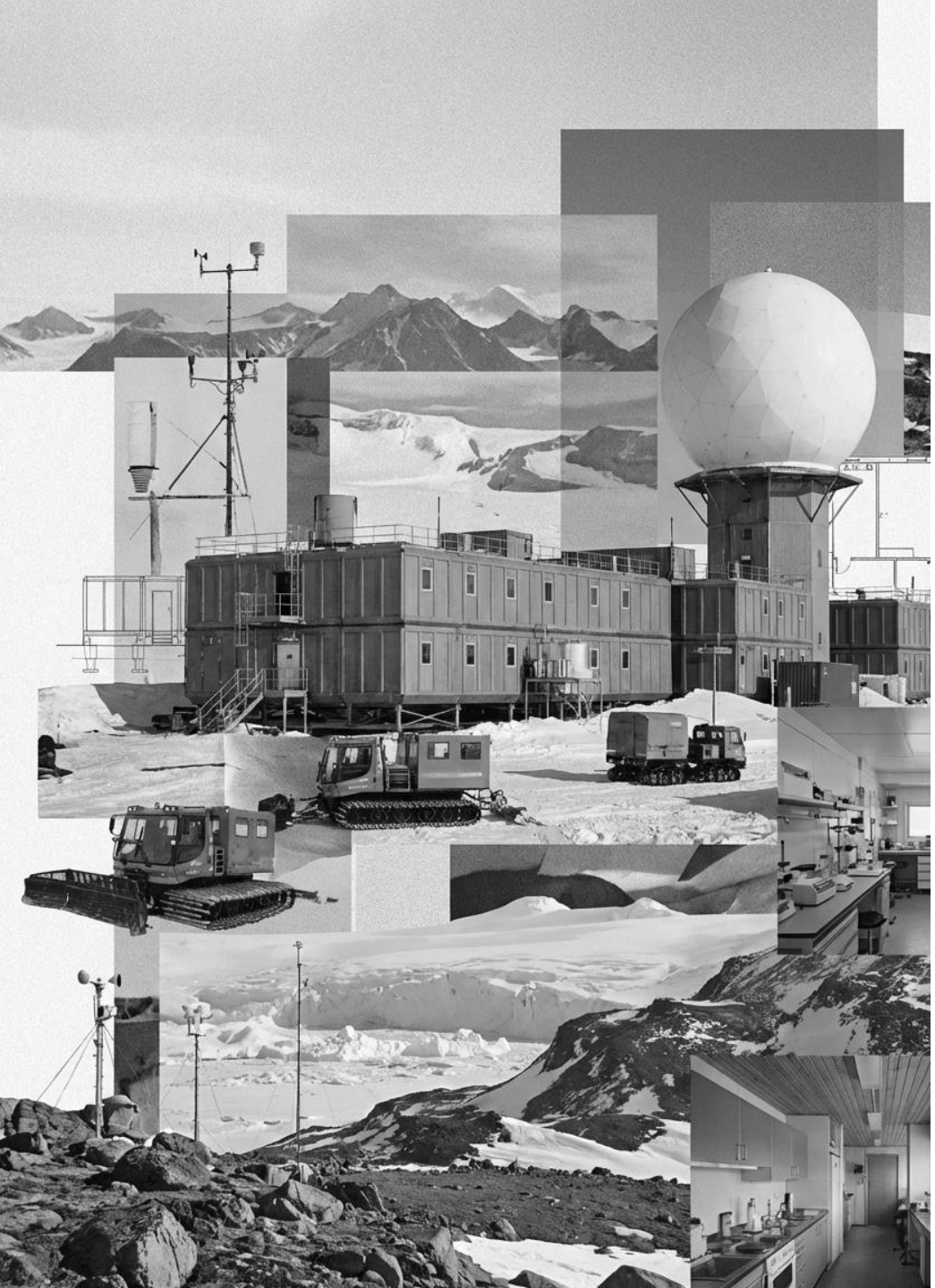
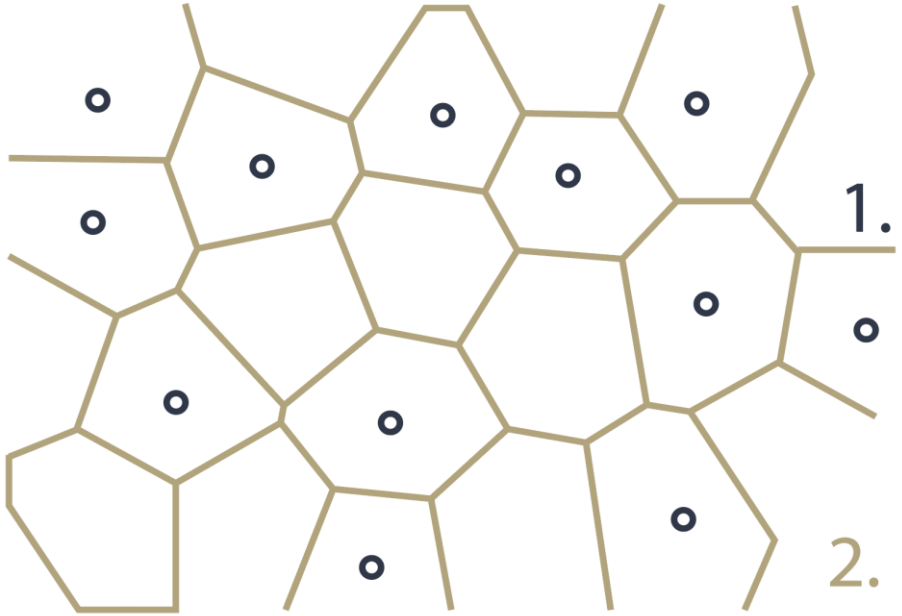


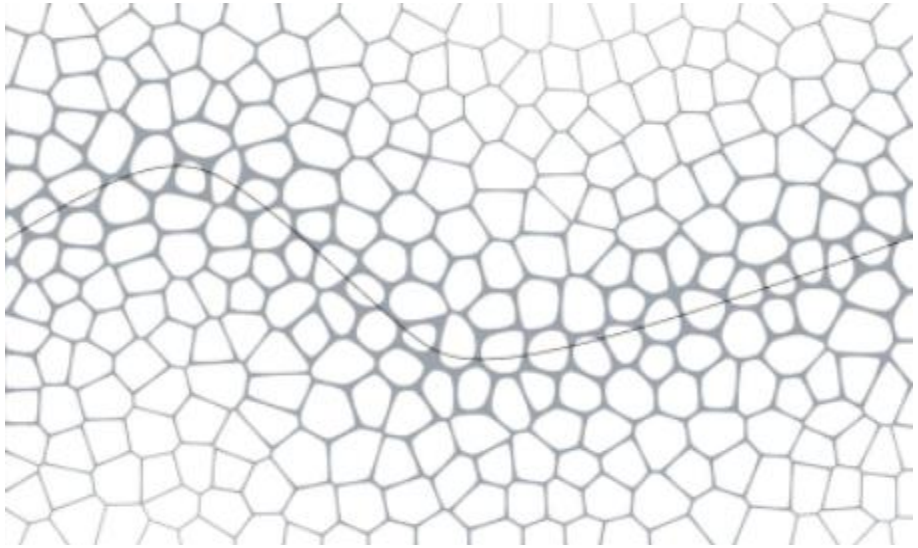
Mission-driven habitability

Designing habitats to support mission-driven confinement,
TROLL Station Containers

Group 2_ Brendan Exterkate, Gabriel Marks, Giorgia Vercelloni, Maciej Sachse, Ruxandra Florut, Zuzanna Schleifer, Long Ki

Light scheme
consisting of two systems





1. MAIN SYSTEM

Main lighting system based on Human Activity Recognition (HAR)

With adjustment of light tone to the season and day time

2. SECONDARY SYSTEM

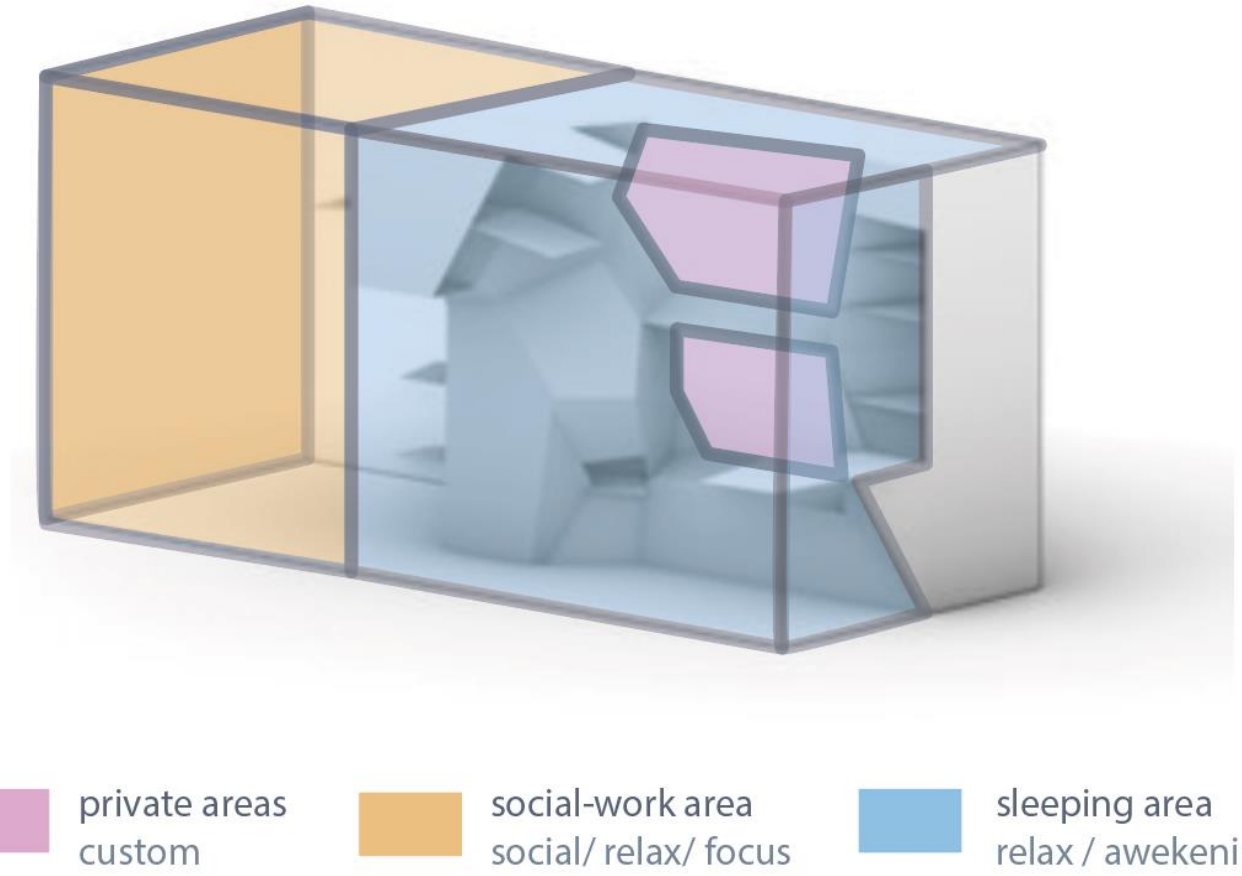
Adjusting to the activity

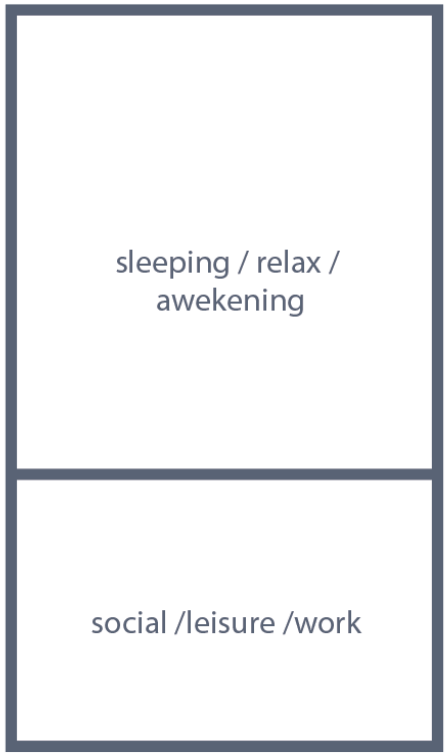
With adjustment of light colour according to the wanted atmosphere:

- Awekening
- Work/ study (focus)
- Social time
- Leisure time (relax)

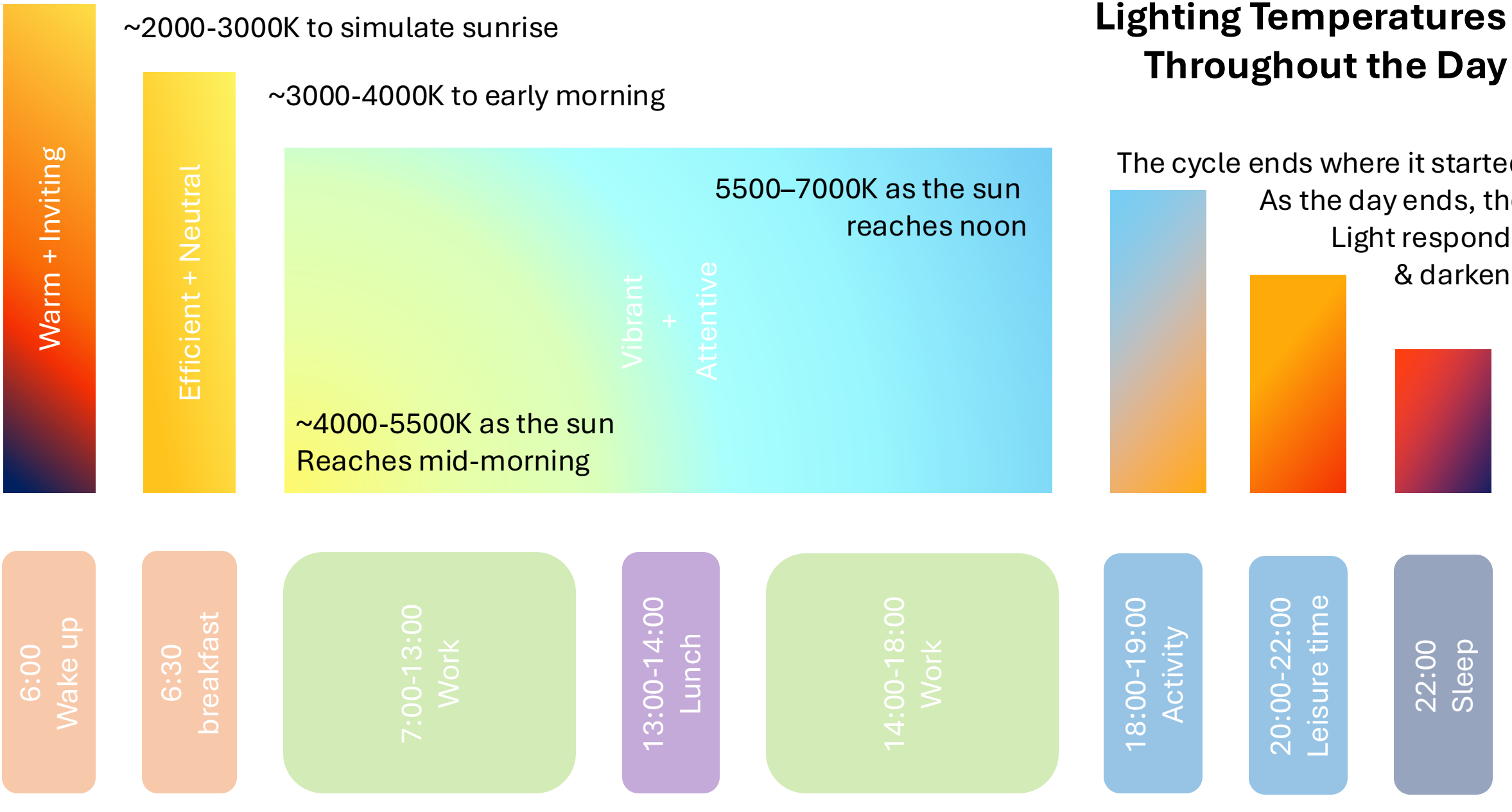
Light zones

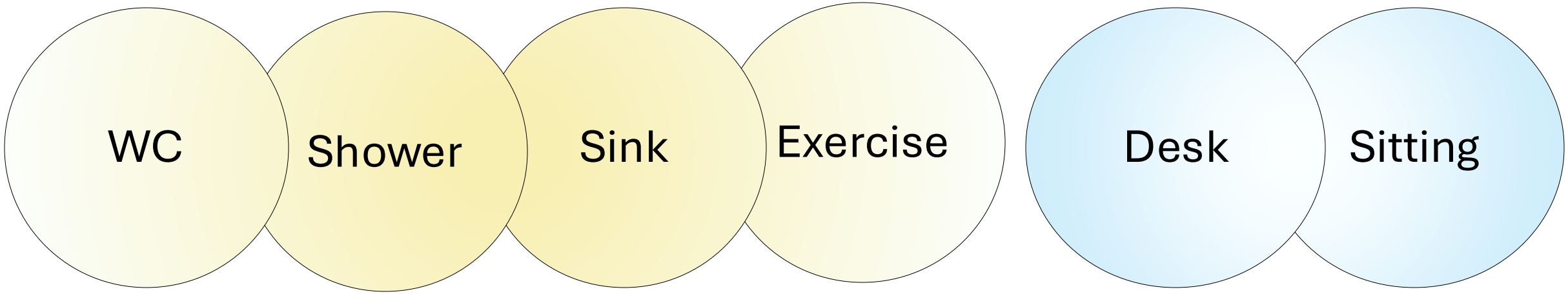
Sleeping area and social/ study area + private custom areas





Lighting Temperatures Throughout the Day





Both areas can vary
Depending on the
Need of the user.

However, typically
Utility lighting, it
Avoids the deep
Oranges

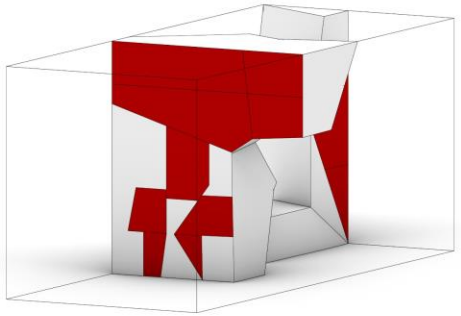
Likewise, the work
Areas tend to have
A higher kelvin as to
Increase alertness +
productivity

https://www.upshine.com/blog/best-color-temperature-bathroom-lighting.html

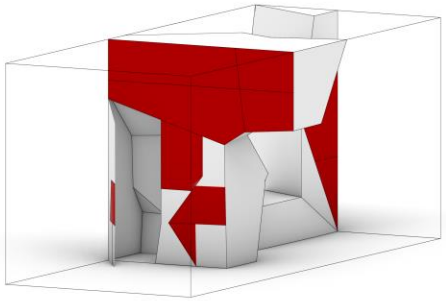
https://www.benq.com/en-us/knowledge-center/knowledge/best-color-temperature-for-office.html

Habitat for ***two***

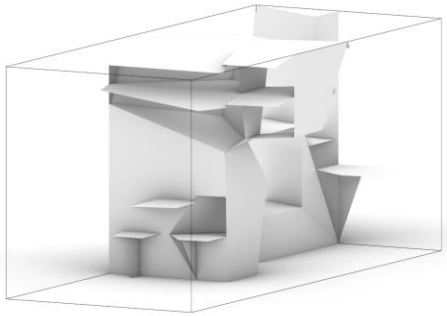
_rest area
_storage space
_desk(s)
_table&chairs
_bathroom



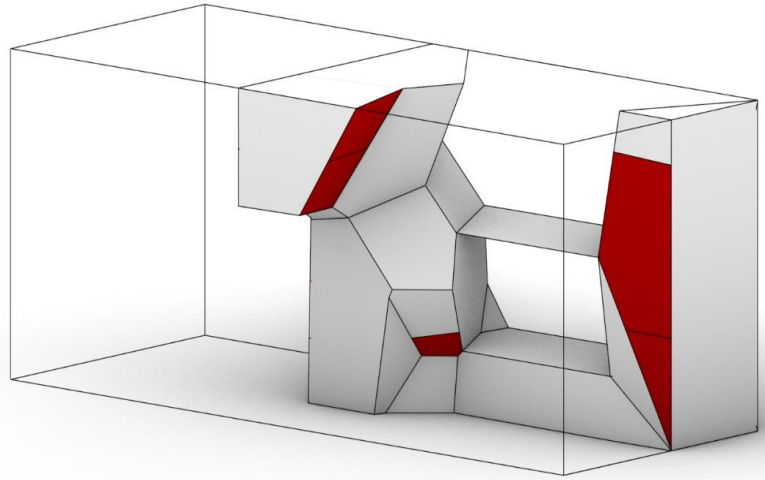
View A, *closed panels*



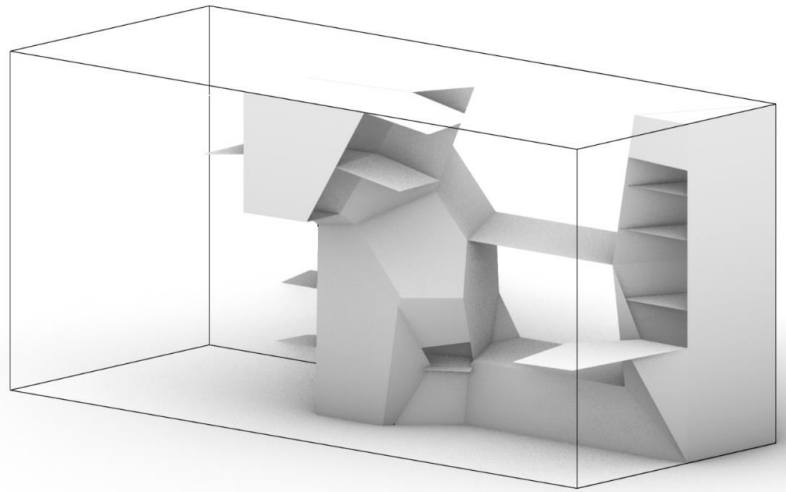
View A, *open bathroom*



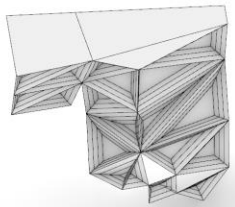
View A, *open panels*

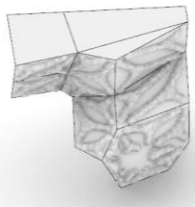


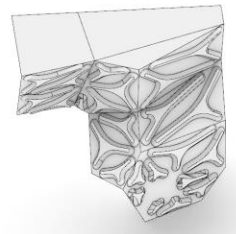
View B, *closed panels*

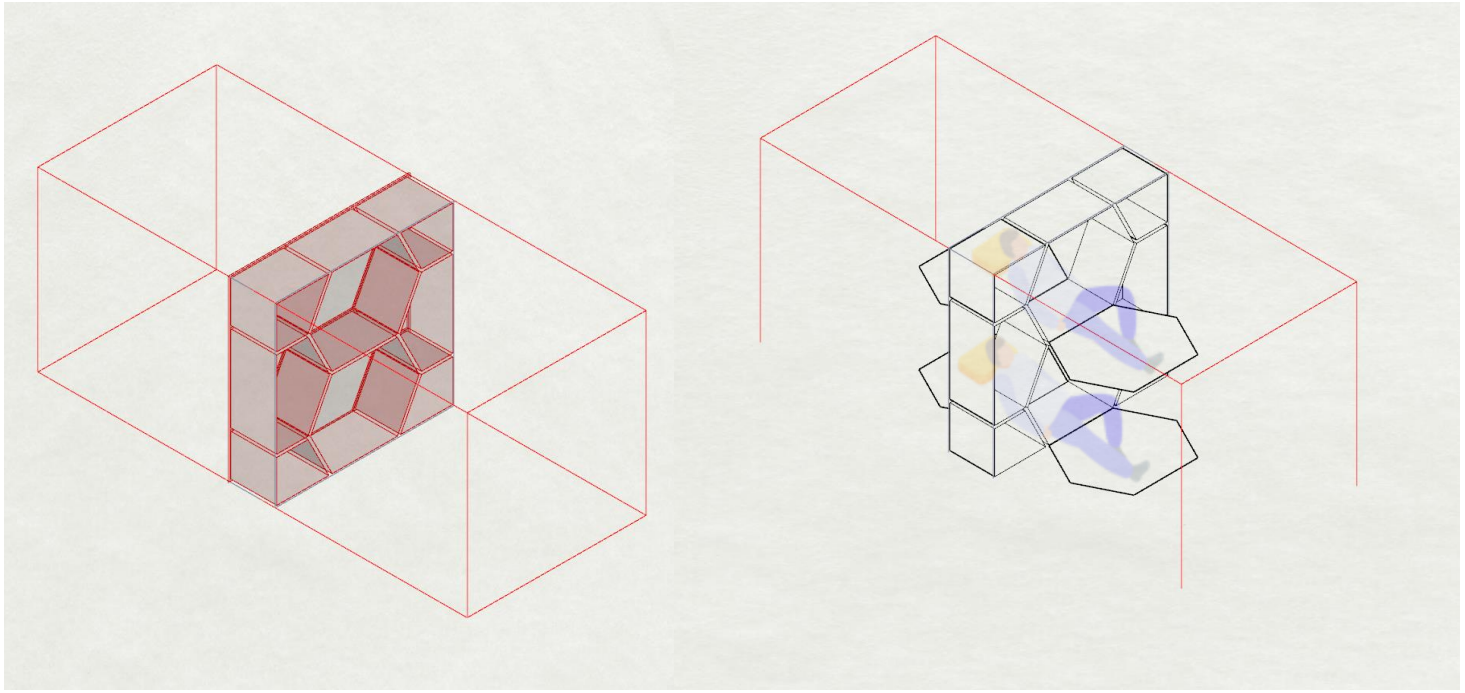


View B, *open panels*



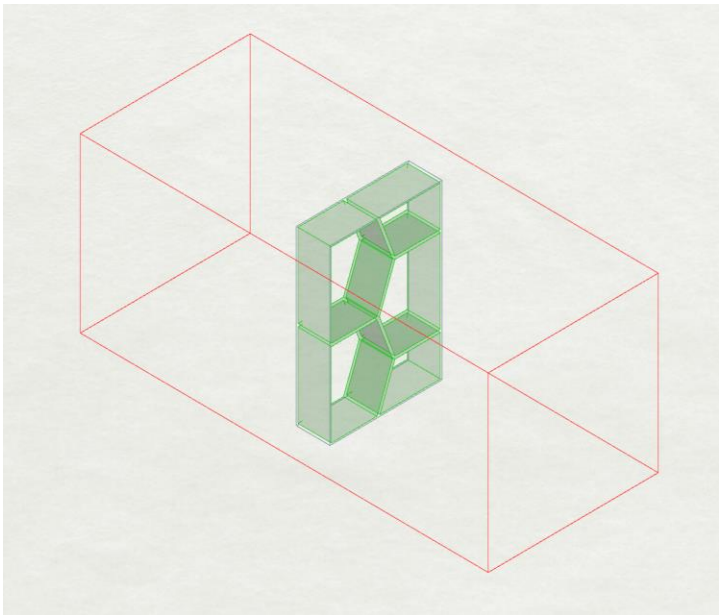


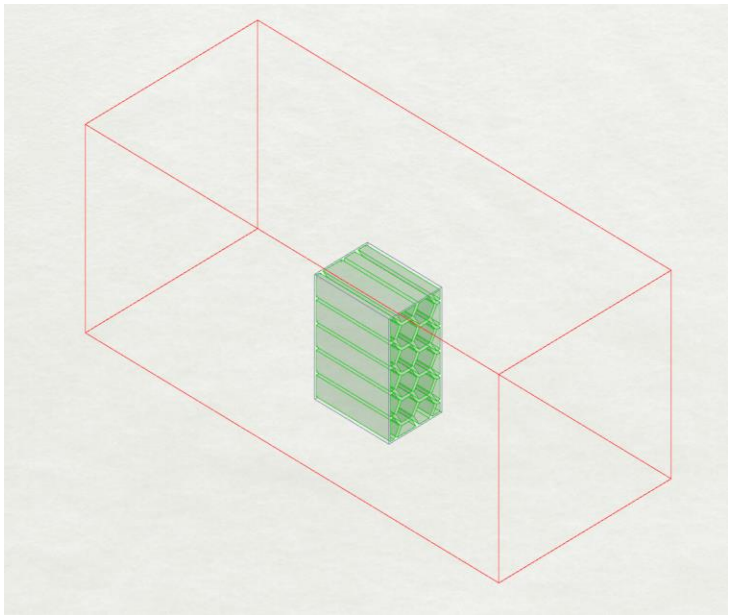


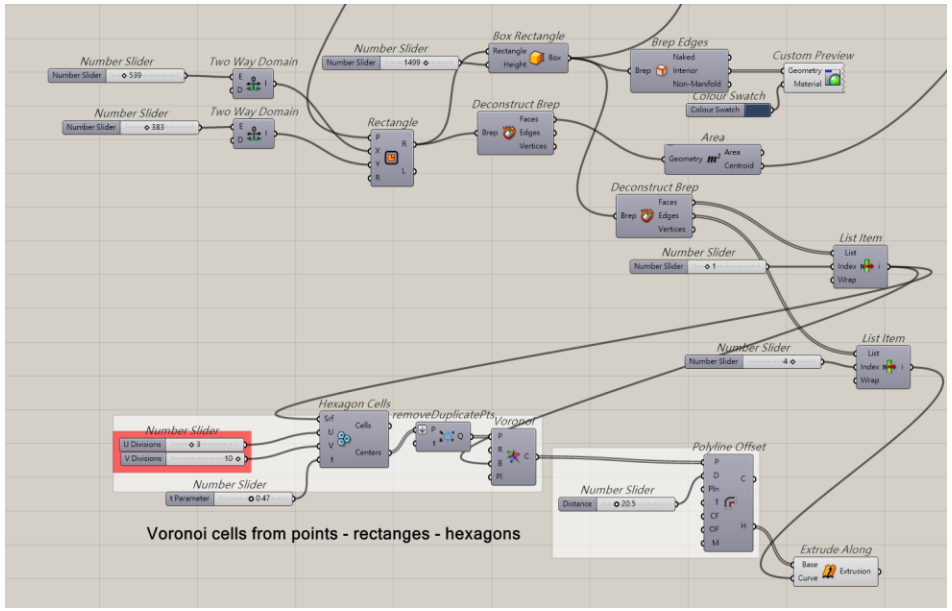


other possibility

Voronoi hexagons

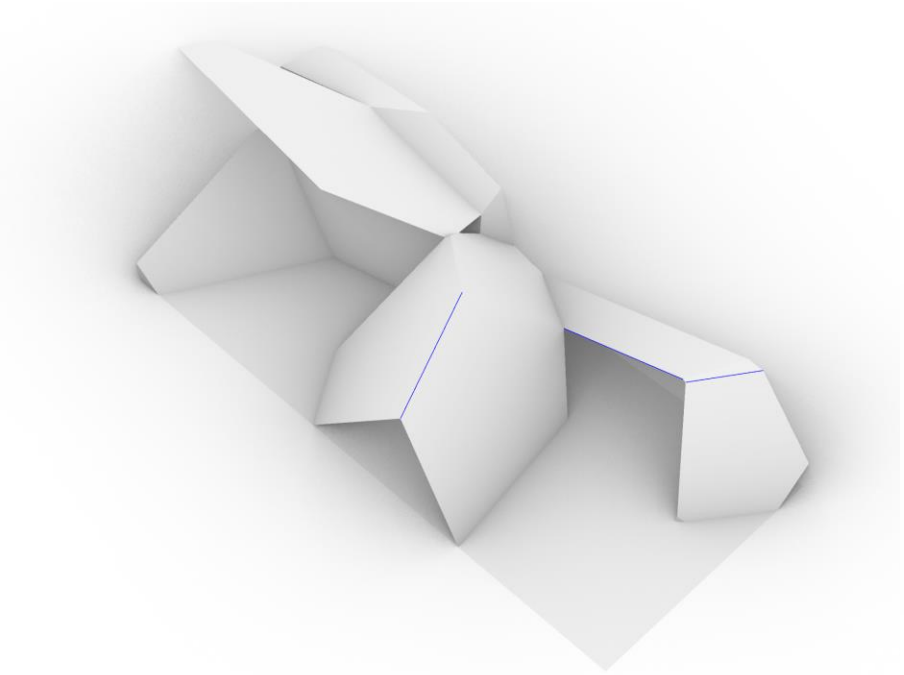


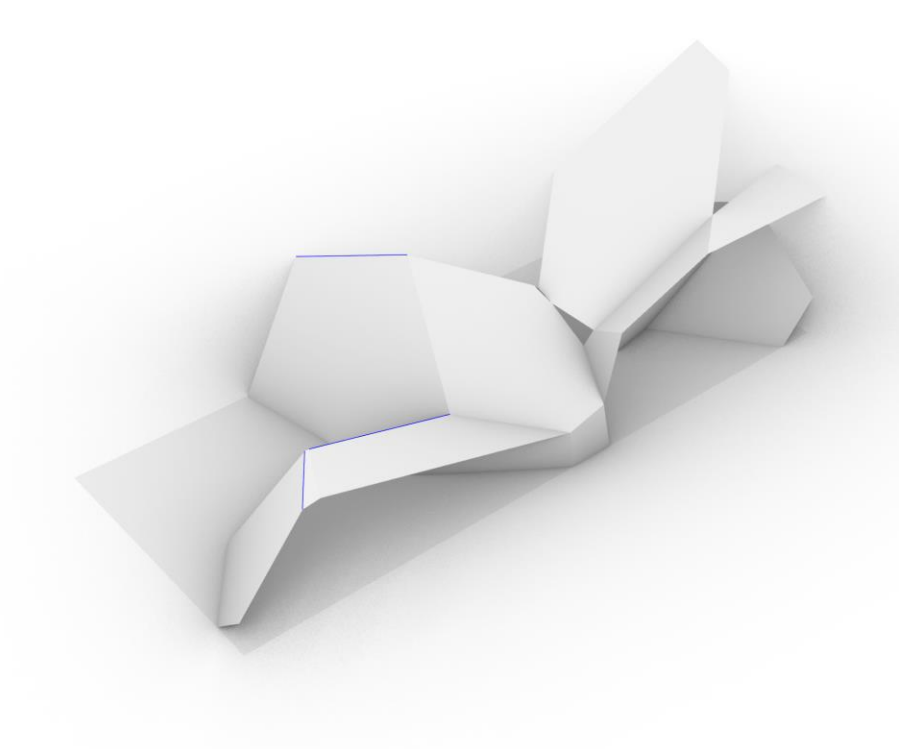


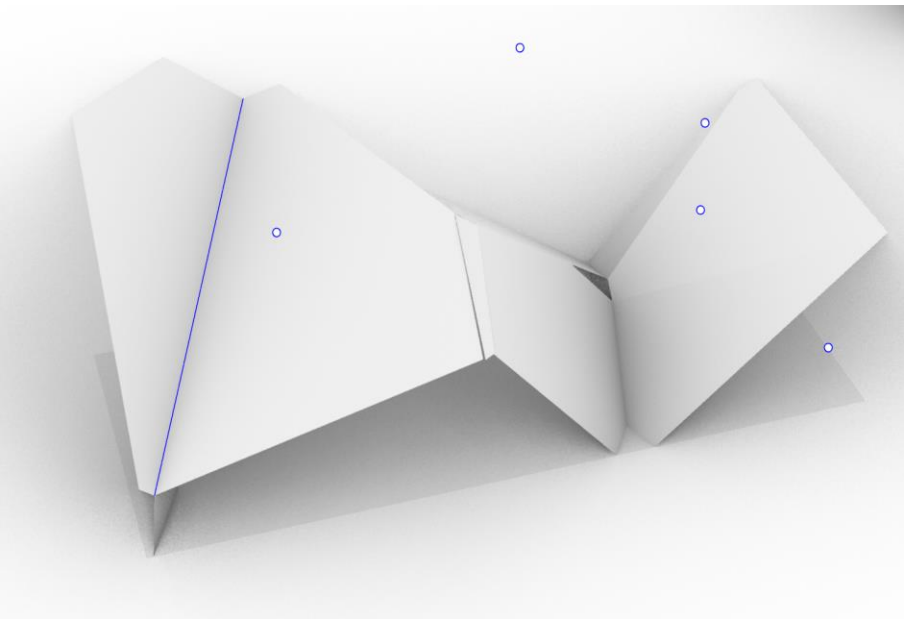


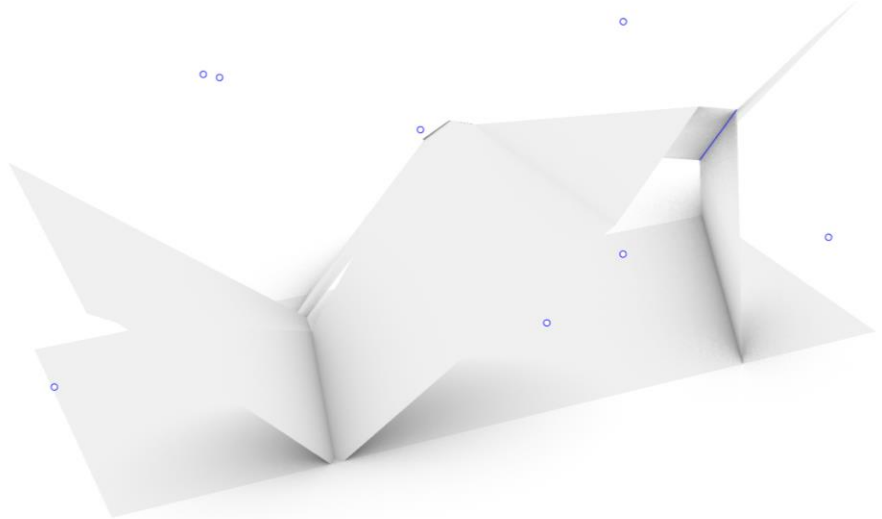
other possibility

Voronoi Furniture





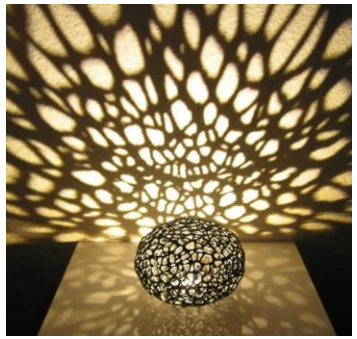


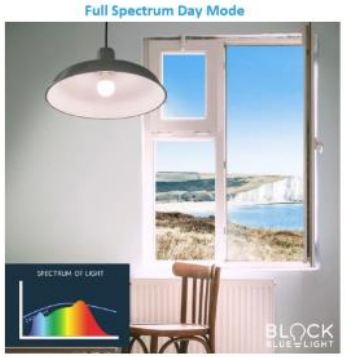


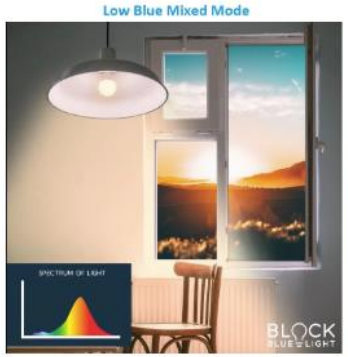
Ambient Lighting

BioLight™

- Energy efficient LED
- 99 CRI [100 is the max]
- 3 Spectral modes to influence melatonin production in the brain = healthy circadian rhythm



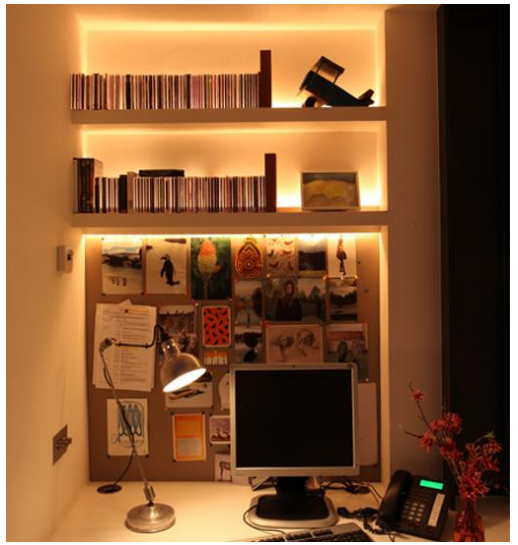




Task Lighting

- Principles for task lights:

- Bright + adjustable LEDs
- Integrated into joinery to reduce clutter
  - Fixed LED Strips
  - Fold out arms
- Positioned bellow user's chin-height to reduce glare
- Faces downwards
- Anticipates the needs of its assigned user



Lighting and AI

- **Natural Light Integration:** Using luminance sensors, the AI system can detect how much light comes in from the outside and adjust the intensity of the indoor lighting to create a comfortable environment
- **Human Presence Detection:** Presence Infrared sensors are installed in the ceiling and furniture to allow the light to stay on only as long as someone is actively using the space, lowering the possibility of a light being left on accidentally for hours
- **Usage Pattern Analysis:** Based on the input from the users (changes in CCT, intensity and turning it on and off), the AI can adapt seamlessly to the day-to-day activities and create a new functioning schedule that is tailored to the user.
- **Energy Efficiency:** Through the above three ways of using the AI, the electricity used in the functioning of the lighting is reduced, as it is only used when necessary
- **Enhanced User Experience:** By being able to control the system until it evolves to be completely adapted to the user needs, the user can completely customize their environment as they see suitable.