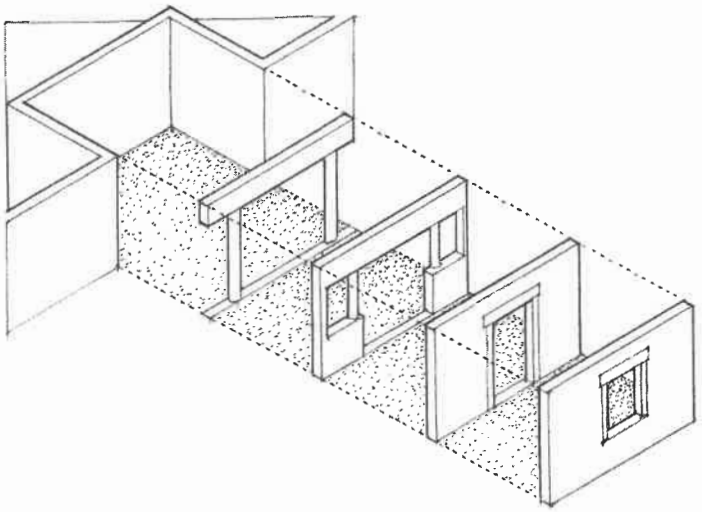
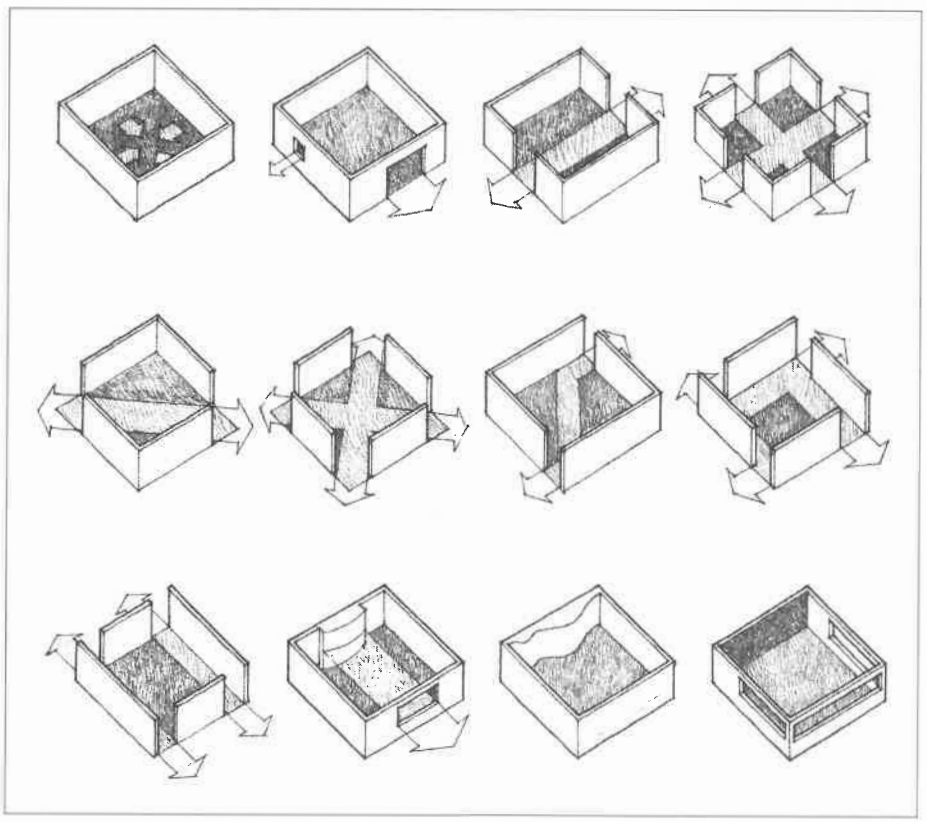


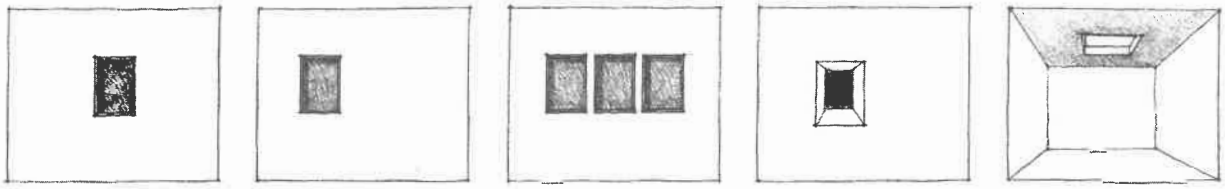
CHING, Francis DK. ARCHITECTURE: Form Space and Order, John Wiley and Sons, Inc, New York: 1996

No spatial or visual continuity is possible with adjacent spaces without openings in the enclosing planes of a spatial field. Doors offer entry into a room and determine the patterns of movement and use within it. Windows allow light to penetrate the space and illuminate the surfaces of a room, offer views from the room to the exterior, establish visual relationships between the room and adjacent spaces, and provide for the natural ventilation of the space.

While these openings provide continuity with adjacent spaces, they can, depending on their size, number, and location, begin to weaken the enclosure of the space. These openings also affect the orientation and flow of the space, its quality of light, its outlook and views, and the pattern of use and movement within it.

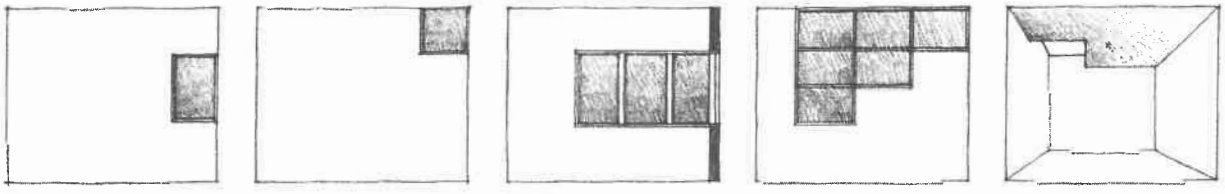
The following section of this chapter focuses on enclosed spaces at the scale of a room, where the nature of the openings within the room's enclosure is a major factor in determining the quality of its space.





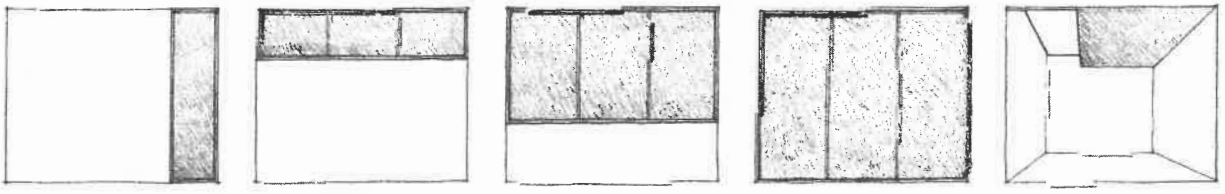
Centered | Off-Center | Grouped | Deep-set | Skylight

Within Planes An opening can be located wholly within a wall or ceiling plane and be surrounded on all sides by the surface of the plane.



Along one edge | Along two edges | Turning a corner | Grouped | Skylight

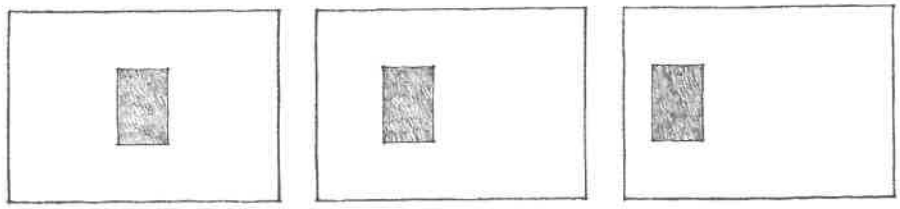
At Corners An opening can be located along one edge or at a corner of a wall or ceiling plane. In either case, the opening will be at a corner of a space.



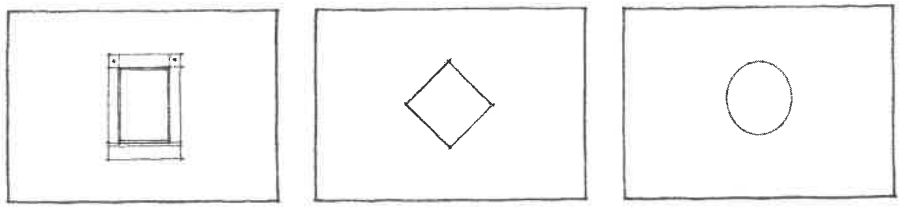
Vertical | Horizontal | 3/4 Opening | Window-wall | Skylight

Between Planes An opening can extend vertically between the floor and ceiling planes or horizontally between two wall planes. It can grow in size to occupy an entire wall of a space.

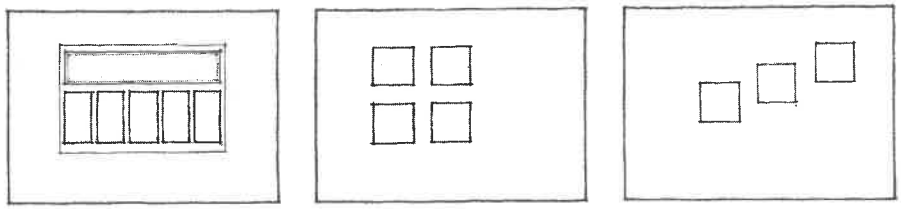
OPENINGS WITHIN PLANES



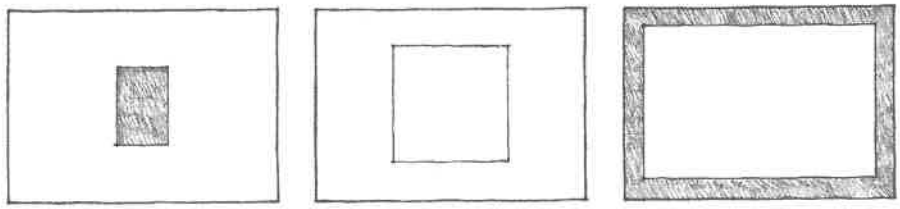
An opening located wholly within a wall or ceiling plane often appears as a bright figure on a contrasting field or background. If centered within the plane, the opening will appear stable and visually organize the surface around it. Moving the opening off-center will create a degree of visual tension between the opening and the edges of the plane toward which it is moved.



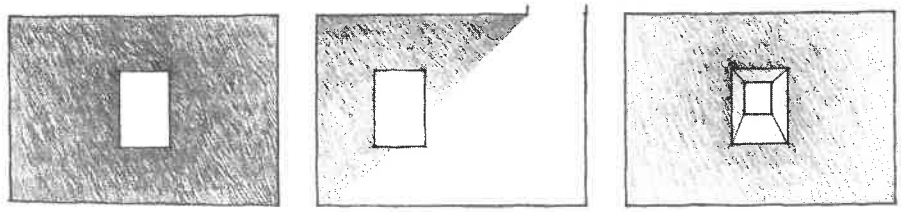
The shape of the opening, if similar to the shape of the plane in which it is located, will create a redundant compositional pattern. The shape or orientation of the opening may contrast with the enclosing plane to emphasize its individuality as a figure. The singularity of the opening may be visually reinforced with a heavy frame or articulated trimwork.



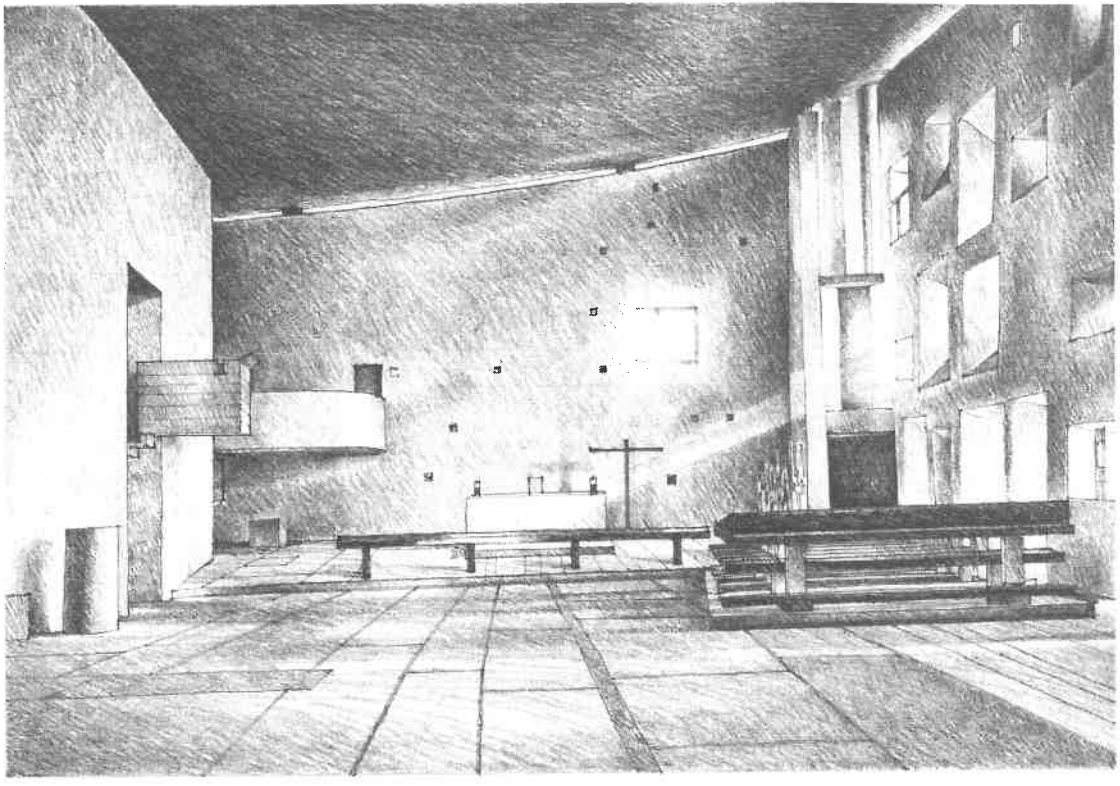
Multiple openings may be clustered to form a unified composition within a plane, or be staggered or dispersed to create visual movement along the surface of the plane.



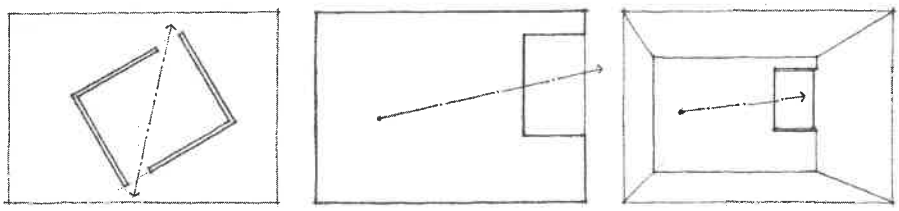
As an opening within a plane increases in size, it will at some point cease to be a figure within an enclosing field and become instead a positive element in itself, a transparent plane bounded by a heavy frame.

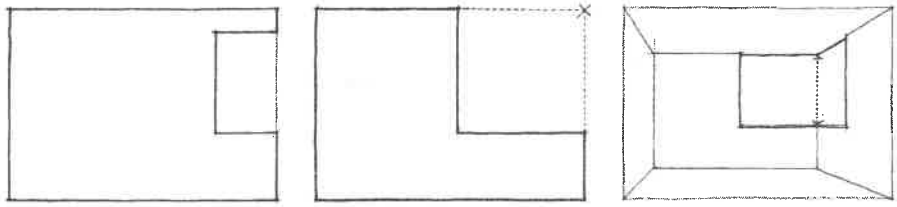


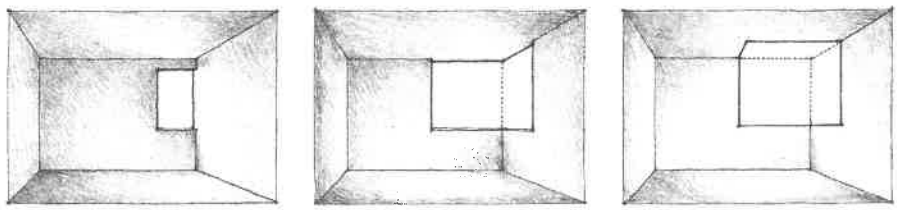
Openings within planes naturally appear brighter than their adjacent surfaces. If the contrast in brightness along the edges of the openings becomes excessive, the surfaces can be illuminated by a second light source from within the space, or a deep-set opening can be formed to create illuminated surfaces between the opening and the surrounding plane.

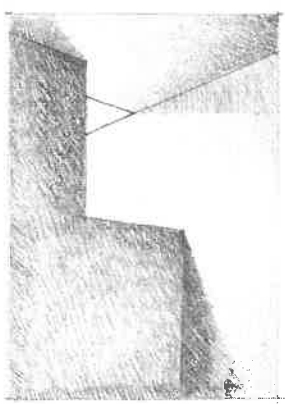


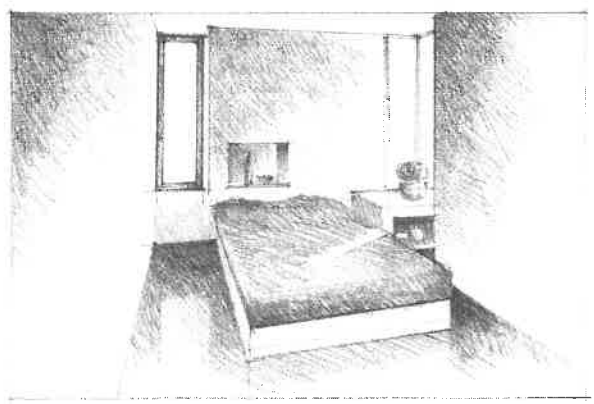
Chapel Space, Notre Dame Du Haut, Ronchamp, France, 1950–55, *Le Corbusier*

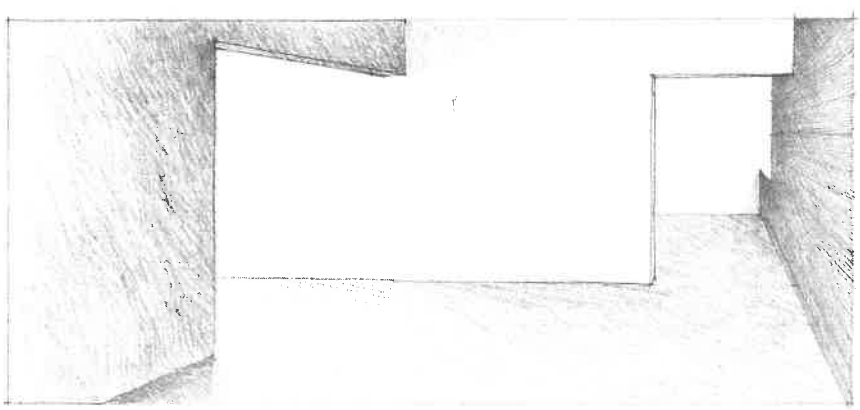










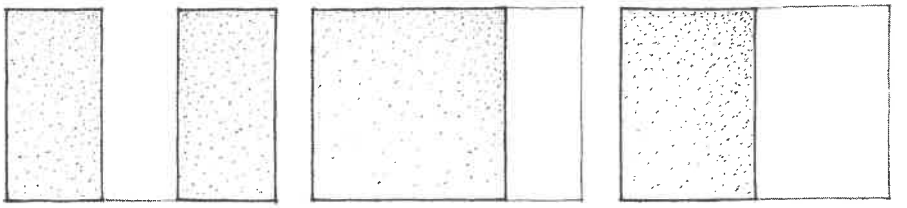


Openings that are located at corners give a space and the planes in which they are located a diagonal orientation. This directional effect may be desirable for compositional reasons, or the corner opening may be established to capture a desirable view or brighten a dark corner of a space.

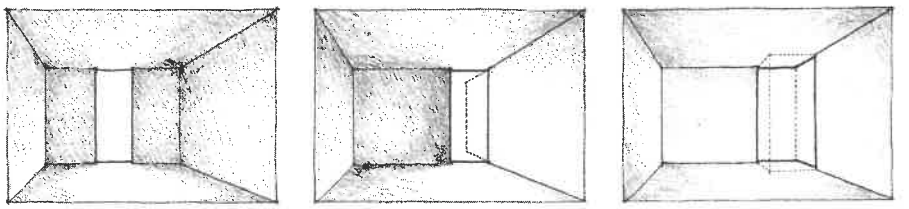
A corner opening visually erodes the edges of the plane in which it is located and articulates the edge of the plane adjacent and perpendicular to it. The larger the opening, the weaker will be the definition of the corner. If the opening were to turn the corner, the angle of the space would be implied rather than real and the spatial field would extend beyond its enclosing planes.

If openings are introduced between the enclosing planes at all four corners of a space, the individual identity of the planes will be reinforced and diagonal or pinwheel patterns of space, use, and movement will be encouraged.

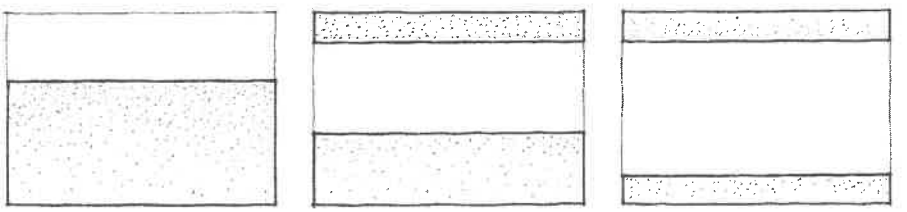
The light that enters a space through a corner opening washes the surface of the plane adjacent and perpendicular to the opening. This illuminated surface itself becomes a source of light and enhances the brightness of the space. The level of illumination can be enhanced further by turning the corner with the opening or adding a skylight above the opening.



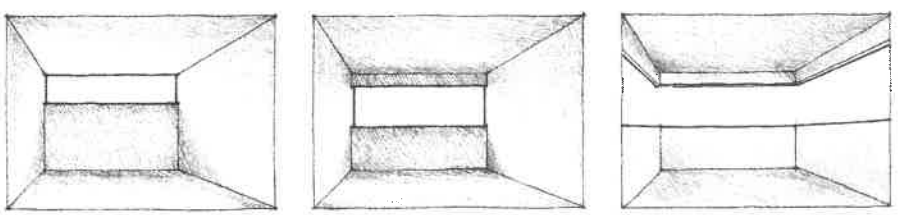
A vertical opening that extends from the floor to the ceiling plane of a space visually separates and articulates the edges of the adjacent wall planes.



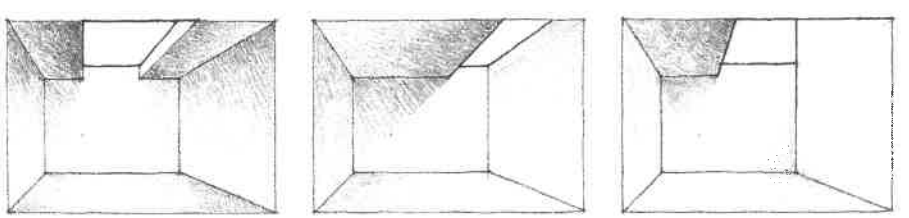
If located at a corner, the vertical opening will erode the definition of the space and allow it to extend beyond the corner to the adjacent space. It will also allow incoming light to wash the surface of the wall plane perpendicular to it and articulate the primacy of that plane in the space. If allowed to turn the corner, the vertical opening will further erode the definition of the space, allow it to interlock with adjacent spaces, and emphasize the individuality of the enclosing planes.



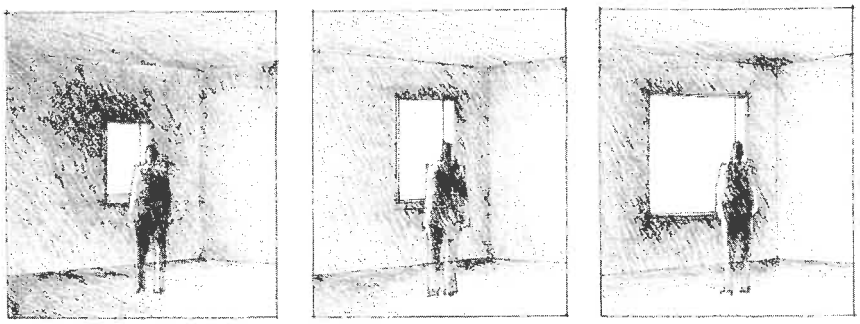
A horizontal opening that extends across a wall plane will separate it into a number of horizontal layers. If the opening is not very deep, it will not erode the integrity of the wall plane. If, however, its depth increases to the point where it is greater than the bands above and below it, then the opening will become a positive element bounded at its top and bottom by heavy frames.



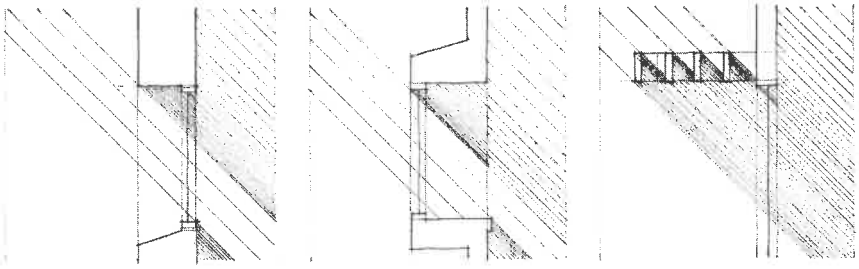
Turning a corner with a horizontal opening reinforces the horizontal layering of a space and broadens the panoramic view from within the space. If the opening continues around the space, it will visually lift the ceiling plane from the wall planes, isolate it, and give it a feeling of lightness.



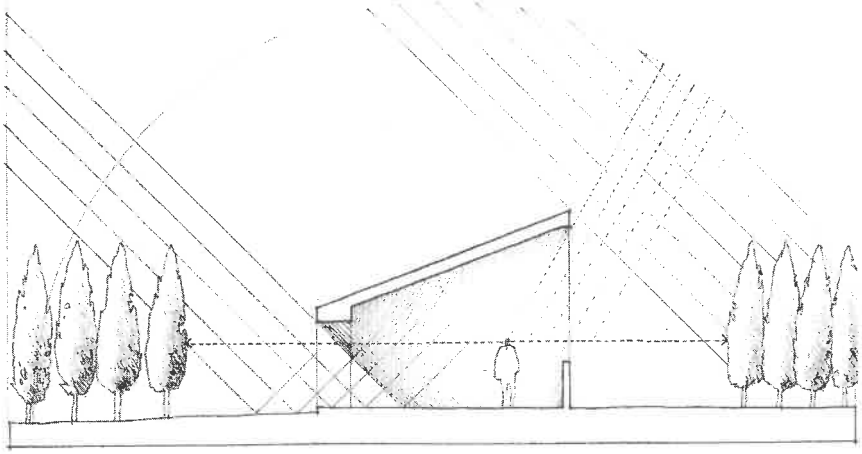
Locating a linear skylight along the edge where a wall and ceiling plane meet allows incoming light to wash the surface of the wall, illuminate it, and enhance the brightness of the space. The form of the skylight can be manipulated to capture direct sunlight, indirect daylight, or a combination of both.



The size of a window or skylight controls the amount of daylight a room receives. The size of an opening in a wall or roof plane, however, is also regulated by factors other than light, such as the materials and construction of the wall or roof plane; requirements for views, visual privacy, and ventilation; the desired degree of enclosure for the space; and the effect of openings on the exterior form of a building. The location and orientation of a window or skylight, therefore, can be more important than its size in determining the quality of daylight a room receives.

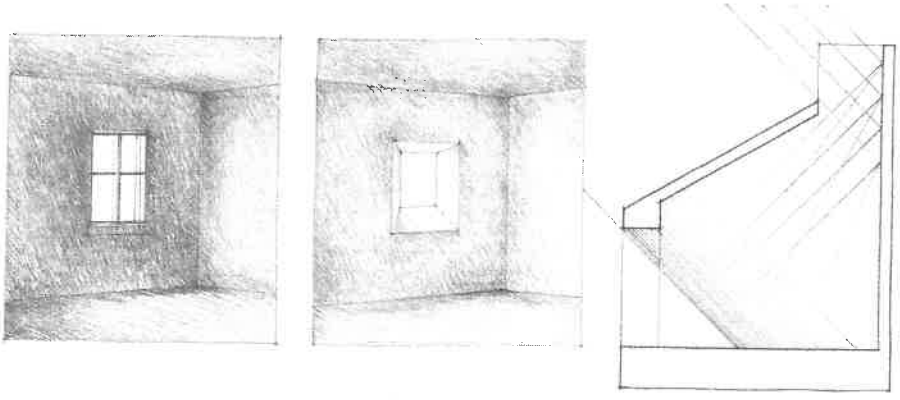


An opening can be oriented to receive direct sunlight during certain portions of the day. Direct sunlight provides a high degree of illumination that is especially intense during midday hours. It creates sharp patterns of light and dark on the surfaces of a room and crisply articulates the forms within the space. Possible detrimental effects of direct sunlight, such as glare and excessive heat gain, can be controlled by shading devices built into the form of the opening or provided by the foliage of nearby trees or adjacent structures.

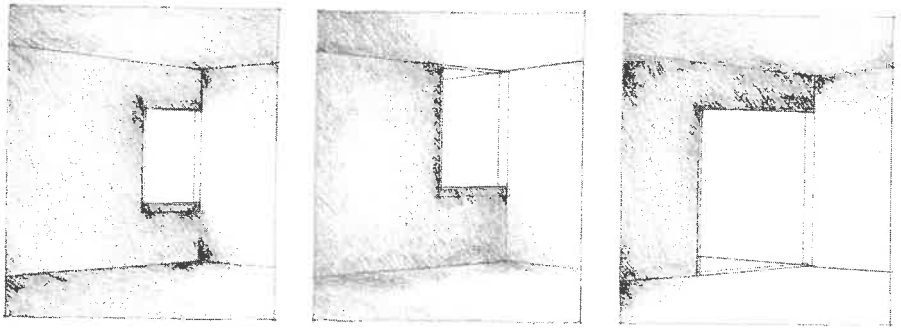


An opening can also be oriented away from direct sunlight and receive instead the diffuse, ambient light from the sky vault overhead. The sky vault is a beneficial source of daylight since it remains fairly constant, even on cloudy days, and can help to soften the harshness of direct sunlight and balance the light level within a space.

The location of an opening affects the manner in which natural light enters a room and illuminates its forms and surfaces. When located entirely within a wall plane, an opening can appear as a bright spot of light on a darker surface. This condition can induce glare if an excessive degree of contrast exists between the brightness of the opening and the darker surface surrounding it. The uncomfortable or debilitating glare caused by excessive brightness ratios between adjacent surfaces or areas in a room can be ameliorated by allowing daylight to enter the space from at least two directions.



When an opening is located along the edge of a wall or at the corner of a room, the daylight entering through it will wash the surface of the wall adjacent and perpendicular to the plane of the opening. This illuminated surface itself becomes a source of light and enhances the light level within the space.



Additional factors influence the quality of light within a room. The shape and articulation of an opening is reflected in the shadow pattern cast by sunlight on the forms and surfaces of the room. The color and texture of these forms and surfaces, in turn, affect their reflectivity and the ambient light level within the space.