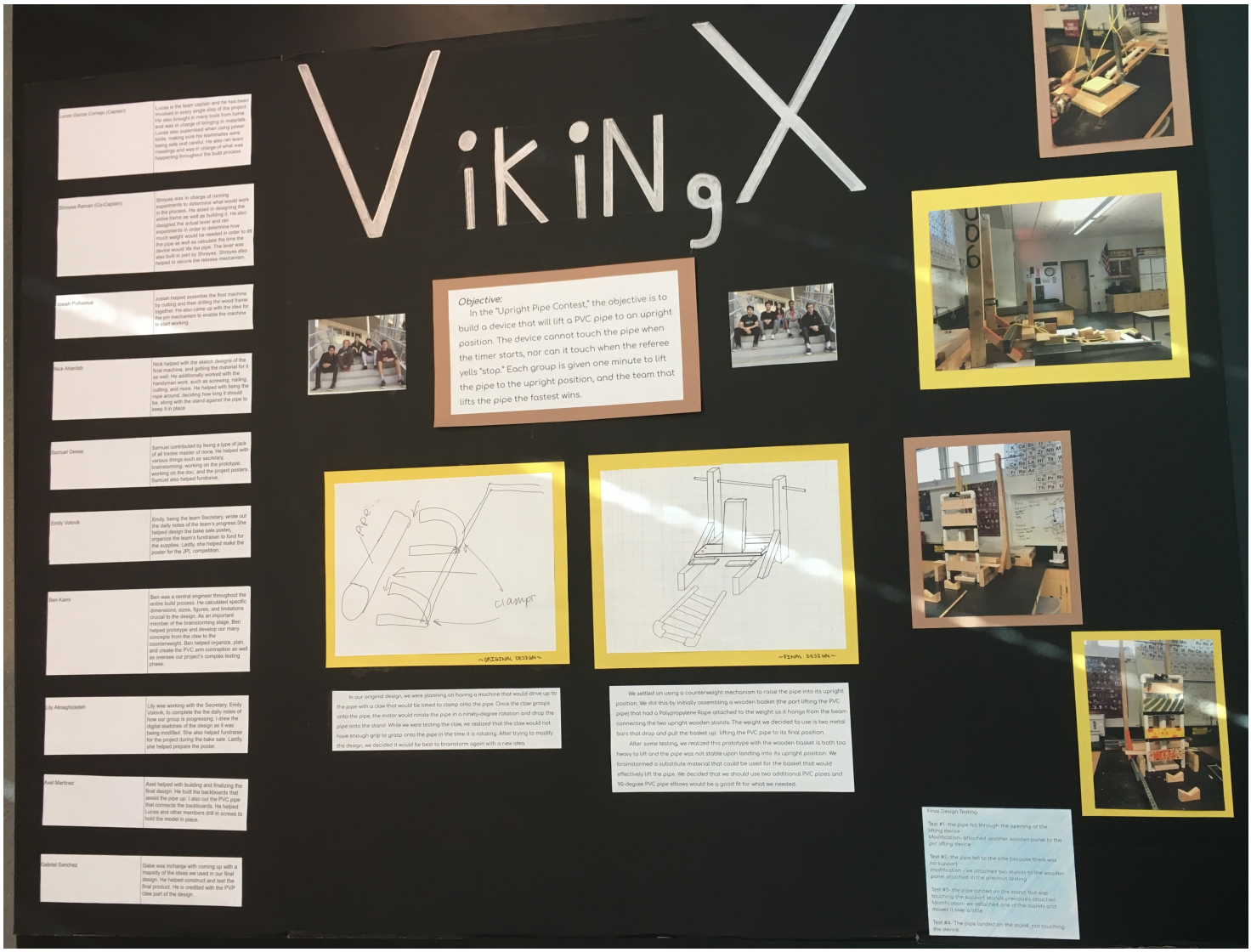
VikiNgX
Objective:
In the "Upright Pipe Contest," the objective is to build a device that will lift a PVC pipe to an upright position. The device cannot touch the pipe when the timer starts, nor can it touch when the referee yells "stop." Each group is given one minute to lift the pipe to the upright position, and the team that lifts the pipe the fastest wins.
Lucas Garcia Cornejo (Captain)
Lucas is the team captain and he has been involved in every single step of the project. He also brought in many tools from home and was in charge of bringing in materials. Lucas also supervised when using power tools, making sure his teammates were being safe and careful. He also ran team meetings and was in charge of what was happening throughout the build process.
Shrayes Raman (Co-Captain)
Shrayes was in charge of running experiments to determine what would work in the process. He aided in designing the entire frame as well as building it. He also designed the actual lever and ran experiments in order to determine how much weight would be needed in order to lift the pipe as well as calculate the time the device would tile the pipe. The lever was also built in part by Shrayes. Shrayes also helped to secure the release mechanism.
Josiah Pulhemus
Josiah helped assemble the final machine by cutting and then drilling the wood frame together. He also came up with the idea for the pin mechanism to enable the machine to start working.
Nick Ahlenlab
Nick helped with the sketch designs of the final machine, and getting the material for it as well. He additionally worked with the handyman work, such as screwing, nailing, cutting, and more. He helped with tieing the rope around, deciding how long it should be, along with the stand against the pipe to keep it in place.
Samuel Desse
Samuel contributed by being a type of jack of all trades master of none. He helped with various things such as secretary, brainstorming, working on the prototype, working on the doc, and the project posters. Samuel also helped fundraise.
Emily Volovik
Emily, being the team Secretary, wrote out the daily notes of the team's progress.She helped design the bake sale poster, organize the team's fundraiser to fund for the supplies. Lastly, she helped make the poster for the JPL competition.
Ben Kami
Ben was a central engineer throughout the entire build process. He calculated specific dimensions, sizes, figures, and limitations crucial to the design. As an important member of the brainstorming stage, Ben helped prototype and develop our many concepts from the claw to the counterweight. Ben helped organize, plan, and create the PVC arm contraption as well as oversee our project's complex testing phase.
Lily Alinaghizadeh
Lily was working with the Secretary, Emily Volovik, to complete the the daily notes of how our group is progressing. I drew the digital sketches of the design as it was being modified. She also helped fundraise for the project during the bake sale. Lastly, she helped prepare the poster.
Axel Martinez
Axel helped with building and finalizing the final design. He built the backboards that assist the pipe up. I also cut the PVC pipe that connects the backboards. He helped Lucas and other members drill in screws to hold the model in place.
Gabriel Sanchez
Gabe was incharge with coming up with a majority of the ideas we used in our final design. He helped construct and test the final product. He is credited with the PVP claw part of the design.
pipe
clamp
~ORIGINAL DESIGN~
In our original design, we were planning on having a machine that would drive up to the pipe with a claw that would be timed to clamp onto the pipe. Once the claw grasps onto the pipe, the motor would rotate the pipe in a ninety-degree rotation and drop the pipe onto the stand. While we were testing the claw, we realized that the claw would not have enough grip to grasp onto the pipe in the time it is rotating. After trying to modify the design, we decided it would be best to brainstorm again with a new idea.
~FINAL DESIGN~
We settled on using a counterweight mechanism to raise the pipe into its upright position. We did this by initially assembling a wooden basket (the part lifting the PVC pipe) that had a Polypropylene Rope attached to the weight as it hangs from the beam connecting the two upright wooden stands. The weight we decided to use is two metal bars that drop and pull the basket up, lifting the PVC pipe to its final position.
After some testing, we realized this prototype with the wooden basket is both too heavy to lift and the pipe was not stable upon landing into its upright position. We brainstormed a substitute material that could be used for the basket that would effectively lift the pipe. We decided that we should use two additional PVC pipes and 90-degree PVC pipe elbows would be a good fit for what we needed.
Final Design Testing
Test #1- the pipe fell through the opening of the lifting device
Modification- attached another wooden panel to the pvc lifting device
Test #2- the pipe fell to the side because there was no support
modification- we attached two stands to the wooden panel attached in the previous testing
Test #3- the pipe landed on the stand, but was touching the support stands previously attached
Modification- we detached one of the stands and moved it over a little
Test #4- The pipe landed on the stand, not touching the device