of knowledge with unique ideas. They can make decisions and find out answers through their own discovery. Knowing that group work requires more classroom management can be daunting for merging teachers

but I try not to shy away from it because when children are engaged in a safe learning space, they can have fun and retain new ideas and concepts.

VI. Assessments: It is essential for both you and your students that your formative and culminating assessments clearly show the extent to which students have achieved learning goals.

a. Explain your main assessments and why they are appropriate for your learning goals.

- My main assessments will be what my students produce and how they produce it. I will be assessing my students on their ability to complete the packet sections assigned. I want them to be able to draw diagrams, fill in data into charts, write reflections, and use relevant vocabulary. I will also be seeing how well they can physically construct bridges within the constraints I assign. Most importantly, I will be assessing how they come to these successes. Students will be expected to collaborate and work together for designing and constructing bridges. They know that I expect them to share ideas, share materials, and share the work. They will be self-assessing their collaboration efforts at the end of the unit but it will be guiding my instruction throughout each lesson.

b. How will students know what to expect and the criteria for good work?

- Students will know the criteria for good work in completion. I will be explaining which sections are to be completed each lesson and I will provide examples by modelling. It is known that if students do not complete steps in the EDP they will have to complete those steps before moving onto the next ones. This means that they know they have to complete their work each day otherwise they will not get to do the next exciting part of the project until they finish. This is their accountability.

c. Attach a draft of your culminating assignment and corresponding assessment criteria/rubric.

- See Packet Attached.(Appendix B)

d. How will students and parents learn about students' overall academic progress from these assessments?

- Information regarding this unit was included in their monthly newsletter we send home explaining the current progress and activities we do in our room. I wrote a small blurb about our bridge building project and what engineering is and what we know engineers do, even in second grade.

VII. Unit Calendar

a. Provide a calendar of key learning activities, learning strategies, and assessments for your anticipated timeframe for the unit.

Unit Plan	Activities	Strategies	Assessments
LAP 1: Intro to Bridges/ the Engineering Design Process	● Video:https://youtu.be/RM04n0-QtNo ● Introduce Project ● Introduce EDP ● Fill Out Ask, and Imagine Sections of	● Technology ● Visual Aide/Anchor Chart ● Freely exploring topic ● Writing skills (Ask/Imagine)	● Completion of "Ask" and "Imagine" sections

	Packet		
LAP 2: Initial Designs with Paper Bridges	● Students will plan their initial designs ● Then we will test them and record the data ● Students will reflect on which models did the best and the worst	● Visual Aide/Anchor Chart ● Collaboration ● Small Groups ● Writing Skills (recording data in a chart, reflection)	● Completion of Plan, Create, and Reflect sections
LAP 3: Picking From Different Materials and Folds	● Video:https://youtu.be/CqYGVW2Eu6Y ● Students will test out different materials for bridges ● Record results ● Students will test types of folds ● Record Results	● Technology ● Visual Aide/Anchor Chart ● Collaboration ● Small Groups ● Testing materials for suitability	● Completion of Different Materials page
LAP 4: Explain Reasoning Behind the Research, Improve, and Redesign	● Student will Define the Strengths and Weaknesses of the Available Materials and Folding Styles ● Students will write about a way to improve their initial design ● Students will draw a new design ● Students will discuss the structure and function of their designs	● Collaboration ● Small Groups ● Connecting to other disciplines (Structure and Function)	● Completion of Improve, Redesign, Structure and Function Pages
LAP 5: Final Tests and Reflections	● Students will draw a final design ● We will conduct a classwide test and record results ● Students will reflect on collaboration skills	● Social Emotional Connection ● Large group sharing ● Collaboration ● Small Group	● Completion of Final Design, Final Test, and Reflection pages

b. Explain your sequence of activities—why does this particular order make sense in light of your learning goals and rationale for the unit?

- My lessons follow this order because we are following the Engineering Design Process. First I must engage their prior knowledge and introduce the project and our problem we will be solving. Students will then explore the question and begin to build

models and test out some first-draft ideas for their solutions. Next the lessons are based on choice. Students will then get the opportunities to practice using different materials and folding their paper-like materials in different ways. This forces them to branch away from their comfort zone and get creative about how they want their final bridges to look. They will then reflect and think about the pros and cons of each choice and make improvements. Finally, to conclude, they will get to make final models with their final designs and test one time. The lessons flow in this way because it is the nature of the problem solving and design process.

VIII. Family and Community Involvement:

a. Are there possible ways for you to actively involve parents in their child's academic activities and performance, and communicate clearly with them?
   - I chose to involve and inform parents in this project through the monthly newsletter. I informed them about the engineering concepts as well as outline the project. In a perfect world, I would have a community member, possibly a parent, come in and talk about engineering. I might have been able to have had the parents come in for the final tests. With all the chaos before February break, I did not want to make anything dysregulating activity out of this unit. Looking back, I might have been able to open the lines of communication more between myself, the students, and their parents.

b. Are there possible resources—such as guest presenters, A/V, field trips, and material artifacts—from colleagues, families, and the community for you to draw on to enhance learning?
   - Of course there are many other resources I could have taken advantage of for this unit. We could have gone to a science museum or any engineering activity-based place for children. We could have had engineer guest speakers, or the author of the Rsie Revere Engineer series come in for a talk. We could have brought in community members and ask them how they have been using the EDP in their fields of work. With engineering and the EDP, the opportunities for extra resources such as those are almost endless. I did my best to include videos and other extras into the unit but unfortunately with the limitations and budget of my role in the school, those other options were not accessible.

IX. Post-Teaching Reflection

This unit went so well for me and my students. It was fun and engaging, but also I felt as if both me and my students gained a lot of new knowledge through this experience. My students now have a grasp on how to identify and choose materials and objects with similar designs for a certain purpose. They can follow the EDP to solve design-related problems. They can collaborate and communicate to work together to construct a model. They had enriching experiences which I am certain grew their minds. I too also grew from this unit. I reacted to my students' needs they were presenting and I changed my plans. I added the vocabulary reflection intervention lesson based off of the response from my students. As an emerging teacher, I felt that to be very meaningful and showing that I can do this and that I am improving in my own practice.

Each lesson built upon the previous. The flow of this unit was so seamless. Students knew what to expect and they established routines which helped them be successful in the end. Students really used their knowledge they were gaining each day to inform their new ideas and improvements. They grew each time they were introduced to something new. They came at the problem with tenacity and perseverance. They collaborated and worked as a team to be successful in designing and constructing models. Students were all stars in this unit and I am confident that

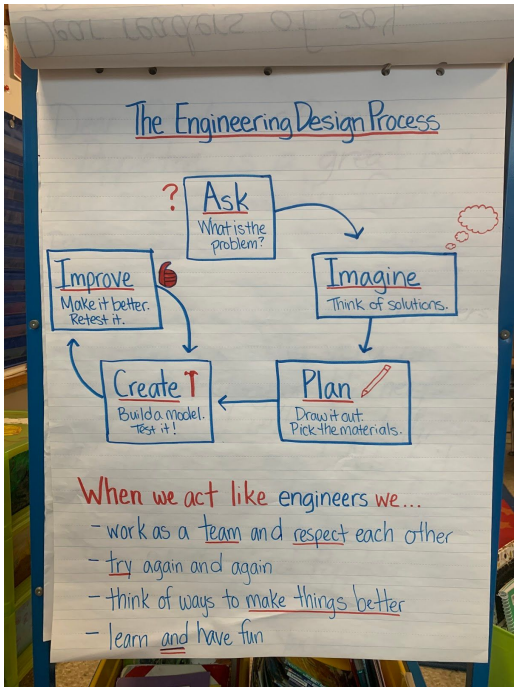
Jen and I share the success with them. Our co teaching had improved so much. HEr lessons with PLTW and mine with this unit really complimented each other beautifully. The students used all their knowledge from both of our work separately and together to grow as learners.

If I were to reteach this unit, I would definitely do more front loading with the word work. Doing the vocabulary intervention was necessary and a good response to assessment on my part. However, next time I teach, I will be making sure all my students have access to the language they need in a unit to access the material as they are exploring and learning so they have the ability to communicate effectively and clearly. I don't want to have to back track or reteach but rather start all my students off on a strong base for whatever content is coming their way.

Overall, I am very pleased with this unit. I feel a sense of accomplishment for my students. You can see in Appendices C-G their work from the first day to the last. Their initial designs and models were simple and slightly off-centered. They weren't sure about the assignment, how the materials would play out, and what it would do which is shown in their simplistic designs and extra details. They struggled to record data and were very focused on themselves and not their team's successes. When we started exploring materials and folds, I still saw the difficulty in their ability to complete charts. I saw a real desire and understanding forming in their discussions but not in their written work as you can see in Appendix E. In response to what I was seeing, in Appendix F you will see a much more thought out response to what choosing appropriate materials and folds would look like. Then with more scaffolding, they were able to make improvements and redesigns which showed a better understanding. Finally, in Appendix G you can see their labelled diagrams for final designs, filled in results tables, and self-reflections on collaboration. You can also see how different their final models are from their initial ones. This evidence shows how my students have expanded on their skills as engineers and created meaningful and powerful work as a result or the teamwork, perseverance, and access to scaffolds provided by their teachers.

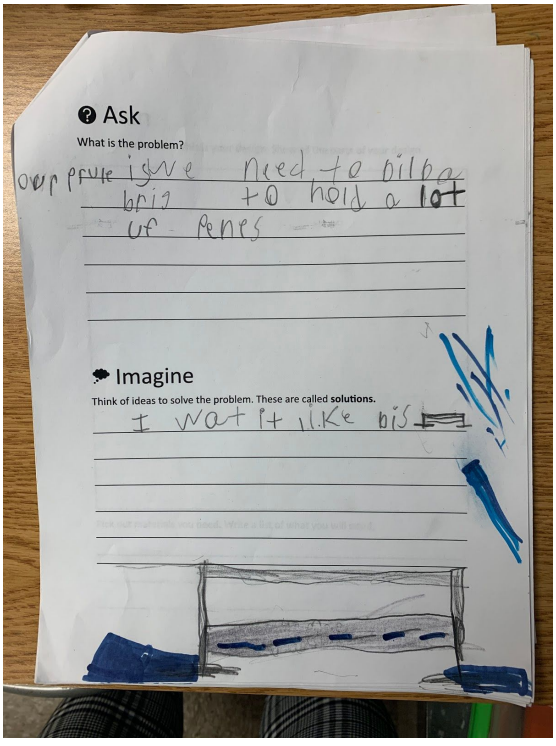
X. Appendix

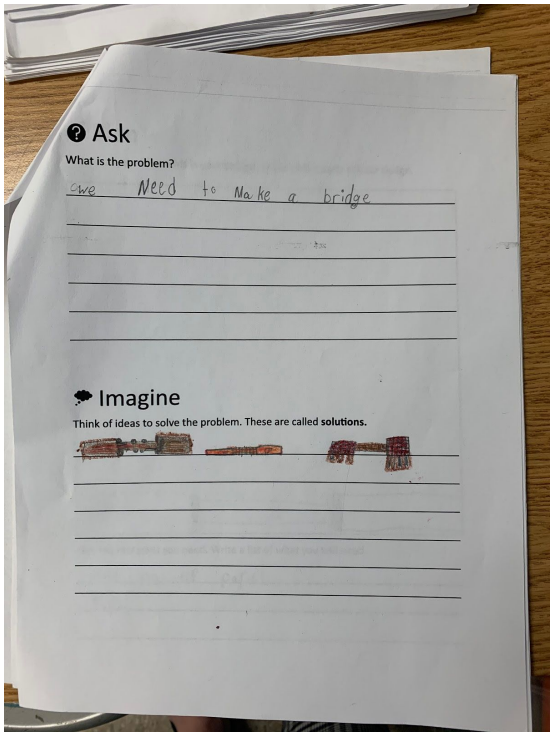
a. EDP Anchor Chart



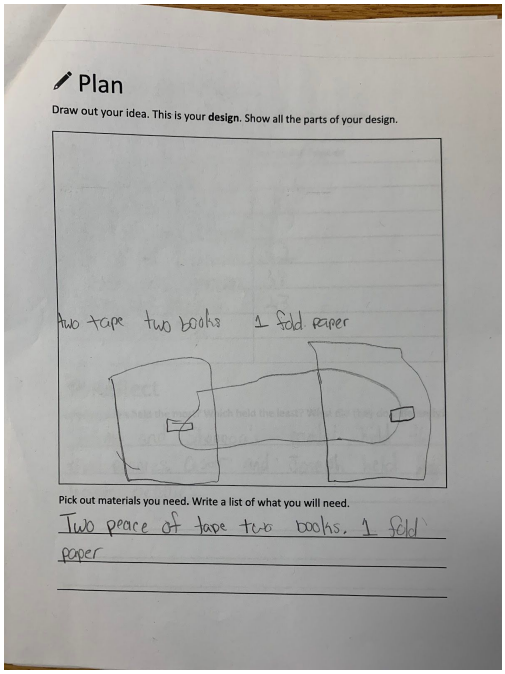
b. Packets (See attached in email)

c. Ask and Imagine Student Work





d. Initial Designs, Tests, and Models



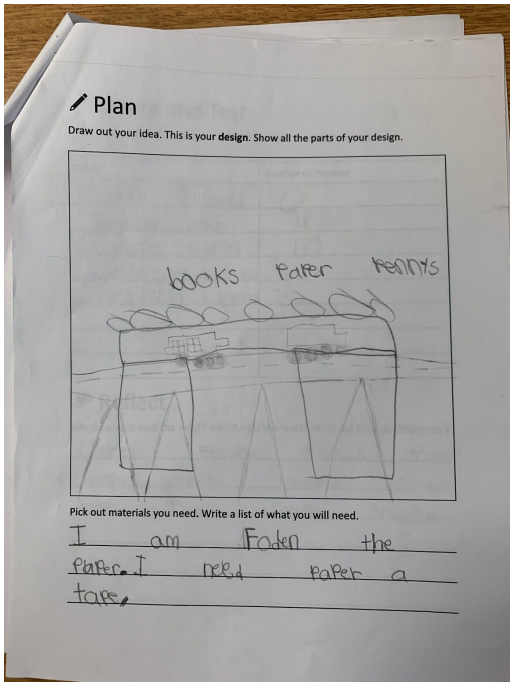
Plan

Draw out your idea. This is your **design**. Show all the parts of your design.

Two tape two books 1 fold paper

Pick out materials you need. Write a list of what you will need.

Iwo peace of tape two books. 1 fold paper



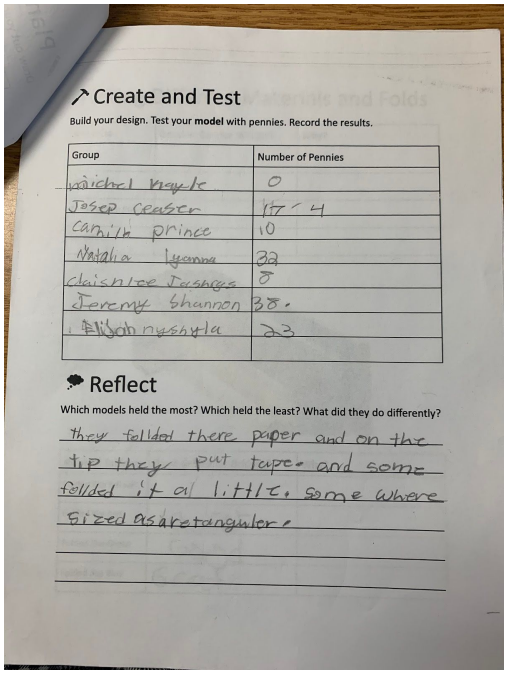
Plan

Draw out your idea. This is your **design**. Show all the parts of your design.

books paper pennys

Pick out materials you need. Write a list of what you will need.

I am Faden the paper. I need paper a tape.



Create and Test

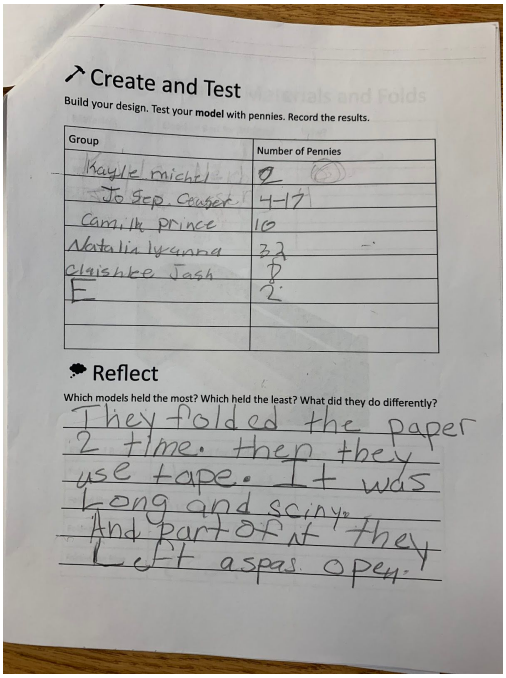
Build your design. Test your **model** with pennies. Record the results.

Group	Number of Pennies
[illegible]	0
Josep ceaser	17 - 4
camilla prince	10
Natalia lyanna	32
claishlee Jashaya	8
Jeremy shannon	38.
[illegible]	23

Reflect

Which models held the most? Which held the least? What did they do differently?

they folded there paper and on the tip they put tape. and some folded it a little. some where fized as a retangular.



Create and Test

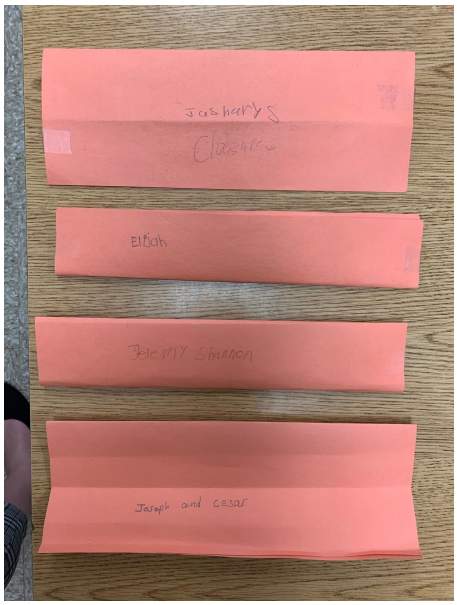
Build your design. Test your **model** with pennies. Record the results.

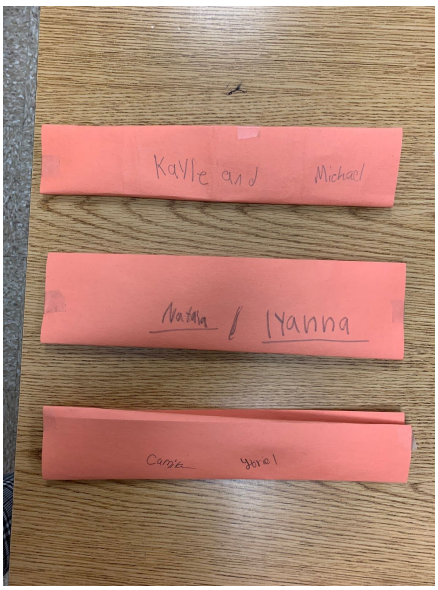
Group	Number of Pennies
Kayle michel	0
Jo Sep ceaser	4-17
camilla prince	10
Natalia lyanna	32
claishlee Jash	8
E	2

Reflect

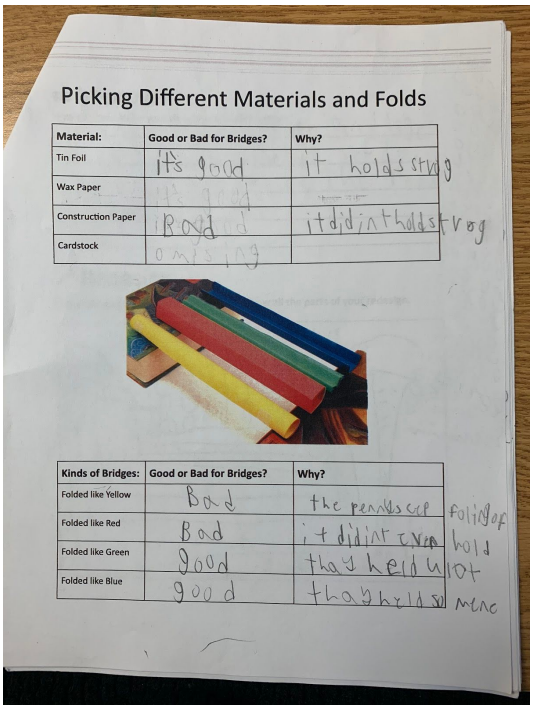
Which models held the most? Which held the least? What did they do differently?

They folded the paper 2 time. then they use tape. It was long and scinny. And part of it they left a spas open.





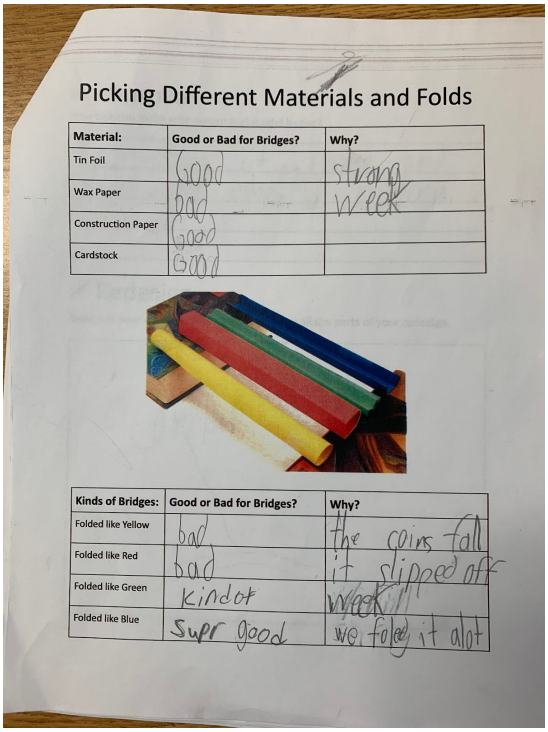
e. Exploring Materials and Folding Styles



Picking Different Materials and Folds

Material:	Good or Bad for Bridges?	Why?
Tin Foil	its good	it holds strog
Wax Paper		
Construction Paper	iBad	it didint hold strog
Cardstock		

Kinds of Bridges:	Good or Bad for Bridges?	Why?
Folded like Yellow	Bad	the pennies cud
Folded like Red	Bad	it didint even hold
Folded like Green	Good	thay held a lot
Folded like Blue	good	thay held so manc

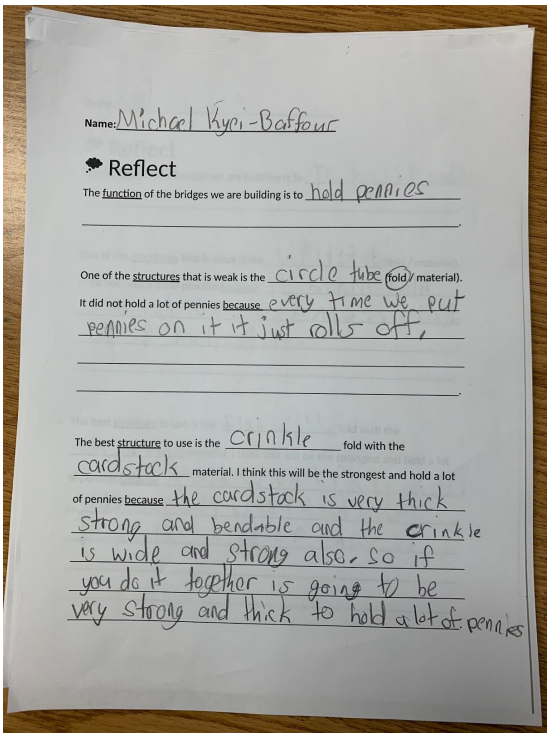


Picking Different Materials and Folds

Material:	Good or Bad for Bridges?	Why?
Tin Foil	Good	strong
Wax Paper	bad	week
Construction Paper	good	
Cardstock	Good	

Kinds of Bridges:	Good or Bad for Bridges?	Why?
Folded like Yellow	bad	the coins fall
Folded like Red	bad	it slipped off
Folded like Green	kindof	week
Folded like Blue	Super good	we folded it alot

f. Improve and Redesign



Name: Michael Kyei-Baffour

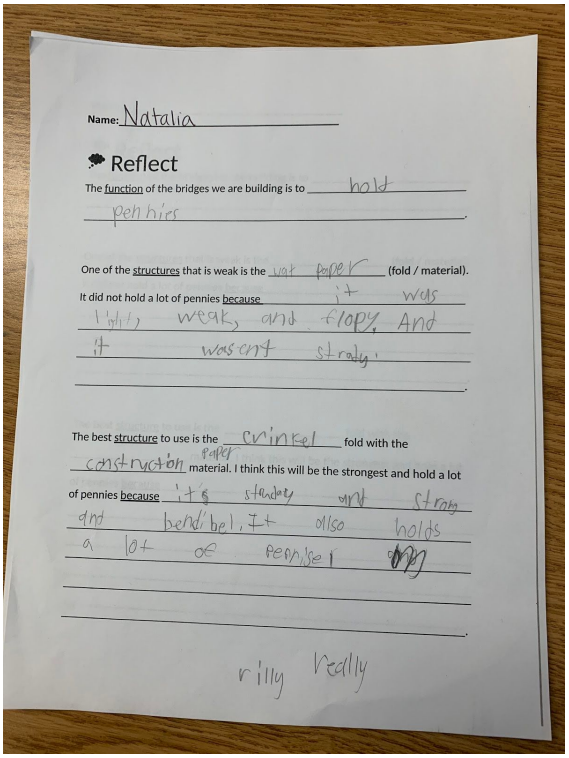
Reflect

The function of the bridges we are building is to hold pennies.

One of the structures that is weak is the circle tube (fold / material).

It did not hold a lot of pennies because every time we put pennies on it it just rolls off.

The best structure to use is the crinkle fold with the cardstock material. I think this will be the strongest and hold a lot of pennies because the cardstock is very thick strong and bendable and the crinkle is wide and strong also. so if you do it together is going to be very strong and thick to hold a lot of pennies



Name: Natalia

Reflect

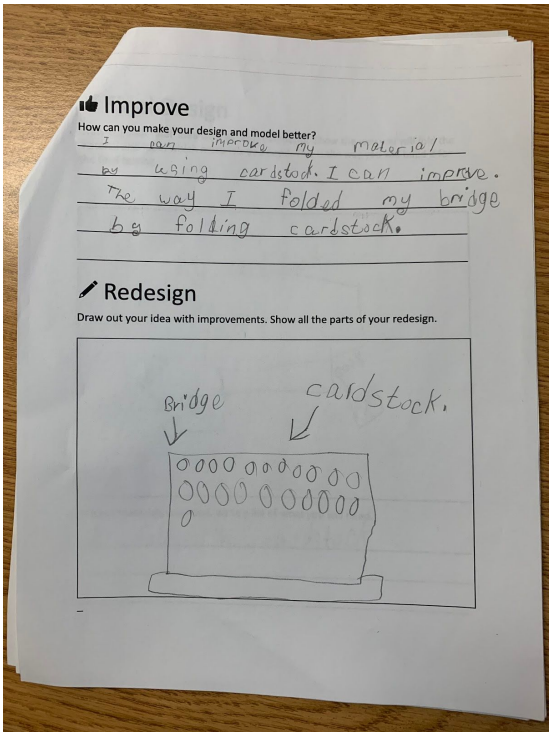
The function of the bridges we are building is to hold pennies.

One of the structures that is weak is the wat paper (fold / material).

It did not hold a lot of pennies because it was light, weak, and flopy. And it wasn't straty.

The best structure to use is the crinkel fold with the construction paper material. I think this will be the strongest and hold a lot of pennies because it's stendey and strong and bendibel, it also holds a lot of pennies

rilly really



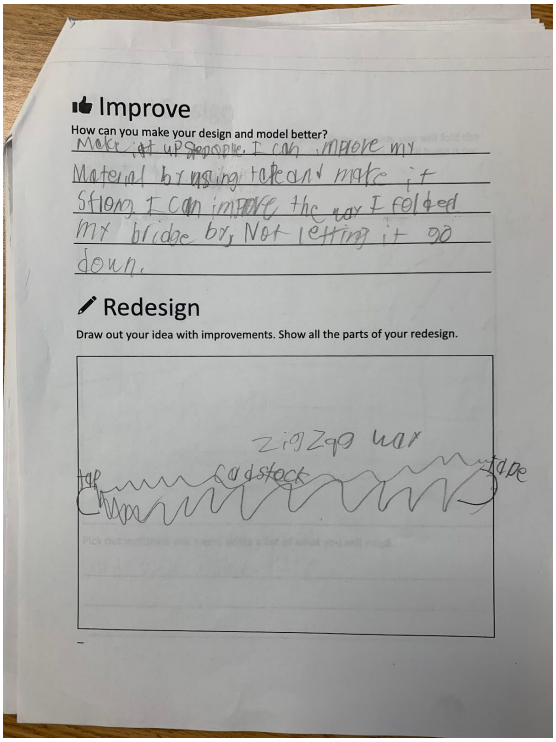
Improve

How can you make your design and model better?

I can improve my material by using cardstock. I can improve. The way I folded my bridge by folding cardstock.

Redesign

Draw out your idea with improvements. Show all the parts of your redesign.



Improve

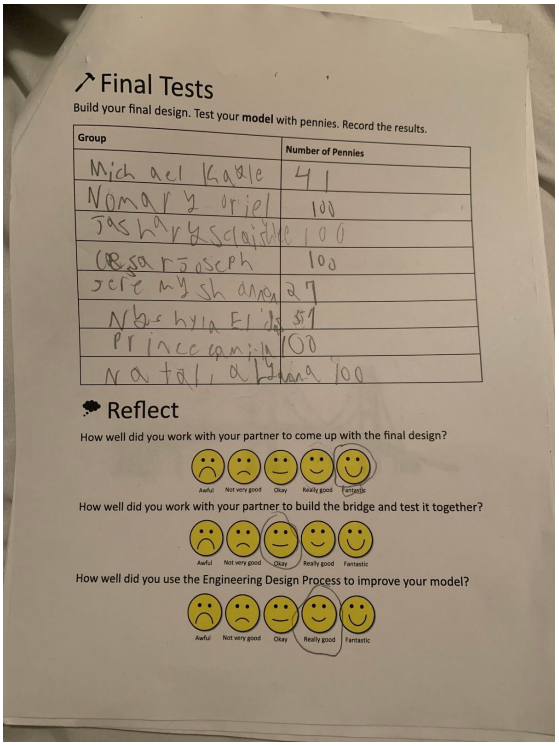
How can you make your design and model better?

Make it upSoopside. I can improve my Material by using tape and make it Strong. I can improve the way I folded my bridge by Not letting it go down.

Redesign

Draw out your idea with improvements. Show all the parts of your redesign.

g. Final Designs, Tests, Reflections



Final Tests

Build your final design. Test your **model** with pennies. Record the results.

Group	Number of Pennies
Michael Kayle	41
Nomar Yoriel	100
Jashay Sclojtlee	100
Cesar Joseph	100
Jeremy Shanan	27
Nyshyla Eliyah	37
Prince camilo	100
Natalia Luanna	100

Reflect

How well did you work with your partner to come up with the final design?

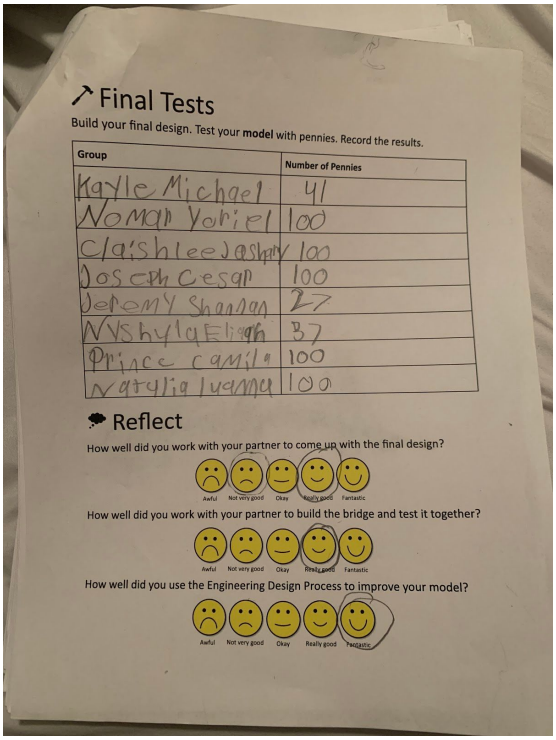
Awful Not very good Okay Really good Fantastic

How well did you work with your partner to build the bridge and test it together?

Awful Not very good Okay Really good Fantastic

How well did you use the Engineering Design Process to improve your model?

Awful Not very good Okay Really good Fantastic



Final Tests

Build your final design. Test your **model** with pennies. Record the results.

Group	Number of Pennies
Kayle Michael	41
Noman Yoriel	100
Cla'shlee Jashay	100
Joseph Cesar	100
Jeremy Shanan	27
Nyshyla Eliyah	37
Prince camilo	100
Natalia Luanna	100

Reflect

How well did you work with your partner to come up with the final design?

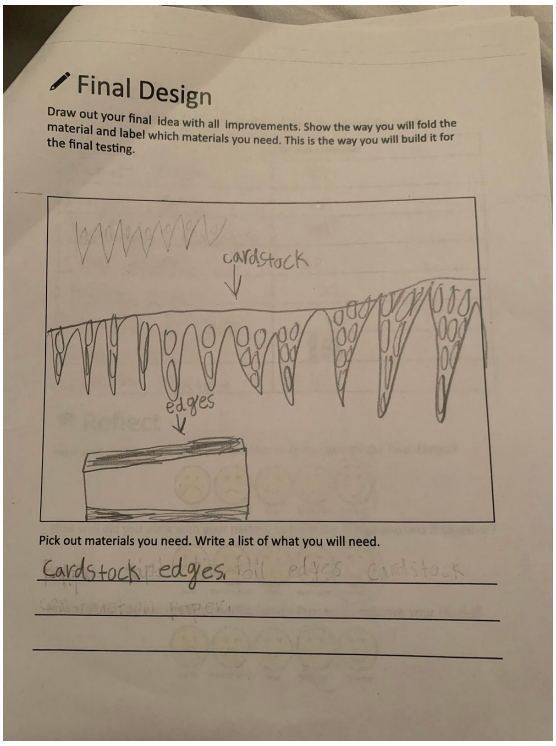
Awful Not very good Okay Really good Fantastic

How well did you work with your partner to build the bridge and test it together?

Awful Not very good Okay Really good Fantastic

How well did you use the Engineering Design Process to improve your model?

Awful Not very good Okay Really good Fantastic

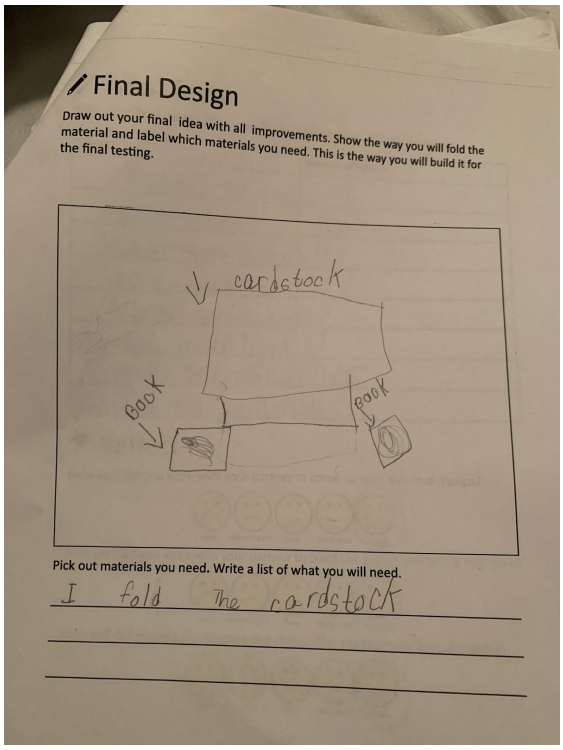


Final Design

Draw out your final idea with all improvements. Show the way you will fold the material and label which materials you need. This is the way you will build it for the final testing.

Pick out materials you need. Write a list of what you will need.

Cardstock, edges,

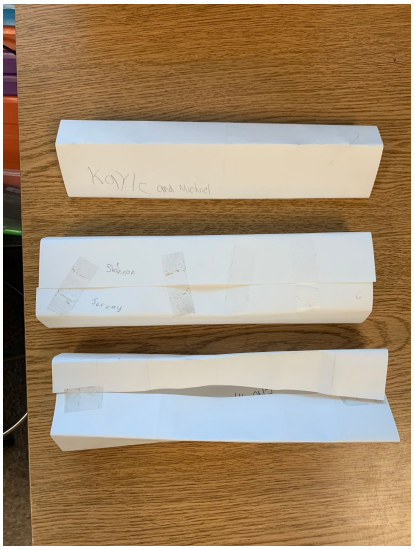


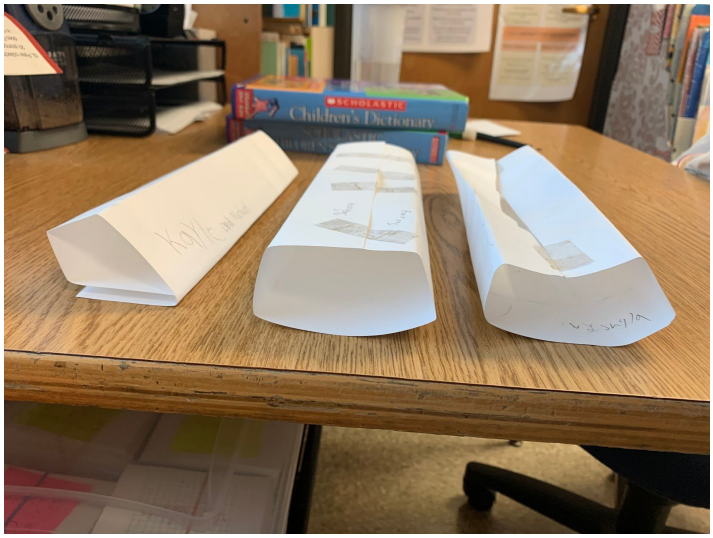
Final Design

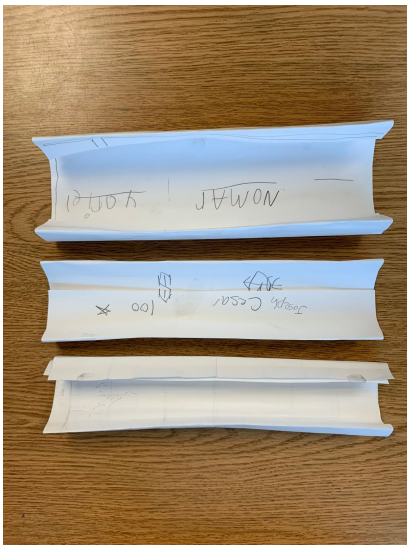
Draw out your final idea with all improvements. Show the way you will fold the material and label which materials you need. This is the way you will build it for the final testing.

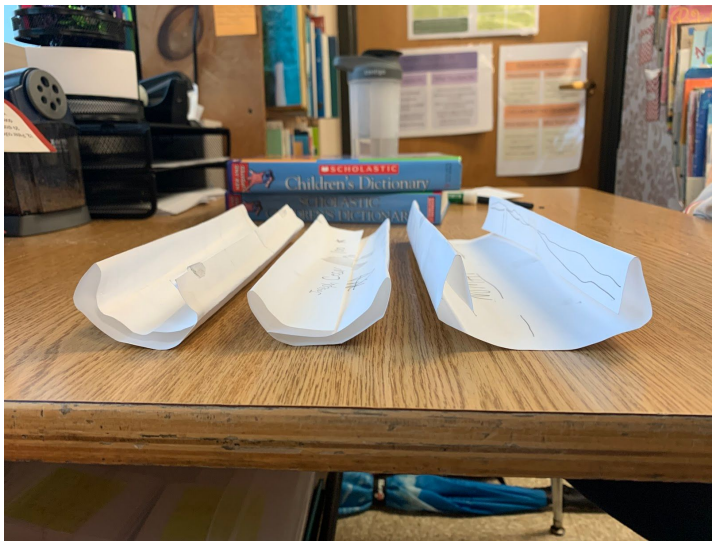
Pick out materials you need. Write a list of what you will need.

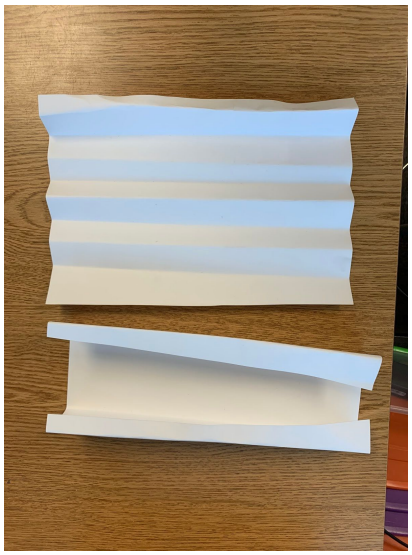
I fold the cardstock

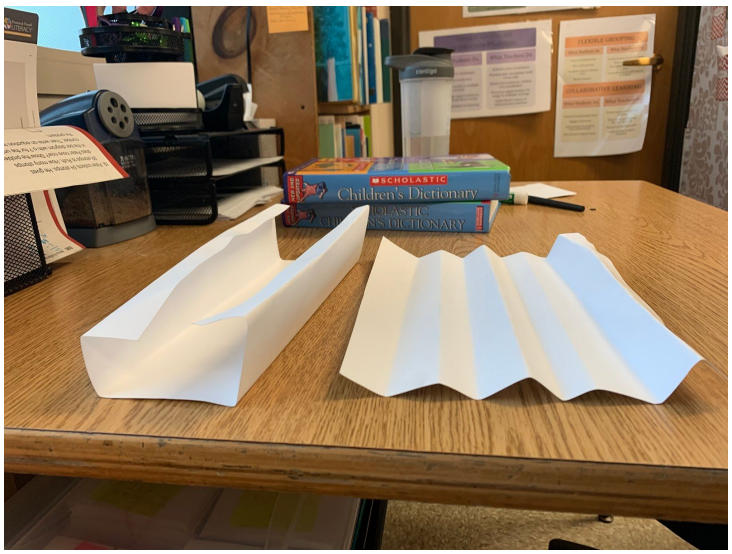



SCHOLASTIC
Children's Dictionary




SCHOLASTIC
Children's Dictionary




SCHOLASTIC
Children's Dictionary