

The LEAFlet

From LEAFlet – Wisconsin's K-12 Forestry Education Program

Where Has All the Toilet Paper Gone?



During the last few weeks at the grocery store, it's not unusual to experience toilet paper anxiety. We brace our shopping carts as we approach the toilet paper aisle. Craning our necks forward to beat the rest of our body, our breath held and eyes wide as we hope for just one package of that two-ply gold only to see a row of bare shelves. We sigh as we ask, where has all the toilet paper gone?

At this point, I'd take that one-ply stuff my depression era grandparents always had or the millimeter thin rolls you find at gas stations that tear each time your fingers grip a square. As if one-ply's not enough they feel the need to ration you. Clearly, not all toilet paper is created equal! Now let's get to the bottom of this missing toilet paper inquiry.

History

Toilet paper is a relatively new invention and was commercially produced in 1857 by an American entrepreneur who wanted to create a product whose particular purpose was for lavatory use. Up until this time, **people used pages ripped out of newspaper and catalogs.**

Before modern paper goods spread across the globe you could find people using items like leaves, moss, rocks, and corn cobs to tidy their tush. If you venture further back in time, the fearless Vikings used wool, the Romans, known for their magnificent bath houses most appropriately used sponges, and the French royalty classed it up with lace.

Science

As you probably know from personal experience, **modern toilet paper comes in a wide range of quality and construction**, but it's all similar in that it's made to degrade easily in a septic system. If toilet paper is made of recycled paper, the process starts by many different kinds of paper being mixed together. Next, recycled paper needs to be washed and is often de-inked prior to being pulped. Toilet paper is then pulverized and reformed into very thin and soft paper. At the end of the process toilet paper is bleached and



occasionally scented.

Virgin fiber toilet paper is made using softwood and hardwood trees. Softwood trees have long fibers that give the paper strength. Hardwood trees like maple and oak have shorter fibers that make the paper soft. Virgin fiber toilet paper is made with a combination of approximately 70% hardwood and 30% softwood. After harvesting, trees are cut into logs and are transported to the mill. At the mill, a debarker removes the bark from each log. The log is cut into boards of varying sizes. The wood that's left over is then converted into wood chips, about the size of corn flakes (though not as tasty in milk!).

The wood chips are then put into "pulp digesters" where they are broken down by steam and chemicals into a gloppy pudding of cellulose fibers and other wood components. In another process, the chemicals, wood resins, and wood lignin (sort of a natural glue in the wood) are removed. The cellulose fibers are cleaned and screened many times to get them ready to be made into paper. **For more on the chemistry of paper [watch this video on the making of pulp!](#)**

To see how pulp becomes paper [watch this video!](#)



Economics

According to Consumer Reports, the average American **uses nearly 21,000 sheets of toilet paper a year**—roughly the length of 23 football fields. Unlike other consumer products in high demand right now, toilet paper is mostly produced domestically in the United States and **Wisconsin is the nation's number one paper manufacturer, cranking out \$13.8 billion in products annually.** With all that supply right here in our backyard, where did all the toilet paper go? As much fun as it is to imagine a black Friday version of toilet paper purchases, the actual answer lies in supply and demand for commercial and consumer markets.

The COVID-19 pandemic has caused demand for toilet paper in commercial settings to fall quickly with many Americans not using toilets at work, school, and in other commercial settings. Georgia-Pacific, a manufacturer in Green Bay estimates that staying at home would increase consumer use by 40%! *Hold that flush!* How much more toilet paper is that? If we use the average household size of 2.6 (according to US Census data) who use 409 rolls per year, to last approximately 2 weeks, a 2-person household would need 9 double rolls, or 5 mega rolls. A 4-person household would need 17 double rolls, or 9 mega rolls to last approximately 2 weeks. **[1] Slipped some math in there too!**

While it seems like a no brainer to use the commercial supply to fill the void in the consumer market there are many supply-chain differences that makes that difficult. Plus, remember those paper-thin rolls discussed above? They come in huge rolls, too big for our tiny home dispensers. So, while you think about how you can DIY a large dispenser, we hope that the industry will adapt. Afterall, **"we've got fiber supply, we've got trees,"** said a spokesman for Georgia-Pacific. "It's just a matter of making the product and getting it out." For more on the toilet paper supply chain and its shortage [read this article.](#)

[1] <https://www.gp.com/news/2020/04/statement-on-georgia-pacifics-response-to-covid-19>

There are many connections you can make with the current toilet paper phenomenon. Below are some activities that can help you get started.

- [Paper making activity from Project Learning Tree](#)
- Video: [Make your Own Paper](#)
- [Explore a forest product through a case study](#) from LEAF's Forest Products Kit curriculum.