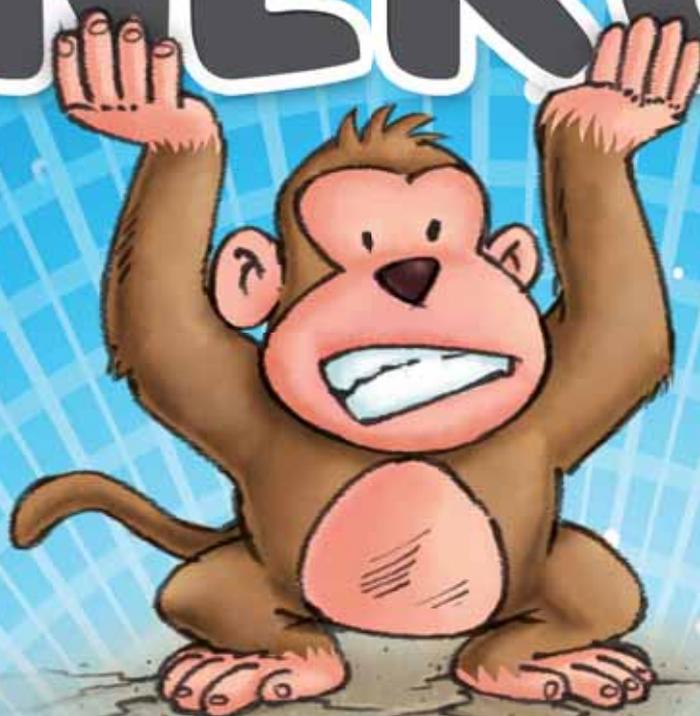


SCIENCE IN OUR ENVIRONMENT

LIGHT SOUND ENERGY



Exciting and
fun-filled
science!





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Author: Aanchal Broca Kumar

Managing Editor: Anupama Jauhry

Series Editor: Arshi Ahmad

Design: Priyabrata Roy Chowdhury

Image Research : Yukti Garg

Illustrations: Yatindra Kumar, Vijay Nipane, Neeraj Riddlan

Production Head: T Radhakrishnan

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LIGHT SOUND ENERGY



A note from Dr R K Pachauri

The field of science has witnessed remarkable advancements during the past century. We have made breakthroughs in space exploration, reduced global distances through innovations in communications, and unravelled mysteries of the human body while continuously adding to our knowledge of the plant and animal kingdoms. Some of these advancements, however, have had adverse effects on the environment, and have endangered the lives of those they were supposed to benefit.

This series throws light on the basic concepts of science while relating them to the environment. For example, what are the various sources of energy we use in our daily lives? What is clean energy? How was our universe formed? How have humans changed the way they communicate over the ages? Who are the members of the plant and animal kingdoms, and what are their special features?

Exploring the world around us through the eyes of budding scientists, these books intend to inform, inspire, and inculcate a spirit of scientific discovery. This series encourages young readers to keep a balance between scientific growth and the environment as they innovate and add to the ever-growing list of scientific inventions that make our lives better.



R K Pachauri
Director-General, TERI
Chairman, Intergovernmental Panel on Climate Change

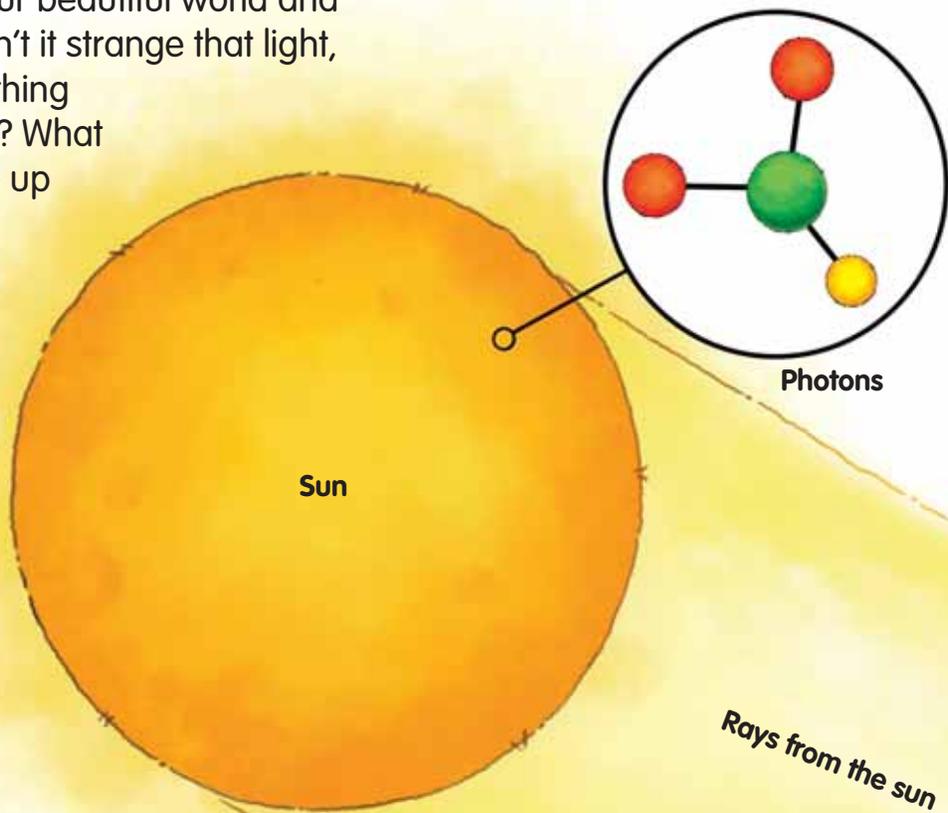
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WHAT IS LIGHT?

What is it that lets us see our beautiful world and its colours? It is light! But isn't it strange that light, which makes us see everything around us, is itself invisible? What is light and what is it made up of? Can we touch it, feel it or smell it?

Light is a form of energy made up of tiny particles called photons. When light travels, these photons move in a straight line. Light also behaves like a wave. It is the fastest moving form of energy. It travels at almost 300,000 kilometres per second. So, the sunlight that you see now left the sun eight minutes and seventeen seconds back!



Question time!

How do fireflies glow in the dark?

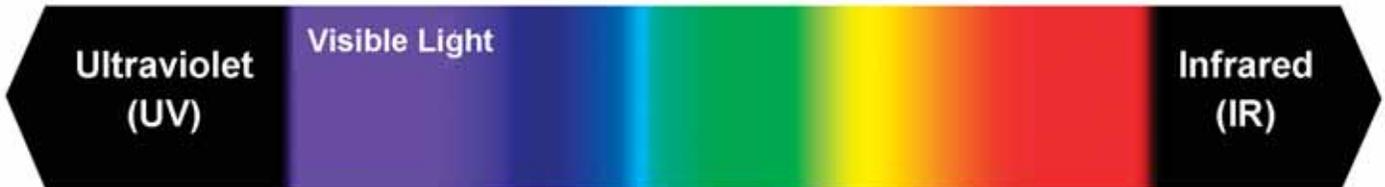


Fireflies make their own light. They have chemicals inside their stomach that combine with oxygen to produce a glow!

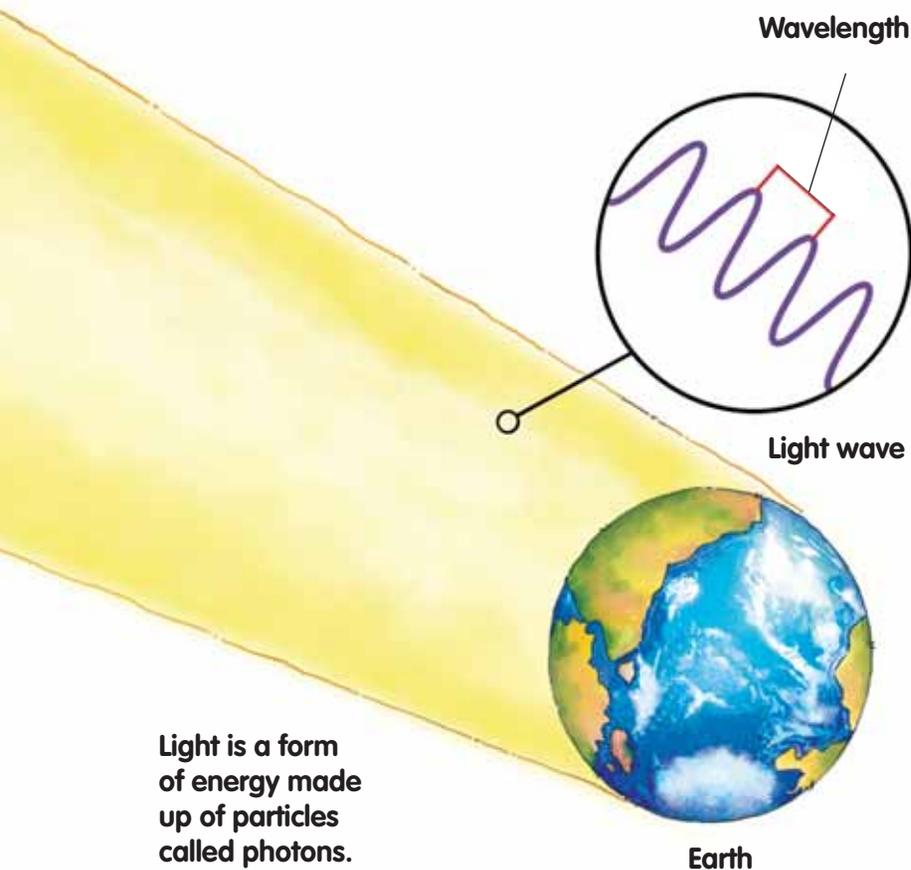
REMEMBER Visible light is a form of energy that we can detect with our eyes.

**Smarten
Up!**

Snakes detect infrared radiations coming from their prey, and bees can see ultraviolet radiations!



VISIBLE LIGHT



Light is a form of energy made up of particles called photons. It also behaves like a wave.

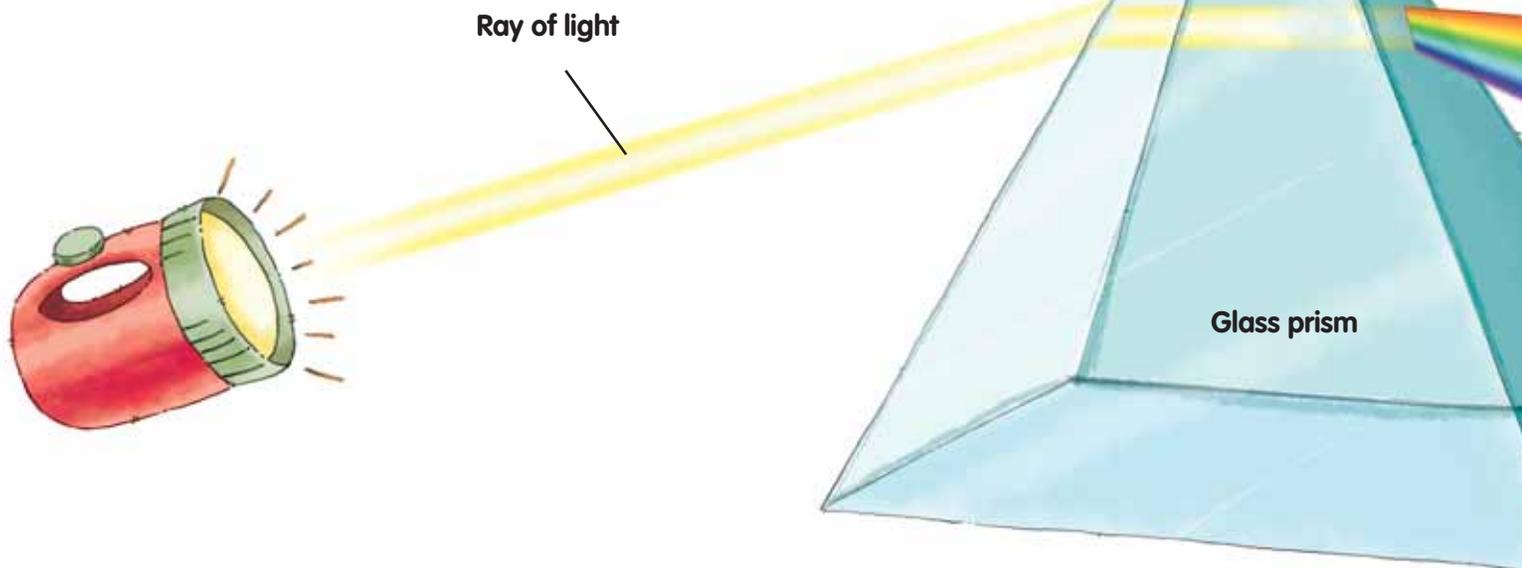
Besides visible light, the sun also gives out ultraviolet and infrared light, but our eyes cannot see these forms of light. Ultraviolet light can damage our eyes and cause our skin to tan. Infrared light causes intense heat.

Light is created from the chemical and nuclear reactions taking place on the surface of the sun. Similarly, fire produces heat and light energy. Such objects that produce their own light are called luminous objects. On the other hand, the moon is non-luminous, because it merely reflects light given out by another source (in this case, the sun). We cannot create light even if we try, but we can convert other forms of energy into light.

WHAT IS THE COLOUR OF LIGHT?

Does light have colours and can we see them? Yes, light is a mixture of different colours. We can see the colours if we make a ray of light pass through a glass prism.

When light enters the prism, it is white, but when it comes out from the other side, it splits into seven different colours—violet, indigo, blue, green, yellow, orange, and red! This happens because when white light passes through a prism, it bends. Each colour bends differently. Red bends the least, while violet bends the most. So, white light separates into different colours.



Smarten Up!

Reflection of light occurs when a light ray hits a surface and bounces off. It is because of reflection that we are able to see our image in a mirror.



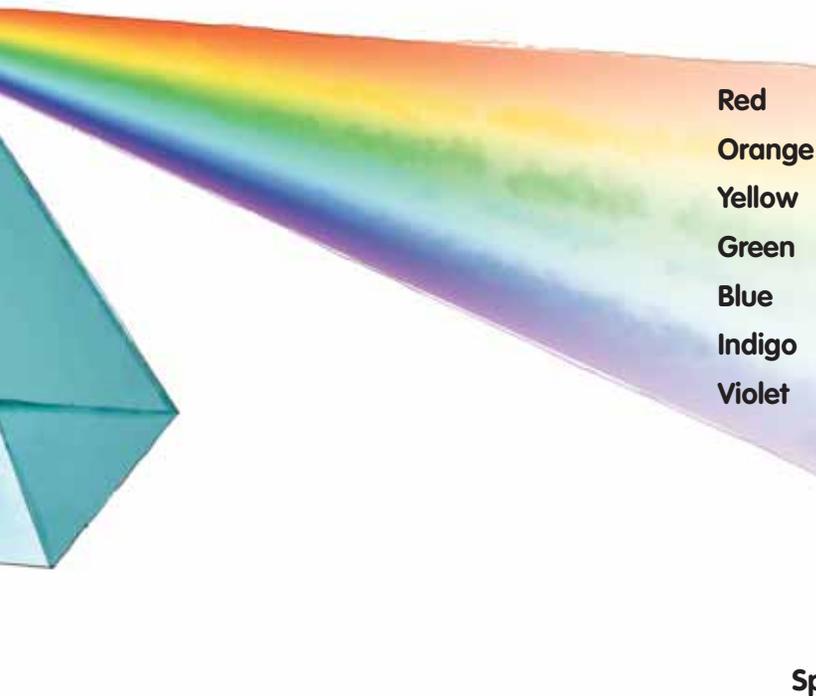
REMEMBER Light is a mixture of different colours.

Question time!



What are primary colours?

Red, blue, and yellow are called primary colours. Mixing them in various ways can result in different colours. Mixing blue and yellow makes green, mixing red and blue makes purple, and mixing red and yellow makes orange.



More than 300 years ago, Sir Isaac Newton discovered that light is made up of seven colours by passing it through a prism and splitting it into seven colours.

Light is a form of energy that travels in waves. These waves have high and low points. The distance between two high points or low points is known as wavelength. Different colours have different wavelengths.

We see white light if all wavelengths enter our eyes at the same time. But if light of only one wavelength reaches our eyes, we see that colour only. Grass looks green because when light falls on it, it absorbs all wavelengths except that of green, which bounces back. The sky looks blue because the tiny particles in the atmosphere scatter blue light more than they scatter light of any other colour.

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Author : Aanchal Broca
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