

UV exposure experiment

An evaluation of the ability of different materials to block UV

This experiment uses UV sensitive paper or beads that change colour when exposed to UV light.

Gather different sunscreen SPF ratings, forms of sunscreen (e.g. creams, sprays, lip gloss, make-up, etc), and/or materials (e.g. sunglasses, fabric etc. With a range of UPF ratings if possible.) to evaluate against each other.

Materials

- UV sensitive paper (teaching.com.au/product/TH891 or madaboutscience.com.au/shop/sunprint-kit.html)
OR
- UV sensitive beads (madaboutscience.com.au/shop/colour-change-uv-beads-bulk-classroom-kit.html or abacused.com.au/science/uv-beads-box-of-500)
- Transparent bags or sheet protectors
- Permanent markers
- UV protection treatment conditions:
 - sunscreens with a range of SPF ratings (SPF 15+, SPF 30+, etc)
 - different sunscreen forms (creams, spray, lip gloss, makeup, etc)
 - other materials with a range of UPF if possible (e.g. sunglasses, fabric etc. With a range of UPF ratings if possible.)
- Worksheet

Method

1. Divide the paper or beads across several bags or sheet protectors (depending on how many materials you would like to test). Remember to include one for a control group.
2. On one side of the bags, label the treatment condition. For example:



3. If using sunscreen, apply this to the opposite side of the bag label to avoid rubbing the label off.
4. List the different treatment conditions in column 1 of the worksheet 'Condition' and complete column 2 of the worksheet 'Prediction'. Try and predict what impact each treatment condition will have on the beads or paper.
5. Place your experimental treatments in the sun or under a UV lamp. If using materials like sunglasses or fabric, place these so that they are blocking the sunlight from hitting the beads or paper.
6. Refer to the instructions of your UV beads or paper for the correct exposure time (usually between 1-10 minutes). UV paper may require an additional step to develop, such as immersion in water – check the manufacturer's instructions.
7. Once the paper or beads have been exposed, complete the remaining sections of the worksheet with your observations.

Adapted from various sources, including: Revealing UV with Color – Changing Beads, Steve Spangler, Inc. <https://www.stevespanglerscience.com/lab/experiments/uv-reactive-beads/>
 Blueprint paper and sunscreen activity, Joanna Turner https://www.youtube.com/watch?v=2hahyn_oB1A. Experimenting with UV-sensitive Beads, Deborah Scherrer <http://solar-center.stanford.edu/activities/UVBeads/UV-Bead-Instructions.pdf>

How well do different materials block UV?

1. Complete columns 1 and 2 before you place your experiment in the sun.

2. Complete the remaining columns once the experiment is complete.

Condition	Prediction What do you think will happen?	Observation What actually happened?	Discussion How well does the condition block UV?
Control			
e.g. SPF 50+			
e.g. SPF 30+			