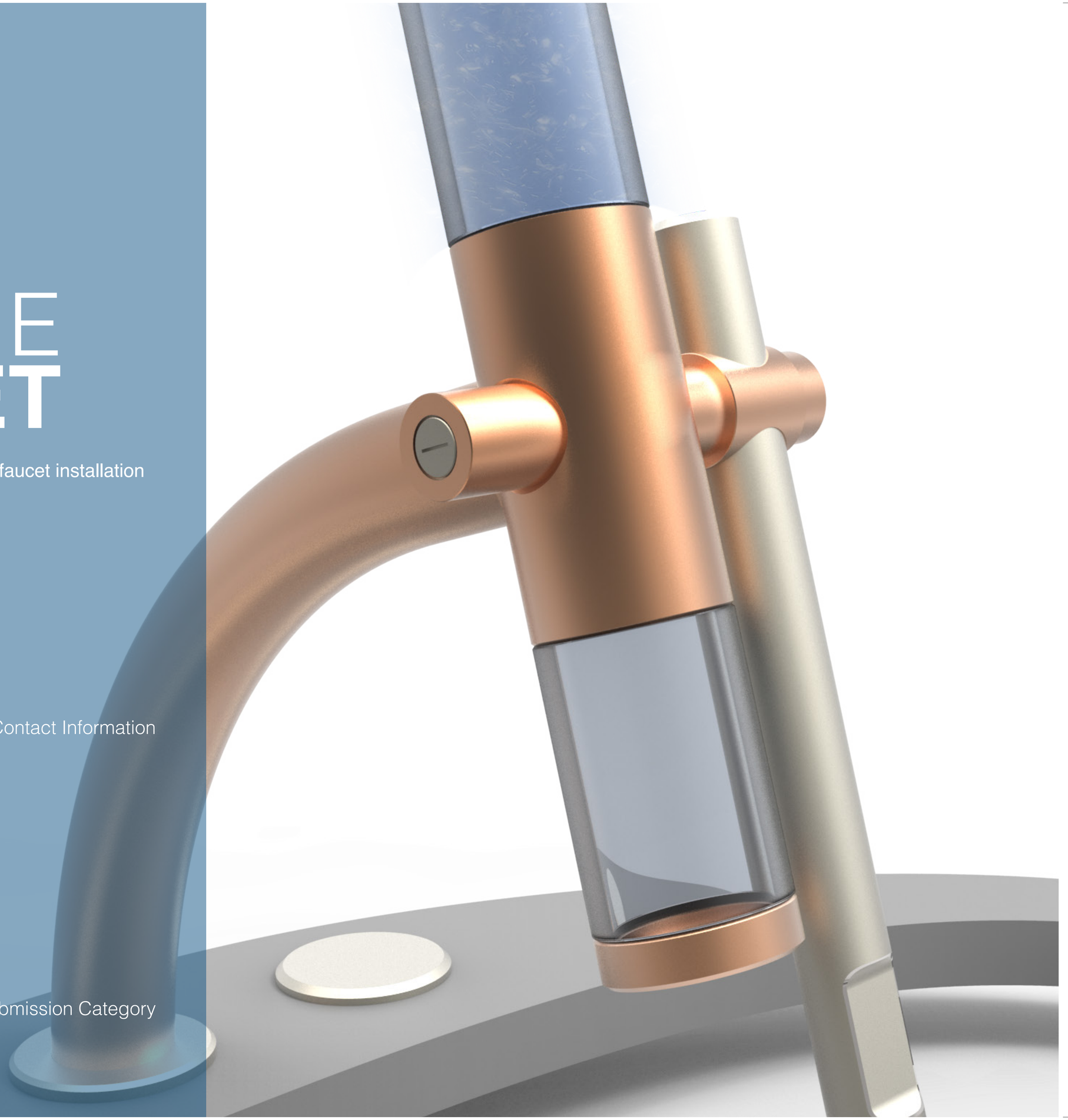
FINITE
FAUCET

Concept for a water-saving public restroom faucet installation



1.1 Contact Information

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1.2 Submission Category

Student project using Fusion 360

The CDC guidelines for handwashing only require two short bursts of water - once to wet your hands, and once again to rinse off the soap. It's unhealthy to use more water than this; leaving hands in running water washes off soap too quickly.

- **Wet** with warm or cold water (.25 litres)
- **Lather** with antibacterial soap
- **Scrub** for 20 seconds or more
- **Rinse** with warm or cold water (.25 litres)
- **Dry** with paper towel or hand dryer

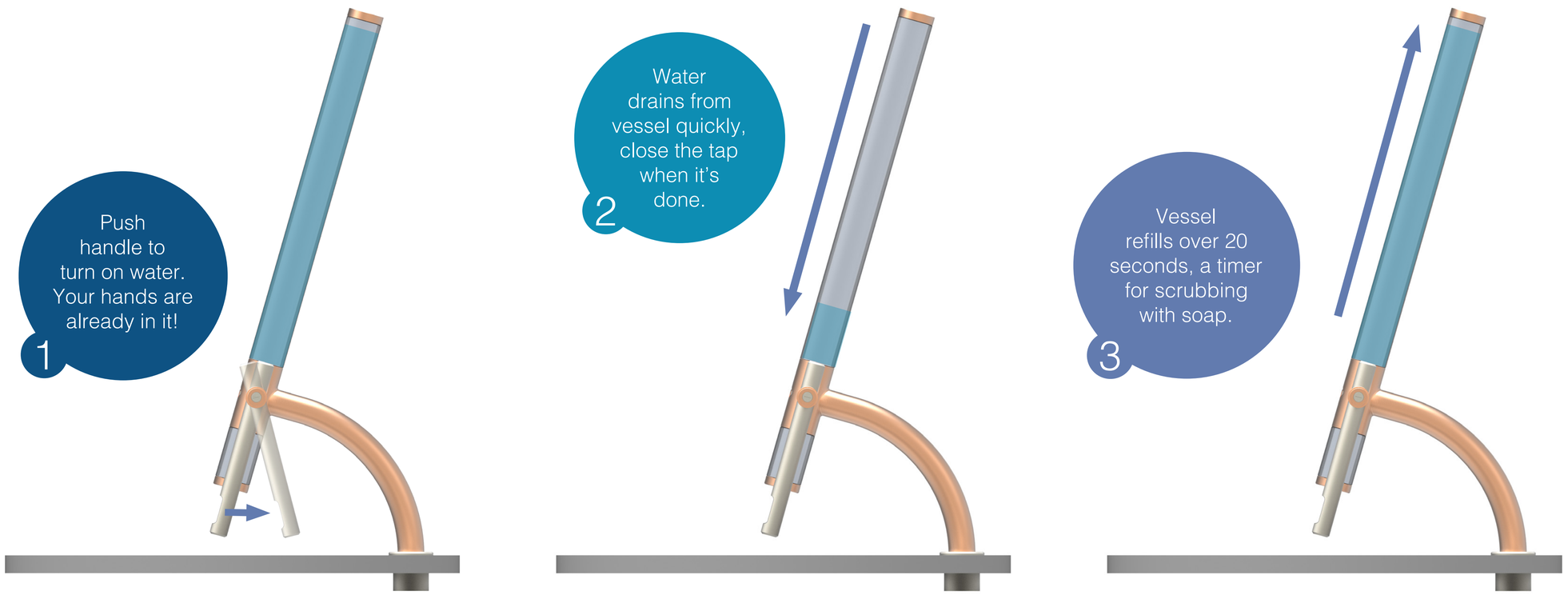
Why couldn't a public restroom faucet help users learn how to wash their hands correctly?

The Finite Faucet drains until it is empty, at which point it must be turned off to refill. **The Finite Faucet reminds users of their impact on the environment.** When public restroom users are reminded of water's limited supply, they endeavor to waste as little of the resource as possible.

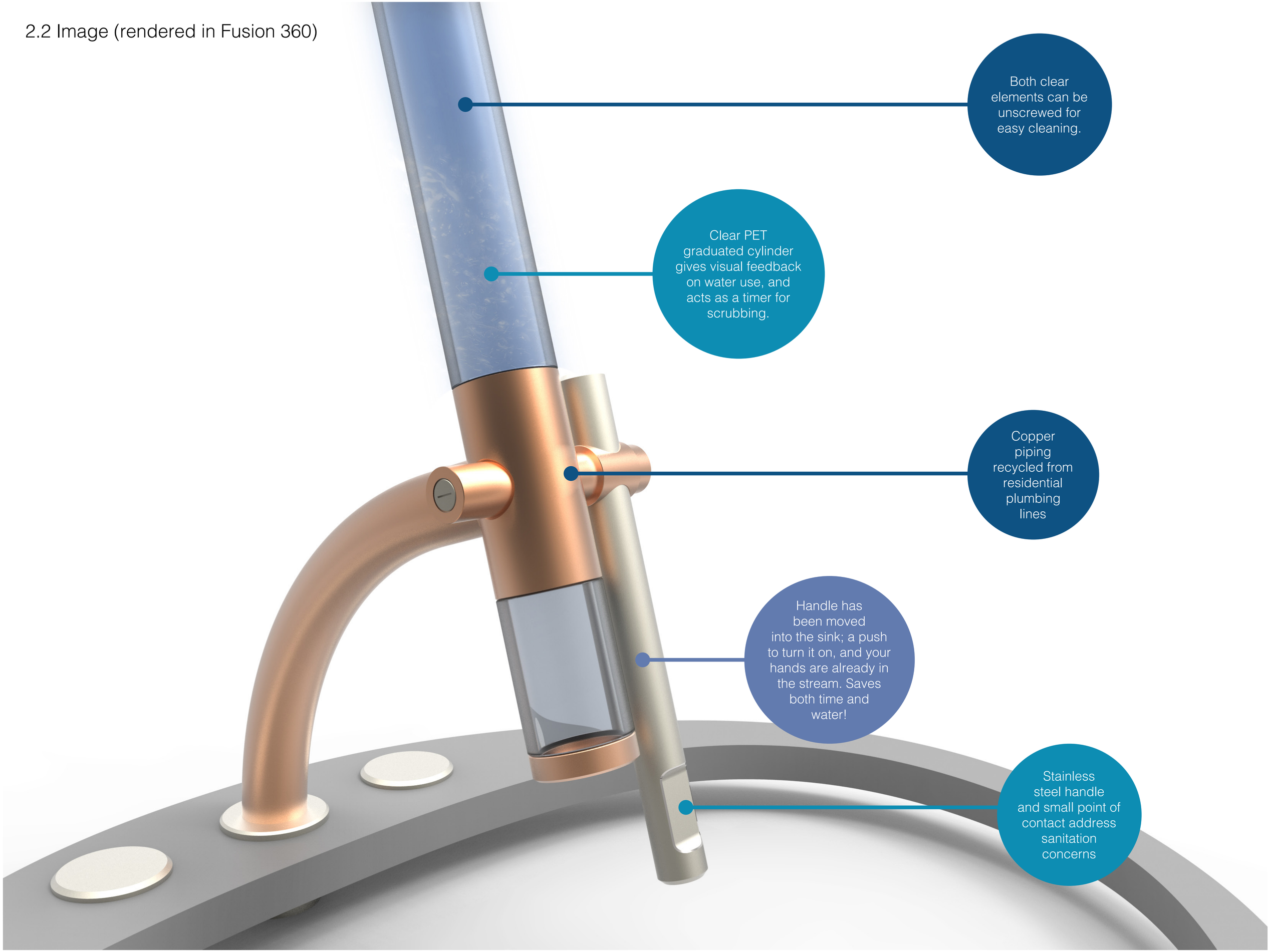
Upper cylinder acts as a visual reminder of water usage.

Refilling water acts as timer for scrubbing your hands.

Antimicrobial faucet handle moved to the sink for easier reach.



2.2 Image (rendered in Fusion 360)



2.3 Illustration of Product System

3. Reutilization Cycle and Business Model

The Finite Faucet is made almost exclusively of reclaimed metals, plastics, and parts. Furthermore, by avoiding paints and plating wherever possible, **the manufacturing processes to make the Finite Faucet have no impact on the materal recyclability**.

By volume, the most common material in the product is copper. **The copper for Finite Faucet is sourced from recycled plumbing and plumbing fixtures**. Because the copper will not be exposed to any chemicals other than water, it will be **recyclable** for non-electrical purposes after it's time as a faucet.

The second most common material in Finite Faucet is PET, one of the most **easily recycled plastics on the market**. Just as with copper, because the PET will only come into contact with water, it is **recyclable again**.

While the materials for Finite Faucet are 100% recyclable, it's greatest impact on the environment will be its **push for social change**. By teaching public restroom users the value of water, and how they a change in a simple habit to improve the situation, **the Finite Faucet is not just less bad - it's more good.**

4. Material Selection

4.1 Overview

Finite Faucet is made entirely of recycled materials, save the valve mechanisms and screws. All of these materials can then be recycled again. Sourcing copper from reycled plumbing fixtures is excellent in energy savings, as the piping does not need to be melted down for use as a Finite Faucet. PET was chosen for its recyclability, durability, and easy molding. Both materials are excellent materials for managing drinking water, and highly recyclable.

4.2 Material Reutilization

Using Fusion 360, I was able to calculate an accurate material reutilization score by material volume.

85% recycled
93.5% recyclable
88.25 MRS

4.3 Material Health

Copper
used in product structure, opaque sections
common material for water-based applications
NFPA Rating (as used): 0
HMIS Rating (as used): 0
Contains no known toxic chemicals as used.
Only potentially hazardous during cutting or grinding.

PET
used in product structure, clear sections
common material for water-based applications.
NFPA Rating (as used): 0
HMIS Rating (as used) : 0
Contains no known toxic chemicals as used.

Steel
used in control element, ball valve, pressure valve
common material for sanitary applications
NFPA Rating (as used): 0
HMIS Rating (as used): 0
Contains no known toxic chemicals as used.
Only potentially hazardous during cutting or grinding.

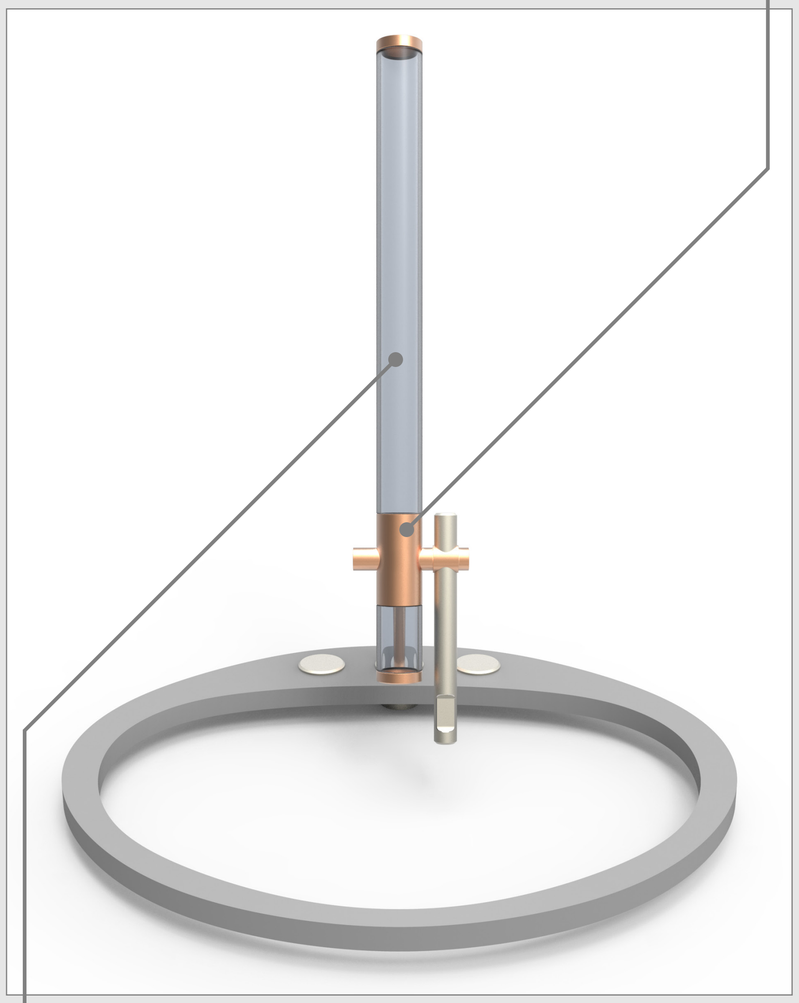
5.

This product was designed using

AUTODESK® **FUSION 360**

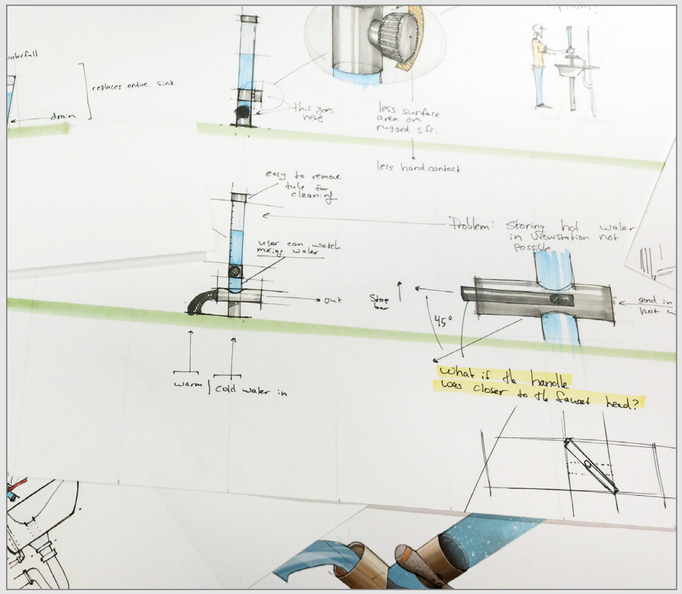
I used Autodesk Fusion 360 modeling tools to develop my idea after the sketching phase. It's one thing to sketch out an idea on paper, but quite another to figure out the if the valves and switches will physically work.

Without Fusion 360, I would only have sketches and a vague idea of how my product could actually function.



Fusion 360 made it much easier to measure, and then tweak, the volumes and relative size of my parts to match the CDC guidelines for hand washing. I made a direct 3D model of the first iteration, and was able to tweak it to perfection without restarting even once. Although my product had no need for the sculpt tools, my experiments with them yielded a similar workflow.

I also used Fusion 360 tools to determine the volumes of the various homogenous material groups in my product, for calculating the Reusability Score..



What's the next step?

Keep on iterating.

Due to the cloud-based nature of the software, I could work with a team in which each member tweaks derivative versions of this design for additional material savings and effeciency. This would be a great chance to work with professionals experience in Cradle to Cradle design. Once we arrive at a solution, Fusion 360 is also a great resource for preparing blueprints and CAD files for production.

After this competition, I'll be seeking investors or crowdfunding to develop a prototype and bring the product to market.