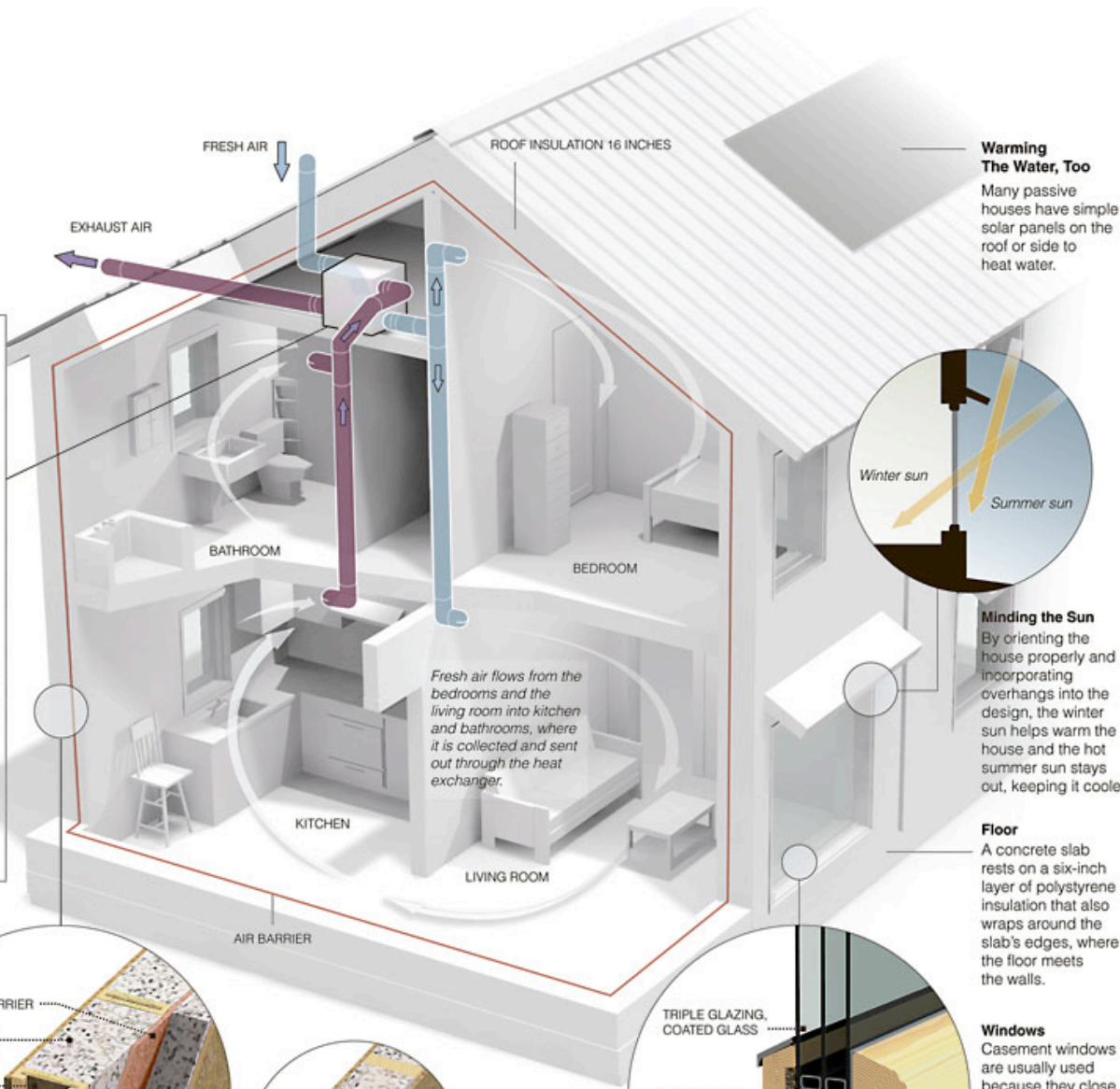
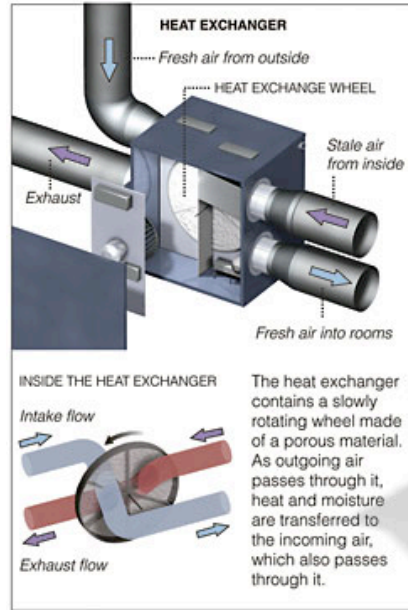


**At the Heart,  
A Heat Exchanger**

The most important element in keeping a passive house warm is the heat exchanger, which uses heat from inside air to warm fresh air from outside. Stale air is constantly being replaced with fresh air; about one-third of the house's air is replaced every hour.



**Warming  
The Water, Too**

Many passive houses have simple solar panels on the roof or side to heat water.

**Minding the Sun**

By orienting the house properly and incorporating overhangs into the design, the winter sun helps warm the house and the hot summer sun stays out, keeping it cooler.

**Floor**

A concrete slab rests on a six-inch layer of polystyrene insulation that also wraps around the slab's edges, where the floor meets the walls.

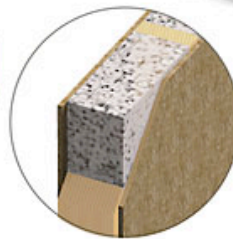
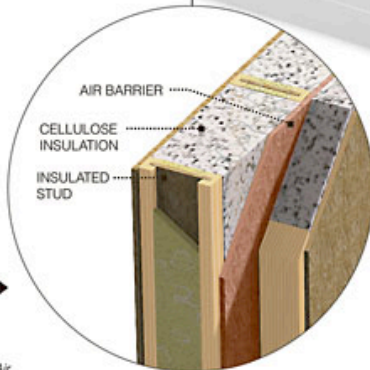
**Windows**

Casement windows are usually used because they close tighter than other types. Coated glass helps reflect heat back inside the house in winter and keeps some heat out in summer.

**Keeping the Heat In**

Exterior walls are two or three times thicker than those in a conventional house and are well insulated, with the amount of insulation varying by climate. A double-wall system is used, with a continuous air barrier between the two walls. Walls and studs are designed to minimize heat conductance.

PASSIVE HOUSE WALL, 12-INCH TOTAL INSULATION



For comparison:  
a conventional  
house wall  
6-INCH INSULATION

