Experiment 1a: Which materials block some or all UV light?

Mission brief:

UV light is harmful. Whether you're playing in the park or swimming in the sea, you need to reduce your exposure to UV light. Astronauts on the International Space Station (ISS) need the strongest protection we can provide.

Mission objective:

Protect an astronaut from UV light.

Mission directive:

Investigate what materials will block UV light and still allow an astronaut to carry out vital work on the ISS.

Method

1. Discuss what materials you would like to test.
2. Become familiar with any colour changes that take place when the beads are inside or outside in the sunlight. (NB note how quickly they change colour when brought indoors)
3. Predict the colour change you expect for each material using the colour chart.
4. Write your predictions on the results table.
5. Place two petri dishes in a box (without lids).
6. Place one bead in each petri dish.
7. Cover the first dish with your chosen material. Leave the second uncovered as a control.
8. Take the box outside to expose the samples to sunlight (for ground floor classrooms you could hold the samples outside an open window).
9. Wait for 30 seconds or until the control turns to the deepest colour on the chart (number 10), whatever comes first.
10. Quickly bring the box inside and remove the material from the first dish to reveal the bead's colour. Match it to the nearest colour on the colour chart (NB the bead may lose colour quickly. If the change is too quick to record, repeat steps 7–9).

    TIP: take a photo of the bead to help with the colour chart reading.
11. Record the colour chart number for your material on the results table.
12. Repeat with more materials or compare class data to complete the results table.
13. Post your results to **http://rsc.li/mission-starlight** and compare with schools worldwide.

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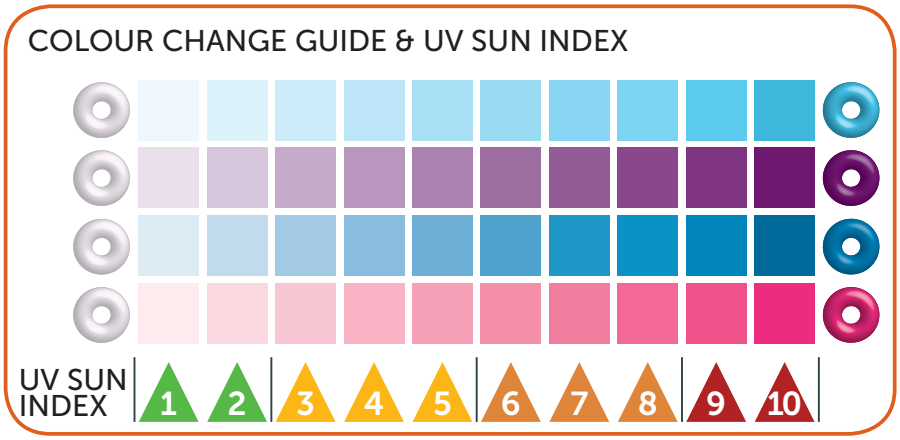

Results

Material	Prediction	Result
White cotton (eg t-shirt)		
Polyester (eg football top)		
Aluminium foil		
HDPE plastic (eg milk carton in the UK)		

Conclusions

- What material blocked the UV light best? Is this material useful for a spacesuit?
- Why is it important to have a control bead in your experiment?
- Did each material give the result you predicted?
- Can you think of how to improve this experiment and/or the recording of the results?

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