

Keep on the Sunny Side, Even in Winter

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While winter's grip may have us thinking more about woolen sweaters and extra blankets than T-shirts and beach towels, the sun's power to warm us is evident even during many of the coldest days in February.

Radiated heat from the sun can be a significant source of warmth for our homes on those clear, sunny days of winter. There are a few simple solar principles and techniques to consider that can be extremely rewarding when designing a new living space and when considering your existing home.

The sun as we all know rises each morning on the eastern horizon and travels across the sky along a westward trajectory. It then sets each evening on the western horizon. In the summer the sun's path runs highest in the sky and hence is visible for a longer length of time each day, the longest period of sunlight each year being on the summer solstice, which is on June 21 this year. Conversely, in the winter the sun's path travels at a lower trajectory in the sky and is visible for shorter amounts of time each day. We experience the least amount of daylight on the winter solstice, which is Dec. 22. From December to June the sun's arc across the sky gradually increases, and from June to December this arc gradually lessens.

Ideally we want our homes to benefit from the sun's warmth when the weather is cold and minimize the sun's effects when the weather is hot. With the above principles in mind, we can add great value and comfort to our homes.

If we were to design the ultimate home, its optimal orientation would have the ridgeline of the roof running east/west. The most lived-in spaces where most windows are located, such as the kitchen, family room and eating areas, would face south. In the winter the sun's warmth would pour in through the windows, helping to heat the living areas; in the summer, with adequate roof overhangs, the sun would be shaded from the windows, keeping unwanted heat from entering the home. This optimal model can be difficult to achieve, but applying these principles can help guide one's decisions in finding good balances between real-world challenges and conceptual excellence.

Energy experts recommend fixed shading options such as awnings, overhangs or trellises, as well as adjustable elements, including window films, blinds and curtains, to reduce heat gain in the summer. Trees also provide an excellent natural source of shading. On the south side of home, a deciduous tree's leaves block the summer sun, while in the winter after its leaves have fallen, the sun passes through, warming one's home.

There are myriad ways to create a symbiotic relationship between the sun and your home.