

## Abstract

**Project Title: To Dry or Not to Dry? Do Air Dryers Spread Bacteria in Public Restrooms?**

**Project ID: 97**

### Abstract

A brief explanation of your project. Enables judges to receive a base understanding of your project and work.

Often when you go in a public restroom, you will have different options to dry your hands - whether it is paper towels, a Dyson AirBlade, or a warm air dryer. Paper towels are harmful for the environment, but the air dryers may spread bacteria. My hypothesis was if hands are dried with a Dyson AirBlade, Xlerator, paper towels, or naturally dried, hands dried with the Dyson Airblade will have more bacteria than drying with any other method because when toilets are flushed a micro-mist is sprayed within a 6-yard radius which then deposits the bacteria on our hands.

In order to test my hypothesis, I first located each drying method. I recruited 10 subjects and I swabbed their unwashed hands. After that, participants washed their hands for 20 seconds without soap and then dried until dry with the drying method. Hands were swabbed again. Bacteria colonies were cultured for one week and then bacteria colonies were counted. I also swabbed the surfaces of the air dryers to determine if bacteria spread in the public restroom.

My hypothesis was supported. The Dyson AirBlade spread 72.2 bacteria colonies on average. Paper towels decreased the number of bacteria compared to unwashed hands. The Dyson AirBlade spread 397% more bacteria than paper towels. Natural drying spread 31.9 bacteria colonies on average. Drying with an Xlerator spread an average of 48.7 bacteria colonies.

Although the bacteria colonies are harmless to most people, immunocompromised patients may be affected. Also, currently with the COVID-19 outbreak, it has been proven to be very important to have proper hand washing techniques. Hand drying techniques are also important to eliminate the spread of bacteria.

Overall, air dryers should be redesigned by adding air filters to make sure the air they take in is clean. Biodegradable paper towels should be created. The layout of public restrooms should be changed to prevent the splatter of microbes from toilets. Also, air dryers should not be used in clinical areas to prevent the spread of bacteria.

### Items to Include:

- **Introduction:** Why did you do this project and why is it important? How will this effect people and why is it needed. Inspire the reader to continue learning more about your research and read your report.
- **Problem Statement and Engineering Goal / Hypothesis:** What is the problem you were solving and what was your engineering goal or hypothesis.
- **Procedures:** How did you solve the problem and or test your hypothesis. Don't go into details, provide a broad, conceptual view of what you did. For engineering, what was your design criteria.
- **Results:** What was the outcome? Use your data and numbers to describe your result.
- **Conclusion:** Was your hypothesis supported or the engineering goal met?