The Sunscreen Showdown

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Guiding question

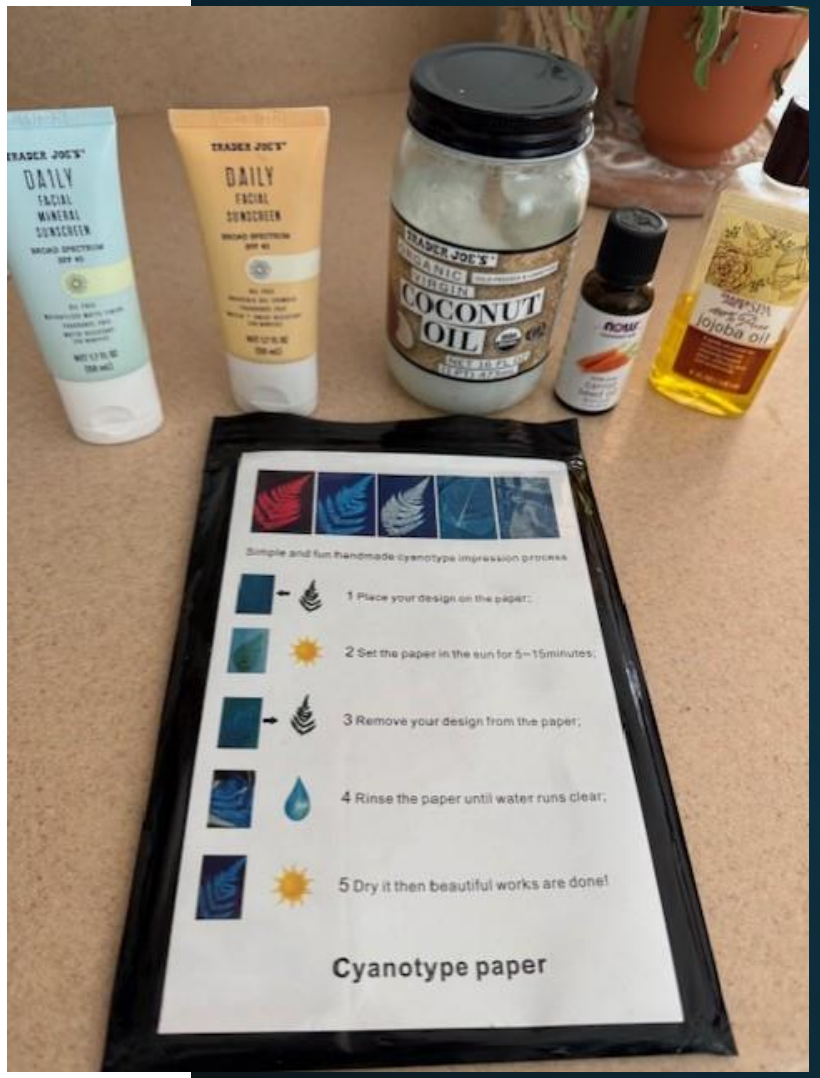
I wanted to know what sunscreen is the most effective so that I can get less damage from the sun.

Hypothesis

- I am using three types of sunscreen such as chemical, mineral, and homemade sunscreen. My hypothesis is that the chemical sunscreen works the best. I think the homemade sunscreen would be a little more on the unreliable side. I think the mineral sunscreen could work but not as good as the chemical sunscreen.

Materials

- Chemical Sunscreen (SPF 30)
- Mineral Sunscreen (SPF 30)
- Homemade sunscreen: Carrot seed oil, coconut oil, jojoba oil (1)
- Cyanotype paper (Sun paper)
- Plastic wrap

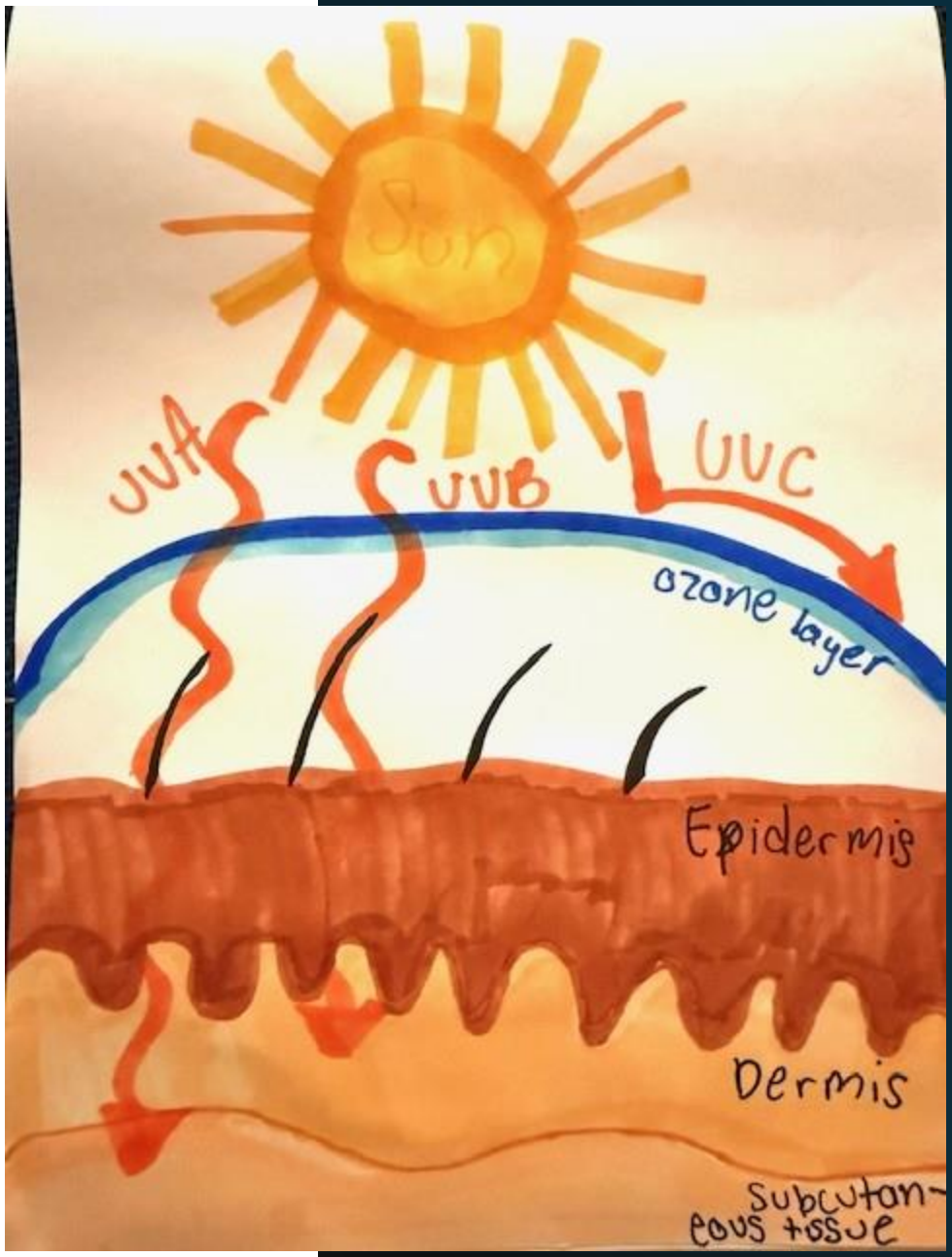


Procedure

- Make DIY sunscreen (1)
  - 10-15 drops carrot seed oil, 2 T coconut oil, 1 T jojoba oil
- 1 tsp of each sunscreen on plastic wrap over sun paper
- Put them outside for 30 min.
- Rinse paper
- See results

Research: Sun Rays

- UVA- Is the most common and dangerous UV ray. It can penetrate your skin down to the middle layer causing aging and cancer.(2)
- UVB- shorter wavelength than UVA it can penetrate your skin but only on the top layer causing burns.(2)
- UVC- The ozone layer stops all UVC rays from the sun. The only exposure humans will get from the UVC ray is from artificial sources such as lasers/ welding torches.(2)

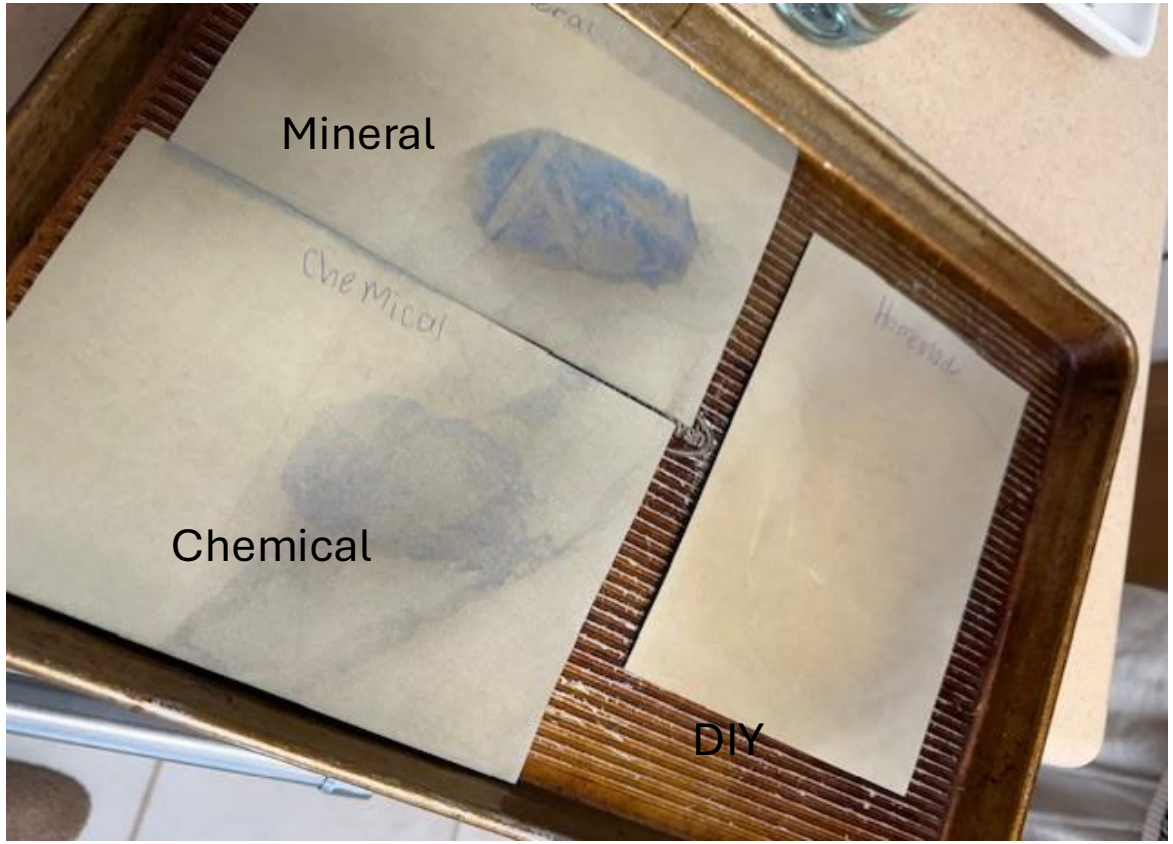


Research: Sunscreen

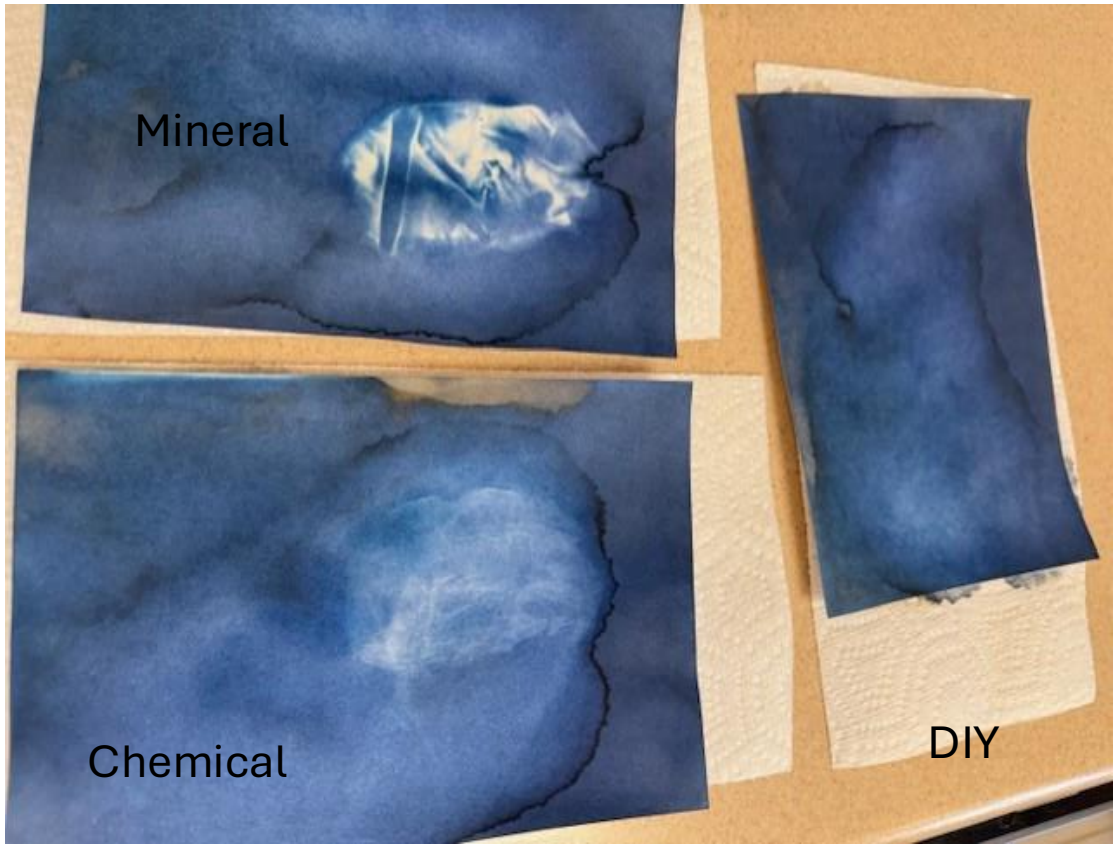
- SPF: Sun protectant factor. the higher the number the more it blocks the sun. (3)
- Mineral: Sits on top of skin and reflects rays. Active ingredient is Zinc oxide. (3)
- Chemical : Absorbs rays and turns it to heat. Active ingredients such as avobenzone . (3)
- Homemade oil blends are unreliable without testing and active ingredients (4)

Results

Before Rinse



After Rinse



The white areas show where the paper was protected from UV rays.

Conclusion

- Based on this test the mineral sunscreen had the best protection, then chemical has some protection and the homemade had very little protection.
- Overall, I would recommend not using DIY sunscreen and mineral sunscreen may have the best protection.
- Sunscreen is not 100% protection so using other protection such as hats and limit being in the sun.

Discussion

In this experiment I did it twice. The first round I did not put plastic wrap on it and I when I washed the paper the sunscreen smeared and would not rinse off. This prevented the water to reacted with the paper under the sunscreen. The mineral was the hardest to remove which may help stay on skin longer and other benefits .

Only one brand was used so results may not be the same.

The homemade sunscreen smelled horrible from the carrot seed oil, so even if effective I would not use it.

Lastly, this is not fully accurate since it was not tested on real skin.

Citations

1. How To Make DIY Sunscreen Without Zinc Oxide At Home How To Make DIY Sunscreen Without Zinc Oxide At Home. How To Make DIY Sunscreen Without Zinc Oxide At Home

2. What's the difference between UVA and UVB rays What's the difference between UVA and UVB rays? | MD Anderson Cancer Center

3.Sun Protectant Factor. FDA. Sun Protection Factor (SPF) | FDA

4.American Academy of Dermatology warns that homemade sunscreens are not proven to be effective and may leave users vulnerable to skin cancer