

Science Of Sunscreen

TAILS AND TALES

**15-minute STEAM
2021 Summer Reading**

Supplies:
Sunscreen

Paintbrush

Black (or other dark colored) paper

1. Have your child use the sunscreen to paint a picture or write words on the dark colored paper.
2. Once your child has completed their painting take it outside. Place it in the sun, using rocks at the corners to make sure it doesn't blow away. (Even if it isn't windy out, put a rock or something on a corner, it will come into play later.)
3. Leave your picture in the sun for a bit. This is best in direct sunlight for a couple of hours. We left ours out for 2 hours.
4. After you have left your painting out to dry in the sun for a few hours, go and check it. You will see that the paper that was covered in the sunscreen 'paint' is the same color it used to be, while the rest of the page has faded! You can pick up the rocks you put in the corners to double-check. They physically blocked the sun and kept the color intact.

Bonus Activity

Also included are both regular & UV detecting beads with some plastic cording. Make a bracelet with the beads & cording. The UV detecting beads will change color when they have been in sunlight. Your child can put sunscreen on some of the UV beads and watch how long it takes them to change color when they are protected from the sunlight.



The Science

Sunshine will fade the paper. This is because the ultraviolet waves from the sun break down the chemical bonds in the dyes that produce the colors we see. This breakdown makes the color look faded. Sunscreen creates a barrier so those ultraviolet waves can't reach the chemical bonds of the dyes. Yep, it's just that simple. When you put on sunscreen you are creating a barrier between your skin and the UV rays from the sun. This is how you avoid sunburns.

There are 2 main ways sunscreens create a barrier.

Physical Barrier: Some sunscreens create a physical barrier so the UV rays can't get through. This is your zinc oxide or titanium dioxide usually. These inorganic compounds physically reflect the UV rays. This sort of barrier used to be white. (Think old movies with where lifeguards had what looked like white paint on their noses.) Now technology is better and you can have the same protection with sunscreen that is clear when applied.

Chemical Barrier: There are also organic compounds that stop UV rays from getting to your skin. These compounds absorb the UV rays and release that energy as heat.

Most sunscreens contain a combination of these two barriers. But you can find some that contain just physical barriers.

Now ask your child, if sunscreen can protect the paper that well, do you think it can protect their skin? Try doing this experiment with different brands of sunscreen, is one more effective than another? Try doing this with different SPF levels & a timer. What happens?

Taken in part from team-cartwright.com/sunscreen-painting-steam/



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