

GREEN

- A N D -

CLEAN★

SCIENTIFIC QUESTION: Do natural
cleaners work as well or better
than toxic cleaners?

WHY GREEN CLEAN? Our parents &
us do a lot of washing, and so do
many, many other families world-
wide. As a lot of wildlife is being
affected by plastics and man-made
chemicals, we decided to do some
research, and found that many
of the cleaners we use aren't
very environmentally friendly.
We wondered if there was a
way to clean laundry, while still
having clean clothes, & without
harming the environment.



NOV 25TH 2021

VARIABLES

| MANIPULATED CHANGE | RESPONDING OBSERVE | CONTROLLED SAME |
|--|-------------------------------|---|
| Type of cleaner (Lysol, Borax, Marseille, PC stain) Type of stain (Ketchup, coffee, chocolate wine) | Difference in stain colour | <ul style="list-style-type: none"> • Same washing machine • Same washing process • Same fabric • Same amount of stain & cleaner • Same time stain was left |

DEC^{1ST}
2023



BACKGROUND RESEARCH

Chemical cleaning products are harmful in many ways as they can trigger asthma, leave burns, pose a risk of long-term sickness and are dangerous if transferred into the human body.

AMMONIA, a commonly used substance in cleaners, is a corrosive and dangerous chemical, used on glass and mirror, as it evaporates quickly and doesn't leave streaks.

Although ammonia is great in many ways, such as water purification, it is a very wild-life damaging substance.

DEC 11TH 2023

It affects plants' structures through soil acidification, changing the vulnerability of plants to drought, diseases, and frost. It is also one of main sources of nitrogen pollution.

BLEACH is also a very harmful substance that is in all sorts of cleaners. Bleach is released into the environment when it leaks through water treatment plants and then kills many plants and animals through water sources. It can have long term impacts on humans and the environment.

HYPOTHESIS: IF we test all the cleaners, Lysol, Borax, Marseille, and PC stain remover, THEN the Marseille Soap will make the most difference in the colour of the stain; making it the lightest.

| QUANTITATIVE CHANGES | QUALITATIVE CHANGES |
|--|---|
| We'll measure the difference in the colour of the stain. | We'll be taking notes on if the fabric gets moved, or tampered with in any way. |



JAN 16TH
2024

MATERIALS

- Lysol Laundry Detergent
- Borax
- Marseille Soap
- PC stain Remover
- Washing machine
- 0.4 mL of Ketchup
- 0.4 mL of Coffee
- 0.4 mL of Chocolate sauce
- 0.4 mL of red wine
- Clean, white T-shirt
- Scissors

JAN 22ND 2024

PROCEDURE

1. Cut up the old T-shirt into 16 squares.
2. Spread the squares into 4 equal ^{piles}
3. Use the syringe to drop on 0.1 mL of ketchup onto a square. Repeat with 3 more squares.
4. Repeat 3 with coffee, chocolate sauce, and red wine. Pat the stains with a clean cloth. Leave for 1 day.
5. Rate the darkness of the stain from 1-10; 10 really dark, 1 not dark.
6. Add amounts of Lysol directed to one □ of each staining substance.
7. Repeat 6 for Borax, Marseille, and PC stain remover.
8. Put all the □s in the machine and put them on a normal cycle.
9. Remove them & record the data (1-10)

DATA CHART

| DATE | CLEANER TYPE | STAIN TYPE | COLOUR DIFFERENCE | Scale 1 to 10 |
|-------|--------------|--------------|-------------------|------------------|
| FEB 3 | Lysol | Ketchup | 2 | |
| FEB 3 | Borax | Ketchup | 1 | |
| FEB 3 | Marseille | Ketchup | 1 | |
| FEB 3 | PC Stain | Ketchup | 2 | |
| FEB 3 | Lysol | Coffee | 2 | |
| FEB 3 | Borax | Coffee | 9 | |
| FEB 3 | Marseille | Coffee | 8 | |
| FEB 3 | PC stain | Coffee | 9 | |
| FEB 3 | Lysol | Chocolate S. | 1 | |
| FEB 3 | Borax | Chocolate S. | 6 | |
| FEB 3 | Marseille | Chocolate | 7 | |
| FEB 3 | PC stain | Chocolate | 9 | |
| FEB 3 | Lysol | Red Wine | 0 | |
| FEB 3 | Borax | Red Wine | 7 | |
| FEB 3 | Marseille | Red Wine | 4 | |
| FEB 3 | PC stain | Red Wine | 7 | |



FEB 4TH
2024

ANALYSIS: Our analysis is that PC stain remover cleaned the stains the best (made the greatest differ. in stain colour), Borax & Marseille Soap were about the same, and Lysol kind of failed.

FEB 17TH
2024

CONCLUSION: Our science fair project aimed to find out if laundry can be cleaned with greener and more environmentally friendly cleaners. After the experiment, we found that the PC stain remover (a natural cleaner) made the greatest difference in the stain colour, averaging 6.75 (on a scale of 1-10), and the lysol made the least difference, averaging 1.25.

FEB 18TH
2024

Our hypothesis was incorrect.

FURTHER PROJECTS: We could: use different cleaners, different stains, different types of cleaners, such as: glass cleaners, carpet cleaners, etc.

MAR. 2ND
2024

SOURCES OF ERROR: The amount of cleaner was hard to keep exact and consistent, as there was a powder, 2 liquids, and a solid soap. We also measured the colour of the stain after, and it wasn't the most reliable, because our observations were subjective (based on opinion). And we didn't repeat every combination of cleaner and stain, and we probably should have done more, so we could've had a bigger sample size. So, that wraps up our presentation on "Green & Clean". Thanks
MAR 6 2024 || For listening! Any questions?

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