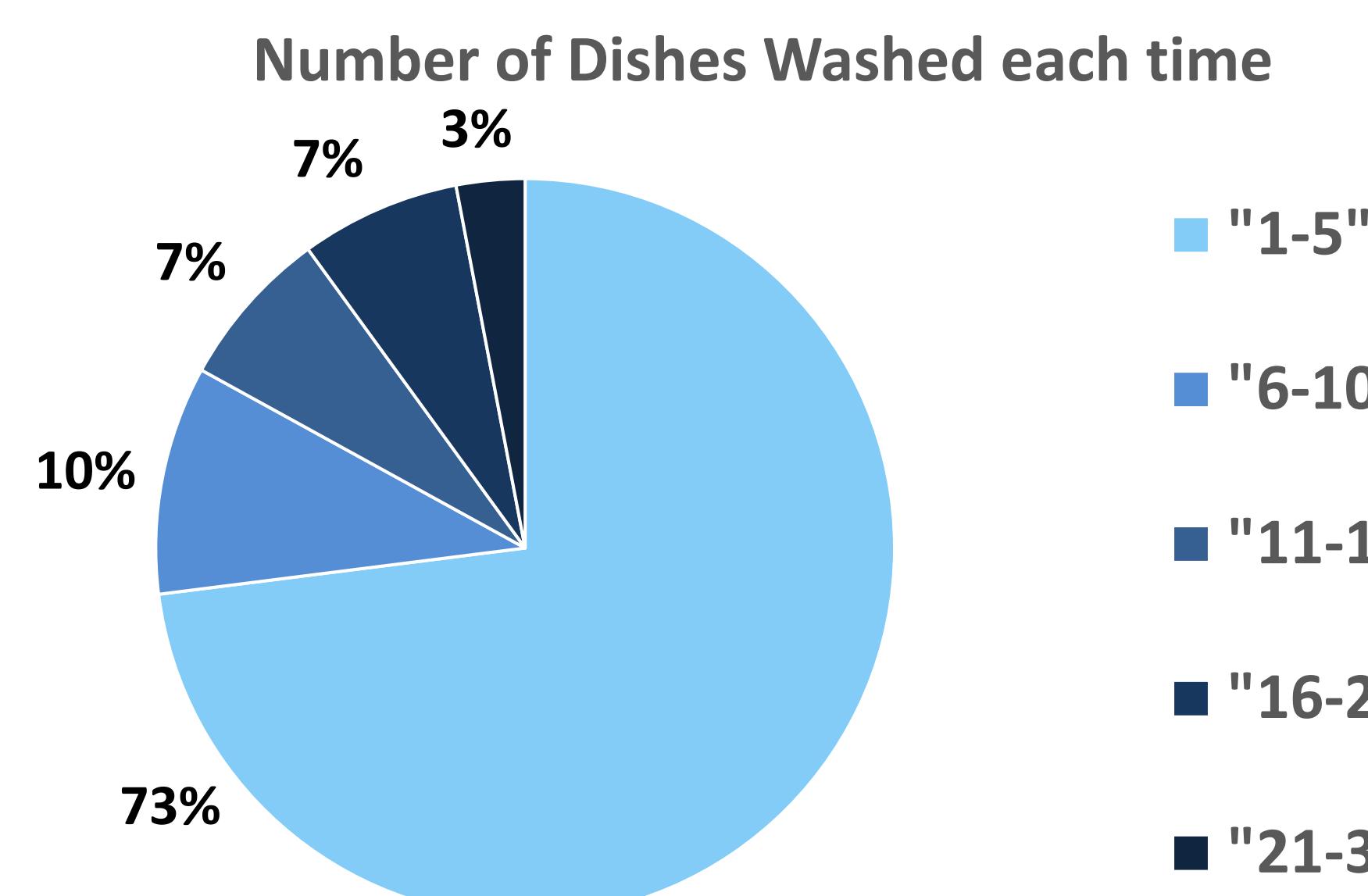


Compact Dishwasher

Problem Statement

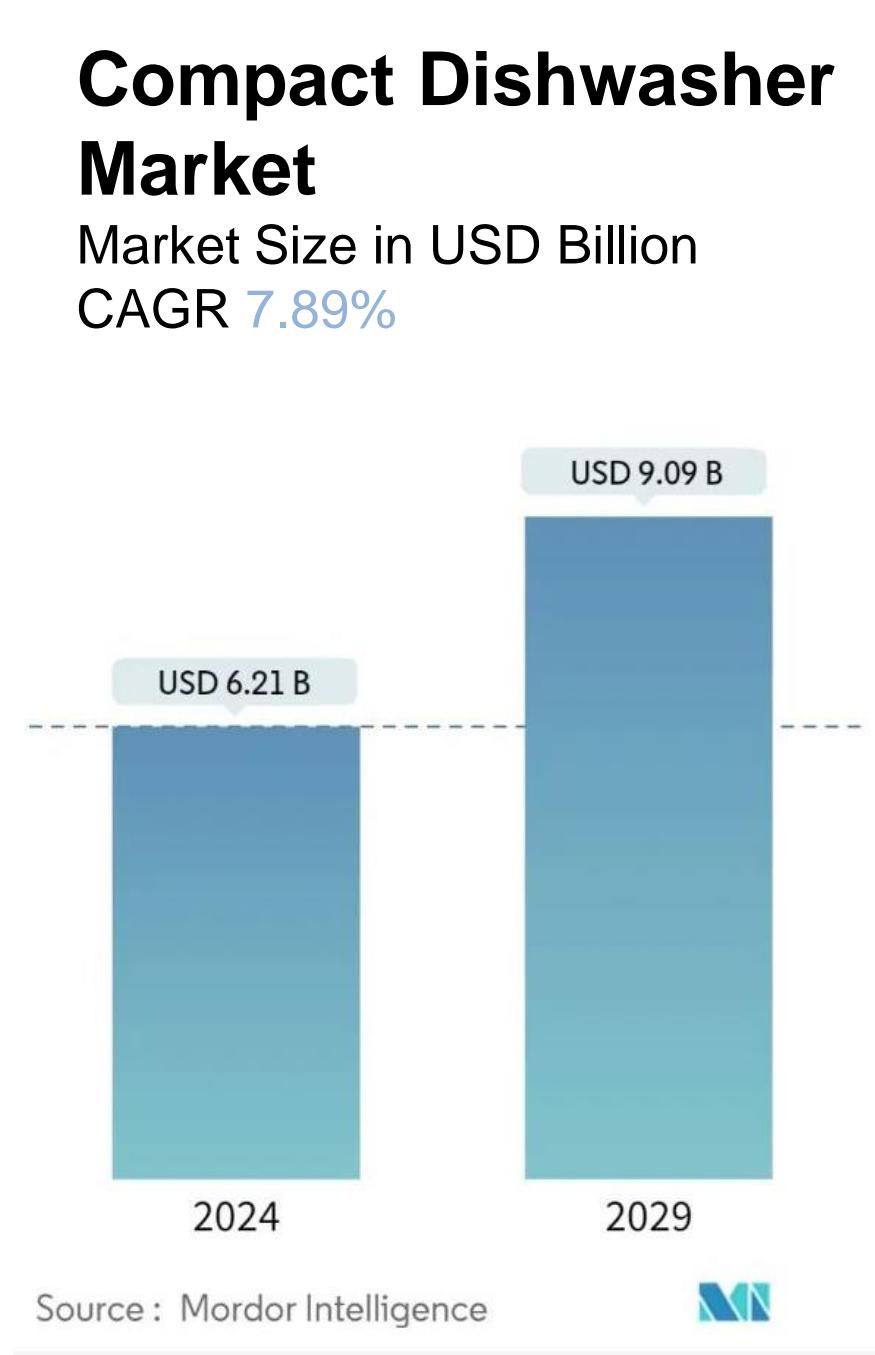
In the absence of dishwashers within some apartments and dorm rooms, handwashing dishes can often become tiresome and intimidating, typically leading to college students procrastinating this necessary task.

Research



Consumer research was conducted to gauge the scope of the problem statement and the validity of a solution to the problem statement. To gain personal information from students on campus, a Google Form was sent out. Responses showed that more than half of the students who responded don't have dishwashers, most students wash 1–5 dishes at a time, and additionally, most students aren't satisfied with their current dishwashing solution. Among the students who didn't own a dishwasher, nearly all of them were potentially interested in a dishwashing solution. The survey indicated that students would comfortably pay a maximum of \$30 for a dishwashing solution.

In addition to consumer research, market research revealed the potential scope of a solution to the problem statement. The compact dishwasher market is projected to increase from \$6.21B to \$9.09B — a substantial increase which suggests strong growth for the compact dishwasher market. It is speculated that this growth is due to the projected increase in smaller homes, especially with urbanization throughout the US and the world.



Both the market and consumer research suggest the viability of a solution to the problem statement.

Primary Concept Description

The Compact Dishwasher features a lightweight yet efficient design which includes a solid plastic base attached to a clear plexiglass lid through which washing can be observed. A sturdy hand crank is fixed within the lid and is supported by a low-friction bearing, making the scrubbing process easy. The crank features a quick-connect mechanism which makes light work of swapping out attachments such as scrubbing sponges of different sizes and drying components to account for different sizes of dishware. Once the correct attachment has been chosen, the dish is secured to the bottom of the device via a series of suction cups. The lid can now be shut, and water and soap can be inserted through the openings in the lid. With the dish thoroughly soaked, the user can begin with scrubbing the dish by turning the hand crank. Once the user observes that the dish is adequately scrubbed, water can once again be sprayed through the lid to rinse off soap. Finally, the scrubbing attachment is replaced with a drying attachment and the user turns the crank once again to dry the dish.

Key Engineering Requirements

- Features a drying ability
- Has a viewing window/clear lid
- Has accessible cleaning components
- Can access water
- Taking up less than a 12" by 12" space on a counter
- Cost less than \$20 to produce
- Leaves zero residue after a cleaning cycle
- Can clean 5 dishes before needing to be drained
- Can fit a plate up to 11 inches in diameter
- Can fit a bowl up to 5 inches high



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Lab Time: 2:30 - 4:30 Tuesday & Thursday

Comparison to Benchmarks

| | Weight | Pristine Solutions | Mueller | CaraMart |
|------------------------------|--------|--------------------|---------|----------|
| Customer Requirements | | | | |
| Dries Dishes | 5 | 0 | -1 | -2 |
| Affordable | 5 | 0 | -2 | 0 |
| Cleans Dishes Quickly | 5 | 0 | -1 | -2 |
| Small Footprint | 5 | 0 | 1 | 0 |
| Easy to use | 5 | 0 | 0 | 2 |
| Rarely Breaks a Dish | 5 | 0 | 0 | 0 |
| Total Weighted Score: | - | 0 | -2 | -2 |

Main Functions

The main functions of the design are washability, secure, drying, and ability to setup/move.

The key function of the design can wash and dry dishes effectively. During the problem definition phase, Pristine Solutions made the promise to its customers to be able to clean a dish as fast as hand washing but be a simpler and more enjoyable process. From the see through plexiglass and the surface area of the sponge, we will be able to meet this requirement by the customers.

Pristine Solution's other two requirements that we held true on was the promise of keeping the product secure and making set up and mobility a breeze. The team has delivered on these essential items by introducing rubber feet on the bottom of the frame, liner to keep as water-tight seal, and yet to be seen suction cups to keep the dishware stable when washing.

With these functions listed, Pristine Solution's original requirements are met while keeping the price lower than all products in the current market.