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LIGHTING

*WHY IS LIGHT IMPORTANT TO
OUR WELL BEING?*

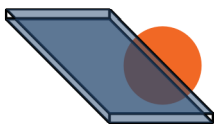


LIGHTING

DESIGN STRATEGIES

WHY IS LIGHTING IMPORTANT?

Lighting is one of several factors that combine to create a healthy work environment that in turn helps promote **employee engagement, well-being, and productivity**. Lighting has the power, however, to not only improve productivity but it also can **relax** people in environments, allowing them to dim the switches of alertness. There are many factors within lighting itself which affect individuals: from **color** to **quality**, to **artificial versus natural**. It is critical that designers and clients are conscious about how these factors affect the well-being of users.



OUR EYES PERCEIVE DAYLIGHT BEST

Spaces with ample daylight will aid in **productivity** and boost people's moods. A small amount of **natural light** has a large impact on an atmosphere. In retail spaces, adding skylights have been shown to increase sales, with more of an impact on sales than variables such as hours open, population in area, and latest remodel to store.

"These results show that adding skylighting to the average non-skylit store within the chain would be likely to improve its performance by 40%, with a probable range somewhere between 31% and 49%."

- George Loisos, *Skylighting and Retail Sales*¹

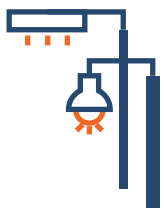


DESIGNING FOR OUR BIOLOGY

The **color temperature** of interior lighting illicit a response in the **circadian rhythm** of individuals. **Cooler** lighting suppresses melatonin production, making it helpful in daytime hours for work or school environments where **alertness** and **productivity** are important. **Warmer** lighting in the **evening** for workplace events or in residences is best as it helps the body **prepare for sleep** early enough to be rested for the next day.

"Zeitgeber: periodic signals of the environment synchronize the human circadian rhythm to the 24-hour day ..."

- Vetter, Celine, et al, *Blue-Enriched Office Light Competes with Natural Light as a Zeitgeber*²



QUALITIES OF LIGHT AFFECT HUMAN PERCEPTION

Artificial lighting quality is important to the way people perceive and navigate their environment. Bad lighting has **spectral gaps**, making slight **variations between objects not as clear**. In addition, **full spectrum light** sources will likely have a high CRI (Color Rendering Index) which helps with **accurate color rendering**. When it comes to usability for various types of clients, the appearance of objects and surfaces is crucial.

"... there is potential for confusion between the apparent colors of objects ..."

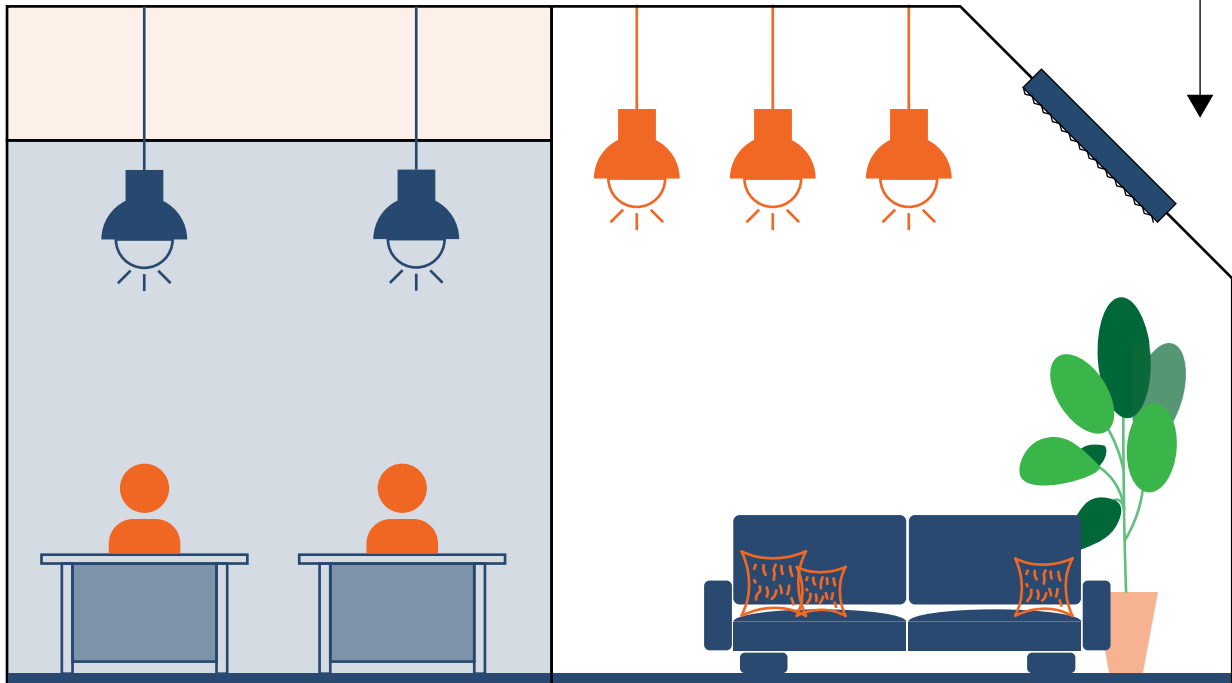
- Lighting Research Center at Rensselaer Polytechnic Institute,
*How Valid are the Claims Regarding Full-Spectrum Light Sources?*³

Skylights are a great way to integrate natural lighting. However, it is important to integrate strategies which **mitigate glare**.

- Introduce lighting from a **different direction** in relation to any given skylight.
- Incorporate **shading strategies** to mitigate direct sunlight when needed.

Tailor your lighting strategy to the program of a space:

- **Cool** lighting in **offices**,
- **Warm** lighting in places of **rest**.
- Ideally, use **diurnal** lighting for places occupied from **morning until evening**.



- Use **contrasting colors** for walls and floors or in areas with potential obstacles,
- Select lights with a high **Color Rendition Index (CRI)** of over 90, especially in areas for **focused work**.

“Lighting in the workplace may influence employee performance in several ways. It may affect eye strain and visual comfort ... influence cognitive performance and problem solving ability by interfering with physiological factors like circadian rhythms ... impact mood and interpersonal relationships at work and therefore job satisfaction.”

- Silvester and Konstantinou, *Lighting, Well-Being and Performance at Work*⁴

1 Loisos, George. “Skylighting and Retail Sales - An Investigation into the Relationship Between Daylighting and Human Performance.” California Board for Energy Efficiency Third Party Program, Aug 1999, <https://www.pge.com/includes/docs/pdfs/shared/edusafety/training/pec/daylight/RetailDetailed820.pdf>.

2 Vetter, Céline & Juda, Myriam & Lang, Dieter & Wojtyasiak, Andreas & Roenneberg, Till. (2011). Blue-enriched office light competes with natural light as a zeitgeber. *Scandinavian journal of work, environment & health*. 37. 437-45. 10.2307/23064905.

3 “How Valid Are the Claims Regarding Full-Spectrum Light Sources?: Full-Spectrum Light Sources: Lighting Answers: NLPiP.” How Valid Are the Claims Regarding Full-Spectrum Light 4 Sources? | Full-Spectrum Light Sources | NLPiP, Lighting Research Center at Rensselaer Polytechnic Institute, 2005.

4 “Lighting - Well-Being and Performance at Work.” Cass Business School, 11 Sept. 2018, www.cass.city.ac.uk/faculties-and-research/research/cass-knowledge/2013/october/lighting-well-being-and-performance-at-work.