
Ten Design Principles for Daylighting Schools

Good daylighting design should contribute to a comfortable, productive, healthy, environmentally responsive, and cost-effective school. Designers can improve the likelihood of meeting the goals described on pages 6-9 by following ten design principles:

1. Configure the room so that the floor area occupied by people is within “daylight zones.” A typical daylight zone is about 15 feet (ft) from the window wall or the entire top floor of a school that is below skylights.
2. Elongate the wings of the school on an east-west axis to avoid glare and excessive solar heat gain.
3. Bring the light in high. Windows high on the wall will allow the light to penetrate further into the space.
4. Use skylights and roof monitors to daylight areas without easy access to windows.
5. Let daylight in from more than one side of the room when possible.
6. Provide views where appropriate, but diffuse or block direct sun.
7. Use light-colored interior surfaces to reduce luminance contrast and improve coverage.
8. Control first costs by avoiding excessive glazing areas and oversized cooling systems.
9. Create a daylighting culture in the school. Educate teachers and students to open blinds and turn off electric lights when daylight is sufficient.
10. Dim or switch off electric lights when there is sufficient daylight.

Patterns to Daylight Schools for People and Sustainability

Turn Off the Lights

Daylight is a key component of a comfortable school that supports human activity and health. However, to save energy, reduce building peak electric demand, and reduce power plant emissions that contribute to acid rain, air pollution, and global warming, electric lights must be dimmed or turned off when sufficient daylight is available. Critical decisions for saving lighting energy come during the design, specification, and commissioning of the electric lighting control systems.

Controls are the key to energy savings when daylighting. Expensive controls are not always more effective than simple ones. Stickers on the switches that remind occupants to turn off lights, coupled with encouragement from teachers and administrators, may

be more cost-effective than automatic daylight control systems. Manual switching or dimming strategies must include readily accessible switches or dimmers for the lighting within the perimeter zone. The row of luminaires closest to the window walls should be controlled separately so that this row may be switched or dimmed when there is sufficient daylight and luminaires deeper in the space can remain on. Multi-lamp luminaires can be tandem-wired with adjacent luminaires and configured to allow users to switch off all, none, or some portion of the lamps within the row of luminaires. This “step dimming” avoids the higher cost of dimming ballasts (currently at least 50% higher than on/off ballasts) and can be controlled either manually or automatically in response to daylight.