WISCONSIN SCIENCE FESTIVAL
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Summer Science Activity

Experiment 1 - Original Sunprinting

Materials:

- Cyanotype (sunprint) paper
- Small object(s) to make design
- Tray/cardboard to place paper on
- Plastic wrap/glass from picture frame to prevent objects blowing away
- Shallow tray/bowl of water

Directions:

1. Place a piece of cyanotype (sunprint) paper on a tray or clip/pin to a piece of cardboard.
2. Place object(s) on top of the paper in your desired pattern or design. If the objects are lightweight, place a layer of plastic wrap or a clear picture frame on top.
3. Put the tray/cardboard with the paper in direct sunlight for 2-4 minutes until the paper changes to a pale blue color.
4. Remove the paper and object(s) from the tray and place the paper in the shallow tray/bowl of water for 1 minute.
5. Take the paper out and let it dry flat. Once dry, you should see the shape of the object(s) on the paper.

What are we learning?

Cyanotype paper is coated with a layer of light-sensitive chemicals. When the paper is exposed to sunlight, the ultraviolet (UV) rays react chemically with the paper to cause a color change. Immersing the paper in water stops the chemical reaction and preserves the color change caused by the sun.

By placing an object on the paper, the object blocks the UV rays in that area. This then imprints the image on the paper because it cannot react with the sunlight. Try keeping the paper in the sun for different lengths of time - how does this change the resultant image?

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Experiment 2 - Sunscreen Tester

Materials:

- Cyanotype (sunprint) paper
- Acrylic sheet or clear sheet protector
- Pencil
- 3 or more different strengths of sunscreen (e.g. SPF 15, SPF 30, SPF 50)
- Shallow tray/bowl of water

Directions:

1. Prepare this experiment indoors or away from direct sunlight.
2. Use your pencil to draw squares on the blue side of the cyanotype paper - one for each type of sunscreen you are testing plus one extra for our 'control' square.
3. Label below each square with which type of sunscreen it will be. Label the extra one "no sunscreen."
4. Place the sunprint paper on your tray with your acrylic sheet on top. Spread a layer on sunscreen on top of the acrylic sheet so it covers the labeled square.
5. Place in direct sunlight for one minute or until the "no sunscreen" square turns white.
6. Remove from the sun and submerge the paper in your tray/bowl of water for 30 seconds. Leave to dry flat.
7. As the paper dries, notice the areas that are turning dark blue - the darker blue areas show where more UV rays came through!

What are we learning?

As we learned in experiment 1, the cyanotype paper is coated with light-sensitive chemicals that react when exposed to the sun's ultraviolet (UV) rays. By using different sunscreens, we can test how well they block the sun's UV rays by seeing which squares on the paper are the lightest. The lighter the square, the fewer UV rays that were able to penetrate through the sunscreen to react with the paper.

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Summer Science Activity

Experiment 3 - Construction Paper

Materials:

- Construction paper
- Object(s) to make prints with
- Clear picture frame or acrylic/plexiglass sheet
- Tray

Directions:

1. Place your construction paper on the tray and arrange your object(s) on top of the paper in your desired pattern or design.
2. Place the clear picture frame or acrylic sheet on top of the objects to prevent them from blowing away if needed.
3. Leave the tray with the paper and the objects outside in direct sun for 4-6 hours - the longer the better!
4. Remove the objects from the paper and observe how the image of the objects is outlined on the paper.

What are we learning?

Ultraviolet (UV) rays can break the bonds of chemicals such as the dyes in colored construction paper. When these bonds break, the paper changes color. Sunprints, like the ones made in these experiment, use objects to shield a part of the paper from the sun's rays such that only the paper surrounding the object(s) changes color. By shielding these certain portions of paper from the sun, the image of the object should appear on the paper.

Try leaving the paper in the sun for different lengths of time - how does this change the print? Does the outline look blurred? How does the movement of the sun across the sky, due to the Earth's rotation, affect our image?

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Observation Sheet

Experiment with making sunprints three different ways!

Use this sheet to write down your observations. Use the blank rows to try your own combinations and see what happens!

Experiment	Hypothesize! What do you think will happen?	Observe! What happened? What did it look like?
Experiment 1		
Experiment 2		
Experiment 3		

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