

When we see, it seems like we are looking out into the world through those dark holes (called pupils) in our eyes.

It is easy to believe that we see by sending something out of our eyes (maybe even some form of energy) to probe the outside world.

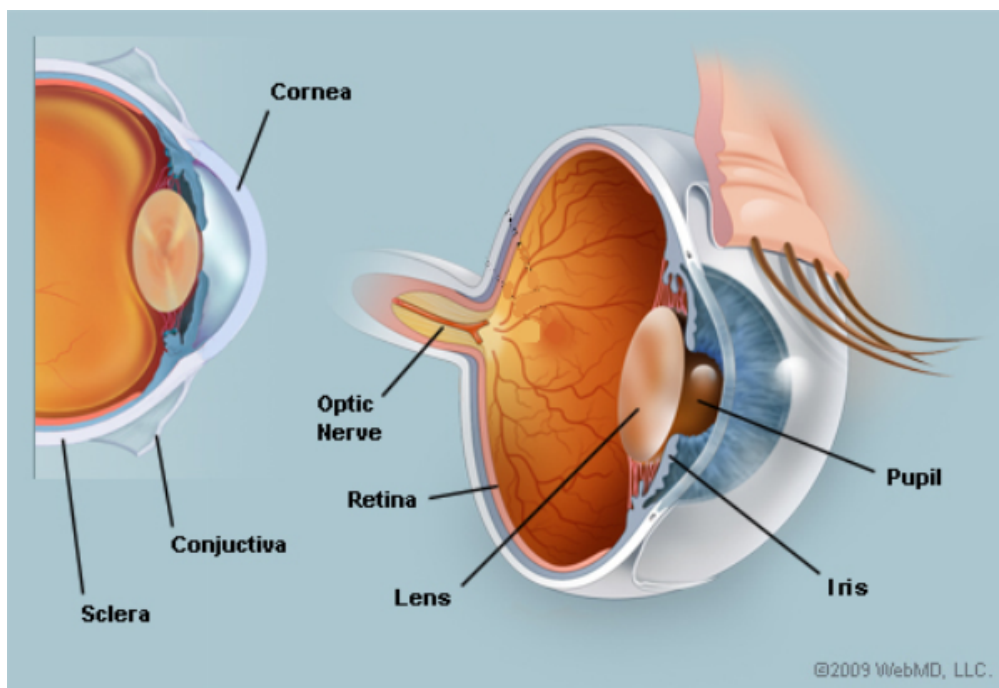
In fact, the opposite is true. We see objects because light leaves those objects and enters our eyes. Light must enter our eyes for us to 'see'.

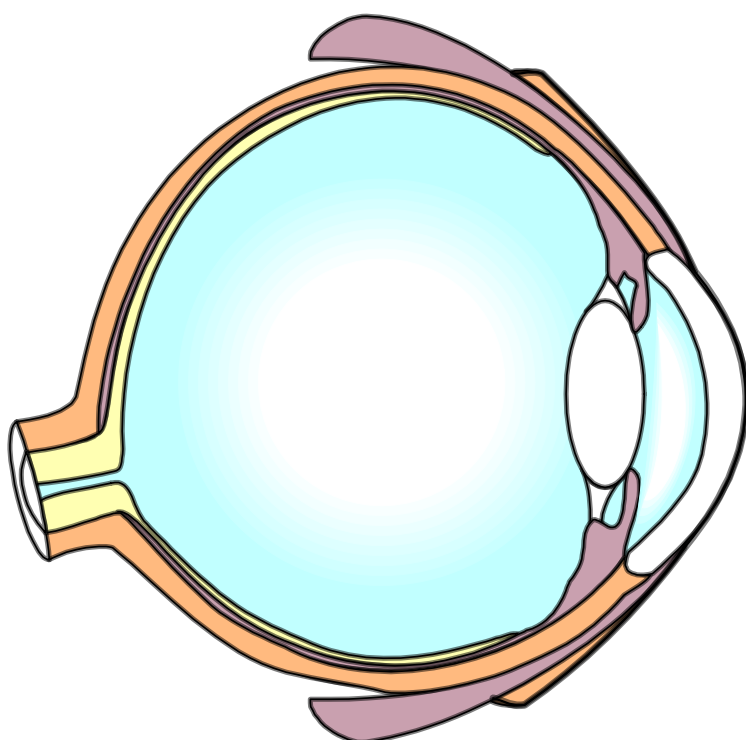
Waves of visible light carry energy that triggers the sense of sight in our eyes. The only way that this energy can help us see is if the waves carrying it enter our eyes.

When the **waves enter an eye**, they are focused by our eye onto a small screen on the back of the eye, called the **Retina**. The screen is made of **many receptors** (roughly 100 million!)

These **receptors transform the energy** carried by the light waves **into a form of electrical energy**. The **electrical energy** from the receptors is **carried by nerves** to the brain.

When the **electrical energy reaches the brain**, it is **interpreted by the brain** and finally, we 'see' the object we are looking at.





Why do we see colors?

Cells in the retina called cones are sensitive to different wavelengths of visible light.

When certain **wavelengths strike a cone cell they are transformed into a form of electrical energy** that is carried to the brain.

The **brain interprets** that signal as color.

When light strikes an object, like your shirt, **some wavelengths are absorbed and transformed into thermal energy.**

If that wavelength is transformed into thermal in your shirt it is no longer light and can not get to your eye!
You **will not see that wavelength!**

Other wavelengths are **reflected** off the pigments in your shirt. If the **wavelengths** are reflected the CAN get in your eye and be **seen!**

What happens to the Energy in light?

Very often, when waves strike a surface, they divide. Some of the waves reflect off of the surface and the rest enter the material.

- The waves that **reflect** off of the surface **carry** their **energy away** from the material.

- The waves that pass through the surface enter the substance and carry their energy into the material. Once inside the material, the waves can continue to travel, and then leave the material, and/or they can be absorbed by the material.

- If **waves are absorbed, their energy is transformed** into a different form within the material.

- If **waves pass through (transmitted)** the material, they carry their **energy** along **with them**.

The different groups of waves behave differently when they strike substances. The behavior depends on the type of electromagnetic wave and the properties of the substance.

•Ultraviolet waves can be harmful to your health because of the energy they carry. They can damage or destroy molecules in the body and lead to problems like skin cancer and cataracts in the eyes.

Sunscreen absorbs U.V. waves and transform them to thermal energy. If the energy has been transformed to thermal, it can no longer damage the skin cells.