



Warm homes

To keep homes warm we need to insulate places where warm air can leak out by conduction, convection or radiation.

Homes are boxes full of air (Picture 1). To keep a home warm, we heat the air. As a result, we don't want to lose too much warm air. But at the same time, we need to let some air escape, or the air will become stale and unhealthy.

Walls

The walls of a house may be made of stone or wood, but most are made of brick.

Brick and stone conduct heat away quickly, so they may let some heat escape. Wood conducts less heat and so the walls feel warmer.

We don't want to lose more heat through the walls than we need to, so we want to build walls out of a good insulator. In most cases, insulating sheets are placed between the inner wall and the outer wall. This traps air and stops convection and conduction.

The inside of the insulation is lined with a thin sheet of aluminium. This reflects any heat radiated from the inner wall back into the home.

Roofs

Hot air rises and so the hottest part of any room is the air near the ceiling. For houses with several floors, the lower floors can be used as a kind of underfloor heating

for the rooms above. So we don't need insulation between the floors of a house. But the upper ceiling can lose a lot of heat to the roof, so this is where we need to put insulation. Most lofts are insulated with fibreglass or pellets of a foamy material.

Windows

Glass is not as good an insulator as brick, so much of the heat in a room can be lost through the windows. But if we can stop air from circulating past the window, we can reduce the loss quite a bit. **DOUBLE GLAZING** traps a layer of air between two panes of glass, giving an invisible insulating layer.

Doors

By opening and closing doors we automatically let in some fresh air and let some hot air get away. This is a good way to get fresh air into a house. The only time it is a problem is if there are **DRAUGHTS**, coming in under the door, for example, so that the air escapes too quickly.

Summary

- To keep heating bills as low as possible, homes need to be insulated.
- Walls and lofts are insulated with fibreglass, foam and other insulating materials.
- Windows can be insulated with double glazing.

▼ (Picture 1) How to keep a home warm.

