



# Protect your eyes from harmful blue light

## 8 steps to avoid serious long-term damage

Ever wonder why the sky is blue? It actually appears blue as a result of light waves from the sun that collide with air and water molecules in the atmosphere, scattering blue light all around us.

Blue light may be pleasing to our eyes, but it may also be doing them harm.

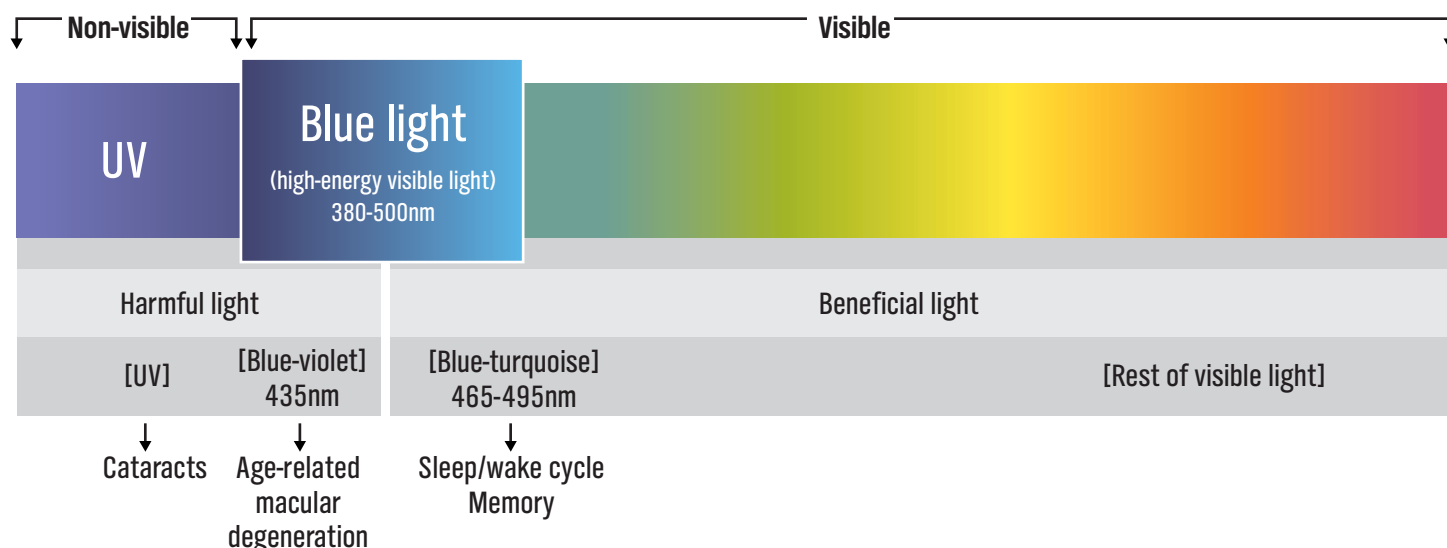
### Where is blue light found?

Blue light is everywhere. It's outdoors, produced by the sun, and indoors, coming from artificial light sources like those on computer screens, tablets and cell phones. It also comes from energy-efficient fluorescent and LED lighting.

We're using computers and other devices now more than ever, so we're getting more exposure to blue light — and its effects are cumulative. Studies show that 60% of adults spend at least six hours a day using digital devices.<sup>1</sup> And many children spend several hours each day in front of digital screens.<sup>2</sup> Children under age 10 are more at risk for the harmful effects of blue light, because their eyes are still developing.

### How can blue light be harmful to our eyes?

Blue light is just above ultraviolet (UV) light, with a wavelength of between 380 and 500 nanometers (nm) in what's known as the "visible light spectrum." Blue light is visible to the naked eye, whereas UV light is invisible.



There are two kinds of blue light. Some blue light — blue-turquoise light in the range from 465 to 495nm — is a good thing. It helps our bodies regulate our sleep and wake cycles, and it helps us stay alert and elevates our mood.

Blue-violet light, on the other hand, is centered at around 435nm<sup>3</sup> and it can do serious damage to our eyes if we don't protect them. It can cause eye strain and eye fatigue. It can disrupt our sleep and wake cycles, preventing us from going to sleep or staying asleep. It may also play a role in diseases of the retina.<sup>1</sup> Retinal diseases include glaucoma and age-related macular degeneration, which can both lead to blindness. Like UV light, blue light can age the eye faster because the damage builds over a lifetime.

### How can we protect our eyes?

Our eyes have no natural filter for blue light. We need to protect them from harmful blue-violet light while still allowing in the beneficial blue-turquoise light. It's important to keep this in mind when choosing protective eyewear.

Here are some ways to reduce the harmful effects of blue light:

1. Outside, wear sunglasses that are polarized or tinted to filter out UV and harmful blue-violet light.
2. Indoors and especially in front of digital screens, wear glasses with an anti-reflective coating that blocks harmful blue light. Transitions® lenses, for example, protect against blue light indoors and out.
3. Limit your time looking at a screen if possible, especially at night when the blue light can also disrupt sleep patterns.
4. Limit screen time for children, especially at night.
5. Use an app that filters blue light coming from your computer, tablet or phone screen.<sup>4</sup>
6. When working in front of a digital screen, adjust the brightness of the screen and dim background lighting to reduce glare.
7. Take 20-20-20 breaks — every 20 minutes, take a 20-second break and look at something 20 feet away.<sup>1</sup>
8. Get your eyes checked regularly by an eye doctor, and talk to him or her about the effects of blue light.



<sup>1</sup> Blue Light Exposed website (accessed September 2016): [bluelightexposed.com](http://bluelightexposed.com).

<sup>2</sup> Henry J. Kaiser Foundation. *Generation M2: Media in the Lives of 8-18 Year Olds* (January 2010).

<sup>3</sup> Arnault E, et al. *Phototoxic Action Spectrum on a Retinal Pigment Epithelium Model of Age-Related Macular Degeneration Exposed to Sunlight Normalized Conditions*. PLOS One (August 23, 2013): [plos.org](http://plos.org).

<sup>4</sup> Harvard Health Publications, Harvard Medical School. *Blue Light Has a Dark Side* (September 2, 2015): [health.harvard.edu](http://health.harvard.edu).

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