

Packing chocolates

Task: A chocolate manufacture produces bars shaped in a triangular prism of length 12 cm. The cross section of the bars is an equilateral triangle of side length 4 cm.



Design a net for the packaging of the individual bars.

The packaged bars are to be put into boxes that are $40 \times 40 \times 40 \text{ cm}^3$. Find the maximum number of bars that can be packed into each box.

1. Draw a diagram of the package for the chocolate. Show all the measurements for the dimensions of the package.
2. Design a net to produce the package. Take care to add flaps that will be needed to stick edges together.
3. To fit the packages in the box, think about layers. How many packages would cover the base of the box? Being triangular prisms, some packages could go upside down to fit neatly on the packages that are covering the base. All of these make up one layer. How many packages in one layer?
4. Work out the height of a layer. How many layers fit in the box?
5. Is there any spare space for more packages to fit in? Consider the layers and the spare space and calculate the total number of packages that can fit in a $40 \times 40 \times 40 \text{ cm}^3$ box.