COLOUR AND LIGHTING

UNIT 4

Importance of Lighting in Interior Designing

Lighting is one of the most pivotal interiors designing elements in all the commercial spaces. It helps in creating a welcoming and productive environment while enhancing the aesthetical value of the space. The leading LED lighting manufacturers believe that lighting holds the absolute key to a good interior design. It not only influences the space perception, ambience, and mood of the people but also holds a great scope for increasing the efficiency quotient of the space.

For instance, deciding on **indoor LED lighting solutions** and **LED office lighting fixtures** not only encourages energy savings but also costs savings. Furthermore, right lighting also compliments other design elements including colour selection, space size and layout, furnishing, etc. to ameliorate the harmony and fluidity of an interior design.

1. Ensures optimal colour management

Lighting is known to lay a significant influence on the appearance of colours in a space. It can add to or subtract from the overall colours of the elements in the room. Moreover, it is also capable of creating an illusion by reflecting the light from the walls. Interior designers assert that lighting conditions can make a space holding light coloured elements seem bigger.

2. Improves functionality and serves a purpose

Improving the functionality of a space is asserted to be one of the primary roles played by lighting in the interior designing domain. It illuminates the space, makes working easier, and ensures the safety and security of the premises as well as the employees. Moreover, top commercial lighting manufacturers also believe that lighting is required to serve a purpose, or else it’s just waste of

money and electricity. For instance, surface mounted luminaires are installed in large spaces like halls, foyers, lobbies, etc. not just because they are charming, but due to the fact that they provide excellent illumination throughout the space.

3. Aids in creating illusion of space

As mentioned earlier, lighting helps in creating an illusion of the space. Interior designers typically find aesthetical ways to bring in lighter in the darker sections of a building. Experts believe that an inefficiently illuminated space often seems cramped, which may be worsened by the close proximity of the furniture arrangements. Thus, interior designers try to illuminate the space with **suspended luminaires**, corner lamps, etc. in order to create a visually larger space.

Various researches also assert that lighting conditions can affect the productivity levels of the people. Thus, people now-a-days are investing in smart lighting solutions like Human Centric Lighting that can be programmed to emulate daylight in a space. Since daylight is recognized as the best light that complements human behavior, it uplifts the mood of the employees while increasing their motivation and concentration levels.

very thing which we see happening around us is because of light. A particular frequency of electromagnetic radiation (which is also being referred to as light), which is around 390 to 700 NM, is visible to the eyes of the human. Even if we look at any particular leaf, we already know that it is green in colour because there is a light that bounces off the leaf to our eyes and tells us that it is green in colour. Light is any form of energy, just like all other energies, which is produced from a source. These sources are called light sources.Types of Light sources IN reality, we have a lot of sources of light, but all of them can be categorised under two categories which are known as natural sources and artificial sources. Natural Light Sources In our universe, there are a lot of objects that emit light of their own. Some of the lights from these sources can

reach the surface of the earth. The things which are present in nature and have the ability of emitting lights are given below. The Sun is one of the major sources of light for our planet Earth. The Sun is considered as a massive ball of fire that produces massive energy by the nuclear fusion at its centre. This energy from the Sun comes out in the form of light and heat. The major factor which is behind the sustainability of life on the planet Earth is the light from the Sun. Every star also produces light, but because of the huge distance between the Earth and these stars, only a small amount or sometimes no amount of it reaches the surface of the earth. The moon also provides light, but it doesn't produce light of its own. The light which we get from the moon is the light that is being reflected by the moon from the Sun. Certain natural phenomena also emit light, such as volcanic eruptions and lightning. There are some living organisms also who can produce light of their own. They are called bioluminescence. Some examples of these are jellyfish, fireflies, glow worms, etc. Artificial Light Source slight can also be produced artificially apart from natural sources. The different lights which can be produced artificially come under three categories. Those categories include incandescent sources, luminescent sources and gas discharge sources.

INCANDESCENT SOURCES:

Under incandescent sources, certain objects are being heated to a high temperature till they begin to emit light. In this process, both infrared and visible lights are being produced. Examples of incandescent sources are incandescent lamps and candles. An incandescent light source is the most common type of source in which Sun, light bulbs and fires can be included. Incandescent light is a type of light source which includes the vibration in the entire atom, as when the atoms are heated, then the thermal vibrations in the form of electromagnetic radiations are released. Depending on the temperature, the materials vary in emitting energy; at a low temperature of the materials, the emission of radiation takes place through infrared wavelengths in the photons. A common example of the incandescent light source is when a metal is heated,

the atoms present in the metals gets vibrated and emit photons which emit radiation to make it visible to the human eye by raising the wavelength in the spectrum. Fire is the most common example of incandescent light, as fire includes a chemical reaction that releases both gases and heat, causing the material to reach a high temperature, causing the material and gases to be incandescent (lighten up). Similarly, light bulbs produce heat through which electrical current passes, raising the temperature of the cable and finally providing incandescent to the cable.

Luminescent sources:

Under luminescent sources, lights are being produced by accelerating changes in the material of luminescence. The common way of doing this is bypassing the current through the material. Its examples are electric bulbs and fluorescent tube lights. As compared to incandescent light sources, these types of sources involve only electrons instead of the whole material vibrations, which takes place in normal or lower temperatures making it different from the Incandescent type of sources. Basically, we can say that when the electrons emit some part of their energy in the form of electromagnetic radiation, then the type of light is known as luminescence light. When an electron drops down in temperature, then the specific light colour is produced through the energy level decrement. Some common examples of Luminescence light sources are neon lights, fluorescent light, bioluminescence, fluorescence light, etc. Fluorescence light is the most common example of luminescence light source, which can be further divided into two parts which are electro-luminescence and photo-luminescence, which can include computers, screens and televisions. Bioluminescence is also the most common example of luminescence which even includes animals like fireflies.

DISCHARGE SOURCES:

Under gas discharge sources, the electricity is being passed through a certain gas at very low pressure for producing light. Its examples include sodium lamps

and neon lamps. More About the Topic There would be no world if lights were not there, as light provides us with the ability to see things. Plants also need light which is provided by the Sun in the form of sunlight through which many processes in nature take place, so we can say that the main source of light on earth is sunlight. Light comes from different sources, which are known as light sources, and these light sources can be defined as the sources through which light (a form of energy) is produced. Light is an energy source that can travel as a wavelength and can travel very quickly. Rainbow formed in the air is the very common example of light striking the droplets of water to separate colours with different wavelengths, making our eyes see those different wavelength colours forming the rainbow. We can say that light is a form of electromagnetic radiation whose particular particle can produce radiation of around 390 – 700 nm, which is visible to a human eye. The human eye can see almost all types of light except for infrared and ultraviolet rays. Our brain further processes the light captured by our eyes, translating the energy bandwidth into the colour spectrum our brain and eyes are sensitive to. The artificial life created by humans is formed by the movement of molecules (rational as well as vibrational) having the transitions with molecules or atoms. An atom or molecule gets excited and enters a state which is considered absorbing, while it can be said as entering an emitting state when these atoms or molecules relax. If the light is in any other form of electrical energy, then these electrical energies can be easily converted into light energy. Basically, we can say that by exciting energy with any means necessary at that particular region, then it is said to be light, as the light lies in the visible spectrum in the form of energy or wave. In the modern world, humans are also creating artificial light, which is the most suitable form of electrical energy in the current world. Neon lights, light bulbs and fluorescent tubes are very good examples of electrical light. Lasers are also a good example of artificial light. Difference Between Natural Light and Artificial Light The most important difference between natural light and artificial light is that natural light can be found in nature, but artificial light is electronic, which is formed with the help of advanced technology. Natural light

has no control over the usage as it is based on the duration of time, but this is not in the case of artificial light. Usage of artificial light is limited. The amount of light produced is the main factor of using artificial light. If the artificial light is produced in less quantity, then the consumption is also low.

SPECIFIC FACTORS IN LIGHTING

MEASUREMENTS OF LIGHTING

Well, when one talk about the unit of light it does not make much sense practically. It's mainly because light is not a physical quantity and as a result, it cannot be measured. However, light does have various physical properties like wavelength, intensity, speed, etc and these all can be measured.

Well, the measurement helps in getting information mainly about the light wave or particle.

Since light has many properties and therefore, there are many different units for measuring them. While it can get quite complicated, some of the few measurement units are discussed below. Light can be measured subjectively, based on the brightness seen by the human eye. Units include **candela, lumens, footcandles** and **lux.**

1. CANDELA (cd)

Unit of luminous intensity of a light source in a specific direction.

This SI unit is used to measure the luminous intensity of a light source which is moving in a specific direction. It is also sometimes referred to as candle and represented as **cd / m ^{2}.**

2. LUMENS (lm)

The SI unit of luminous flux, this is a unit of light flow.

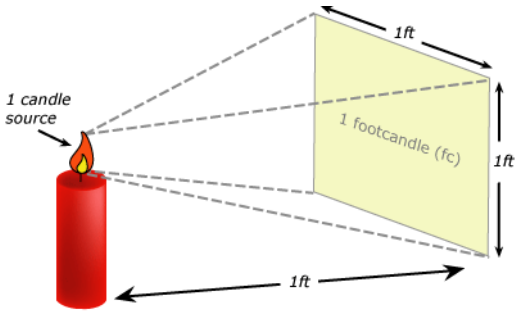
Another measurement unit lumen is actually a derived **SI unit of luminous flux**. It is represented by the symbol **"lm"** and is basically used to measure **the output of artificial lights.**

3. FOOTCANDLES (fc or ftc)

A **footcandle (fc)** is the Standard unit of measure for illumination on a surface. It is a lumen of light distributed over a 1-square-foot (0.09-square-meter) area.

Light intensity can also be measured in terms of footcandle which is equivalent to lumens per square foot.

In simple terms, this can be defined **as the brightness of one candle covering a distance of one foot**. One footcandle is approximately 10.7639 lux.



The average footcandle level on a square surface is equal to the amount of lumens striking the surface, divided by the area of the surface.

FC = Lumens of Light / Area in Square Feet

4. LUX (lx)

Lux is a **standardized unit of measurement of the light intensity**.

The **SI unit of illuminance and luminous emittance**. One lux is equal to one lumen per square meter

Formula: Lux - Lm/m^2

Lux is basically the **unit of illumination** and **is equal to one lumen per square metre**.

One lux equals 0.0929 footcandles and this is the metric equivalent of foot-candles. It is also known as metre-candle.

GLARE

INTRODUCTION

Light is a daily necessity of our lives. Since the introduction of the light bulb in 1879. The technology of Light has greatly improved thus illuminating our night sky. However, the use of excessive light has only caused side effects. These effects include glare and light pollution which the article will cover. We will also cover the importance of visual comfort.

GLARE MEANING

Glare is a visual sensation caused by excessive and uncontrolled brightness in the field of view. It is produced by brightness in the visual field that is so much greater than the brightness to which the eyes can handle. Glare ends up limiting a person's ability to distinguish details and objects. Also, sensitivity varies between people and older people are usually more sensitive to glare due to ageing characteristics of the eye.

Glare is the loss of visual performance or discomfort produced by an intensity of light in the visual field greater than the intensity of light to which the eyes are adapted. Simply put, glare occurs when too much light enters your eye and interferes with your eye's ability to manage it.

DEFINITION

Glare by definition brightness within the field of vision that causes discomfort, annoyance interference and eye fatigue.

Glare is defined as a visual condition in which the observer feels either discomfort and/or exhibits a lower performance in visual tests (e.g., visual acuity or contrast sensitivity). This is produced by a relatively bright source of light--called the glare source-within the visual field.

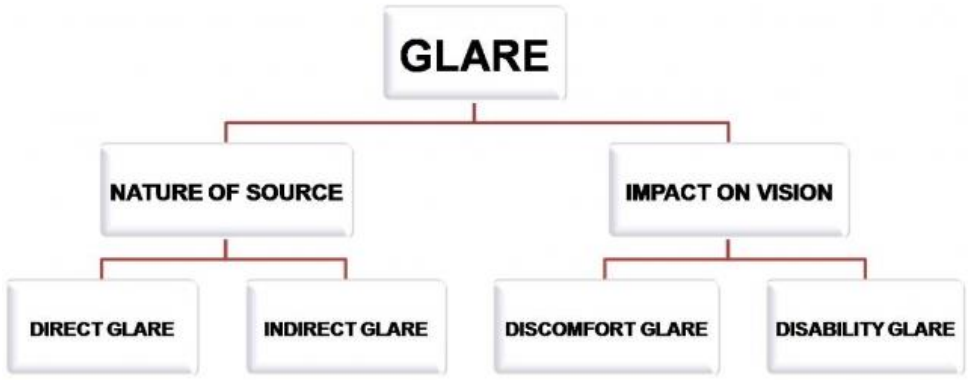
The CIBSE SLL Code for Lighting (2012) defines glare as 'the condition of vision in which there is discomfort or a reduction in the ability to see details or objects, caused by an unsuitable distribution or range of luminance, or to extreme contrasts.'

FORMS OF GLARE

There are **two forms** of glare. They are **disability glare** and **discomfort glare.**

1. **Disability glare** is the reduction in visibility caused by intense light sources in the field of view. How it works is that it causes a loss of visibility from stray light being scattered within the optical system of the eye. This results in a uniform brightness/luminous veil being drawn over the retina. This veil reduces the apparent contrast in the visual scene to impair visibility.
2. **Discomfort glare** is the discomfort of annoyance or pain induced by overly bright source. Discomfort glare also refers to as "psychological glare" as a physiological test can't measure it. Thus, discomfort glare measure and evaluate exclusively based on the individual. The main physical parameters that determine discomfort glare are the brightness of glare source and background, size of the glare and position of the source.

TYPES OF GLARES



Glare can be distracting and even dangerous and can occur day or night in a number of ways. Glare may come directly from a light source or be reflected. There are four types of glares: **Distracting glare, discomforting glare, disabling glare, and blinding glare.**

Disability glare and discomfort glare can be caused by two types of glares, they are direct and indirect glare.

Direct Glare: Most type of brightness conditions directly associated with the source of lighting or the immediate surroundings. Direct glare is the result of high brightness from a light source in the field of vision. For example, the sun in front of a person's eye is direct glare.

Indirect Glare: Results from specular reflection of high luminance in polished or glossy surfaces in a field of vision specially in close proximity to the visual task. Whereas indirect glare is the result of light that is reflected in the eye. For example, light from the sun being reflected from a surface to a person field of view is known as indirect glare.

1. **Distracting glare** – Distracting glare results from light being reflected when it moves from one optical medium to another (e.g., from air to glass). This results in some of the light being reflected off the surface, or internally reflecting within a spectacle lens. Distracting glare comes from light reflected off the front of lenses so that others can't see your eyes, and from light reflected off the backs of or within the lenses so that you see reflections in your lenses. This type of glare can also be experienced at night, forming "halos" around headlights or streetlights. Distracting glare can represent an annoyance or distraction to the viewer and lead to eye fatigue.
2. **Discomforting glare** – Discomforting glare may result from direct or reflected glare and can be caused by every day, bright sunlight conditions. Discomforting glare occurs in varying degrees of intensity, but even the milder degrees of discomforting glare result in visual discomfort, often shown by symptoms of eyestrain or fatigue. Depending upon one's light sensitivity, this glare can also be discomforting regardless of weather or time of day. The unprotected eye will respond to discomforting glare by squinting and constriction of the pupil. It is common for the affected individual to try to avoid the glare by shielding the eyes or turning another direction.
3. **Disabling glare** – Disabling glare, also known as veiling glare, is more intense than discomforting glare and the high level of light produces a glare that can actually interfere with or block vision. This type of glare comes from excessive, intense light that can occur when you face directly into the sun. Disabling glare causes objects to appear to have lower contrast than they would if there no glare. Disabling glare occurs because light scatters when it enters the eye, which, in turn, reduces the sharpness of vision and raises the differential light threshold. Disabling glare tends to become more problematic in the elderly, as the decreasing transparency of the crystalline lens that comes with age leads to developing cataract formation.
4. **Blinding glare** – Blinding glare results from light reflecting off of smooth, shiny surfaces such as water, sand or snow. It can be strong enough to block vision. When the light reflects of the surfaces, it becomes polarized and produces blinding glare.

Blinding glare can block vision to the extent that the wearer becomes visually compromised.

Glare tends to be worse with older age, light coloured eyes, prior eye surgery, and certain eye conditions, including cataracts, dry eye and macular degeneration.

CAUSES OF GLARE

1. When there is an excessive contrast between the dark areas and bright areas in the direction of viewing, then glare can result. Simply, when there is too much light hitting the surface, this phenomenon will cause glare.
2. Glare is directly linked to the quantity and distribution of light. This means even if people are inside a building where there is a balanced level of light distribution, they won't be able to appreciate this if there is direct glare from an outdoor source.
3. Glare can be caused by a direct view of the bright sky from the interior of a building. This glare can be an impediment to vision and even a direct hazard, as on a stairway, or it can cause serious or mild discomfort.
4. It's not just visual comfort that glare can impact, there are links between glare perception and thermal comfort. In some cases, glare can be used to naturally heat up a space, but there can be a risk of overheating if the air temperature is already warm or the glare is too intense for a long period of time.
5. Glare is experienced, when Lamps, Windows, Luminaries, other areas are brighter than general brightness in the environment.
6. Glare is the common fault of lighting installations.
7. Glare can happen both during the day and at night. Examples of where glare can occur include moving from a shaded location into bright sunlight, and the reflection of light from a surface that is shiny and highly reflective.
8. Blinding glare can be described as the glare that is, for example, caused by staring directly into the sun. Meanwhile, reflected glare can be described as light reflecting off surfaces that are smooth and shiny, such as sand, snow, or water.
9. Discomfort glare is caused by situations such as spending prolonged time in a snowfield under bright sunlight. Discomfort glare can occur in any weather condition as well as at any time of the day.

10. Disability glare can be best described as being blinded by a light source such as the oncoming lights from a vehicle.
11. In addition to its direct form, glare has an indirect variety, which can also be a source of visual discomfort. Indirect glare results from high luminance reflections off of polished or glossy surfaces in the field of view.
12. Screen displays are a leading cause of indirect glare – or reflected glare.
13. Glare is caused by natural sunlight streaming in through a window.
14. Reflected light from mirrors, shiny surface also causes glare.
15. Direct light rays from a light bulb or a spotlight is one of the reasons for causing glare in a space.

PREVENTION OF GLARE

Whether designing lighting or daylighting, the principal objective is to ensure that there is the right amount of light with appropriate limits to glare. Because glare is physiological and can cause intense physical response, there are occasions when glare is wanted, such as scanning a concert audience with a spotlight to heighten the excitement. In architecture, glare is desirable when a designer wants to cause extreme contrast that exhilarates the visual experience. But for most architectural lighting and daylighting, effective methods of glare control and prevention are essential to good lighting practices.

STRATEGIES TO ELIMINATE GLARE

Strategies commonly employed to reduce unwanted levels of glare include:

1. Indirect lighting that throws more light upward than downward, diffusing the light and reducing glare on computer screens
2. Parabolic louvers, special lenses or other diffusing media on fixtures that diffuse the fixture's light output
3. In an office, it may be possible to de-emphasize the ambient lighting system with reduced light output and diffusing media, while providing adjustable task fixtures at workstations
4. Relocating the light source

5. Relocating the task or changing its orientation until the glare is removed
6. Changing the surface reflectance of the task
7. Use blinds or shades on windows to control the amount or transmittance angle of sunlight entering the space.
8. Filter and diffuse light – Direct light causes the most glare. Diffuse light with lampshades and use curtains on windows to reduce glare.
9. Work surfaces – Ensure work surfaces are dull instead of shiny as reflected light reflects more off shiny surfaces which results in indirect glare.
10. Wear polarized lenses
11. Anti-glare coatings
12. Adjust light level to necessary
13. Install adjustable light so workers can adjust the light level
14. Use automatic brightness on computers and phones
15. Desk arrangement – For example instead of having to face a window, adjust the desk perpendicular to the window to reduce glare.
16. Provide high levels of light within each spacing fixture to ensure that light is uniform throughout.
17. Provide a “transition zone” with medium-bright lighting in areas where residents must pass from a brightly lit space to a more dimly lit space.
18. Provide as much natural light as possible. If skylights are specified, they should be fitted with partially obscure glazing rather than clear glass or plastic to prevent glare effects.
19. Reduce the potential for direct and reflected glare wherever possible by specifying flat or satin floor and wall finishes rather than gloss or semi-gloss. Avoid shiny metals and metallic paints.
20. Position television sets and computer monitors away from light sources that produce reflected glare.

21. Provide multiple layers of light in spaces where appropriate with ambient light, task lights and a bit of accent lighting, as long as accents won't produce direct glare.
22. Use indirect lighting (e.g., cove-type fixtures, lighted valences, wall washers, floor lamps and torchieres) wherever possible to produce high levels of ambient light.
23. If wall sconces are used, the light source should be well shielded from direct view.
24. Task lights for reading, writing, sewing and the like should be positioned above and behind the individual wherever possible and offer light levels of varied brightness (such as with three-way bulbs). Be sure that task light sources are well shielded with opaque shades or louvers.
25. Avoid specifying light fixtures with bright lenses or shiny louvers.
26. Avoid fixtures with bare or exposed lightbulbs.

PREVENTION OF GLARE IN OUTDOOR LIGHTING SYSTEMS

Glare from outdoor lighting can be prevented by using fixtures with **an adequate beam shape,** and making sure they are **installed correctly.** A very useful metric when selecting outdoor fixtures is the BUG rating. When the concept is heard for the first time, one might incorrectly assume it is related with insects, but it is actually an acronym that describes light beam shape:

1. Backlight (B): How much light does the fixture emit behind itself?
2. Uplight (U): How much light does the fixture emit upward?
3. Glare (G): How much is the fixture shielded to prevent glare?

The BUG rating can range from 0 to 5, and an individual rating is assigned to each letter. The best possible score is B0 U0 G0, where all three effects are minimized, and the worst score is B5 U5 G5. In a parking area, for example, a poor BUG rating can result in plenty of light being projected towards drivers and neighbours.

PREVENTION OF GLARE IN INDOOR LIGHTING SYSTEMS

Glare issues with indoor lighting systems often occur when the lamps are directly visible. For example, glare is very likely when an office uses linear fluorescent strip lights instead of recessed fixtures. It can also occur in warehouses or industrial settings if you use high-bay fixtures without adequate shielding.

The same principles that help prevent glare outdoors apply for indoor installations: use lamps and fixtures with the correct beam shapes, and make sure they are installed correctly. Volumetric LED troffers are very effective in office settings, since their LED arrays and geometric features are optimized for a uniform lighting distribution that does not produce glare. These fixtures also offer a very high energy efficiency.

Keep in mind that the sun can also cause glare when directly visible through windows. This effect can be prevented with optimal window placement, using external shading where needed.

1. In the northern hemisphere, the north side of buildings gets the least direct sunshine throughout the year. North-facing windows should be used whenever possible to maximize indirect solar lighting without the glare effect.
2. East-facing windows get direct sunlight in the morning, and west-facing windows are affected in the afternoon. Windows with these orientations should be equipped with adequate shading, or avoided when possible.
3. South-facing windows get little direct sunshine in the summer because the sun is high in the sky. They are more exposed during the winter, when the sun’s path is at a lower altitude. With shading and adequate orientation, these windows can be used for natural lighting and free winter heating, while avoiding glare.

OPTICAL SOLUTIONS TO PREVENT GLARE

Several optical solutions exist that can help combat the effects of glare. One solution is an anti-reflective (AR) coating, which can be added to your prescription lenses and decreases reflected light and glare. Photochromic Transitions lenses, which adapt their level of tint based on how much UV is present, can also help reduce the effects of glare. Transitions lenses are also compatible with AR coatings, and perform even better when combined with

AR. Transitions lenses with an AR coating blocks distracting, discomforting and disabling glare. For additional protection against blinding or reflected glare, Transitions Vantage lenses with variable polarization are a good solution. In addition to Transitions Vantage lenses, polarized sunglasses can also be used to eliminate blinding glare or the light off of flat surfaces like wet roads, water, and ice and snow.

CONTROLLING TOO MUCH LIGHT

Too much light from an electric lamp is not common. The brightest lamp we are likely to use is a 1000W high-intensity discharge or, perhaps, a high-wattage xenon arc lamp. It is hard to imagine that anyone would use these lamps without proper enclosures, optics, and shielding.
On the other hand, direct sunlight is, for most practical purposes, too much light—indoors or out. Regardless of the eye's ability to adapt to brightness levels, one cannot look directly at the sun without risking retinal damage. The sun's brightness must be mitigated by some type of shading device. In humans and other mammals, the shape of eye socket and eyebrow provides shading during the brightest part of the day. At low solar angles, the pain of too much light causes physical aversion and one must turn away or shield his or her eyes. Outdoors, the use of sunglasses and billed hats is strongly recommended for both comfort and to prevent long-term damage to the eyes. For instance, those who wear glasses or contacts have fewer cataracts and other aging eye issues because of the ultraviolet protection of corrective lenses.

In buildings, too much natural light is almost always manageable. The simplest roof provides shade during the brightest period of the day. Without direct sunlight, the diffuse light of the lower sky near the horizon, in combination with reflected light from the ground plane and vertical surfaces, produces adequate light. However, in the early morning and late afternoon, direct sunlight does penetrate into the structure. Shading, therefore, is needed to control glare.

CONCLUSION

Good lighting design practice either diffuses the light to reduce the luminance or shields the source from view. The control of glare in electric lighting is generally called shielding. For natural light, however, the term shading is used. While technically they are almost the same thing, the slight difference in language is welcome to help differentiate between lighting and daylighting.

Types of Light Fixtures:

Chandeliers.

Suspended from the ceiling, chandeliers direct their light upward, typically over a table. They can **Ceiling.**
enhance the decorative style of a room. Chandeliers provide ambient lighting. This type of fixture is mounted directly to the ceiling and has a glass or plastic shade concealing the light bulb. Ceiling fixtures have been common in homes for nearly a hundred years, often providing all the ambient light in a room.

Wall Sconces.

Surface-mounted to the wall, sconces can direct light upwards or downwards, and their covers or shades can add a stylistic touch to a room. Wall sconces provide ambient or task lighting.

Desk, Floor & Table Lamps.

Made in a wide range of sizes and styles, lamps are extremely versatile and portable sources of light in a room. Most lamps direct light downward, with the exception of a torchiere, which is a floor lamp that directs its light upward. Lamps are often used as task lights, particularly for reading, but can also provide ambient light.

Lighting Design: Material Matters:

Lighting designers and architects pay close attention to what materials are incorporated into a lighting fixture, as well as how each material is used to help curate a specific look and feel. Different materials perform better than others when used for different design purposes, thanks to the way factors such as chemistry and workability affect light play, texture, suspension, weight distribution, and more.

These choices offer insight into what the manufacturer intended for the product, as well as clues into the craftsmanship and creative vision of the original designer. Learning a little bit about each type of material will give you a leg up when choosing a new light for your home. Common materials you should become familiar with include:

Glass:

Nina Pendant Light from Molto Luce

Before synthetic compounds, glass was your go-to transparent or semi-transparent material of choice for lamps, windows, vases, drinkware and pretty much everything else. Today, glass is primarily an aesthetic choice for lamps, one that allows designers to cleverly use variable textures, tones, and thickness to create light play and geometric intrigue.

Seemingly minuscule factors such as the edge thickness of a cylindrical diffuser can define its aesthetic tradition, whether that may be chunky and more modish or dainty and almost rococo in fashion. Glass can be perfectly clear for direct lamping, semi-opaque for a warm glowing light, or seeded to produce a dimpled lighting effect.

Metal

Lamella Pendant Lights from Molto Luce

Nearly every lamp you find on the market will include some metal components. Metal is a popular choice for pendant and wall mount framing because of its strength-to-weight ratio. Unlike some other materials, it will hold its form for years to come.

When metal becomes the central element in a lamp, a lot of wonderful looks can happen. Different metals are defined by a characteristic look and touch. Think of what you associate with the look of brass, and compare it with your thoughts about aluminum or wrought iron or copper.

Metal can be textured or smooth, natural or finished in a vibrant color, which makes it especially versatile. It can look like something from the blacksmith's shop or straight off the International Space Station. The smoothness in texture and form you can get with a cylindrical metal shade is unmatched for adding a futuristic feel to any mid-century lamp.

Cement

Soft Pendant Light and Soft Wall Sconce from Molto Luce

Human beings have been firing clay to make pots, tiles, and other household items since around 10,000 B.C. Cement in essence, is technology taking that cultural tendency into the new era. Since the earliest days of the 20th century, cement and steel have combined with glass to become the predominant urban building materials in most urban centres, which likely explains why it has such a strong modernist association today.

Cement has a weighty and organic look and usually comes complete with a more textured finish. It can create a brutalist effect, especially when used in sconces, or be more refined, using slow and smooth geometric flourishes that meld nicely with contemporary and transitional decor.

Fabric

Silence LED Pendant Light from Molto Luce

Another classic look, fabric adds texture along with light diffusion and shadow play for a look that is old school and sophisticated. Because different fabrics offer such a diverse range of colors and patterns, you can get a lot of different styles from fabric shades and accents. A pleated fabric shade is a classic Americana look unlike any other, whereas a looser burlap can give a rustic or even avant-garde feel to your decor. Depending on how it's used, another unexpectedly advantage of fabric is its ability to muffle sound.

Acrylic

Ice-Q Accent Light from Molto Luce

A relative newcomer to the world of lamps, acrylic components revolutionize the way lighting designers can create geometry and form. Acrylic is modern, precise, lightweight, and highly pliable, which is why it's popular for making everything from swooping arcs that walk on air to intricate statuary that, with metal or wood or marble, would take an artisan weeks to create. Acrylic comes in any shape, any size and any color. Quality acrylic offers a high modern look that appeals to many folks, although it can be too synthetic for some styles (especially when it's used to recreate natural looks, such as wood).

Knowing a little more about the materials a designer will use helps fill in the vision in ways you often can't glean from even the best photography. Each material has characteristics that make it appealing for different uses, and understanding how each performs can help you choose just the right look for your home.