Colour Film
Bluebird Colour

What you need!

- A black bowl, or line a bowl with dark paper
- Water
- Various kinds of oil
- Kitchen sink

Some of the most spectacular colours in nature are not created by pigments, but rather they are the result of reflection.

Ordinary light is made up of many different colours, and each colour is represented by a specific wavelength. Because light is a wave, objects will absorb some wavelengths, and reflect back others. Try this test to see the hidden colours in light and come up with the answer to the question "Why is the sky blue?"

What you do:

1. Use a black bowl, or line a bowl with dark paper to make a black background.
2. Put the bowl in the sink, fill it with water, and let a thin stream of water run into the bowl so it overflows.
3. Make sure the room lights are fairly bright and the ceiling is well lit.
4. Drip tiny drops of various kinds of oil onto the water surface.
5. Watch what happens.

Ask yourself

- What do you see on the surface of the water? On the ceiling?
- Why do you think this happens?
- Explain why you think the sky is blue.
- Can colour be made without dyes and pigments?

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What did you find out?

Light is made up of waves. Each wave of light has a specific height and frequency, known as a wavelength, and each wavelength has a specific colour. In this experiment, the black background absorbs some wavelengths and reflects back others; those are the colours we see on the water's surface. The reason the colour of the water is not clear and white is because the structure of the oil film is reflecting back some wavelengths or colours and not others.

Reflected colours are the brightest and most pure colours there are. For this reason, reflectors are used to make street signs and road markings more visible at night. These surfaces are designed to reflect back specific colours. Natural reflectors are around us all day long too.

The sky looks blue because the water vapour in our atmosphere acts as a natural reflector. It just so happens the structure of the water molecule reflects blue light but absorbs other wavelengths. This also explains why lakes and rivers appear to be blue. The same is true for the colour of a bluebird. Unlike your favourite blue jeans these beautiful birds really don't have a blue pigment or dye in their feathers. Bluebird feathers have a microscopic structure that bounces the blue wavelength of light back out to the world. And that's a blue-tiful thing indeed.

Specific Learner Expectations (SLE)

Grade 4 Topic D: Light and Shadows.

SLE 11: Recognize that light can be broken into colours and that different colours of light can be combined to form a new colour.