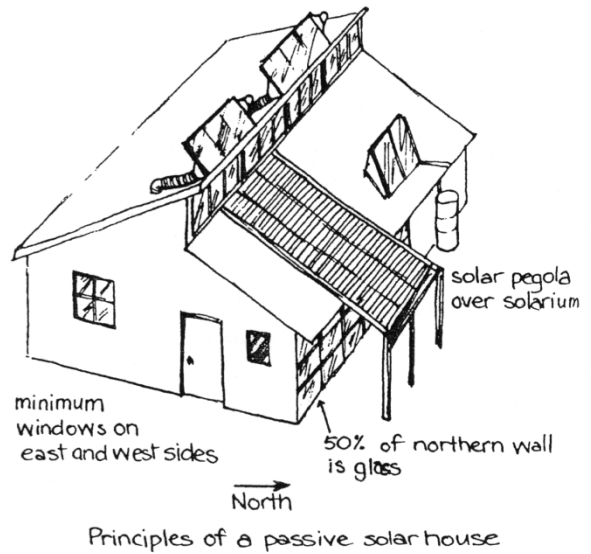


Passive Solar Home Design

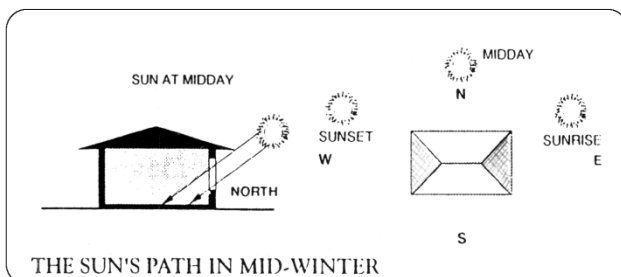
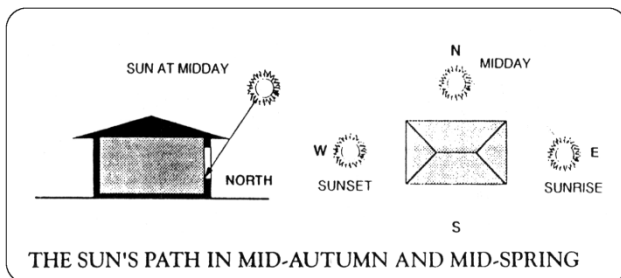
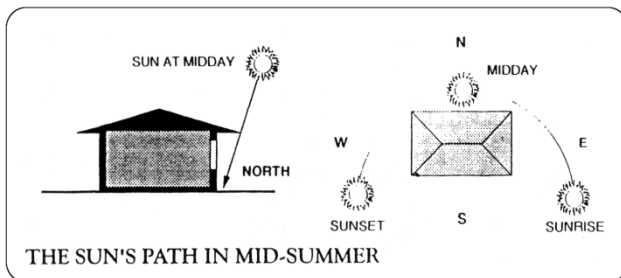
Passive solar design employs 5 key, yet simple, principals: orientation, glazing, thermal mass, insulation, and ventilation.

By *orienting* the house correctly we harvest the sun's energy in the colder months and exclude it in the hot months. *Glazing* (windows) allow for significant heat and light transfer and this can be both good and bad.

Incorporating *thermal mass* allows one to stabilize the internal temperature fluctuations when used correctly. *Insulation* is about reducing unwanted heat transfer. *Ventilation* helps to cool the house and provide better quality air.



The Sun's Yearly Path



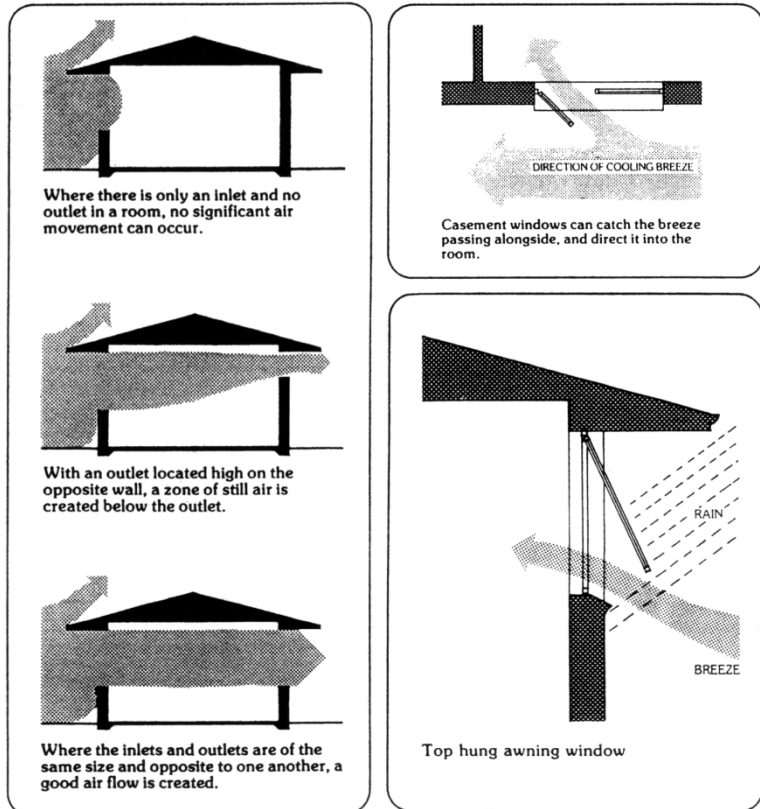
Australia receives about 600 watts per square metre in clear conditions on a horizontal surface at noon. With careful use of windows and thermal mass we can trap much of this heating energy.

Principles of Passive Solar Design

- **Orientation:** long axis east-west to provide maximum solar access in winter and minimum exposure in summer.
- **Glazing:** For Perth approximately 50% glazing to the north side (50% of available surface area) with minimal windows to the east/west. Windows on the east and west are particular hard to shade externally due to the sun's low position in the morning and afternoon.
- **Thermal Mass:** high thermal mass to smooth external temperatures and provide a more stable internal environment.

- **Insulation:** in ceilings and walls to minimize heat gain and loss. Window insulation is also important and can be improved with double/triple glazing and/or heavy curtains with box pelmets.
- **Ventilation:** cross-ventilation for cooling in summer and general indoor air quality.

Ventilation



There is lots of material available on this now mainstream permaculture principle. So we won't bother replicating anymore.

Your Home Technical Manual <http://www.yourhome.gov.au/technical/index.html>
(also available on CD-ROM or as a printed book)

The Alternative Technology Association (ATA) <http://www.ata.org.au/>
ATA provide a great magazine called ReNew with full back issues available online for members too.

http://www.energy.wa.gov.au/2/3414/64/energy_smart_homes.pm

The main news page is also a good source for information on WA related changes to home energy efficiency, solar power systems and the feed-in tariff scheme, etc...

If you wish to learn more about solar passive home design so you can design and plan your house and land layout as best possible for your site, we recommend you attend a permaculture design course. During this 72 hours course there is a detailed explanation of all the factors affecting each site and its associated design. Head to the PermacultureWest website to find courses and more information.