YOUR happy WINTER

Let there be LIGHT

Our bodies need light, but during winter we get limited amounts. With shorter days and darker nights now upon us, we look at alternative ways you can boost your quota for more get up and glow!

MANFRED MANN was blinded by it, Madonna sang about its rays, and, more recently, Ellie Goulding mentioned it 36 times within one song of the same name. Second only to love, light is probably the most sung about, written about and painted phenomena of our universe. And it's no wonder, as numerous studies have shown just how important it is for our physical, mental and emotional health.

Like love, we need light to survive. Not only does it allow you to see the world in which you live, but it controls your internal body clock. The reason for this is that sunlight exposure controls the production of melatonin, which is the hormone that regulates your sleep/wake cycle.

How it works is that by getting lots of sunlight during the day, your body

is able to produce enough melatonin at night so you fall asleep. Exposure to light in the morning stimulates nerve pathways between your retinas and the hypothalamus in your brain. There, the suprachiasmatic nucleus (SCN) sends signals to the other parts of your brain that control hormones, temperature and other functions that help you to feel either wide awake or sleepy. The SCN delays the release of melatonin until night-time. So, when the sun goes down, the SCN switches on the pineal gland – a tiny gland in the centre of your brain – so it begins producing melatonin, which is released into your bloodstream. This process is meant to kick-in around 9pm, with melatonin staying high until first light the next morning, dropping off completely by around 9am.

'As soon as you wake up, try to go outside or at least look out of the window, as this helps to kick-start your energy and stop melatonin production,' says medical research scientist and expert in light waves, Leanne Venier.

It helps if you sit next to a window at work, too. 'Research in 2014 showed that office workers who sat next to windows had higher melatonin levels later at night, meaning better sleep,' says Leanne.

However, scientists have more recently discovered that it's the blue rays of the visible light spectrum – made up of red, orange, yellow, green, blue, indigo and violet – that are responsible for regulating your melatonin and therefore circadian rhythm, and not the rest of the coloured wavelengths. 'When you are exposed to blue light it tells your body to stop producing melatonin. So, when you don't get enough natural sunlight, which contains blue rays, during the day, you end up with low levels of melatonin at night,' says Leanne.

Exposure to blue light in the day can boost melatonin levels at night, helping you have a better night's sleep.

Because blue wavelengths are shorter than the other colours, they don't penetrate clouds so well, which is why you get more blue wavelengths when it's sunny – and why the sky is blue! 'It's still important to get outside even when it's overcast, as the brightness level is always higher than it will be indoors under artificial light,' says Leanne.

It was only in 1998 that researchers discovered the existence of photoreceptors in our eyes that detect this particular range of blue waves. Researchers at the University of Greenwich tested a theory that working under 'blue-enriched' light might be better for employees. In a two-month study, workers reported they felt happier, and more alert and productive.

But, when you're exposed to blue light at night-time, sleep problems can occur. 'Your eyes can't distinguish between the natural blue wavelengths of daylight and the blue light emitted from digital devices,' explains Leanne. 'In effect, blue light from electrical sources matches that from the sky. So if you look at a screen at night, your eyes think it's the middle of the day and you start shutting off melatonin production. Artificial indoor lighting is also usually bright enough to prevent melatonin being released.

'Humans are not designed to live this way. In caveman times, we couldn't afford to be tired during the day as our survival depended upon staying alert. This is why we need to be active and outdoors during daylight hours.'

HEAL YOUR BODY

Melatonin isn't only a 'sleep-inducing' hormone, it plays other important roles. 'High levels are needed during sleep to help repair bodily tissues. This is due to the antioxidant effect of the melatonin,' says Leanne.

Antioxidants are not in fact substances, but chemicals – both naturally occurring and man-made – that behave in a certain way to slow cell damage. They donate electrons to what are called 'free radicals', which are unstable particles that would otherwise contribute to inflammation. In this unstable state, they cause oxidisation. Just imagine what happens to an apple when left out on the countertop and you'll get the picture. Stabilising the cells by donating an electron to them, counteracts this oxidative process.

The protective antioxidant effect afforded by the melatonin really can't be underestimated either. 'When melatonin levels are low, your chances of getting cancer are exponentially higher,' says Leanne. 'Numerous studies have been done in this area, including one lasting two decades, conducted i n Sweden, which revealed that our probability of dying from cancer is in direct inverse correlation to the amount of sunlight we regularly receive. In short, if you don't get sunlight, your longevity is dramatically reduced.'

FEEL HAPPIER

It's at this time of year that cases of seasonal affective disorder (SAD) begin to rise. SAD is a medically recognised condition that affects people during the winter due to decreased light levels. It has similar symptoms to depression, such as lethargy, feeling down and being uninterested in life.

Doctors often prescribe light therapy to help ease symptoms of SAD. This involves sitting in front of a very large light box from 15 minutes up to a few hours a day. The original-style light boxes, which are still available, simulate full-spectrum daylight of around 10,000 lux (see roundel over the page) but without the ultraviolet rays, so they are not harmful to your skin or eyes – and no, you can't get a tan!

While these boxes can be effective, they are very bright and some people find them uncomfortable on the eyes. But there are newer alternatives. 'SAD sufferers no longer need a big clunky light box on their table or desk, running for hours at a time, as there are much smaller devices, about six inches square, that only emit the blue wavelengths of light, which are the only wavelengths responsible for reducing SAD symptoms,' says Leanne.

Blue-only boxes emit light at a far lower intensity than full-spectrum ones, which is gentler on the eyes. But, if you have an old-style light box, you'll still feel the benefits. 'Full-spectrum light boxes do work but it's only because they emit a small amount of blue light along with all the other colours, and you have to sit in front of them for much longer to be effective than you would with a blue light therapy device,' says Leanne. 'Using a big, old-tech, full-spectrum box is equivalent to using a record player or Walkman to play music. It'll still work, but nowadays much smaller MP3 players are available with better technology.'

Full-spectrum light

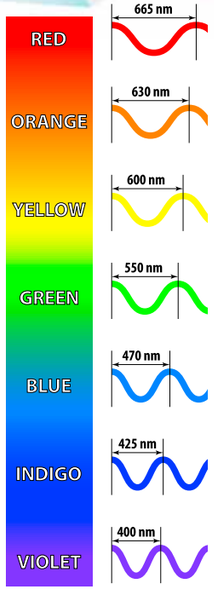
So what actually is light? Put simply, it's an electromagnetic wave. The word light actually refers to full-spectrum, visible light, which is made up of all the colours of the rainbow, together creating what we see as white light. Refracting white light through a prism – a transparent pyramid with flat, polished surfaces – is the best way to see all the colours.

Infrared and ultraviolet, which go off the ends of the visible light spectrum, should technically be called radiation, not light, as they are not visible to humans.

Wavelengths are measured in nanometres (nm). Visible light lies roughly between 400 and 700nm and each wave creates a different colour. Red has the longest wavelength and violet the shortest.

The reason humans are good at seeing detail is because of the high density of colour-sensitive cells in our retinas, which produce high-quality images needing only a small amount of light. These cells also play a major role in how we see colour.

Scientists believe our eyes filter out the ultraviolet rays to improve visual clarity. Most animals and insects are able to see more frequencies, including ultraviolet. Experts are discovering more and more ways to use different types of light and radiation to help treat a plethora of health conditions.



WORDS: KATY SUNNASSEE, LARISSA CHAPMAN. PHOTOGRAPHS: GETTY, SHUTTERSTOCK.

SHINE YOUR LIGHT

Light is not only all around you but in you, too! It is made up of particles called photons, which carry energy. We absorb and trap this energy through the cells in our skin and eyes, which is converted into energy to communicate with other cells, then emitted back out into the world as biophotons. These are invisible to the naked eye. Biophotons have been researched since the 1970s but it was in 2009 that photos were published from a camera developed at Kyoto University in Japan, proving that humans do in fact emit light.

'Subjects sat in a pitch-black room with a long-exposure camera pointing at them. The resulting images showed tiny dots of lights – photons – emanating from their bodies and faces,' says Leanne. The brightest areas were around the cheeks, forehead and neck. 'This proves that we take in light, just as plants do. In fact, all living things have light in them and give off light.'

WHEN TO GO RED

'Numerous research studies conducted around the world, including those done by NASA, have looked into the benefits of red light and how it can heal on a cellular level,' reveals Leanne. In a two-year clinical trial, cancer patients undergoing chemotherapy who developed oral mucositis (a painful ulceration and inflammation in the mouth caused by chemotherapy) were treated with red and near-infrared LED (light-emitting-diode) lights. The study has since been repeated numerous times, so the outcome is now clear: the red light is responsible for relieving the pain of these lesions and helping them heal more quickly.'

The red part of the spectrum, including near-infrared, stimulates your mitochondria – the cells' generators – to produce more energy. 'Shining red light onto a cut, for example, helps the cells increase their energy production, thereby speeding up healing,' says Leanne. 'Different wavelengths do different jobs, but 660nm is one of the optimal wavelengths for stimulating the mitochondria into action.'

Both red light and near-infrared, can also stimulate collagen formation to help plump up skin, hence why it is used in anti-ageing beauty treatments. You can also halt a cold sore from forming with near-infrared at 1072nm. 'When held up to the affected area, the rays stimulate your immune response to prevent the cold sore from coming to the surface,' says Leanne, who recommends a product called LipZor (£29.99, lipzor.net), to shine on the affected area at the first signs of the tingle. It's worth noting though that high doses of red light can be contraindicated for people with asthma, high blood pressure, heart disease or epilepsy.

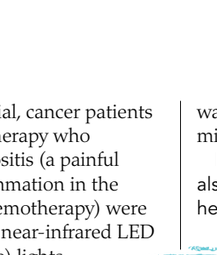
Levels of lighting

Lux is the standard international unit of illuminance and luminous emittance, measuring luminous flux per unit area. One of the highest lux levels is a surface illuminated by direct sunlight, at up to 100,000 lux.

Outdoor daylight: 10,000-25,000 lux
Indoor light on an overcast day: 1,000 lux
Sunrise on a clear day: 400 lux
Office lighting: 320-500 lux
A dim hallway: 80 lux
Light reflected off the full moon: 0.027 lux.

'MY LIGHT BOX CHANGED MY LIFE.'

Jenny Scott-Thompson, 28, from London suffered from SAD for 10 years before being properly diagnosed.



I STARTED SUFFERING FROM depression in my late teens, with fairly noticeable external causes to start with, including problems with friends, a relationship break-up and exam stress. I was miserable most of the time, often crying myself to sleep and struggling at school. I went to my GP and a counsellor, but diagnosis of depression relied on symptoms such as loss of appetite and insomnia, and I had the opposite problems. I struggled through and went to Cambridge University to study maths. My final year was particularly tough. I got flu at the beginning of the winter, which meant I was behind in my work for the whole year and never really caught up. For a while I was referred back and forth around various departments of the NHS, but didn't really recover until my exams were over and I could relax during the summer break. When autumn arrived I was feeling much more myself and got a job as a graduate IT consultant in London. I enjoyed the work, but still struggled with periods of exhaustion and misery that seemed so out of proportion to what was going on in my life.

During spring 2009, however, I noticed how much my mood and energy levels lifted after what had been a hard winter, despite nothing at work or in my personal life having changed. I spoke to my new GP about it and she diagnosed me with SAD and recommended I use a light box and take a winter sun holiday. Both were incredibly effective. At first, I used my light box for the recommended half hour in the morning, but it wasn't enough, so I gradually increased the time to up to six hours a day. It made a huge difference to my energy and mood. Suddenly, I could be productive all winter long. Winter 2009/10 was the first time in six years I managed to go all the way from September to April without feeling suicidal – that might sound dramatic, but it's true. It was only then I realised how bad it had been before, and that not everyone is used to spending half the year hating themselves and wanting to die.

I still struggle with low moods from time to time, however, I continue to use my light box, keeping it on my desk while I'm working. Although I still secretly want to hibernate in winter, I no longer feel as tired at 3pm as I would at 2am in summer, which has made a huge difference to my quality of life and my sanity.

Spa treatments

A number of spas and clinics now offer light-based therapies, so why not book a healing treat to ward of the winter blues?

LUCKNAM PARK IN BATH offers Haslauer Reflective Sunlight Therapy. Sit back and relax in a room bathed in lights that replicate the change of light from sunrise to sunset. The treatment creates the feeling of a warm summer's day, promoting vitamin D production. From £30. Visit lucknampark.co.uk.

HYDROTHERM 3D MASSAGE allows you to lie face up on a water bed while being masaged and guided through a personalised visualisation. Coloured light is added to the therapy, such as red to boost motivation, blue for better communication or purple to uplift your spirits. Available in London, South Kent and East Sussex. See benbarnett.co.uk.

KODOBIO SENSORY THERAPY involves light and scent to improve your mood as well as lowering blood pressure and anxiety. Choose from three settings: bright, therapeutic light teamed with lemon essential oil to enhance mood, bright light coupled with peppermint to energise, and soft light with lavender to ease anxiety. Available in selected UK spas. Find out more at kodobio.com.

FURTHER INFORMATION

Find out more about the medical applications and healing effects of blue, red and near-infrared light, as well as the benefits of sunlight, at Leanne Venier's website catalyticcolor.com.

BRIGHTEN UP

The **Lifemax SAD Therapy Light** is portable and utilises blue light. It doesn't flicker, so won't cause black spots on your eyes. It emits 14,000 lux within a 2.5cm range. £79.99, robert dyas.co.uk.

This **EnergyUp Energy Light** is the latest blue light device from Philips, providing a brightness of 10,000 lux. Just 15-30 minutes a day in front of it will provide maximum feel-good benefits. Even light distribution prevents bright spots. £150, philips.co.uk.

The **Lumie Arabica SAD Lamp Light Box** is a regular full-spectrum device providing a brightness of 10,000 lux at a distance of 25cm. It's best kept stationery and has a built-in stand. £99.95, lumie.com.