Lighting Guidance

Newcastle University

a 10:10 University

This guide aims to inform readers of the heating and cooling systems across campus, to give building users a greater understanding of their environment, how things work, and the level of local control.

Also available online at
http://www.ncl.ac.uk/estates/environment/energy/resources.htm

Sustainability Team, Estate Support Service
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Lighting Guidance

The theory behind lighting levels

Lighting levels, or Illuminance, is a measure of how much luminous flux is spread over a given area and the intensity of illumination on a surface. Luminous flux as a measure of the total "amount" of visible light present. This is measured in lux units (light output per square metre).

The outdoor light level is approximately 10,000 lux on a clear day. Inside, in an area closest to windows, the light level may be reduced to approximately 1,000 lux. In an area located in the middle of the building, it may be as low as 25 - 50 lux. In these circumstances, additional lighting equipment is often necessary to compensate the low levels (www.engineeringtoolbox.com).

The table below is a guidance for recommended light level in different work spaces:

Activity	Illumination (lux, lumen/m^2)
Public areas with dark surroundings	20 - 50
Simple orientation for short visits	50 - 100
Working areas where visual tasks are only occasionally performed	100 - 150
Warehouses, Homes, Theatres, Archives	150
Easy Office Work, Classes	250
Normal Office Work, PC Work, Study Library, Groceries, Show Rooms, Laboratories	**500**
Supermarkets, Mechanical Workshops, Office Landscapes	750
Normal Drawing Work, Detailed Mechanical Workshops, Operation Theatres	1,000
Detailed Drawing Work, Very Detailed Mechanical Works	1,500 – 2,000
Performance of visual tasks of low contrast and very small size for prolonged periods of time	2,000 – 5,000
Performance of very prolonged and exacting visual tasks	5,000 – 10,000
Performance of very special visual tasks of extremely low contrast and small size	10,000 – 20,000

To achieve the appropriate lighting level for you, and for lighting tips, please see page 2.

Lighting Guidance

How much light do I need?

If you are working in a normal office environment, in a location with large (non-filtered) windows, or you sit near a window of any size, natural light on clear / sunny days is sufficient for your tasks. This is also true to seminar / class rooms , study areas, coffee rooms / kitchens, PC clusters, reception areas etc.

On a cloudy day, if you sit away from a window location, or if you undertaken detailed work (such as lab work), you might require more light. The more efficient way to achieve a suitable lighting level is to use local lighting, such as desk top lamps. As everyone's eye sight is different, this method provides personal preference in the amount of light you have.

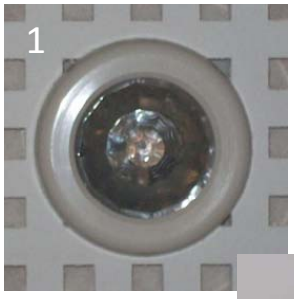
Alternatively, dimmable lights (now installed in many new buildings and often combined with PIR movement sensors) provide automatic response to lighting levels in your room / area, depending on the natural light being received.

If you have PIR lighting in office spaces....

The lighting in office spaces that are fitted with Passive InfraRed (PIR) movement sensors will be different for each building in terms of sensitivity, zoning of areas etc. Regardless, this lighting works when people move, the sensor puts the lights on.

This lighting is usually zoned into the areas, each of which will usually turn off after movement has ceased at a pre-set lag time (this can be locally changed if you decide the lag time is not suitable).

Where local control is available, a wireless remote controller can be used to temporarily turn the lighting on / off, or adjust the brightness (depending on the make and model). The remote controller is usually located in a wall mounted dock with a local guide for use. To use the remote, point it at the ceiling detector (Figures 1 and 2) and press your required button (accurate aim is important).



This technology is also available in corridors, stairwells and toilets.

Lighting Guidance

Corridor lighting

There is a current programme of ongoing work, using Salix funding, to install PIR movement sensor lighting in corridors (and toilets in many cases) across campus. Your building may have already received this upgrade.

But please be aware – in the majority of building, only the corridor lighting is automatic to movement, so remember to turn off room lighting when vacating.

Stairwell lighting

Stairwells can be small and dark, or naturally light and airy. Regardless, stairwells can be dangerous without suitable lighting levels. Where natural light is minimal, please make sure lighting is on constantly, for safety reasons.

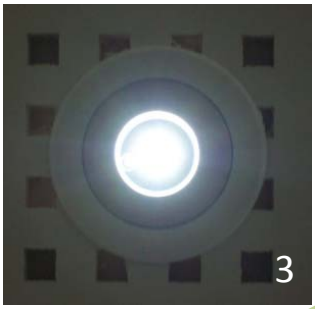
At present, most stairwell lighting is manually controlled with light switches – please make sure the lights remain on. In new buildings, stairwells are fitted with PIR movement sensor lighting, which will come on automatically – you do not need to manually control these lights.

Emergency lighting

All emergency lighting is outside of general staff control. These lights are for use in a power failure emergency, to allow you to see in order to vacate the building. There are two main types of emergency lighting;

- Maintained lights; permanently on, such as LED emergency lighting in Merz Court,
- Non maintained lights, which only come on once a power failure has occurred, such as CFL emergency lighting in Kensington Terrace.

In addition, new campus buildings have small, maintained, LED lighting set into the ceiling, which is often confused for movement sensors (Figure 3). These small bright lights are highly efficient emergency light for your safety.



3

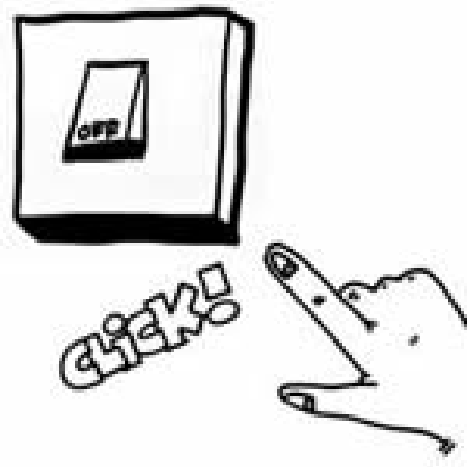
Lighting Guidance

Tips for achieving the right light level for you

1. Is the natural light sufficient for you to undertake your tasks?
2. Open / close blinds / curtains , to change the amount of natural light in the room,
3. Dim / brighten the ceiling lights (where possible),
4. Use local lighting, such as a low wattage personal desk lamp,
5. Only switch on the ceiling lights you need (if the room lighting is zoned).

General lighting tips

- Why not try marking the light switches with information of what lights they turn on, so only the necessary lighting is used?



- We appreciate that light switches are not always in the most suitable position, but please remember to turn of all unnecessary lights – especially when exiting vacant rooms for the night / weekend.
- Turning off unnecessary lighting saves energy and money that could be better spent elsewhere – such as improving University buildings / facilities.

Remember – too much light can be just as bad as too little light!

Glare, flicker, strobe, and colour distortion are all common side affects from lighting levels that exceed the required amount for that task, which can lead to head aches, squinting, and eye sight problems. If you find yourself suffering from these affects, please lower your lighting level by dimming / turning off lights, closing blinds / curtains, moving away from bright areas.

University Lighting – a quick theory lesson

The majority of lighting on campus is fluorescent tube lighting, however we are introducing LED (light emitting diode) lighting, which is more efficient, has a longer life span, and are more powerful / produce a higher lighting level.

The introduction of LED lighting will be taking place across campus as old fluorescent tube lighting comes to the end of its life span.