Free Guide
Learn about light
and its impact on sight

light and sight guide
for serious readers

What is light?
Learn why the spectrum matters

Blue Light
The impact and how to avoid it

Great Lighting
Understand what to look for
Imagine if the very thing which could transform your vision was in plain sight, right in front of your eyes.

If you are a person who believes that you would enjoy more of what life has to offer you if only you could see more clearly and concentrate for longer in comfort, this guide will help explain the importance of light to not only your sight but also your overall well-being.

Alex Pratt OBE
Founder
The problem
every day our eyes face a tougher challenge

1. The Ageing Eye
   Just as our physical health and performance degrade with age, so too does our eyesight, particularly once we reach our sixties. Presbyopia for example is the normal loss of our near-focusing ability, something many of us will first notice in our forties. Every day is tougher to see through than the one before as the amount of light which reaches the retina falls off sharply.

2. Eyestrain
   This is now a very common condition affecting three in every four of us daily. It often occurs when our eyes get tired from intense use when staring at a digital screen or reading small print. Our generation is living through an eyestrain epidemic not experienced by our ancestors. The effects of eyestrain can thankfully be largely mitigated by taking sensible precautions.

3. Eye Conditions
   There are many common eye conditions affecting millions of people. These include macular degeneration, cataracts and glaucoma. Although such damage to the eyes cannot normally be reversed, living with such a condition can be made more comfortable.

There is an inextricable link between light and sight. Both the light your eyes have to work with and the lenses prescribed by your optician should be thought of as two integral parts of a complete eye-care solution. This is especially the case if you read or enjoy close hobbies like sewing or model-making. All sight is light. But all light is not the same. The light you choose to live under will make a big difference.

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Lighting
All sight comes from light. The light is reflected into our eyes, the lens displays the image on the retina at the back of the eye and your brain interprets this information to create the image that we see.

Lenses
Lenses are prescribed by your optician to assist your natural eye lens in focusing the available light onto the retina. Improving the available light itself therefore makes a big difference to the effectiveness of the lenses in generating a clear detailed image.
what is light?

All light is not the same

The sun is in fact white. It only appears yellow because the atmosphere scatters the light waves.

Something called the genetic photic sneeze reflex means one in three of us sneeze when we look at the sun.

A jiffy is the time it takes light to travel 1cm in a vacuum.

All light is not the same

Colour is often mistaken as a property of light alone when it is in truth a complex property of the entire visual system including our brains. Our experience of colour depends first and foremost on the wavelengths of the light rays that hit the retina, but the context in which we perceive the light, like the background, the lighting levels, and the ambient surroundings also matter.

These charts show that light sources which to the naked eye might seem similar, are often fundamentally different in their make-up. These differences will literally change what you see.

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Indoor Light
Brightness levels are generally much lower indoors than outdoors. This is an important factor when lighting indoors because a different mix of photosensors is triggered in the eye, meaning we see differently indoors. Brightness, colour temperature, and the light spectrum all play their part in helping us see and feel better.

Colour Temperature
In short, colour temperature offers us a scale to measure how ‘warm’ (yellow) or ‘cool’ (blue) a light source is. It is measured in Kelvin (abbreviated to k). The higher the number, the ‘cooler’ the light.

The image showing different colour temperatures opposite illustrates the difference between 3,000k (warm white) and 6,000k (cool white).

Colour Rendering Index (CRI)
The colour rendering index describes how closely a light source makes the colour of an object appear true to the human eye and how well subtle variations in colour shades are revealed. It is measured in %. The higher the number, the better.

Brightness
As we age, the amount of light which manages to pass through the cornea, lens and aqueous fluids drops off dramatically, which is why the older eye often needs more light. By the same token, too much light will also make things worse.

Lumens (lm) - This is the measure of the total amount of visible light visible from a light source. If you are focussed on energy-efficiency, this measure matters.

Lux (lx) - A standardised unit of measurement of light intensity, which is commonly referred to as “brightness”. It measures the amount of light hitting a solid surface from a set distance. If you are performing a close task, this measure matters.

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Computer Use
Research shows that flickering or glaring blue light is one of the causes of eyestrain and the headaches, physical tiredness and mental fatigue caused by hours of screen time.

Lighting
Artificial sources of intense blue light include electronic devices as well as normal energy-efficient LED lights.

In the News: Blue Light has a Dark Side
Scientists at Harvard have researched the effects of exposure to blue light. At night, it throws the body’s biological clock out of whack. Sleep suffers. Worse, subsequent research shows that this may contribute to the causes of some cancer, diabetes, heart disease, and obesity. While all light has the potential to suppress the secretion of the melatonin that helps us sleep, blue light does so very powerfully in the dark.

Source: Harvard Health
While all sight is light, it happens in the brain, not in the eye.

When light falls onto an object, that light is then reflected into our eyes. Our eyes collect this light which travels through the cornea, pupil and lens en-route to the retina. The lens sharpens the image, turns it upside down and displays it on the retina. The retina is very complex delicate tissue, made up of millions of light sensitive photoreceptors. The optical nerves transfer the inverted image from the retina to a special part of the brain which interprets the light message, tells you what the object is, and what to do about it.

How we see:
Our eyes have three different types of photoreceptors which combine to deal with the light we encounter.

Cones:
There are 6 to 7 million which provide the eye’s colour sensitivity. They are concentrated in the central spot known as the macula. The cones see either red, green or blue light.

Rods:
With 120 million in each eye, the rods are spread around the retina. More sensitive than the cones, they pick up low light but are not sensitive to colour.

IpRGC:
Intrinsically Photosensitive Retinal Ganglion Cells play no role in sight but are very sensitive to blue light and synchronise our body clocks and sleep patterns.

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the ageing eye
and common eye conditions

As our eyes mature with age, we begin to notice changes in our visual acuity.

**Macular Degeneration**
Also referred to as AMD, this refers to the deterioration of the macula, the central area of the retina that controls visual acuity. A gradual loss of the central vision occurs.

Because of the loss of the central vision, a wide beam spread is important to cover the area of peripheral vision. Too much blue light has been shown to risk accelerating the condition.

**Cataracts**
A cataract is developed when the eye’s natural lens clouds over. Cataracts are the most common cause of visual impairment in the over forties.

Symptoms can include blurred vision and finding some light sources too bright or glaring. Try making sure the light projected onto your page is both as natural as possible, and equipped with a dimming function.

**Glaucoma**
Glaucoma is a group of eye conditions that cause damage to the optic nerve, carrying information from the eye to the brain. Gradual loss of the peripheral vision occurs.

Because glaucoma impairs peripheral vision, a wide spread of light is less important, what matters is having strong, clear high quality light directed into the centre of the vision area.

To read more about eye conditions visit seriousreaders.com/eye-conditions

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Visual acuity begins to degrade as a result of presbyopia. Increased risk of dry eye.

Seeing detail gets more difficult as a result of presbyopia and we are at increased risk of dry eye.

Our ability to see in low light degrades and the likelihood of problems such as floaters increases.

The risks of cataracts, glaucoma and macular degeneration increase. Presbyopia advances.

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Rest Your Eyes

Regularly looking away from a computer or mobile screen and focusing on distant objects will help. Looking far away relaxes the focusing muscle inside the eye which in turn reduces eye fatigue.

Shed Better Light

Projecting good quality, balanced, bright controllable light directly onto the task on which you are focusing is an easy way to avoid unnecessary eyestrain.

What is Eye Strain?

This is a very common condition that usually occurs when our eyes get tired from intense use, for example when staring at digital screens or reading small print. Usually, eyestrain isn’t a permanent condition and it will go away once you rest your eyes. However, in some cases the symptoms of eyestrain can indicate an underlying eye condition.

What Might I Notice?

The symptoms of eyestrain are many. If you are suffering any of these irritations, it is likely that your eyestrain is a contributing factor:

• Sore, tired or burning eyes
• Watery or dry eyes
• Blurred or double vision
• Sore neck, shoulders or back
• Increased sensitivity to light
• Feeling you can’t keep your eyes open

What Can I Do to Avoid It?

• Sore, tired or burning eyes
• Watery or dry eyes
• Blurred or double vision
• Sore neck, shoulders or back
• Increased sensitivity to light
• Feeling you can’t keep your eyes open

In the News: Electronic Screen Alert

There are many reasons to restrict the amount of time we spend in front of our electronic screens. More hours sitting at a computer or smartphone means fewer hours of being physically active and looking at a screen at night can stimulate the brain and make it difficult to fall asleep.

Here’s another reason to curb that screen time: computer vision syndrome — an umbrella term for the unhealthy outcomes that result from looking at a computer or smartphone screen.

Source: Harvard Health

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better light helps
what to look for

Poor lighting is a major cause of two thirds of people now experiencing eyestrain on a daily basis and by 2050 over half of the world’s population is expected to be short-sighted. A great light will adjust to match individual visual acuity needs and will provide welcome relief from eye strain, fatigue and blurred vision.

Daylight Quality
Daylight contains a mix of 10 million hues of the rainbow. The true quality of light is judged by its closeness to the natural light spectrum under which the human eye has evolved during millions of years.

Colour Temperature
We have found after decades of user feedback that the optimum colour temperature for concentration indoors is 3,500–4,000k. Colour temperature, measured in Kelvin (K), is the measurement of how white a light is. Candlelight, a very yellow light, might be 1,000K and a harsh blue LED is around 6,000K.

Brightness
The older we become, the less our eyes allow light to reach the retina so we need more light to see detail and colour in high definition. Too much light on the other hand can also be unhelpful.

Beam Spread
Take into consideration whether you read small books, magazines, newspapers and whether you suffer an eye condition. The eye will tire more quickly if it keeps passing from light to dark.

Flexibility
Our sight generally dominates our sensory perception, so we can’t help ourselves subconsciously strain to try and see more clearly. Because sight is so personal to the individual it is important, therefore, for a light beam to be easily adjusted to meet the differing needs of the moment. Let the light take the strain so your eyes don’t have to.

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