

DAYLIGHTING INITIATIVE

DAYLIGHTING AND PRODUCTIVITY

Pacific Gas and Electric Company sponsored the Daylighting and Productivity Study, conducted by the Hescong Mahone Group, as part of The Daylighting Initiative under its Third Party Market Transformation Program. Pacific Gas and Electric Company's Daylighting Initiative promotes the use of daylighting in the design and operation of institutional and commercial buildings through design tools, research, technical information, classes and events.

Prior to this study, the relationship between daylighted buildings and occupant productivity had not been rigorously documented. The Daylighting and Productivity Study examined the correlation between occupant productivity and exposure to daylight within retail and school buildings. **The study demonstrates increased retail sales (average 40%) and better school test performance (typically 10-20%) when occupants are exposed to daylight.** This indicates a clear direction for our future building investments. Daylight design, when done with care, is the single most powerful strategy to reduce energy use in commercial and institutional buildings (from 30-60% reduction). Daylight has now been shown to increase productivity as well. The combined assets of daylighted buildings will help to remove market barriers to using daylight in commercial and institutional building design.

DAYLIGHTING IN SCHOOLS: This study examined student performance data from three elementary school districts-one each in California, Washington and Colorado. The three districts have different curricula and teaching styles, different school building designs and very different climates. In spite of these differences, the results of the studies showed consistently positive and highly significant effects on student performance from daylight.

School test results were analyzed from three districts: Capistrano in California, Fort Collins in Colorado and Seattle, Washington. In Capistrano, students in daylighted classrooms progressed 20% faster on math tests and 26% on reading tests than in classrooms with no daylight. Similarly, students with the largest window areas were found to progress 15% faster in math and 23 % faster in reading. In Seattle and Fort Collins, students in the classrooms with the most daylighting were found to have 7% to 18% higher scores than those with the least.

SKYLIGHTING AND RETAIL SALES: This study considers the impact of skylighting on retail sales. Sales performance data from 108 stores operated by a chain retailer were analyzed. The design and operation of the stores was nearly identical, with the exception that two-thirds of the stores had skylights and one-third did not. Skylights were found to be positively and significantly correlated to higher sales. The addition of skylights boosted sales by close to 40%.

Retail sales analysis included data from 108 stores, two thirds with skylighting. The study found that skylights significantly correlate to higher sales, with 99% statistical certainty. A skylit store would be likely to have an average of 40% higher sales than similar stores without skylights, with an expected range of increase between 31-49%. Thus, if a typical non-skylit store were averaging sales of \$2/sf, an increase in sales to \$2.61-\$2.98/sf could be expected with the addition of a skylighting system.