



Colorado Science and Engineering Fair

2024 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: Toilet Talk

Finalist's Name: Marin Cantrell

School and City: Cardinal Community Academy, Keenesburg

Sponsor's Name: Sarah Johnson

Category: Chemistry (CHEM)

Division: Junior (6th - 8th grades)

Abstract (250 words or less):

Tricky, tender, toilet-paper is a necessity for most households all over the world. A problem most people don't think about when it comes to toilet paper is the solubility of their toilet paper and how it has affected their septic tanks. I used this question to test the solubility of different ply's and materials of toilet paper. After doing some research, I originally thought that the thinnest of the toilet paper types (being a 1 ply) would dissolve the fastest because there is less material to be dissolved than that of a larger ply. When it was time to get down to the testing, I used nine different mason jars as the containers for the testing. I tested each type of toilet paper individually in order to be able to observe them one on one. To prepare the solution used to simulate septic water, I made sure all the jars were around the same starting temperature for the 400 mL of water inside. Then, I put two enzyme pills inside and stirred them 6 times around in a clockwise motion. I would then drop the toilet paper in and start the timer simultaneously. When the toilet paper started to fully dissolve meaning that more than two pieces of the toilet paper were coming off, I would record that time. After ten minutes of soaking, I would take the toilet paper and strain it to simulate the sand filters that the toilet paper would go through in a septic system. I then recorded the end texture of each of the toilet papers and noting how that would affect a septic system. In the end, the bamboo 3 ply ended up dissolving the fastest and best texture wise. Both brands of flushable wipes performed equally bad with neither of them dissolving whatsoever within the given time period. On a brand scale, cottonelle did the worst overall between their different ply's doing poorly against other brands of the same ply. Now we know which toilet papers are best for your septic system, but was my hypothesis correct? I was incorrect in guessing that the thinner the toilet paper, the faster it would dissolve because the three ply bamboo toilet paper performed the best, yet it was the thickest ply that was tested. Overall, this experiment was very controlled, but if I was to do it again, I would make sure to video each of the tests so that I could easily access and compare results. Additionally, I would use a full 24 hour day cycle to test the toilet paper so that they could fully dissolve.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature:

Date:

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. A signed copy of this form must be included in your notebook.