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## Why do black materials absorb light and white materials reflect it?

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*Question submitted by Becky Elder's fourth-grade class at West Boulevard Elementary School*

**Meera Chandrasekhar, a curators' teaching professor of physics and astronomy at the University of Missouri, says, "Light is a form of energy. The energy comes to the Earth from the sun through electromagnetic waves."** The human eye can detect what scientists call visible light, which is only a small slice of a broad range of electromagnetic waves, called the electromagnetic spectrum. Other forms of energy on this spectrum that humans cannot see include infrared (also called heat) and UV light.

How light interacts with objects determines what we see. Light rays that come from a source such as the sun reflect off items and enter our eye. Chandrasekhar explains: "When the energy is taken up by the object, it's called absorption, and when" the energy "is bounced back by" the object, "it's called reflection." Objects are selective about which colors they will absorb or reflect. "A black object is black because it's absorbing all the light; it's not reflecting any color," Chandrasekhar says. White objects reflect all color.

Why do you feel hot when you wear black clothes? While black objects absorb the energy from all colors and become hot, the objects gradually release some of that energy back into the air around it. Your body receives part of the heat energy that the black clothing radiates.

To better understand light waves, Chandrasekhar suggests wearing diffraction grating glasses. Examine different light sources, such as LED versus fluorescent bulbs, and compare what you see. Be sure to never look directly into the sun, even with your glasses, as the light can damage your eyes.