

Sunlight is made up of red, orange, yellow, green, blue, indigo and violet light. Rays on the red end of the visible light spectrum have longer wavelengths and less energy. Rays on the blue end are shorter and have more energy. Like ultraviolet radiation, visible blue light has both benefits and dangers.



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Blue light is everywhere. Before the digital age, the only source of blue light was the sun. Today, eyes are being exposed to an abnormal percentage of blue light indoors and at night, emitted by the screens of tvs, computers, smartphones and by high-efficiency fluorescent, halogen and LED lighting.



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Scattering makes the sky look blue. Blue light—also referred to as High-Energy Visible (HEV) light—scatters more than other colors (red, yellow, green) when it strikes the atmosphere's air and water molecules. This makes a cloudless sky look blue.



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How long you view blue light matters. Blue light from digital devices and indoor lighting is only a fraction of what is emitted by the sun. But people spend more time closely staring at digital screens, which can result in negative long-term effects on eye health.



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The eye is not good at filtering out blue light. Almost all of the visible blue light that passes through the eye reaches the retina (the inner lining at the back of the eye). That is why it is important to protect the eyes against blue-light overexposure.



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Too much blue light can harm vision. Overexposure to blue light can potentially cause damage to the macula, an oval area of light-sensitive cells in the middle of the retina. This potential damage could lead to permanent central vision loss (reading, driving, recognizing faces) over time.



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Blue light can contribute to digital eye strain. Hours at computer screens and other digital devices can cause Computer Vision Syndrome (CVS). Symptoms may include blurry vision, difficulty focusing, dry eyes, sore eyes and headaches, as well as neck and back pain.



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Some blue light during the day is beneficial. Full-spectrum sunlight (including blue light) can be good for you. It helps keep melatonin levels low (boosting attention, reaction times and mood), increases nitric oxide (maintains blood pressure and reduces risk of heart attack and stroke) and helps optimize vitamin D production.



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Blue light at night negatively impacts your sleep. At night, blue light suppresses melatonin, which disrupts the natural—or circadian—wake/sleep cycles. As a result, exposure to indoor lighting and unprotected screen viewing near bedtime can cause sleepless nights and daytime fatigue.



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Nighttime blue light may affect your overall health. Harvard researchers have linked unprotected blue-light exposure while working night shifts to different types of cancer, diabetes, heart disease, obesity and an increased risk for depression.



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Children are at a greater risk. Everyone needs to protect their eyes against the harmful effects of blue light, especially children. Children tend to hold digital devices closer to their eyes, and their shorter arms and larger pupils allow more blue light to enter than adults. In fact, children spend over 9 hours a day on their devices, predisposing them to potential macular damage.

Ask your doctor about the positive and negative effects of blue-light exposure and how to protect your eyes.

1 Take a digital device break:

Follow the 20-20-20 rule. Every 20 minutes, take a 20-second break and focus your eyes on something at least 20 feet away. This helps in reducing eye strain.

2 Full-spectrum sunlight (including blue light) can be beneficial. Just don't overdo it:

Some blue light during the day can help boost your mood, alertness and overall health. Getting blue light has been used to help treat acne and antibiotic-resistant bacteria such as MRSA. Full-spectrum white light increases blood flow and antibody production, and helps decrease inflammation. If you spend a lot of time outdoors, avoid getting sunburn and be sure to wear doctor-recommended sunglasses to reduce the harmful effects of blue light.

3 Beware of the glare:

Several lens manufacturers have introduced special glare-reducing, anti-reflective coatings. However, these coatings only filter a minimal amount of blue light from both natural sunlight and digital sources. Be sure to ask your optometrist for a lens that filters at least 30 percent of blue light at the peak 455 nanometers (nm) wavelength being given off by a digital device.

4 Enforce visual bedtime:

Beginning two to three hours before bedtime, avoid looking at bright screens. Give your eyes a rest.

5 Get yourself blue-filtering eyeglasses:

If you work or use a lot of electronic devices at night, consider wearing blue-filtering eyeglasses to help reduce blue-light exposure. Ask your eye doctor about prescribing a lens with embedded color like BluTech® Lenses for optimal protection. They are available with or without a prescription.

6 Try single-vision lenses:

If you are farsighted (hyperopic) and routinely wear progressive lenses or bifocals, consider prescription computer glasses with a single-vision, blue-filtering lens. These lenses offer the additional benefit of a much larger field of view for seeing your entire computer screen clearly.

7 Avoid yellow/amber blue-blockers:

These lenses effectively filter blue light, but can compromise color perception, contrast sensitivity and visual acuity (sharpness).

8 Don't rely on screen filters:

Blue-light filters, which are available for most smartphones, tablets and computer screens, do very little to filter blue light. They simply change the color of the screen, and can have a negative impact on visibility and display quality.

9 Reduce screen time for children:

Digital screen time has been connected with altering a child's brain structure, reducing brain function and lower performance on school exams.¹ A recent study in the UK demonstrated that children spending just two hours above average in front of blue-light emitting screens dropped a full grade level in four subjects on their examinations.

10 Ask your optometrist:

Ask your doctor about which type of vision correction and lens features best suits your needs for viewing digital devices and protecting your eyes from blue light. At a minimum, start by protecting your child's vision. Your doctor may also recommend nutritional supplements that can help protect your macula.