

Reid Loscalzo
Introduction to Engineering for the Logic Stage
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My favorite design project this semester was designing an emergency sled. We had to design a sled that would have a high speed but could also carry resources across uneven ground. This sled had to be 6 inches and the ramp had to be 17 inches long and 12 inches high (See Picture 1). The ramp also had to be covered with aluminum foil or something else that would simulate uneven ground (See Picture 2). The sled had to make it down with no help.

My initial prototype used a lot of tape and was made of popsicle sticks and had two rails on the bottom to reduce friction and a back to keep the load on. It wasn't very wide but could still carry my load, an eraser. I figured out after I built it that it was about 1.5 inches short, so added some popsicle sticks to the front at the last minute (See Picture 3). I decided that the back was creating too much drag, so I took it off and taped down the eraser instead. I also checked it to make sure it didn't need anymore taping or repairs (See Picture 4). The second prototype was about 5 in/s faster than the original and was faster in most of the attempts (See Graph 1). I believe that by taking off the back, less drag was created, therefore it was able to accelerate easier.

This project was based on Civil Engineering, or engineering used for the use of people. During this investigation, I used a few engineering principles. First, I was always trying to better my design and make it more efficient. I was also thinking about the best and most efficient way to make it, while also still having a very sturdy product. Finally, I thought about lots of different prototypes and went through several ideas before finally creating my desired product. While doing this project, I learned that there can be many different solutions to a problem, you just need to narrow it down and choose which one you think would be best.



Picture 1: The Ramp
17" in Length



Picture 2: Aluminum Foil
This is supposed to simulate uneven ground.



Picture 3: Initial Prototype
You might be able to tell that the front was added on after.



Picture 4: Second Prototype
As you can see, I ripped off the back to decrease drag.

Table 1: Prototype Speeds

	First Attempt	Second Attempt	Third Attempt	Average Speed
First Prototype	0.5 in = 34 in/s	0.43 = 39.535 in/s	0.95 = 17.895 in/s	30 in/s
Second Prototype	0.5 in = 34 in/s	0.63 = 26.984 in/s	0.4 = 42.5 in/s	34.5 in/s