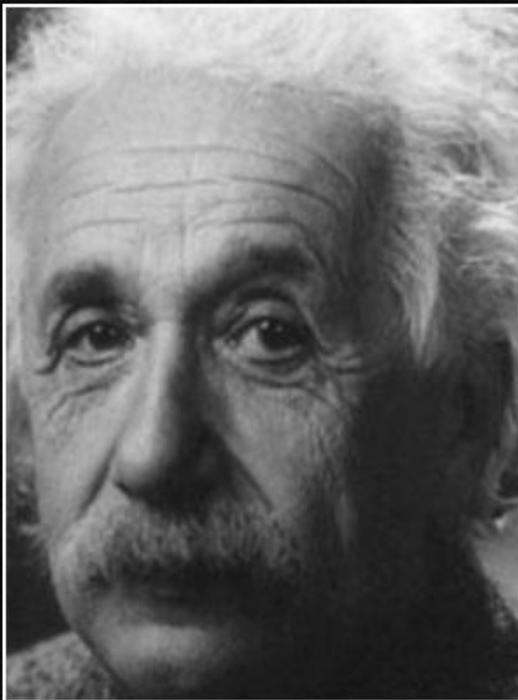


Team Lile
Engineering Design Notebook



Scientists investigate that which
already is; Engineers create that
which has never been.

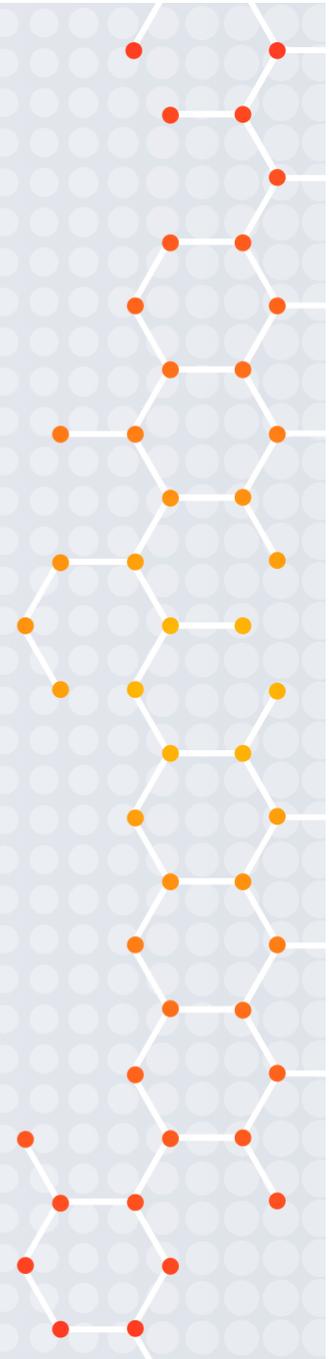
— *Albert Einstein* —

AZ QUOTES

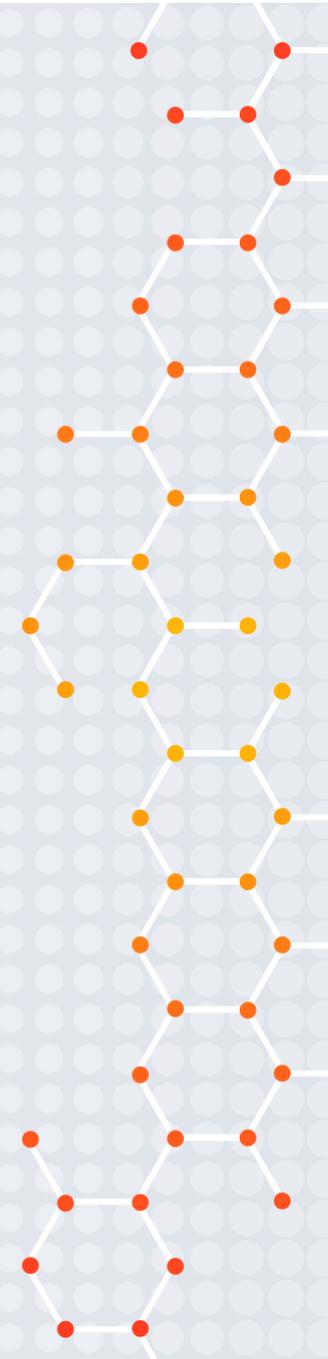


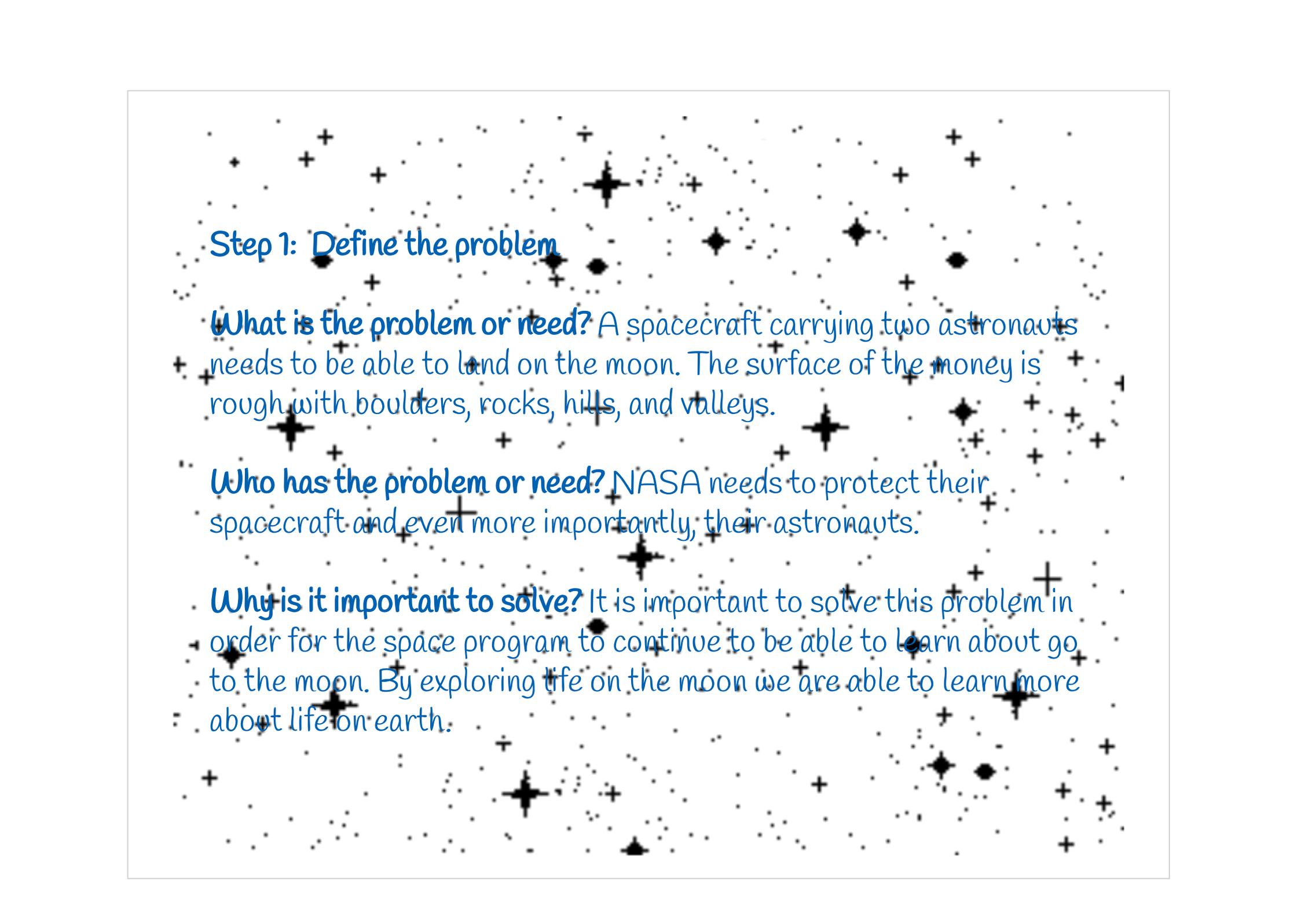
Meet the Engineer Designer:

I am Gracie. I will be entering the 8th grade in September 2020. My favorite subject is science, but have not had very many engineering design tasks in my school experiences. I really enjoy doing engineering design tasks because you work hard, do lots of thinking but you don't realize it because you are having so much fun. I hope you enjoy following my journey to success with Project: Touchdown.



My name is Sophie. I am happy to be
Gracie's assistant. I love to do
science.





Step 1: Define the problem

What is the problem or need? A spacecraft carrying two astronauts needs to be able to land on the moon. The surface of the moon is rough with boulders, rocks, hills, and valleys.

Who has the problem or need? NASA needs to protect their spacecraft and even more importantly, their astronauts.

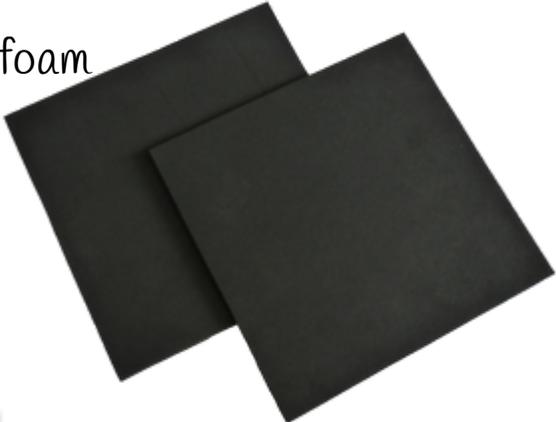
Why is it important to solve? It is important to solve this problem in order for the space program to continue to be able to learn about going to the moon. By exploring life on the moon we are able to learn more about life on earth.

Step 2: Research & Explore the possibilities

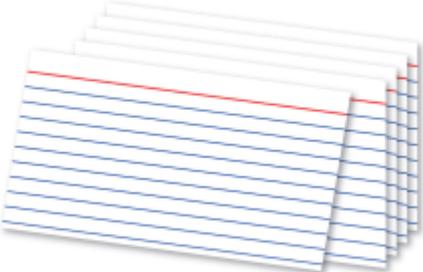
marbles



foam



index cards



marshmallows

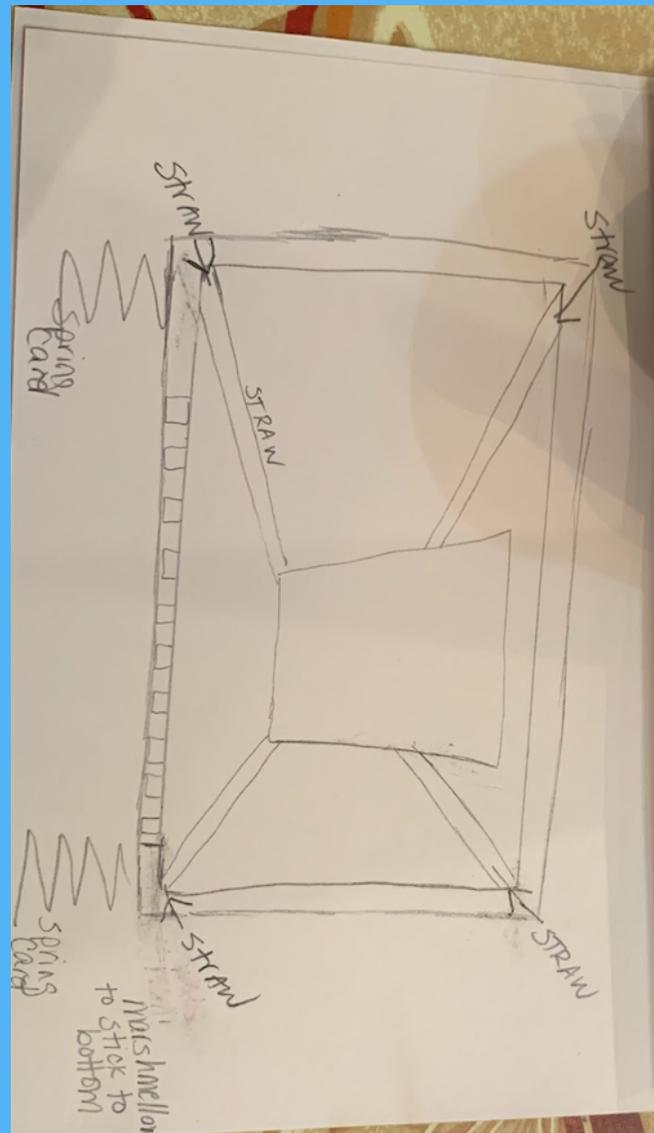


bubble wrap



Step 3: Brainstorm - Evaluate - Choose Solution - First Design

I only used two shock absorbers and tried to make mini marshmallows stick to the bottom of my platform. I also made the shock absorbers by folder the short side of the card. It made the base unbalanced and top heavy.



I thought the straws would make it sturdy, but it made the top weigh more than the bottom.

Build/Develop your prototype Design 1

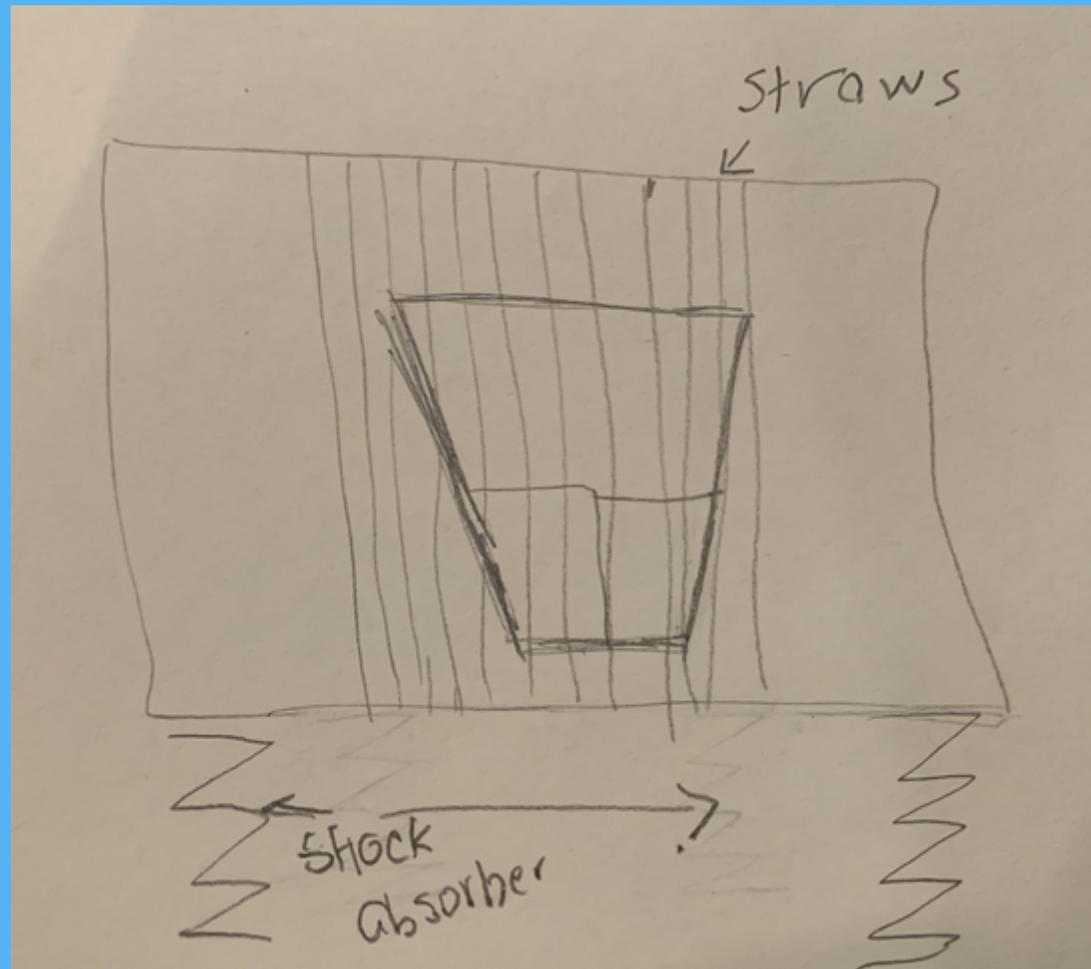


Test Prototype Design 1 – Failure! It tipped over.



Step 3: Brainstorm - Evaluate - Choose Solution - Second Design

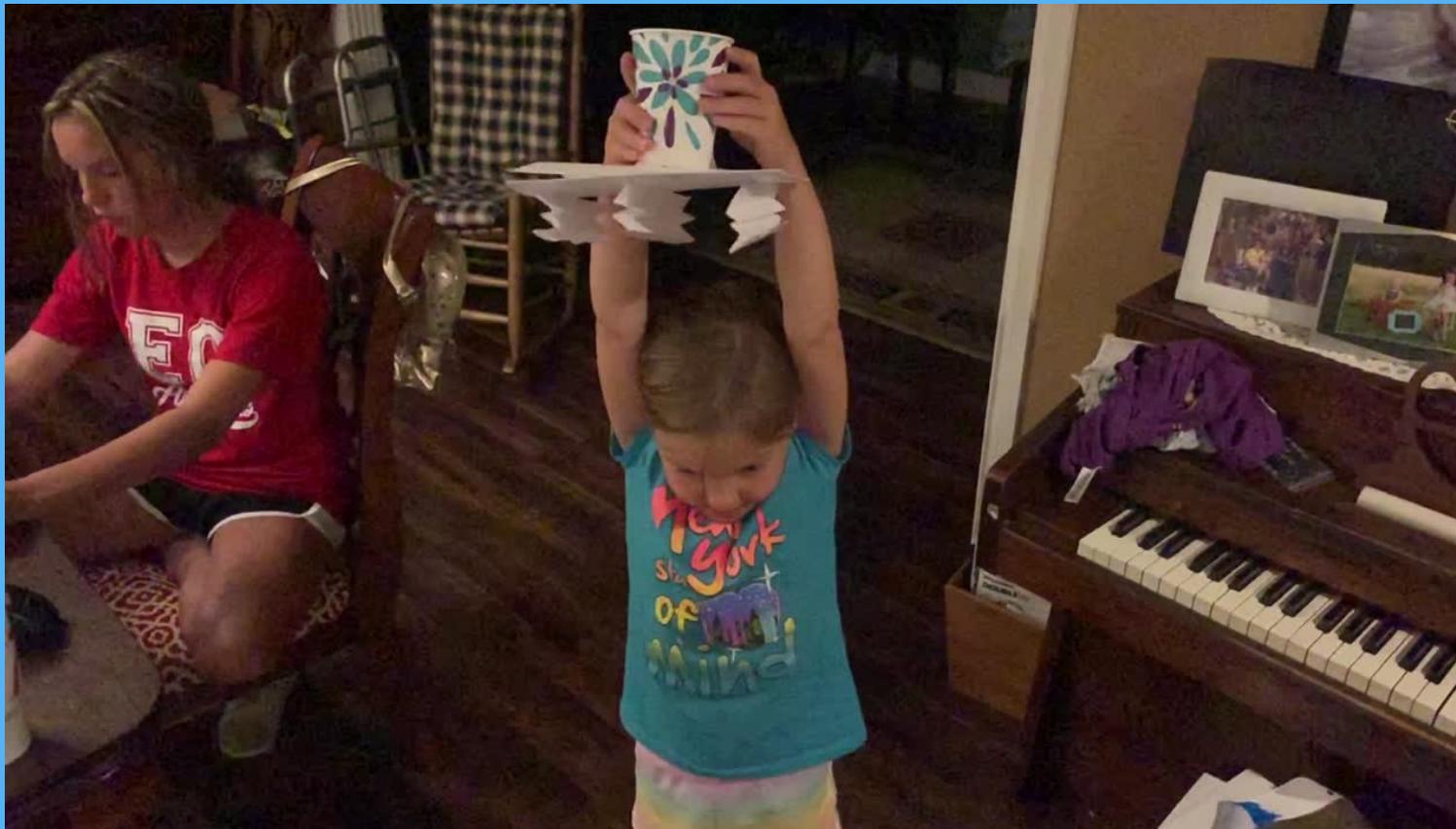
This design was more stable. I turned the long end of the cards to fold and make the shock absorbers. I only used one on each end. The spacecraft didn't tip over and the astronauts didn't fall out, but it was a hard landing.



Build/Develop your prototype



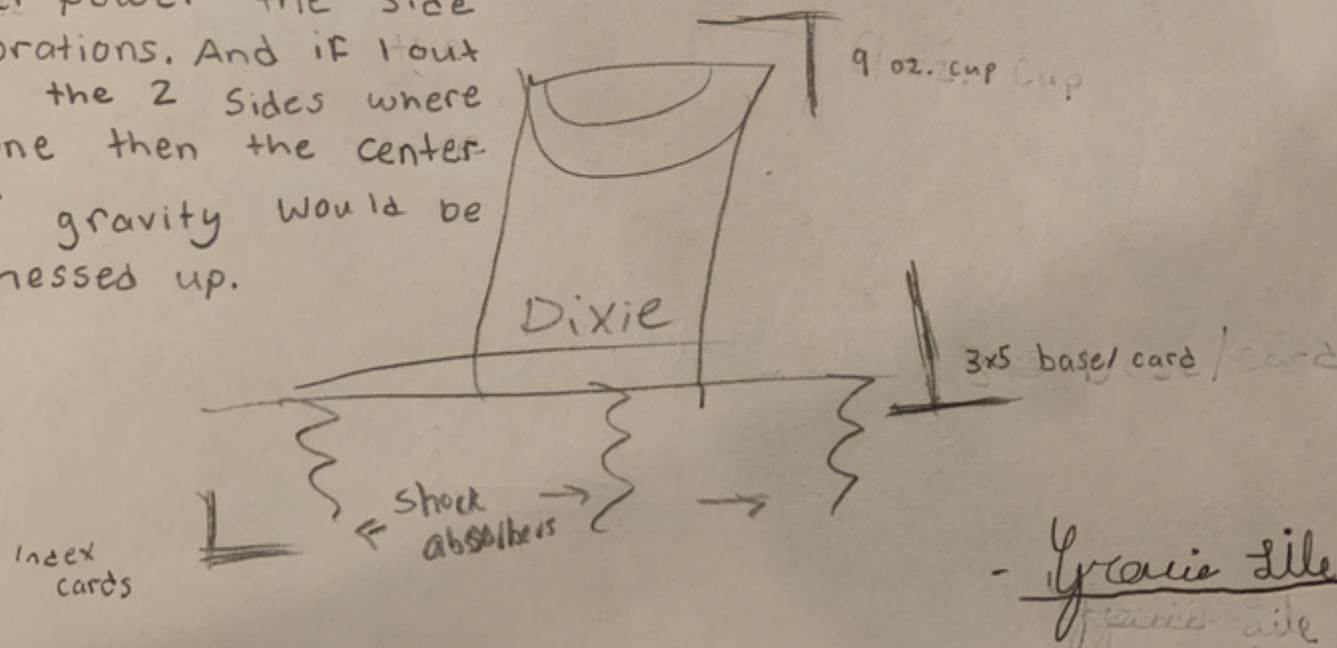
Test your prototype





Third Design and THE BEST Design

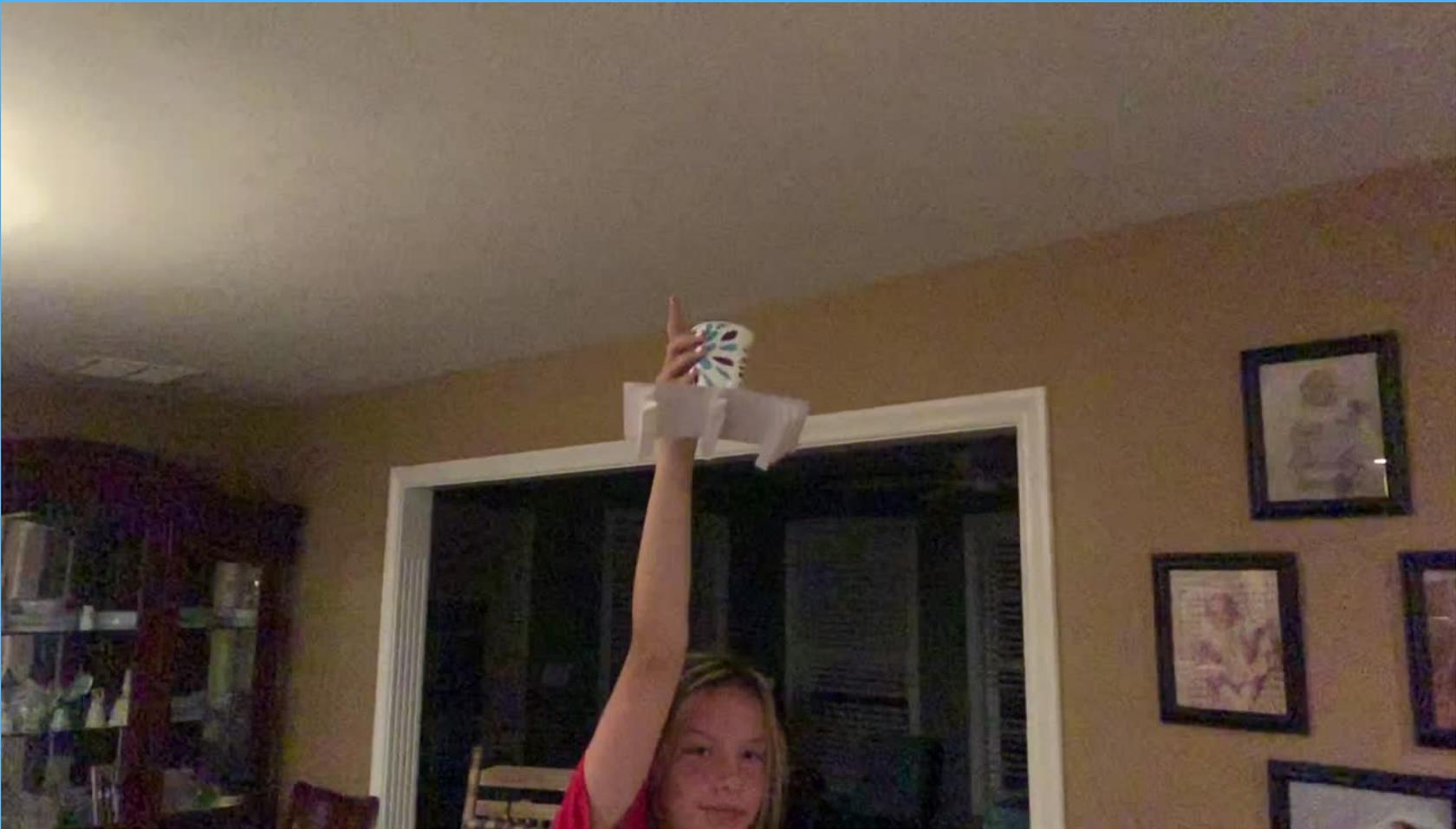
I think that 3 accordians is best because if the middle accordion was gone the mass of the cup might over power the side vibrations. And if 1 out of the 2 sides were gone then the center of gravity would be messed up.



Build/Develop your prototype



Test your prototype



Communicate/Share with others

The most important thing I learned from the design and redesign is it is important to make sure the top of the platform is lighter than the bottom of the platform.