Science 14

Unit B: Energy transfer technologies

Insulation and thermal protection

Heat loss through a window

- A jacket traps air so body heat reaches the winter air more slowly.
- A single pane lets room heat reach the outdoors faster than a double pane.

Insulation and protection

- Insulation slows heat leaving a warm place, as a jacket traps air.
- Protective gear blocks a dangerous heat transfer, as a firefighter’s coat does.

Key terms

insulation

A material or gap that slows conduction, convection or radiation so heat transfer falls.

double glazing

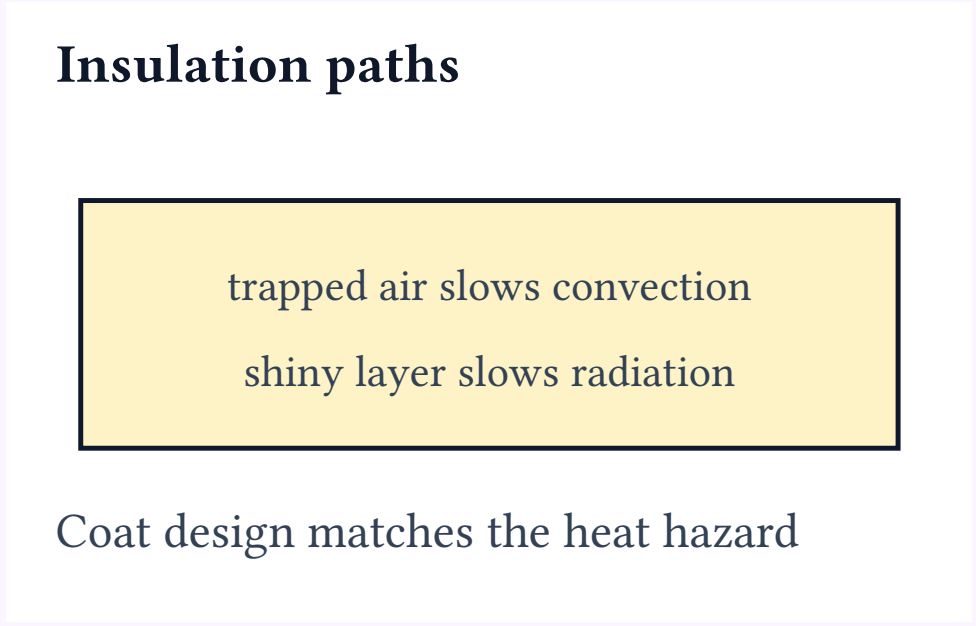
Two panes with a trapped gap, used so conduction and convection through a window slow down.

protective clothing

Gear that keeps a dangerous heat flow away from skin, such as a firefighter's layers.

Insulation and heat transfer paths

- Trapped air slows convection, and a shiny layer slows radiation.
- A firefighter's coat is built for extreme heat. A winter jacket is built for a cold walk.



Double glazing

- Two panes with a gap slow the heat leaving a room.
- The trapped air is the barrier in that gap.

A shiny layer

- A shiny layer sends radiation back.
- Trapped air slows the convection path.

Bottle test

- The bottle whose temperature rises slowest has the stronger insulator.
- Rank the materials from that temperature record.

Insulation test graph

- The slowest temperature rise marks the stronger insulator in your bottle test.
- House upgrades and safety gear are two uses of that ranking.