



## Questions and Answers About LED Lighting

### **Q. Why should I be concerned about LED lighting in schools?**

A. LED lighting can have many advantages for schools, including significant energy and maintenance savings. However, not all LED lighting is the same. LED bulbs that emit a bright, almost-daylight color contain a large portion of the blue light portion of the light spectrum, which can be harmful to the eyes of young children.

Over time, LED lighting with high levels of blue light can negatively affect the lens and, especially, the retina of the eye. Studies in both animals and humans have shown a relationship between long-term exposure to blue light and age-related macular degeneration.

### **Q. What is blue light?**

A. Blue light is part of the visible light spectrum, which also includes green, yellow, orange and red. Blue light has a very short wavelength, and produces a higher amount of energy than other parts of the spectrum. The higher the color temperature (see below), the higher the proportion of blue light being emitted.

### **Q. Are children more vulnerable to the blue light part of the spectrum?**

A. Yes. The absorption spectrum of the human eye changes with age. In young children, more than 65% of blue light is transmitted to the retina through the lens. At around 25 years old, only about 20% of blue light is transmitted to the retina. For this reason, many health experts recommend avoiding the use of light sources emitting light with a high blue component (above 5000 degrees on the Kelvin scale) in schools and other places frequented by children.

### **Q. What's the Kelvin scale?**

A. The Kelvin scale, named for a 19th century Irish engineer, is the measurement tool we use to gauge the color temperature of lighting sources. Daylight is approximately 5600 K on the Kelvin scale; a typical indoor incandescent bulb is about 2700 K.

### **Q. So are LED lights available with lower temperature bulbs?**

A. Yes, manufacturers make bulbs in a variety of different color temperatures. Some manufacturers of industrial and school lighting even allow users to "tune" the temperature of the light, in a range from 2700 K to 5000 K, depending on the tasks being performed.

### **Q. So what should schools do about LED lighting?**

A. If your classrooms and hallways look as if they're constantly bathed in daylight, chances are good you're using very high temperature bulbs. Talk with your school administrator about changing the color temperature of the bulbs, especially in elementary school classrooms where younger children are more vulnerable, and where they are usually in the same classroom all day long.

This document is part of **The ChildSafe School Program** created by Grassroots Environmental Education, a science-based non-profit organization.

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