

Pack a box

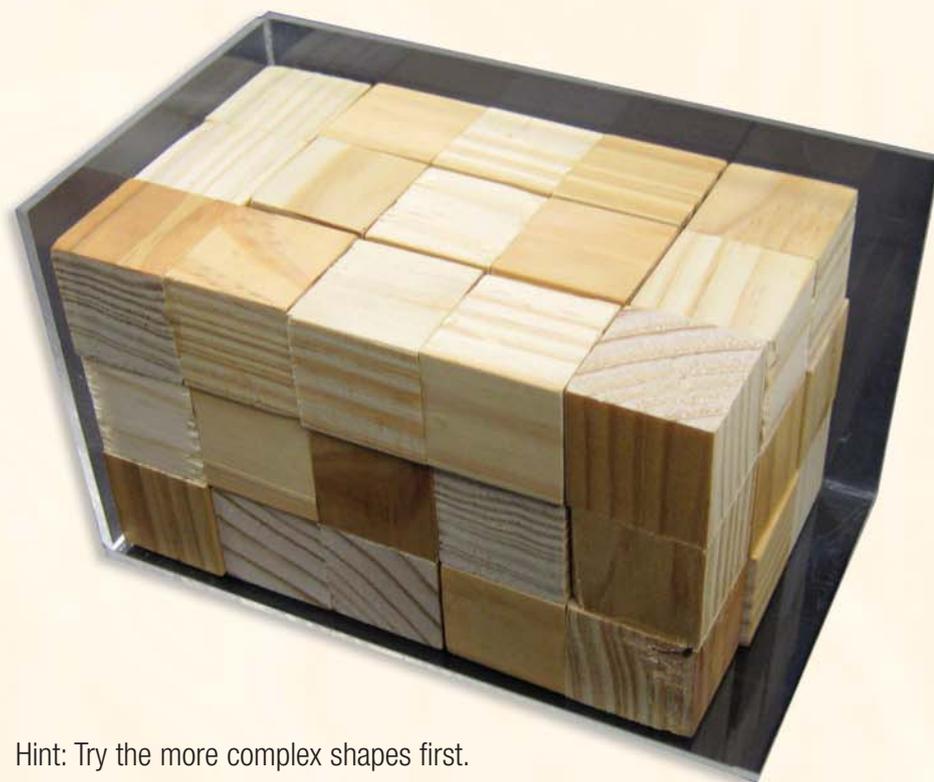
Goal: to practise arranging, manipulating and stacking 3D shapes into a box

You need

- > plastic box shape or frame*
- > 14 wooden shapes
- > 1 or more participants

What to do

Pack **ALL** the wooden shapes into the box so they fit within the box and there are no gaps between blocks.



Hint: Try the more complex shapes first.

* The plastic frame is not necessary to complete this task.
Just build the shape so it is 3 x 3 x 5 like the one above!

Where the task came from

Sometimes it is necessary to pack food items into boxes, eskies or freezers to transport them long distances or keep them for long periods of time.

Food and other items can be bought in a major town or city, packed into boxes and eskies in a car, and taken home. They are then unpacked and repacked into freezers, fridges and cupboards.

The numeracies include...

- > using spatial manipulation skills to make efficient use of storage space
- > using trial and error.

The mathematics include...

- > analysing and understanding the uses and purposes of flips (reflection), slides (translations) and rotations to explore geometric relationships and alternative preferred possibilities in the physical world.

Curriculum framework key ideas

- > understanding and appreciating the extent to which shape and structure help make sense of world
- > exploring and analysing features in the immediate and extended environment in geometric terms. Learners compare perspectives of spatial sense and geometric reasoning to understand different human interactions with the environment
- > exploring and communicating the ideas and language of geometric change and transformation. Learners use combinations of mathematical transformations
- > refining concepts of measurable attributes and units of comparison. Learners choose the most appropriate attributes and units to quantify 3 dimensional (3D) solids for a wide variety of purposes, and are able to justify their choices to others
- > understanding attributes, units and systems of measurement, and recognising transferability between these and other contexts

Educator options

- > Monitor and assess to inform future practice:
 - what questions are the learners asking?
eg 'Will this fit here?' 'Is this going to work?' 'How long is this going to take?'
 - what do you hear the learners talking about?
eg different ways to arrange blocks; mathematical language; starting the task again
 - what strategies are the learners using?
eg which shapes do they start with; where do they start from (corner, centre); putting shapes together and then placing in a box.
- > Use measurement to look at volume, capacity and size.
- > Use the task to explore the terms 'flip', 'rotate', 'transform', 'turn'.
- > Time how long it takes to assemble shapes.
- > Discuss, trial and improve strategies.
- > Discuss the mathematical terms.
- > Identify strategies used by the learners.

Learner options

- > Count the number of cubes on each layer.
- > Use volume – height x width x breadth.
- > Pack other storage containers.
- > Talk about the mathematical language you use. Can this language be used in other contexts or situations? Are there other words that have the same meaning?
- > Think about your strategies – what was the best way to pack the box?
- > Which shapes are easiest to stack?



Link to CD: Family organisation
> Storing food