

# WORKPLACE

## || INTRODUCTION

Successful workplace lighting facilitates connection. We know as a proven fact that when we are connected to our office environment, in tune with our surroundings, we are more productive, happier and healthier.

Biophilic design principles, which advocate a closer connection with nature, offer us pointers on how lighting can work to make the workplace more human centric.

Having a connection to natural daylight is always the optimal way to light a workplace. However, in our modern world, boosting and or replacing daylight with artificial light is often necessary.

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## Circadian rhythm - colour change

Our bodies have a natural time cycle that wakes us in the morning and relaxes us at night. This time cycle is tuned to the colour changes of natural daylight. As we spend on average 90% of the day indoors, our artificial light systems should also mimic this changing cycle for us to remain healthy.

### Tip:

Vary the colour temperature of the artificial lighting to mimic the changes of the colour of natural light throughout the day: neutral white in the morning, cool light at midday, warm light in the evening.

## Changes in intensity

Our circadian rhythms are also supported by changes in intensity of light. Daylight can vary from well over 10,000lx by day to less than 1lx at night. Prolonged exposure to flat, uniform light has been shown to lead to depression, insomnia and even osteoporosis.

### Tip:

Automatically program the brightness of artificial lighting systems to mimic the changes of intensity of natural daylight. Boost light levels to boost concentration. Reduce light levels near the end of the working hours to begin the process of relaxation.

## Full Spectrum Lighting

We respond more positively and feel more happy with light rich in all the wavelengths of natural light, particularly with light rich in the red wavelengths. However, the most common LED light sources have large parts of the wavelengths missing, with almost no light in the red spectrum.

### Tip:

Choose light sources (bulbs, lamps) that provide light across the whole visible spectrum: 380nm to 750nm. Information on a lamp's spectral distribution is readily available from the manufacturer.

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## Layers of light: 1 surface brightness

Indoor spaces feel more natural when light comes from multiple directions; think of a room lit from multiple windows. Another characteristic of natural light is that it illuminates room surfaces to different intensities.

Artificial lighting that mimics this multi-directional nature creates a more pleasing, natural feeling context or environment.

## Layers of light: 2 task lighting

Different tasks require different light levels based on the level of detail involved. Rather than waste energy to light the whole space to suit the most detailed task - which may only be undertaken periodically - use task lighting to provide specific highlighting of tasks as required. A good example of task lighting is the desk lamp. Built-in lighting over work counters is also task lighting.

### Tip:

Design lighting in layers of light. Ambient light can illuminate the room surfaces and give a general overall illumination which facilitates safe movement. Add task lighting as required to provide light for visual acuity.

## Personalised control

If any of you have experienced office management, you will know lighting in the workplace is often a source of complaint. Human eyes are not all the same, we all have different sensitivities to light.

### Tip:

Allowing as much local, preferably personalised, control of the lighting in a workplace will allow people to tune lights to their own needs. Ability for people to personally set their lighting has been shown to improve productivity and satisfaction.

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## Daylight harvesting

Using daylight as a light source is free. Research has shown that internal space up to a depth of 2 x the window height can be lit by daylight for significant parts of the year. This depth can be increased using architectural devices such as "light shelves".

### Tip:

Install daylight sensors in the workplace to activate lighting near windows only when daylight light levels drop due to weather or time.



## Occupancy control

Lights consume up to 40% of the energy used in an office. We have all seen office floors illuminated at night and wondered about sustainability.

### Tip:

Install occupancy sensors to reduce lighting levels when spaces are not occupied. Turn lights off automatically through the use of timers (with overrides to allow for late night cram sessions!)

## Scale

Scale needs to be appropriate to use. Different scales of space and lighting give rise to different perceptions of appropriate behaviour - think of the difference between a large formal gathering place and a small person-sized reading corner.

### Tip:

Vary the mounting heights of lights across the workplace. Consider lamps for reading areas, pendants over small meeting places or large light sculptures over gathering places.