

Light is made up of both visible light and invisible light, including ultraviolet and infrared light.

Both visible and invisible light can fade and damage light sensitive materials. Daylight and electric light sources produce visible and invisible light.

What common household light sources cause fading?

- Daylight
- Electric light
 - Incandescent
 - Tungsten halogen
 - Fluorescent

How can you control invisible light?

- Install special filters for lighting fixtures.
- Install special films for doors, windows, and skylights.
- Reduce exposure to light. Consider rearranging furniture and artwork from time to time.

What materials will fade in your home?

- Materials that can fade are called light sensitive, responsive, susceptible, or fragile.
- Paper-based materials fade quickest.
- Fabrics and leather fade quickly.
- Draperies without linings on sunlight-facing sides may fade quickly.
- Some dyes or colors fade quicker than others. For example, yellow may fade faster than black.

**WANT MORE INFORMATION?
PLEASE CONTACT YOUR LOCAL EXTENSION OFFICE:**



SOURCES:

Clover, C. (2008, June 20). The National Trust sees the eco light. *The Telegraph*. Retrieved from <http://www.telegraph.co.uk/earth/3345054/The-National-Trust-sees-the-eco-light.html>

Cuttle, C. (2007). *Light for art's sake: Lighting for artworks and museum displays* (1st ed.). Amsterdam; Boston: Butterworth-Heinemann.

Cuttle, C. (2008). *Lighting by Design* (2nd ed.). Amsterdam: Architectural Press.

Frequent Questions. (2007, December 4). *ENERGY STAR*. Retrieved from <http://www.energystar.gov>

Gordon, G. (2003). *Interior Lighting for Designers* (4th ed.). Hoboken, NJ: John Wiley & Sons, Inc.

Illuminating Engineering Society of North America. (2008). *Light and Design: A guide to designing quality lighting for people and buildings* [IES DG-18-08]. New York: Author.

Kadolph, S. J., & Langford, A. (2001). *Textiles* (9th ed.). Alexandria, VA: Prentice Hall.

Karlen, M., & Benya, J. (2004). *Lighting Design Basics*. Columbus, OH: John Wiley & Sons, Inc.

McCormick, M. (n.d.). Technical Briefs. *The Exhibition Alliance*. Retrieved from <http://www.exhibitionalliance.org/learn/technical-briefs/>

Miller, J. V., & Miller, R. E. (n.d.). Books and Papers -- Museum Lighting - Pure and Simple. *NoUVIR Lighting*. Retrieved from <http://www.nouvir.com/index.cfm?ref=16100>

Saco Museum Receives two Prestigious Conservation Grants. (2009, March 3). *Dyer Library and Saco Museum -- News*. Retrieved from http://www.sacomuseum.org/lib_news_temp.shtml?id=EkVVpkIVyESBHasEPR

Patkus, B. L. (n.d.). Preservation Leaflets - Protection from Light Damage. *Northeast Document Conservation Center*. Retrieved from http://www.nedcc.org/resources/leaflets/2The_Environment/04ProtectionFromLight.php

Rea, M. S. (2000). *The IESNA lighting handbook: reference & application* (9th ed.). New York, NY: Illuminating Engineering Society Of North America.

Tyson, P. (n.d.). NOVA: Saving the National Treasures- Fading Away. *PBS: Public Broadcasting Service*. Retrieved from <http://www.pbs.org/wgbh/nova/charters/fading.html>

Werthwein, P. (n.d.). WD Archives- Shedding new light on UV and fading. *Window & Door*. Retrieved from www.glass.org/ecart/pastarticles.php?id=304

Winchip, S. M. (2007). *Fundamentals of Lighting* (1st ed.). New York: Fairchild Publications, Inc.

Winchip, S. M. (2007). *Sustainable design for interior environments*. New York: Fairchild Books.

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Light & Fading

CHOOSE LIGHTING
TO LIMIT FADING
IN YOUR HOME.



you
can
make choices to
reduce fading!

When thinking of lighting to limit fading, **consider...**

Daylight:

- Fading caused by daylight can be reduced by filtering skylights and using window coverings. When replacing windows, consider purchasing low-E glass. Low-E glass will help reduce fading and save energy.

Cost:

- Energy costs vary across light bulbs. Look at the package to see how much energy the bulb uses.
- Some bulbs use more energy than others. For example, for the same amount of light produced, incandescent bulbs use more energy than the new light emitting diodes (LEDs).

**Turn off lights when not in use
to lower electric light levels,
save money, save energy...
and reduce fading!**

Remember:

- Lower wattage lights help reduce fading. Look for bulbs that use 15 watts or less.
- Lighting fixtures, locations, and controls can be used together to help reduce fading. Think about shielding fixtures, using indirect lighting, and turning lights on only when needed to help reduce fading.
- Don't rely on dimming light sources to reduce fading. Dimming incandescent bulbs "shifts" visible light to infrared, which will cause fading. Reduce fading by using lower wattage bulbs instead of dimming higher wattage bulbs.
- Consider using motion sensors to help control lighting, reduce fading, and save energy.

Other info:

- When selecting bulbs, check the package to find the color of light that is right for you!

Fading effects add up over time. Damage due to fading is irreversible.

- If you want to be absolutely sure that your light sensitive items will not fade at all, you must keep them completely in the dark at all times.
- **Try this!** Instead of keeping your light sensitive photographs, fabrics, and artwork in the dark, try rotating them in and out of the light from time to time. Retail stores and museums rotate items to reduce fading.

Important Information

*What causes fading from light sources:
Visible Light and Invisible Light
(ultraviolet and infrared).*



DAYLIGHT: Natural light entering your home through windows, glass doors and skylights contains ultraviolet light, which may fade materials.



ELECTRIC LIGHT: Some light sources produce ultraviolet light, which may fade materials. Fading increases with more visible light.

Tools to reduce fading:

Specialty ultraviolet or infrared filters may help reduce fading. These filters may be used to protect very valuable pieces. These products are typically special ordered.