

Web Shooter

Our problem is my brother needed a costume for halloween and he wanted to be Spiderman so we had to build him a web-shooter to add on to his costume but we don't know how to make a web-shooter and what materials we need to make one at a cheap cost.

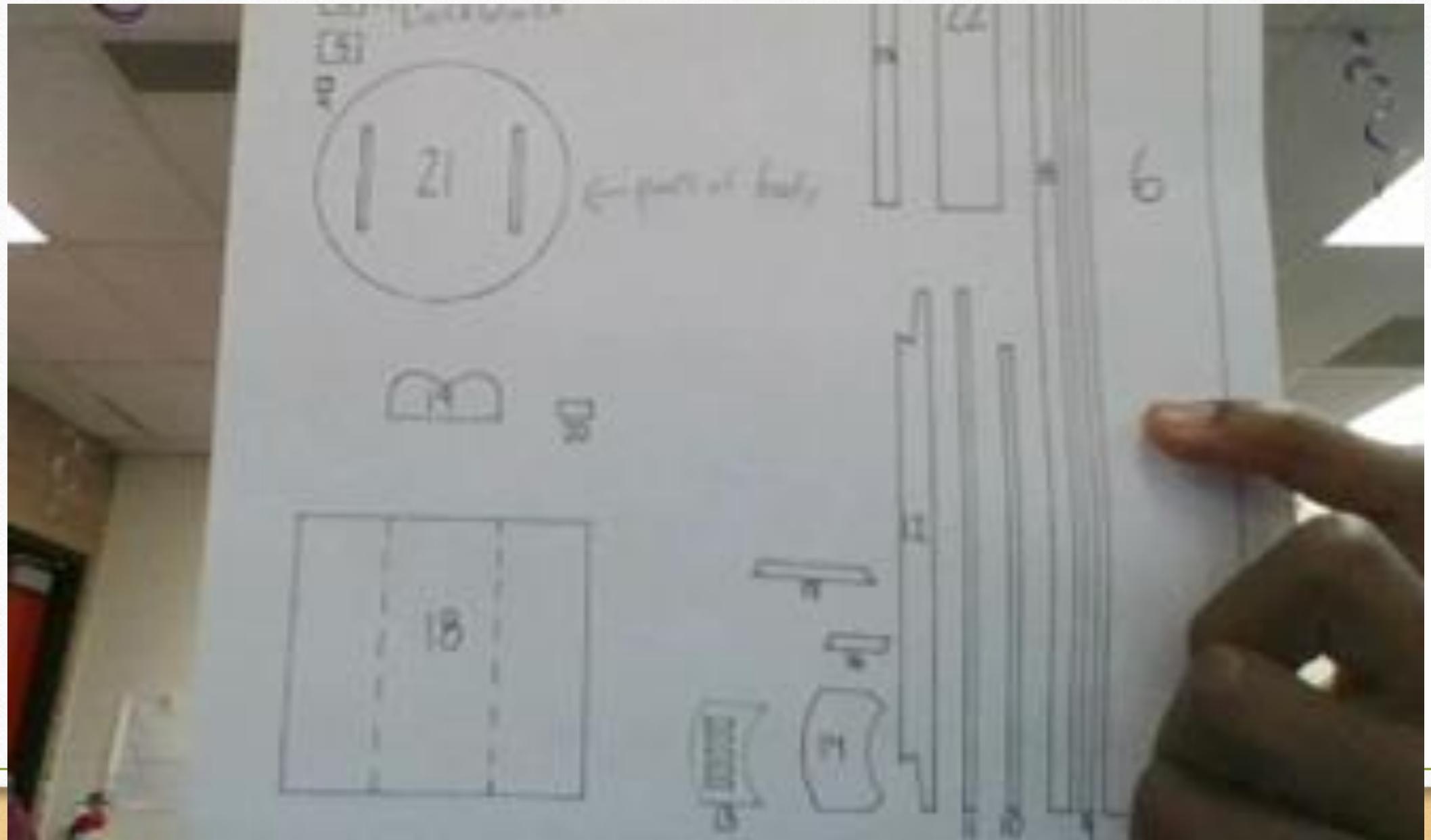
Constraints (Limitations and Conditions)

1. didn't have access to all the materials
 2. took a long time to 3d print design
 3. dad is not always available
 4. we don't know how to use a 3d printer
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Criteria (standards or features to be measured)

1. only 10 weeks to design and build
2. must be affordable
3. must meet 7th grade standards

- What is a web shooter? A web shooter is a pair of wrist-mounted mechanical devices developed and used by Spider-Man to project synthetic webbing.
- What is nylon? Nylon is a polyester thread of plastic that can act as webs for our web shooter and can be used in a variety of other things such as clothing rope or thread and tires. For the web-shooter we were going to be using nylon line to hold in the lockblock for our web-shooter.
- How do you make a web-shooter? To make a web shooter you are going to need Projectile springs, watch strap, 4x6mm magnets, lockbox spring, lockbox, Bingo chip, hex nuts, 4x M3mm screws, .45mm nylon line, 5x LEDs of any color, spring, CR2032 battery, watch gears and, 4x3mm magnets and of course a 3D printer or a design of some kind to make the body of the web shooter.
- How do you use a 3D printer? To use a 3D printer first you have to get a design off of a website such as Blender or Thingiverse. We got our design off of Heerotech's website. You will need to connect the 3D printer to your computer where you can import the files of the design you want into your 3D printer. Then from there you will start printing it using your filament.
- Those are the main parts on how to build a web shooter. What is a web shooter and how to use a 3D printer.



The materials we used to make our web shooters were a Projectile springs, watch strap, 4x6mm magnets, lockbox spring, lockbox, Bingo chip, hex nuts, 4x m3mm screws, .45mm nylon line, 5xledsofanycolor, spring, cr2032 battery, watch gears and, 4x3mm magnets

step 1. to making a web shooter was using a 3d printer that we rented from my dads work when we got the 3d printer we had to put it together immediately after that we started finding different designs of web shooters when we found the one we wanted we printed it out we got our web shooter design from herotech

step.2 was popping out the exterior plastic which I think was the hardest part of the process of actually building the web-shooter. After we popped out the extra exterior plastic from the webslinger we had to put it together.

step.3 we attached the nylon through the web-shooter and inserted the scrimp through the nylon

step.4 we had to solder the leds on to the web-shooter and connect it to a battery using our reed switch for it to light up.

step 5. we attached an old watch strap to it for it to stay on our arms and attempted to shoot it.

Prototype A

- The weakness of prototype a was the layers of the design because they are not very thick and are very fragile
- There are no strengths of the design because it broke before we could build the entire thing

Prototype B

- it's weakness is also the same as prototype A because the layers of the plastic of prototype b broke multiple times but we were able to reglue it
- A strength of prototype A was that we had a strap to easily take it off and on



Another weakness of This was one of the piece we had to reprint because it broke while we were trying to get the exterior plastic from the inside of it out.



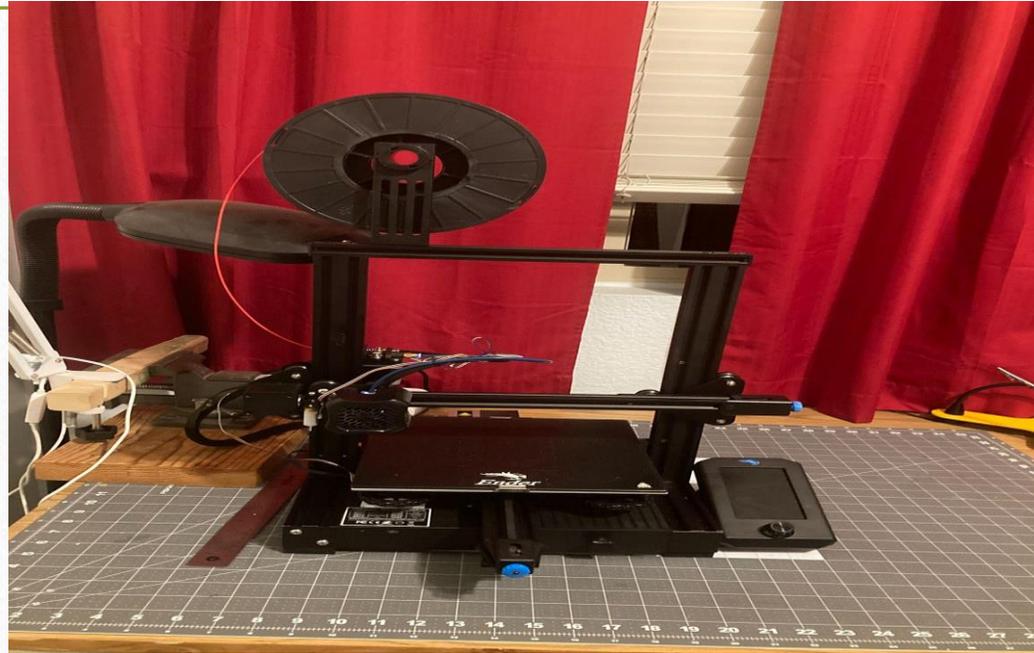
This was a weakness we had with prototype A because it's body broke so we had to reprint it.



This was the reed switch it broke while we were soldering the leds on to prototype b this was another weakness because we couldn't use the leds.



A strength I had was access to a solderer to attach the leds to the body of the web-shooter.



Another strength we had was access to this 3d printer to reprint our pieces that broke.



This was the last strength we had had which was super glue because we were able to reattach pieces on prototype b a lot of times with this.

Improvements

- used glue instead of screws
- used different glue material
- we used a drill to get out exterior plastic

Days tested	times worn on wrist by little brother	observations about web-shooter
1	1	uncomfortable on his wrist
2	2	strap is not very tight
3	3	strap is too long
4	4	strap was falling off a lot

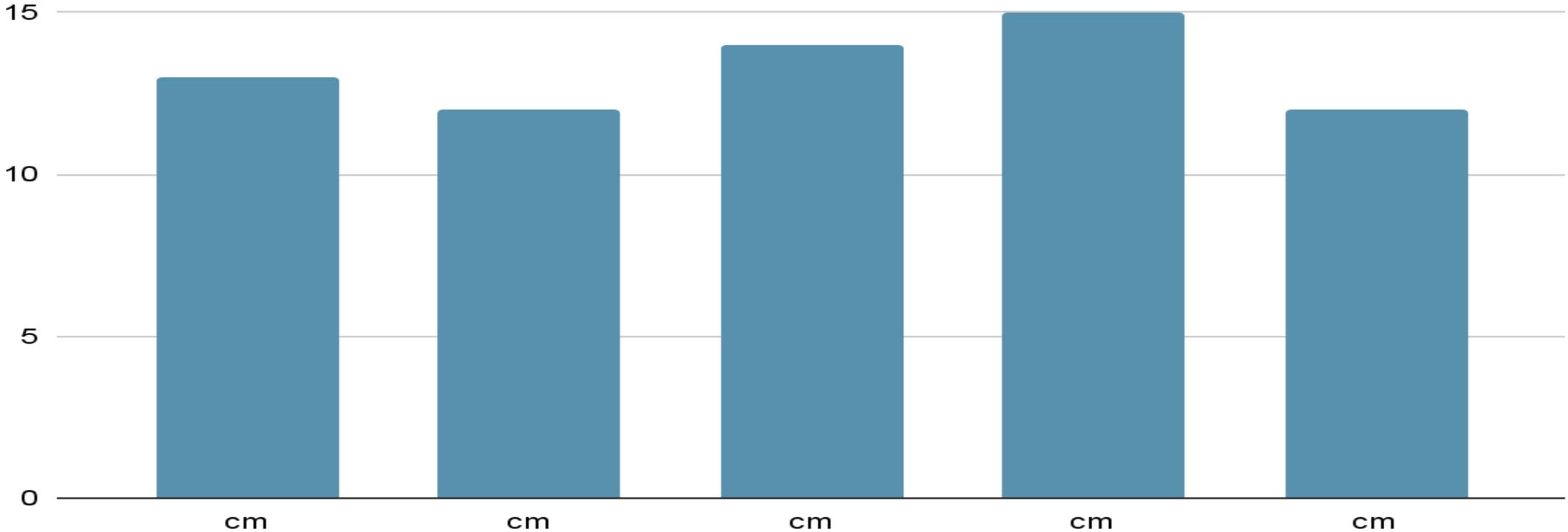
- Our initial design was difficult to print and resulted in a lot of broken pieces.
- The magnet sizes we were able to get were too small for the initial design.
- Thread was hard to procure so we had to improvise with string and the string was much heavier
- We had to re-glue pieces multiple times to fit in all of the pieces

The design did solve the problem our problem and we tested our prototype on my little brother's arm to see if it would fit around his arm and it did

Prototype B performed best on my little brother's arm considering prototype A broke while we were building it.



design 1 and design 2



- I think people should care about what we did our project on because this project took a long time to build and it took a lot of effort to make it.
- If this project were to be extended I would change the color of the web-shooter and I would use the exact materials to make it, considering a lot of the materials would take months to get to us.
- I think this project could have value to society if it were to be used in a costume or as special effects in a movie.

“I would like to thank my amazing science teacher for having us do this project. I learned so much. I would like to thank my mom and dad for getting me all the materials I need and keeping me on track with my schedule an I would also like to thank Herotech for giving us this idea..”