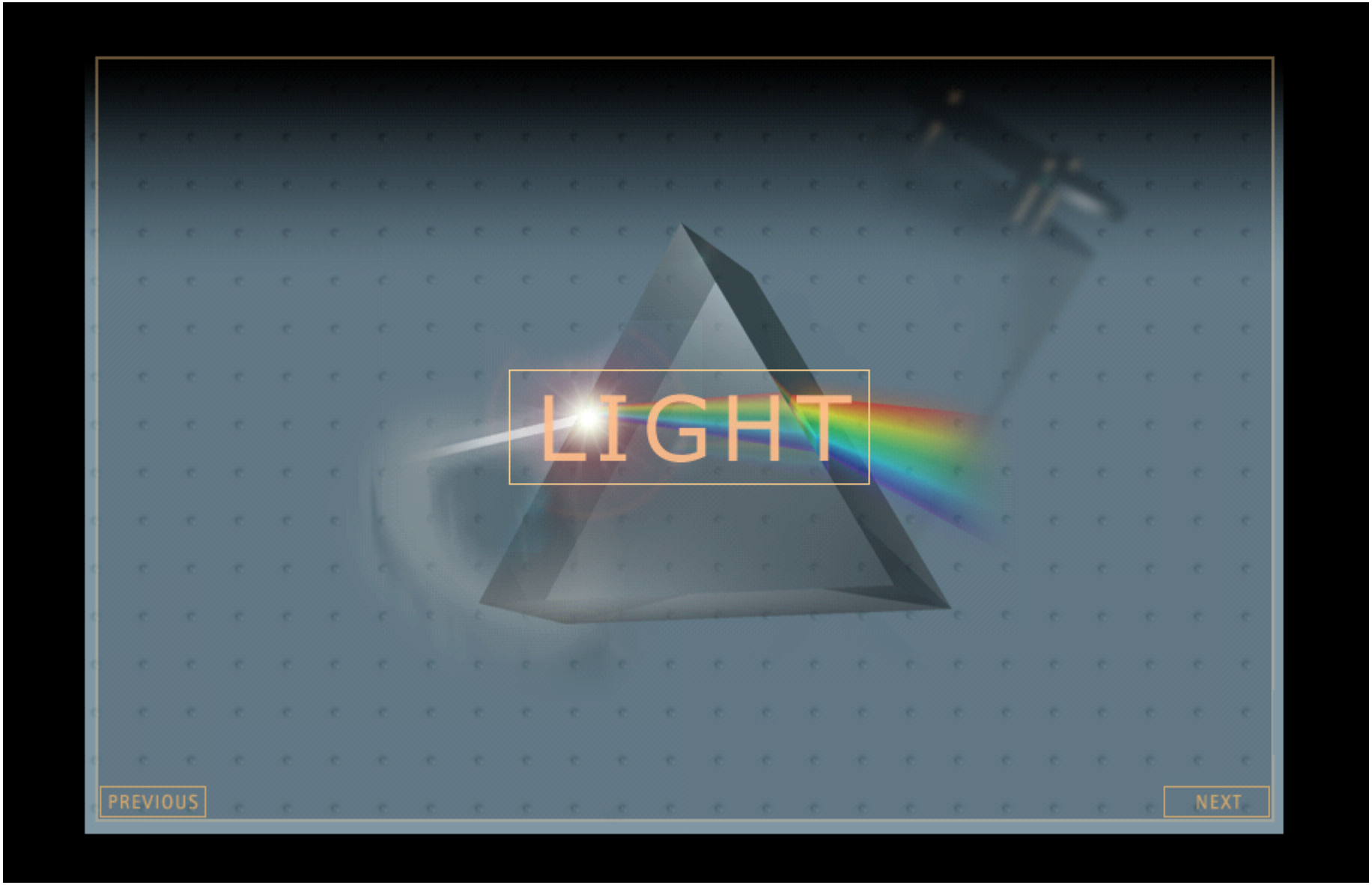
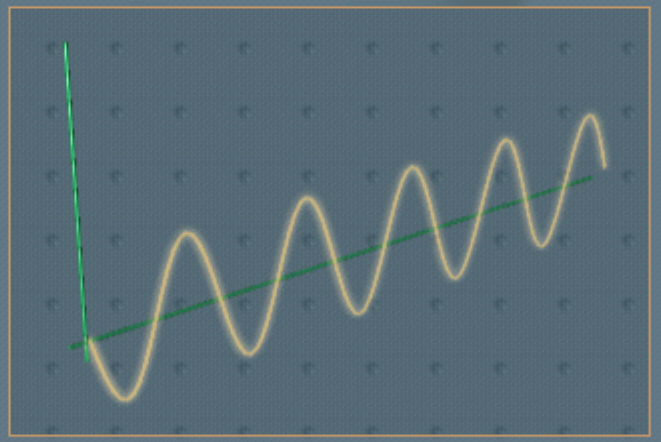

LIGHT
PREVIOUS
NEXT

Light is electromagnetic radiation.

Light may be understood as propagating waves. Sound may also be described as propagating waves.

However, light waves are [electromagnetic] waves, [sound] waves are not.

All electromagnetic waves propagate at the [speed of light].



PREVIOUS

NEXT

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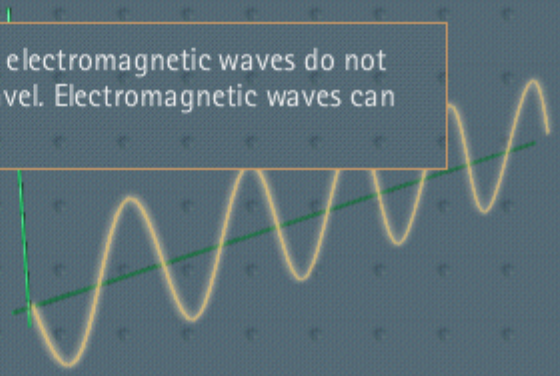
However, light waves are waves, [sound] waves are not.

All electromagnetic waves propagate at the [speed of light].

In contrast with sound waves, electromagnetic waves do not need a medium in which to travel. Electromagnetic waves can even travel in vacuum.



PREVIOUS

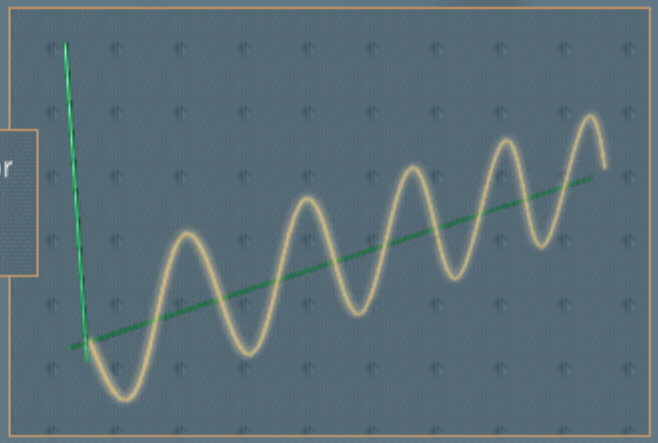
NEXT

Light is electromagnetic radiation.

Light may be understood as propagating waves. Sound may also be described as propagating waves.

Sound waves require a medium in which to travel. Air or water are typical examples. In air, sound travels at a velocity of around 330 meters per second.

All electromagnetic waves propagate at the [speed of light].



PREVIOUS

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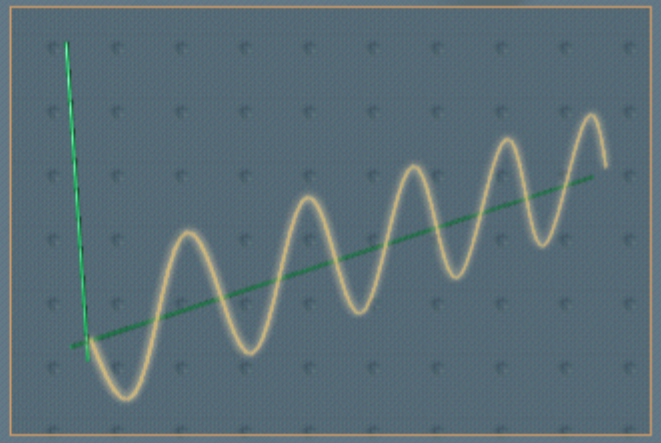
However, light waves are [electromagnetic] waves, [sound] waves are not.

All electromagnetic waves propagate at the

Light travels in vacuum at almost 300 000 kilometers per second. This is almost 1 million times faster than the velocity of sound traveling in air.



PREVIOUS

NEXT

Light is a part of the electromagnetic spectrum.

Waves differ from each other by their [wavelength].

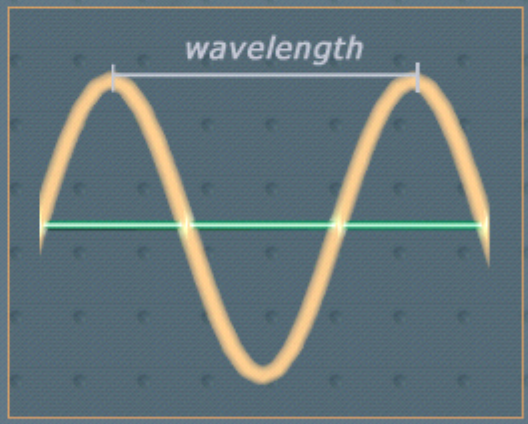
Electromagnetic waves of all wavelengths make up the electromagnetic spectrum.

PREVIOUS NEXT

Light is a part of the electromagnetic spectrum.

The wavelength is defined as the distance between two peaks of a wave. The wavelength is frequently symbolized by the greek letter lambda (λ) and ranges over many [orders of magnitude].

electromagnetic spectrum.



PREVIOUS

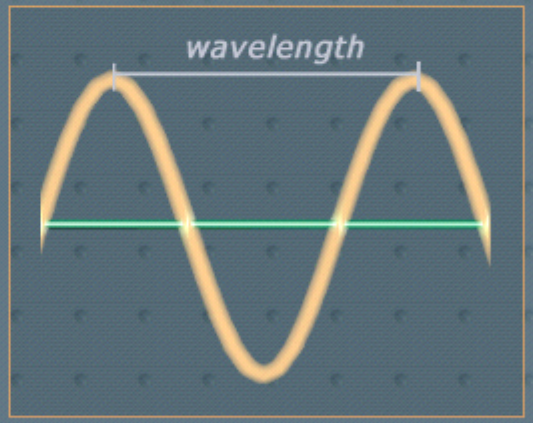
NEXT

Light is a part of the electromagnetic spectrum.

The wavelength is defined as the distance between two peaks of a wave. The wavelength is frequently symbolized by the greek letter lambda (λ) and ranges

electromagnetic spect

1 kilometer	(km)	=	1 000 m
1 millimeter	(mm)	=	0.001 m
1 micrometer	(µm)	=	0.000 001 m
1 nanometer	(nm)	=	0.000 000 001 m
1 picometer	(pm)	=	0.000 000 000 001 m



PREVIOUS

NEXT

Visible light makes up only a very small portion of the electromagnetic spectrum.

With respect to the wavelength, the electromagnetic spectrum is divided into several parts.

The shortest wavelengths are called [cosmic rays] and [gamma rays], followed by [X-rays] and [ultraviolet light]. Then there is a very small region called [visible light], next to the [infrared] part of the spectrum. [Microwaves] and [radio waves] represent the longest wavelengths of the spectrum.

Lasers usually emit optical radiation that is ultraviolet, visible or infrared radiant energy, with few [exceptions].

PREVIOUS NEXT

Visible light makes up only a very small portion of the electromagnetic spectrum.

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$\lambda < 0.01$ pm

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PREVIOUS

NEXT

Visible light makes up only a very small portion of the electromagnetic spectrum.

With respect to the wavelength, the electromagnetic spectrum is divided into sev

λ = 1 pm – 10 nm

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and [radio waves] represent the longest wavelengths of the spectrum.

Lasers usually emit optical radiation that is ultraviolet, visible or infrar

λ = 100 nm – 400 nm
In photobiology, ultraviolet radiation is subdivided into 3 parts:

UV-C	100 - 280 nm
UV-B	280 – 315 nm
UV-A	315 – 400 nm

PREVIOUS

NEXT

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Lasers us et, visible or infrared radiant energy, with few [exceptions].

λ = 400 nm – 700 nm
Visible light is by far the smallest part of the electromagnetic spectrum.

PREVIOUS

NEXT

Visible light makes up only a very small portion of the electromagnetic spectrum.

With respect to the wavelength, the electromagnetic spectrum is divided into several parts.

The shortest wavelengths ved by [X-rays] and [ultraviolet light].
Then there is a very small part of the spectrum. [Microwaves]
and [radio waves] represe

Lasers usually emit optica adiant energy, with few [exceptions].

λ = 700 nm – 1 mm
In photobiology, infrared radiation is subdivided into 3 parts:

IR-A	700 nm – 1400 nm
IR-B	1.4 µm - 3 µm
IR-C	3 µm – 1 mm

PREVIOUS

NEXT

Visible light makes up only a very small portion of the electromagnetic spectrum.

With respect to the wavelength, the electromagnetic spectrum is divided into several parts.

The shortest wavelengths are called [cosmic rays] and [gamma rays], followed by [X-rays] and [ultraviolet light]. Then there is a very small region called [visible light], next to the [infrared] part of the spectrum. [Microwaves] and [radio waves] represent the longest wavelengths of the spectrum.

Lasers usually emit optical radiation that is ultra

Research groups sometimes use lasers at other wavelengths, e.g. soft X-ray lasers. At present, those systems are of little relevance for medical applications.

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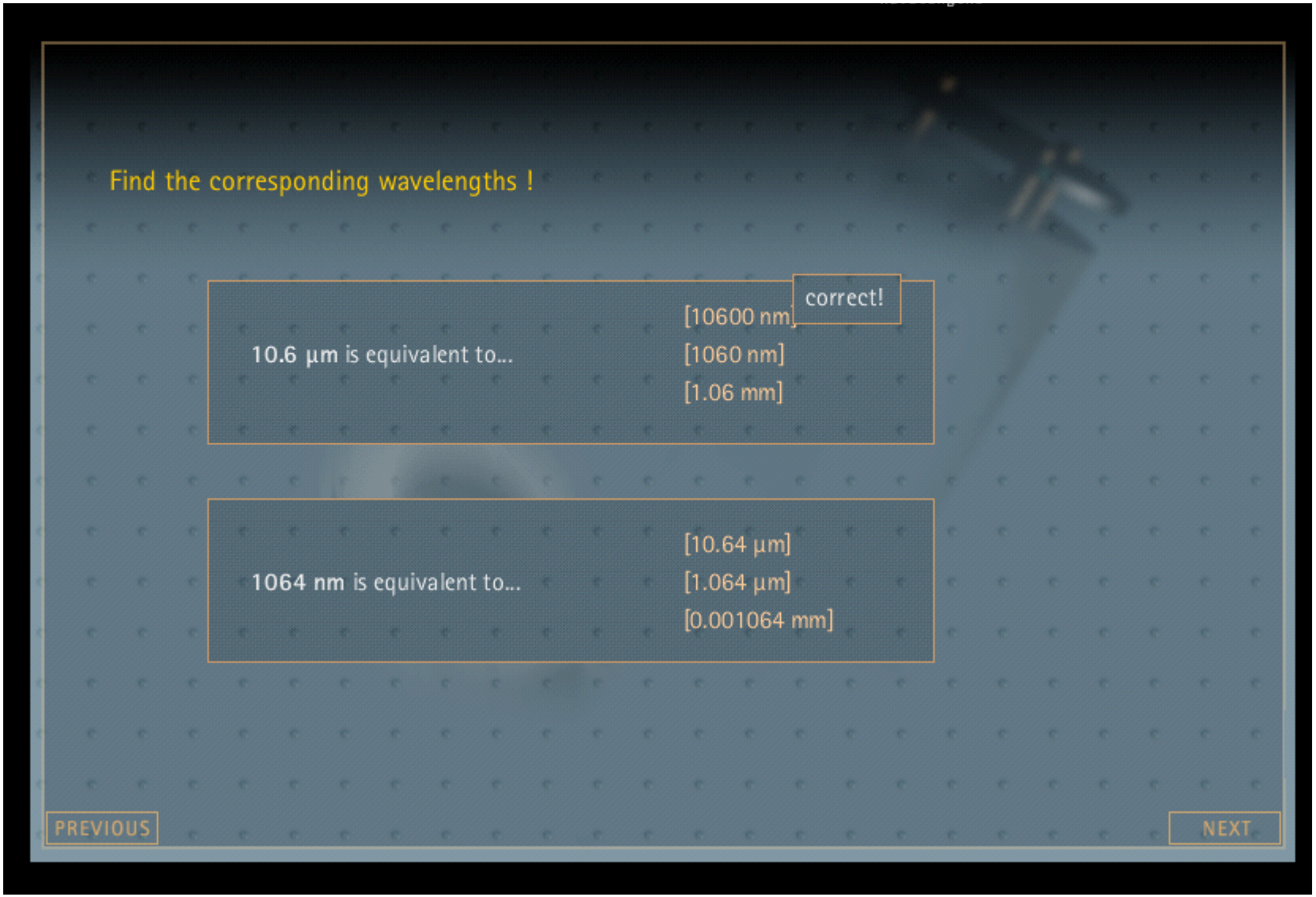
NEXT


Find the corresponding wavelengths !
10.6 µm is equivalent to...
[10600 nm]
correct!
[1060 nm]
[1.06 mm]
1064 nm is equivalent to...
[10.64 µm]
[1.064 µm]
[0.001064 mm]
PREVIOUS
NEXT

Find the corresponding wavelengths !

10.6 µm is equivalent to...

- [10600 nm]
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PREVIOUS

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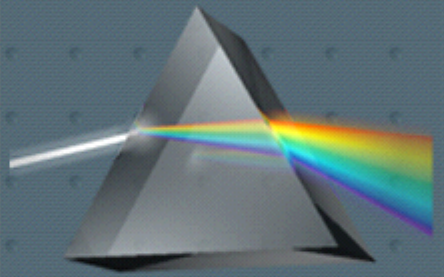
correct!
PREVIOUS
NEXT

Different colors correspond to different wavelengths.

Natural light consists of electromagnetic waves of different wavelengths.

Different wavelengths of the visible part of the spectrum are interpreted as different colors by the human eye:
short wavelengths appear blue, longer wavelengths appear red.

The human eye detects different [colors] with different [sensitivities].



PREVIOUS

NEXT

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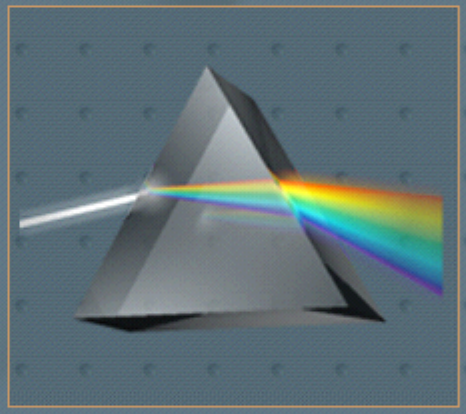


Looking at electromagnetic radiation, different wavelengths correspond to different colors. Listening to sound waves, different wavelengths correspond to different pitch.
While the human ear can only detect specific sounds the human eye can only detect specific colors. Ultrasound is not audible, ultraviolet radiation is not visible.

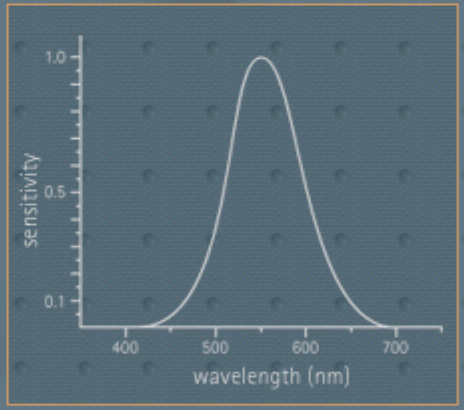
Different colors correspond to different wavelengths.

Natural light consists of electromagnetic waves of different wavelengths.

Different wavelengths of the visible part of the spectrum are interpreted as different colors by the human eye:
short wavelengths appear blue, longer wavelengths appear red.

The

The human eye is most sensitive at a wavelength of $\lambda = 550$ nm. Thus, green and yellow light are detected especially well, other wavelengths not as well.
Assuming a green ($\lambda = 550$ nm) and a red ($\lambda = 650$ nm) light source appear equally bright to the human eye, this means that in reality the red light is much more powerful.
If those light sources emitted the same output power, the red light would appear much fainter than the green light.



PREVIOUS

NEXT