

A vibrant, colorful drawing of a landscape. At the top, a large, multi-colored rainbow arches across the sky. Below the rainbow, there are stylized, swirling clouds in various colors like purple, green, and yellow. In the middle ground, a large, thick tree trunk stands on the right side, with a dense canopy of colorful, swirling leaves. The background consists of horizontal bands of color, including shades of blue, orange, and pink, suggesting a sunset or sunrise. In the foreground, there are stylized, swirling waves in shades of blue and green, with some green foliage or grass at the bottom. The overall style is whimsical and artistic, using a variety of colors and patterns.

Permanent Sharpie test

Background information

Did you know If you dip the tip of the sharpie in Rubbing Alcohol it will dry it out in 15 secs? The main components in Sharpie are made out of dyes, n-propanol, n-butanol, and diacetone alcohol. Different kinds of fabrics are polyester, rayon, bamboo. Man-made fabrics are polyester and rayon. Natural fabrics are bamboo, Sateen, lawn cloth, and poplin.

N-propanol smells like alcohol and has a clear color. N-butanol is also clear in color and has the scent of banana. It can be mixed with many liquids, according to Dow.com. "N-butanol should not be inhaled and can irritate the eyes and skin." Diacetone alcohol is an odorless and colorless liquid. ChemicalLand21.com "reports that it evaporates slowly and is used as a component of printing ink." Diacetone alcohol, according to ChemicalLand21.com "reports that it evaporates slowly and is used as a component of printing ink."

Polyester is a man-made fiber. It is a kind of plastic and is usually derived from petroleum. The dictionary states that petroleum is a liquid mixture of hydrocarbons that is present in certain rock strata and can be extracted and refined to produce fuels including gasoline, kerosene, and diesel oil; oil." Alternatives to oil-derived polyester exist, including those made from recycled plastic, crops, or even waste.

Hypothesis

If the cloth is placed in tide, dawn, water, Rubbing alcohol, and white vinegar than the sharpie will come out with of the rubbing alcohol and the vinegar. It will not come out of the water, tide, and dawn. Because the dish soaps are only effective with water and water isn't going to do much

Materials

- 600mL of white Vinegar
- 600mL of liquid Tide plus ultra oxi
- 600mL of Tap Water
- 600mL of 70% Isopropyl Alcohol
- 600 mL of Dawn ultra
- Red, Pink, Blue, Orange, Black colored sharpies
- 5 glass bowls
- 25 squares of 7.62cm by 7.62cm 100% Cotton cloth
- 5 unused Oral-B medium toothbrushes



Procedure

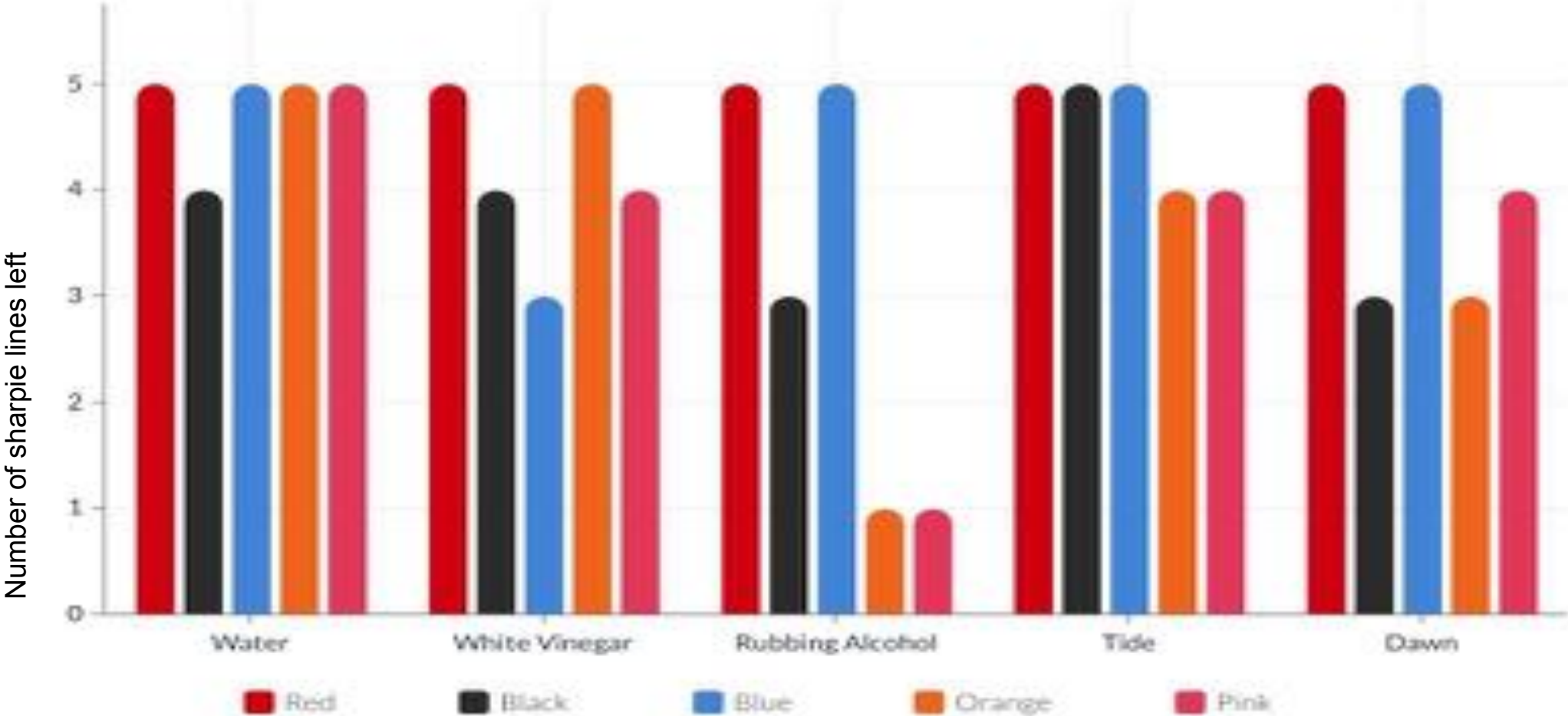
1. Pour 120 mL of white Vinegar in a bowl, repeat four times for a total of five bowls
2. On one square of cloth, draw 5 lines of the same color. Repeat with the other four colors on separate cloth squares
3. Place each cloth in a separate glass bowl of the same liquid
4. Set a timer for 50 minutes
5. After 50 minutes, take each cloth out of the liquid
6. Scrub with the toothbrush for 1 minute each
7. After you scrub for 1 minute, stop and set out to dry
8. After it is dry, observe how many out of five of the lines came off. Graph your results.
9. Repeat steps 1-8 with Tide Plus Ultra Oxi, Tap Water, 70% Isopropyl Alcohol, and Dawn Ultra

Data Table

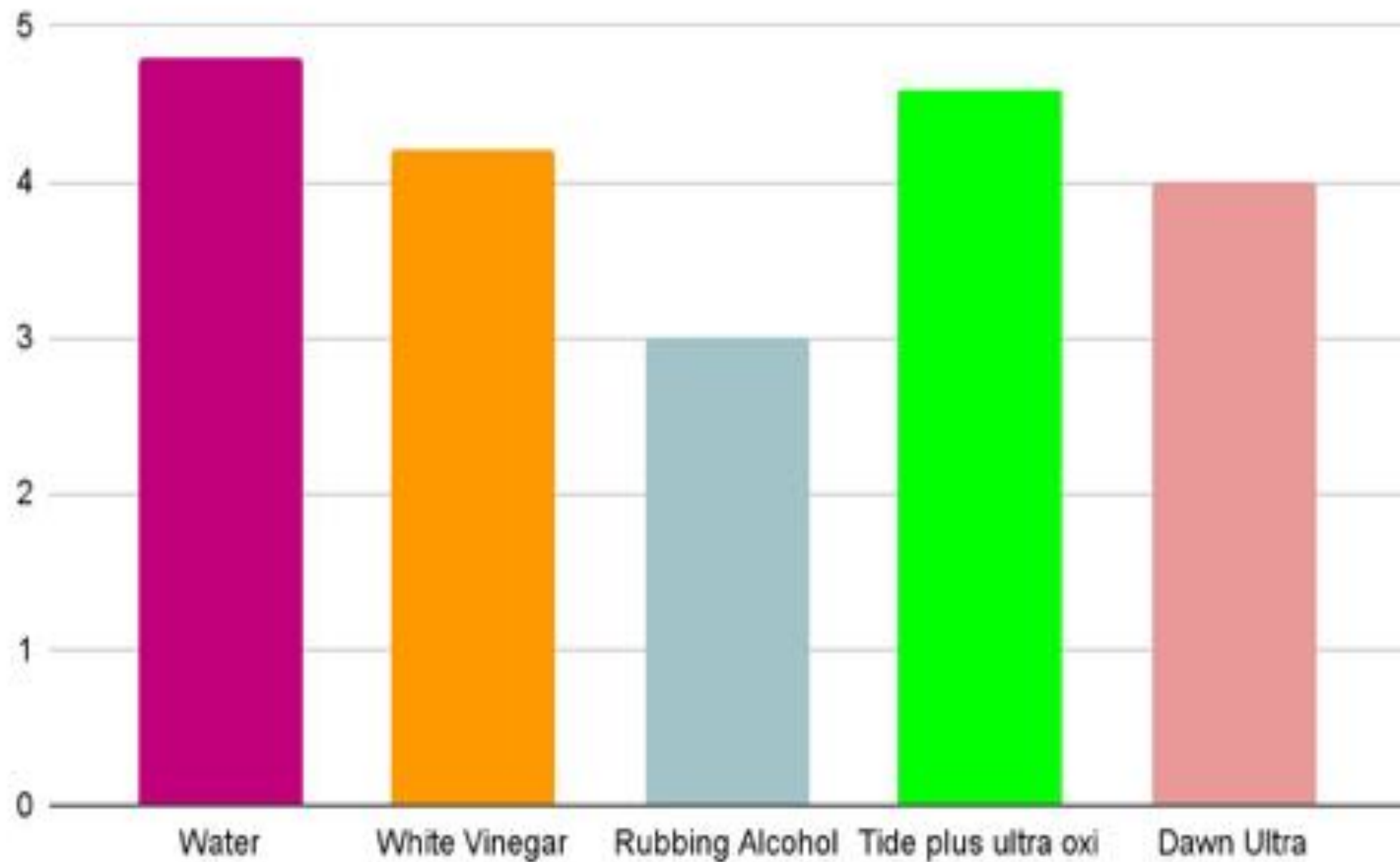
Color of Sharpie	Water	White Vinegar	Rubbing Alcohol	Tide	Dawn
Red	5	5	5	5	5
Black	4	4	3	5	3
Blue	5	3	5	5	5
Orange	5	5	1	4	3
Pink	5	4	1	4	4

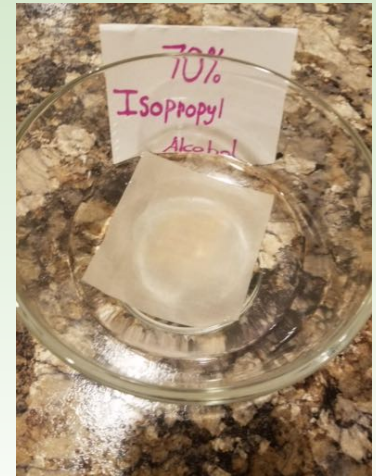
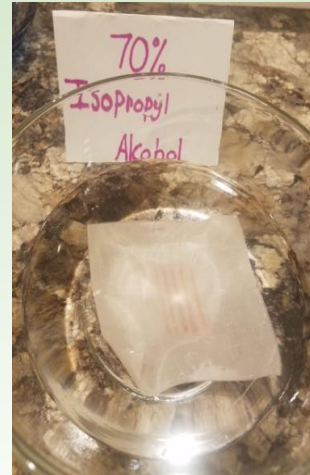
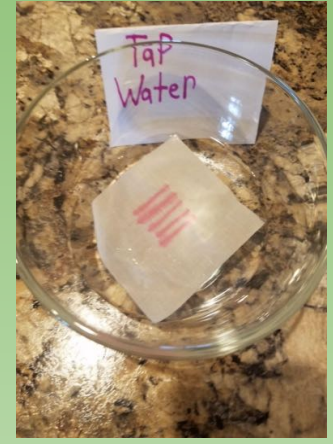
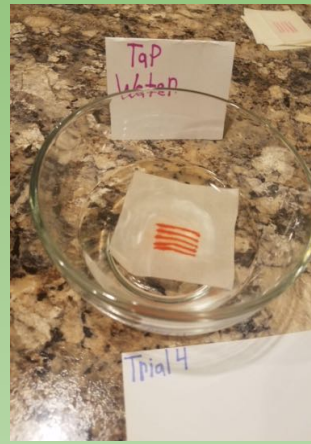
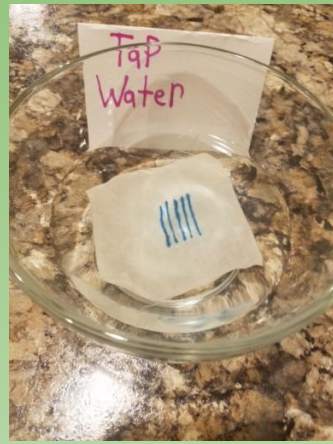
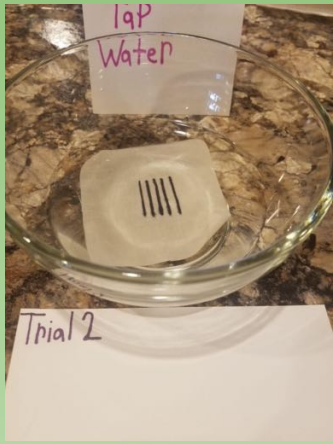
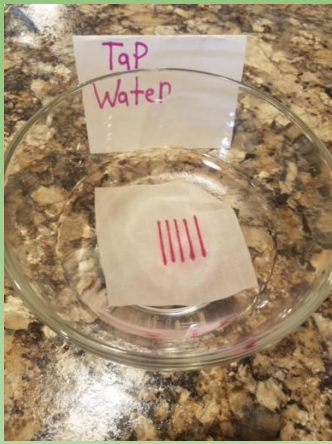
Number of lines left after being clean with the different solvents

Number of Sharpies Lines left after cleaning with different solvents



Average Number of lines left of all color







Conclusion

- This project tested to see if sharpies are as permanent as they say. The project is done by taking some cotton cloth, getting different colored sharpies, draw one-inch lines in the middle of each cloth, in each color of sharpie.
- If the sharpie stain stayed on with the rubbing alcohol and came off with water then my hypothesis would be Inaccurate.
- The sharpie came off with rubbing alcohol and stayed on with the water, Tide, white vinegar, and dawn so the hypothesis was not exact because I believed the white vinegar and rubbing alcohol would take out the most
- Some mistakes i could have made was doing more than 120ml so i could have put more or a little less

Bibliography

Clairenstein, Goody. "Which Are the Best Permanent Markers?" *Bizfluent*, 3 Dec. 2018, Which Are the Best Permanent Markers?.

"What to Know about Rubbing Alcohol." *WebMD*, WebMD, <https://www.webmd.com/first-aid/ss/rubbing-alcohol-uses>.

Chan, Jonathan. "The 5 Best Laundry Detergents You Can Buy." *USA Today*, Gannett Satellite Information Network, 8 Nov. 2016, <https://www.usatoday.com/story/tech/reviewedcom/2016/11/08/5-best-laundry-detergents-you-can-buy/93283354/>.

Amertes@qualitylogoproducts.com, and 866-312-5646 x 277. "What's the Difference between 50/50 and 100% Cotton?" <https://www.qualitylogoproducts.com/>, <https://www.qualitylogoproducts.com/promo-university/fiftyfifty-vs-100percentcotton.htm>.

"The Chemistry of Sharpies." *Www.ChemistryIsLife.com*, <https://www.chemistryislife.com/the-chemistry-of-sharpies>.

Diamond, Dora. "Permanent Marker Ingredients." *Our Pastimes*, 10 Jan. 2019, <https://ourpastimes.com/permanent-marker-ingredients-12344815.html>.

MasterClass. "Natural vs. Synthetic Fibers: What's the Difference? - 2022." *MasterClass*, MasterClass, 26 Aug. 2021, <https://www.masterclass.com/articles/natural-vs-synthetic-fibers>.

Nall, Rachel. "26 Uses for Rubbing Alcohol, plus What You Shouldn't Use It For." *Healthline*, Healthline Media, 16 Sept. 2020, <https://www.healthline.com/health/rubbing-alcohol-uses>.