

Emergency Shelters

You need

★ thin card ★ scissors ★ sticky tape ★ a calculator ★ a classmate

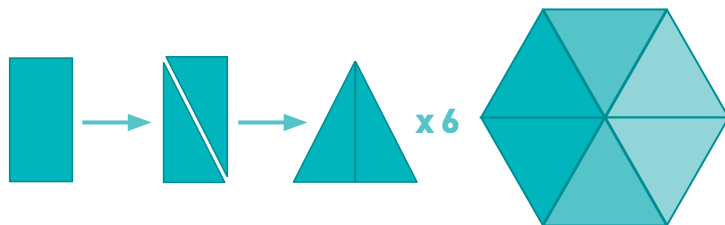
TECHNOLOGY

Shelter is a basic human need. Designers have created emergency shelters that are cost-effective to make and easy to put together.

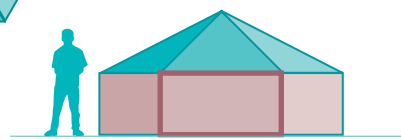
Activity One

Wiremu is researching shelters used after disasters such as floods and earthquakes. One example is the hexayurt.

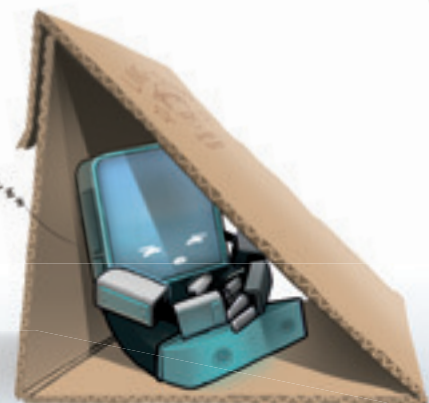
1. A hexayurt is made from rectangles with a length-to-width ratio of 2:1. The roof is made from 6 rectangles that are cut diagonally and rejoined side by side to form triangles.



The roof is placed on 6 rectangular walls that are arranged to form a hexagon.



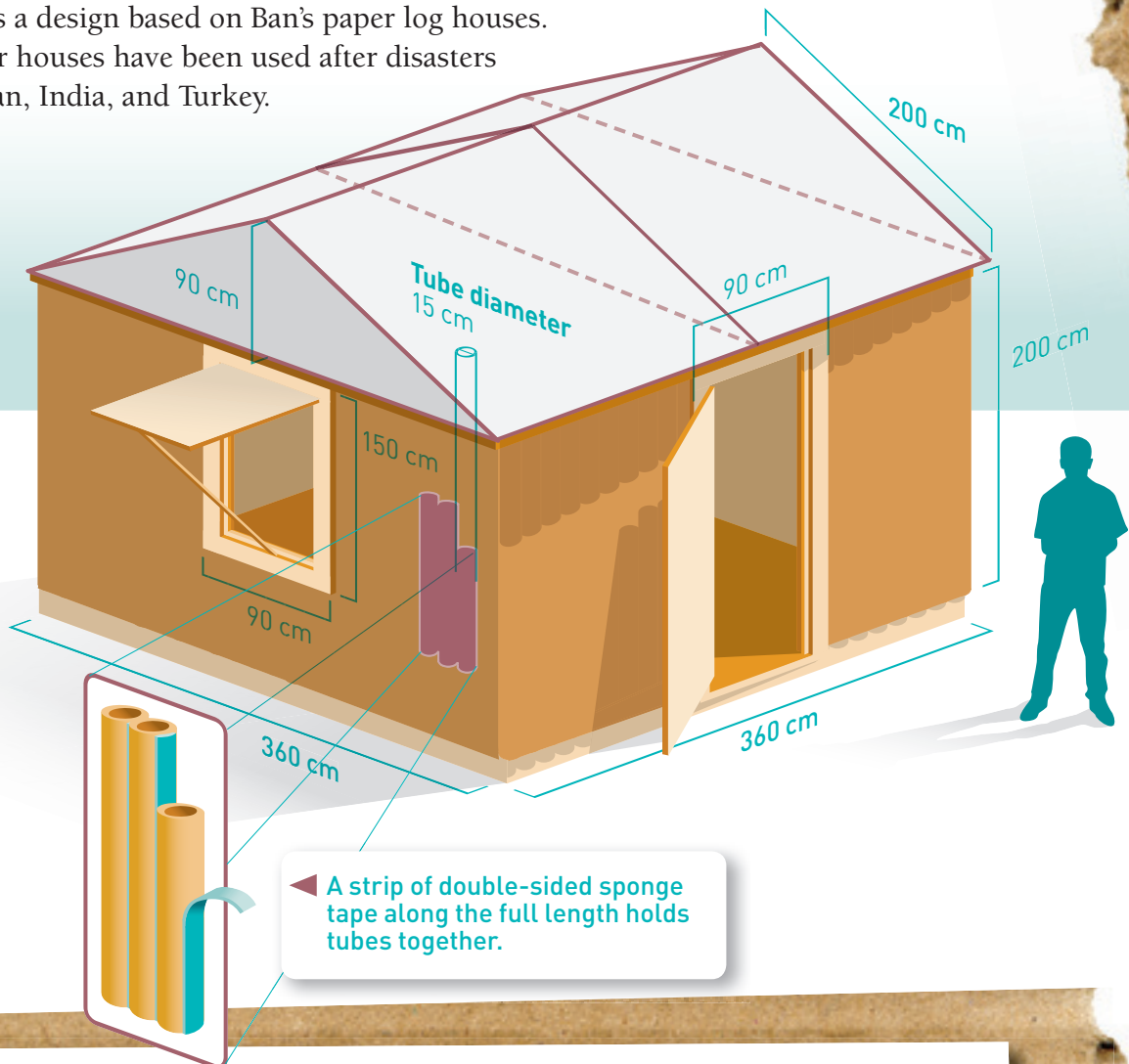
- a. Wiremu is making a model of a hexayurt from a single piece of card that is 20 centimetres (cm) by 30 cm. What should the dimensions of a hexayurt rectangle be so that no card is wasted?
 - b. Can any rectangle with an area of 600 cm^2 be cut up into exactly 12 hexayurt rectangles? Support your answer with examples.
2.
 - a. Make your own model of a hexayurt.
 - b. Use your model to estimate the height of a hexayurt with walls that are 1 metre (m) by 2 m.
 3. The hexayurt uses rectangles that are twice as long as they are wide. Could you make a hexayurt from rectangles that are four times as long as they are wide? Use drawings to support your answer.
 4. The hexayurt design can be adapted in various ways. Design an extended hexayurt that could be used as a meeting place.



Activity Two

Shigeru Ban is an architect from Japan. He is famous for designing emergency shelters made from “logs” of recycled paper. These buildings are a cost-effective way to provide shelter after a disaster.

Here is a design based on Ban’s paper log houses. Similar houses have been used after disasters in Japan, India, and Turkey.



1. With a classmate, use the information in the diagram above to work out:
 - a. the number of 2 m tubes needed to make the shelter walls
 - b. how much double-sided tape is needed
 - c. the length of tubing (in metres) needed to make the frame for the roof
 - d. the area of plastic (in square metres) needed to cover the roof.
2.
 - a. How many paper log houses this size would fit in your classroom?

When similar houses were used after the 1995 Kobe earthquake in Japan, they were spaced 1.8 m apart.

- b. How could you estimate the number of paper log houses that would fit on your school field?
- c. Carry out an investigation and make a sensible estimate.

Focus

Exploring area and interpreting diagrams