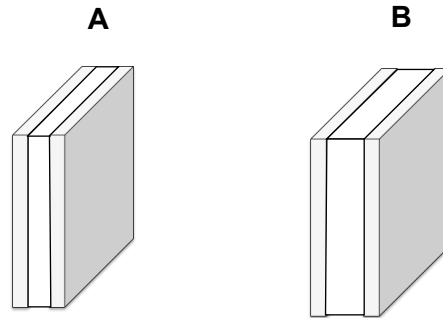


- 1 Cavity wall insulation is made of two layers and a gap filled with an insulating material.  
The diagram shows two designs of cavity wall insulation.



U-value  
1.6

U-value  
1.1

The U-value for each design is shown.

- 1 (a) (i) What is meant by the term U-value? [1 mark]

How effective or good a material is at keeping energy in or, the lower the U-value the lower the rate of heat transfer. [1]

- 1 (a) (ii) Explain which design is better for building the walls of a house. [3 marks]

Design B or U-value 1.1 [1]

(because) It has a lower U-value. [1]

It transfers less heat energy in or out of the building or it keeps the inside warmer. [1]

- 1 (a) (iii) The insulating material is injected between the walls in liquid form. It sets to make a solid with many air bubbles.

Why does the presence of many air bubbles improve the insulation of the material?

[2 marks]

Air is a good insulator or air is a poor conductor. [1]

(because) The particles are far apart. [1]

Convection is prevented or no convection. [1]

Air is trapped in the bubbles  
so no convection.

(Total 6 marks)

End