

There's No Such Thing as a Blue Bird



Idaho's state bird is the Mountain Bluebird. But, there's actually no such thing as a bird that is blue.

Most birds get their coloring from pigment in their feathers, but blue pigment is not present in feathers (or in most places in nature). Humans view the blue color because of the microscopic structure of the feathers.

Blue feathers contain tiny pockets made of air and a protein called keratin. The tiny pockets are even smaller than the wavelength of visible light, which is exactly why they work. Visible light strikes the feathers and encounters the keratin-air nanostructures. The size of

the nanostructure matches that of the wavelength of blue light. So, while all of the other colors pass through the feather, the blue does not. It is reflected, so you see blue. But if you were to take a feather and grind it up, the resulting powder would be brown (in contrast, the powder from a cardinal's feather would be red, and the powder from a flamingo's feather would be pink).

This phenomenon can be used in the physical science classroom to explore optics and properties of light. Students can investigate pigments with chromatography, or use mirrors and blocks of glass to explore how light behaves when it interacts with different media. In a life science classroom this phenomenon can be used to discuss variations and adaptations. You can also expand this phenomenon to discuss why we see the sky or the ocean as blue.

Additional Resources:

- [There's no such thing as a blue bird - National Geographic](#)
- [Why are some feathers blue? Smithsonian](#)
- [How Birds Make Colorful Feathers Cornell Lab of Ornithology](#)

Performance Standards

1 st Grade	4 th Grade	Middle School	High School
1-PS-1.3. Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light.	4-PS-2.2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.	MS-PS-4.2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	HS-PSP-3.1. Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.



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