

The Pender Premium Pump Bottle created by Collin Allen and Quinton Pender.

Logo:



My partner Collin and I (Quinton) redesigned the common pump bottle. Over the course of just about two months we managed to put out a great piece of work. The Pender Premium Pump Bottle is no ordinary pump bottle, it's more efficient and more stylish. It does what normal pump bottles can't, and that's dispense the entirety of its contents with ease. We managed this by adding a funnel to the bottom of the bottle, which, per its name, funnels the contents to point where the straw can then suck it up and dispense it. This was all made possible by our passion towards making a pump bottle more efficient. This document contains all of our progress from start to finish, I hope you enjoy...

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We began this redesign by surveying people in our school to find 15 problems that they found in everyday life. Here are the 15 results we collected:

- Metal part of seatbelt brands you during the summer
- Remembering to turn off you head lights
- Graphite on your fingers after you finish writing a paper.
- Trash bag gets stuck in trash can.
- Upside down USP plugin.
- Unplugging devices from a distance.
- When you forget to zip up your pants zipper.
- when your shoe bottom begins to peel off.
- Opening a door with hands full.
- Trying to sleep in a hot pillow during the summer.
- That last layer of soap in a soap dispenser. <-----|**
- Razor gets jammed during shaving.
- Filling up a change jar, then it's too heavy to carry.
- When you have too much clothes for one clothes basket.
- Squeaky shoes.
- Unable to cut straight lines with lawnmower.
- Outlets don't hold plugs tightly enough.
- Sweaty hands after having them in your pockets for too long.

We were then paired into groups based off of what we had decided would be the most interesting problems, and that is when Collin and I were paired together.



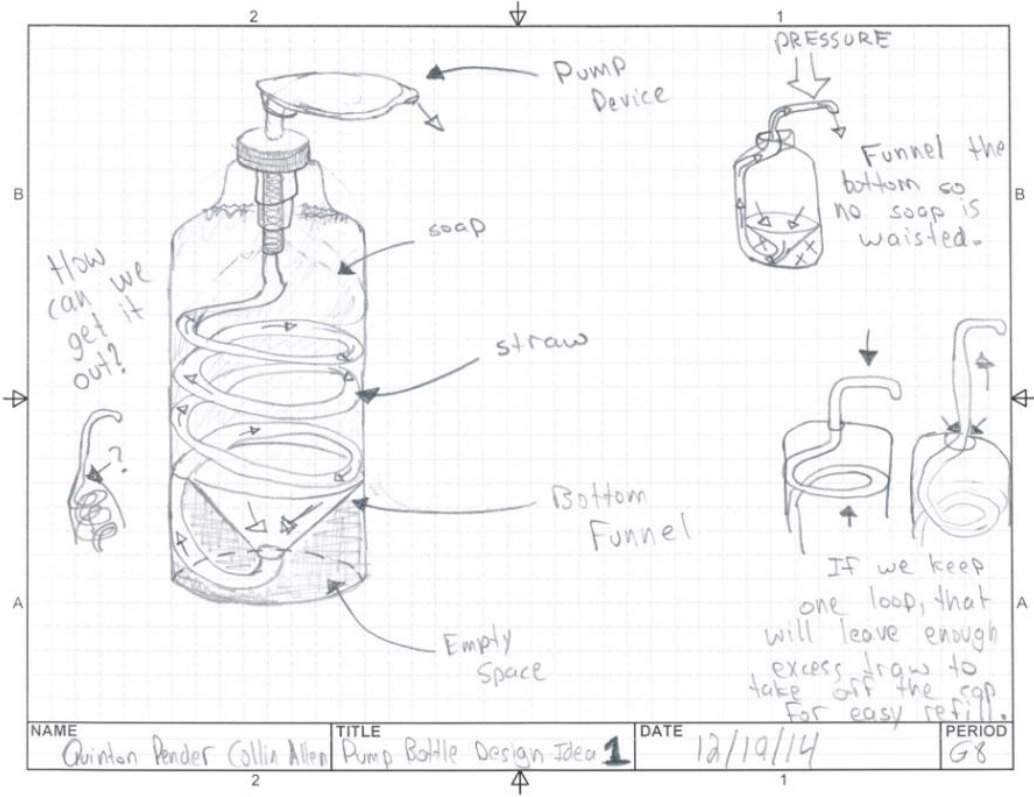
Now with the ultimate dream-team formed, we wasted no time in beginning our quest to number one in the Extreme Redesign Challenge.

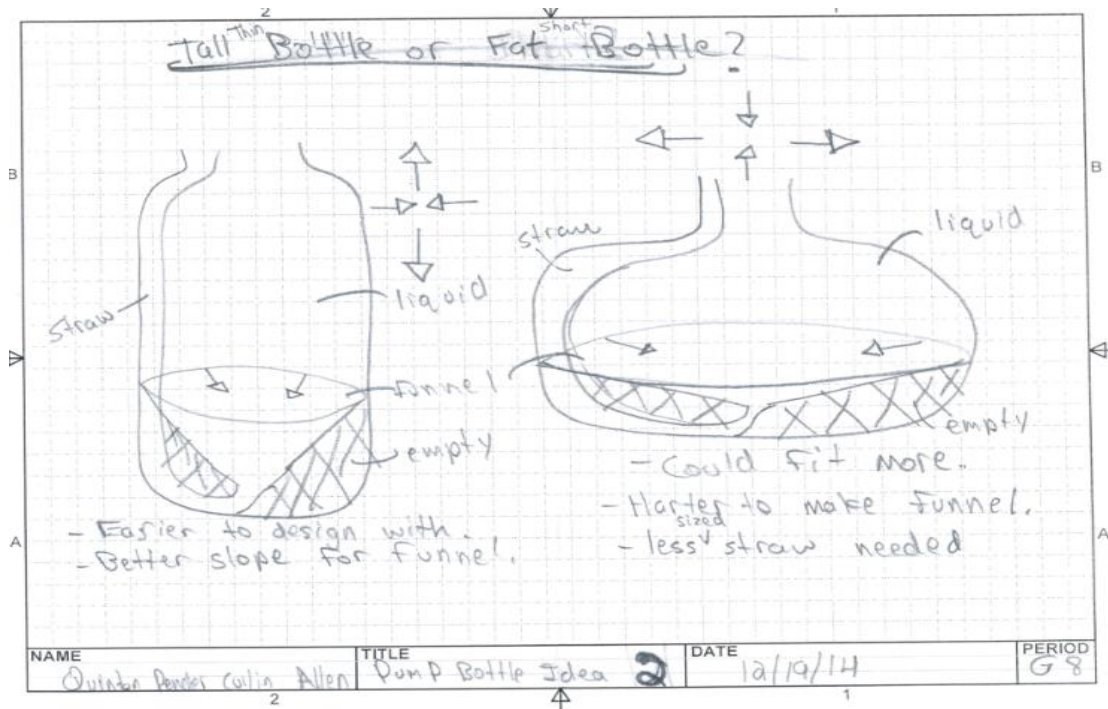
We started by first researching past solutions to our pump bottle problems. We had brought up 5 different ways to solve the problem, but the one that stands out for us was the funnel at the bottom of the bottle, shown here:



Other methods used scraping the contents out, or keeping the bottle upside down.

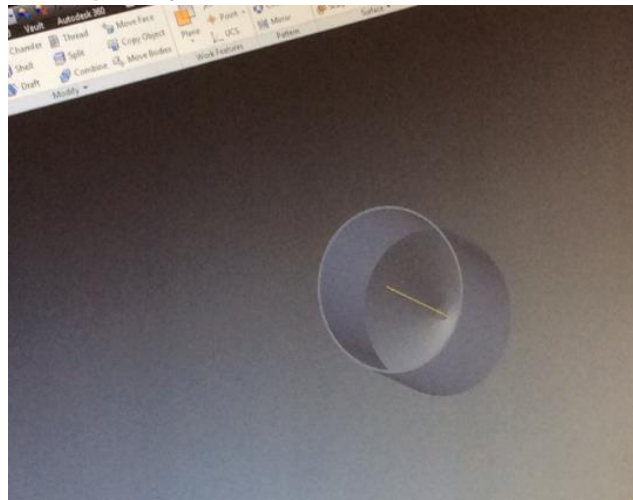
Now with our primary solution for the bottle, we began to sketch our ideas:





We settled on the ideas that we both wanted: A) our bottle to be tall and skinny instead of short and wide. B) Would want our straw to go vertically up from the center of the bottle instead of circular following the edge.

Now with those in mind we got on Autodesk Inventor to begin designing out bottle, we began with a completely circular bottle with the funnel at the bottom:



But then decided to make the bottle more oval for appeal.



After completing the bottom funnel part of our bottle we then 3-D printed it to make sure it worked:



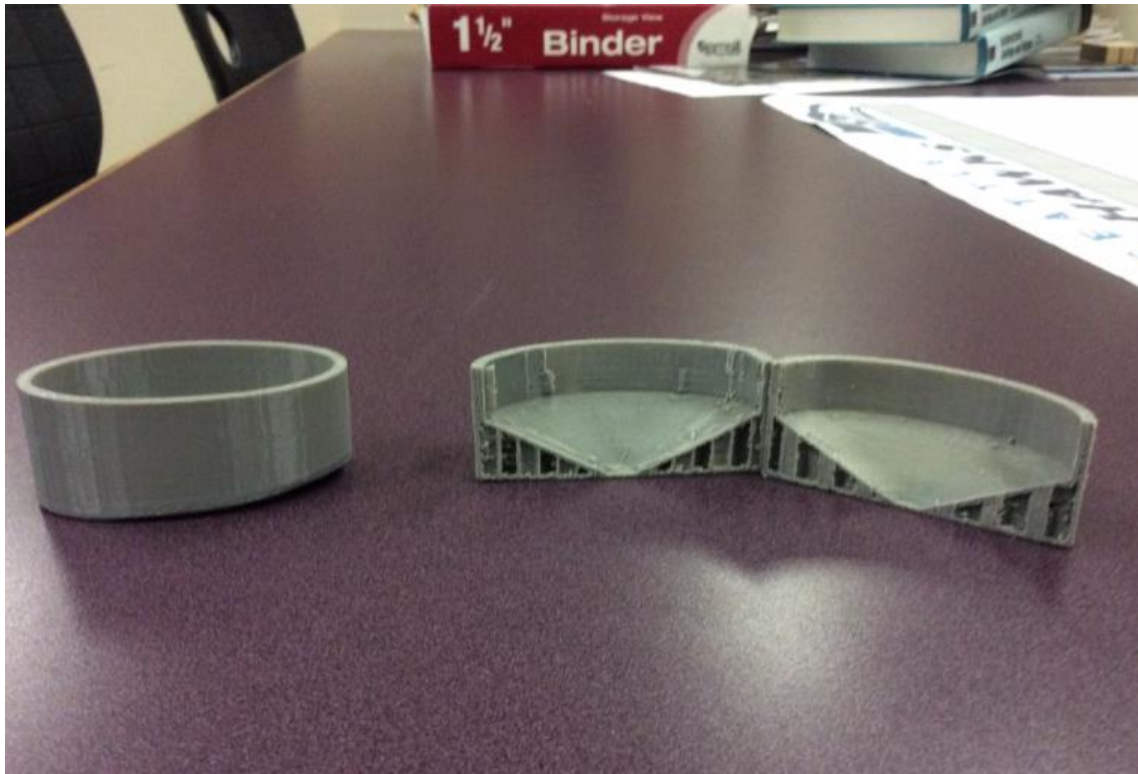
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The general shape was perfect, but there were flaws with the support material as seen above, so we reprinted it so that it would be smooth:



It was a great success, and now that we had one extra we could cut it open for a section view to show the inside support material:

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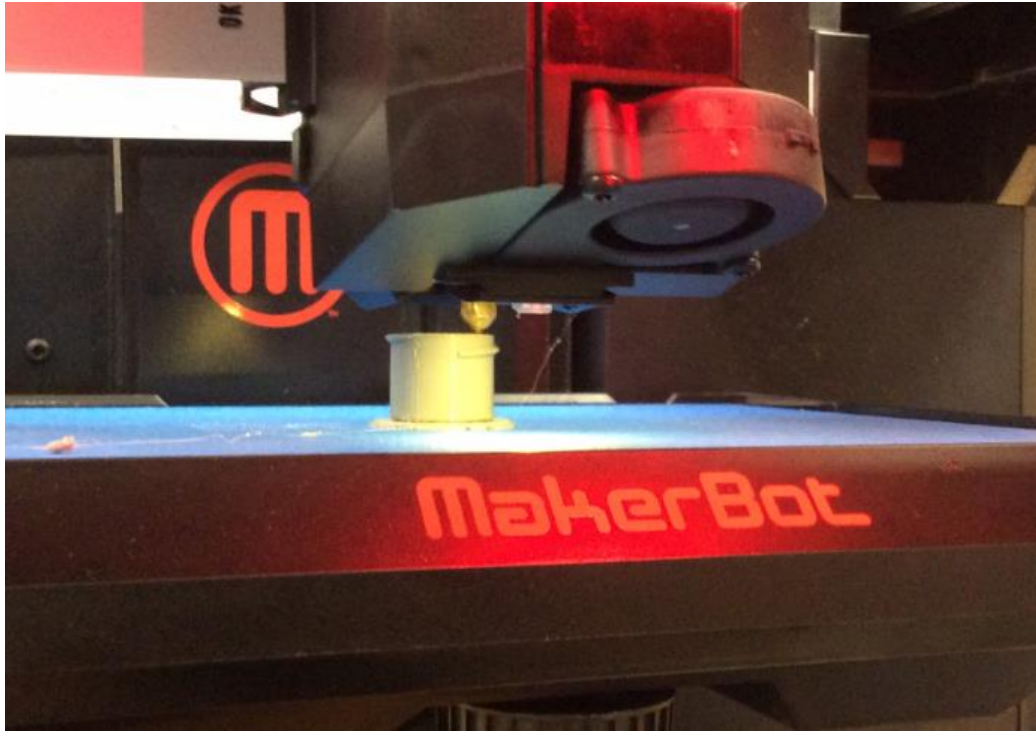


With the bottom and the funnel checked, we then started to work on the threading for the pump cap that would screw into the top of our bottle:

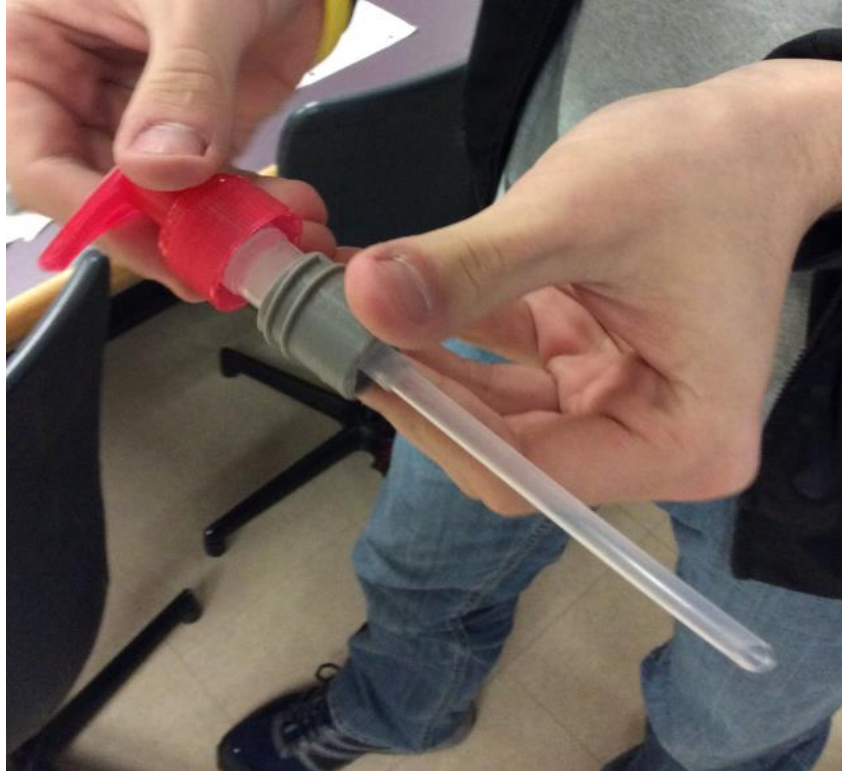


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This part took much trial and error, and we had to reprint the thread 3 times, but we finally got the correct result:



We then twisted the cap on to insure that it works correctly:



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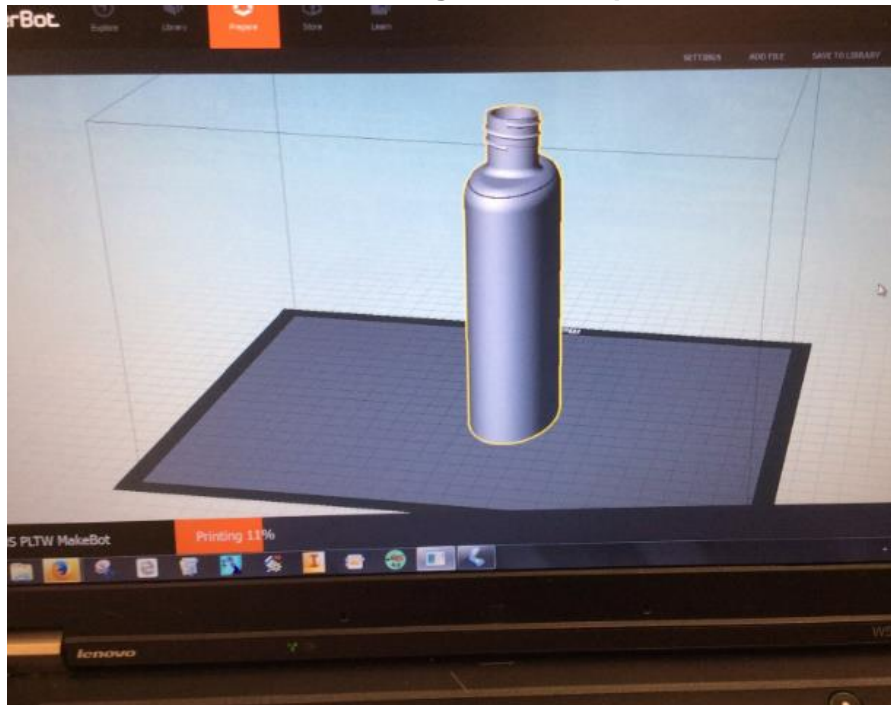


Now with the bottom funnel and the top threads done all we had to do was add the body, which took no time at all:



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And then we began the final print:

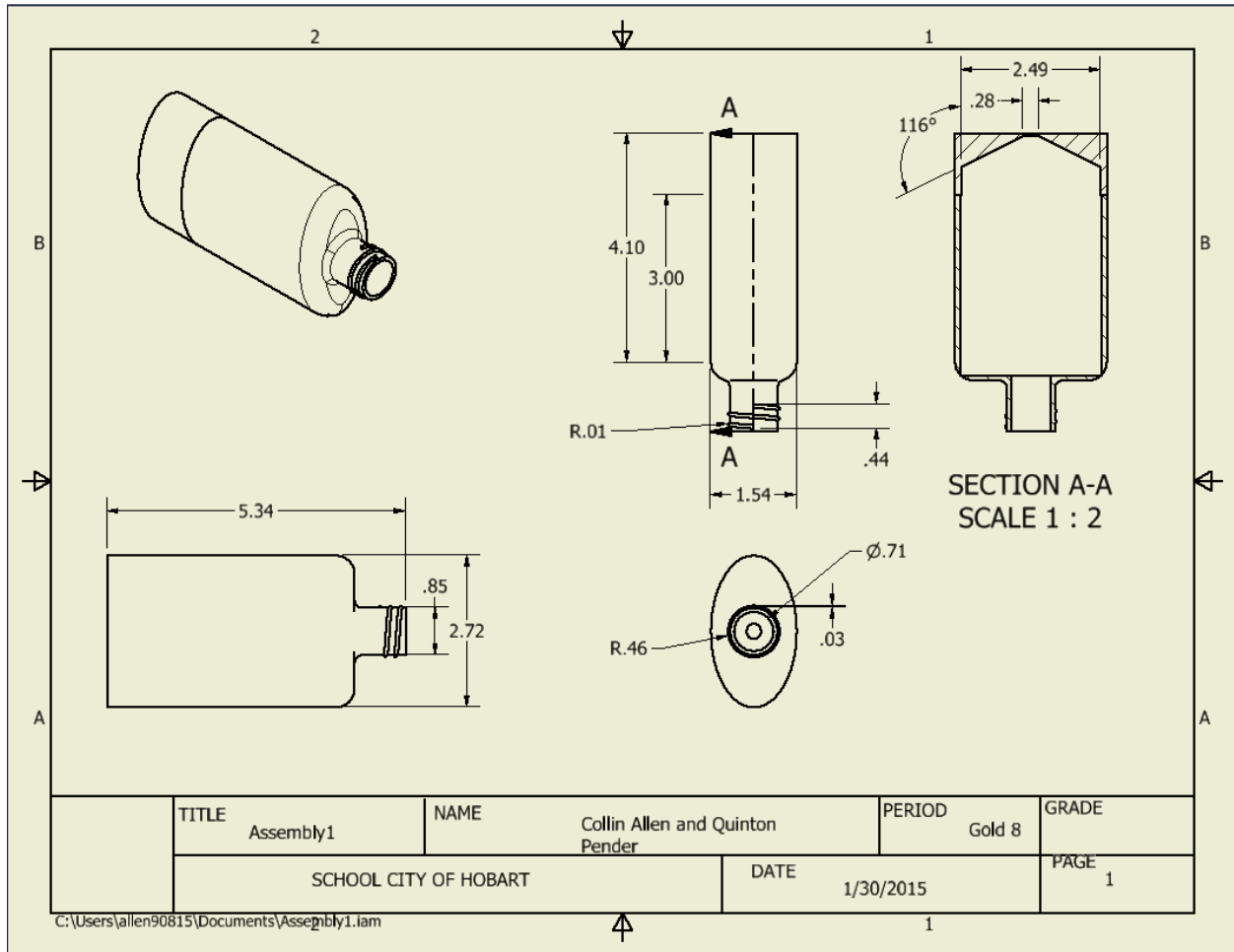


And here's the final redesign (Along with logo):



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We then put the bottle on a title block with all its dimensions:



Check the Extreme Redesign Facebook page if you want to view our test video, and thank you for viewing our Redesign submission.

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