



Building Towers

NRICH

Exploring 3D shapes



Children enjoy stacking 3D shapes

Adults could use this context to encourage children to manipulate 3D shapes and develop an awareness of the properties of 3D shapes

The Activity

Provide children with a selection of wooden blocks of various shapes. Talk about experiences of building and stacking. Encourage children to feel the surfaces of the blocks, finding and selecting flat surfaces on

Encouraging Mathematical thinking and reasoning.

Describing

Which block are you going to put on top of your tower?
Which is the tallest block in your tower?

Recording

Let's make a picture of your tower.
You could print a picture with blocks dipped in paint.

Reasoning

How could you make your tower taller?
I wonder if we could stack two shapes like this on top of each other?
Which blocks would you use to make a very big castle?

Opening out

Can you balance this flat block on these three cones?
Can you do it if the cones are in a straight line?
Can you do it if you squash the cones together?
Can you build a crooked tower?

Resources

All the blocks both hollow and solid that you can find, including regular shapes and odd ones.

The Mathematical Journey

Exploring the properties of the blocks::

- Describing the shape of different block using simple language; flat, sharp, slopey, pointy, like a brick, arch, box, roof etc.
- Explore and describe shapes as children handle the blocks, turning them and looking at the various faces. Encourage children to examine the blocks and to turn them in their hands. Some shapes, such as cylinders, will stack in one orientation but not another.
- During tower constructions children explore and observe as they handle the blocks and experiment with ideas. Encourage children to compare experiences of building towers in which the faces on the sides of the tower are 'higgledy -piggledy' or are well aligned. Develop understandings of balance as you ask 'Which falls down more easily?'.
- Some shapes, such as cones and pyramids are usually used by children to decorate the tops of towers. Activities such as placing a cone in the middle of a cuboid show an intuitive understanding of measure.
- Complicated building such as castles often show an understanding of symmetry. Older children often develop this as they stack two towers at once, building with both hands.
- And of course as children build, they will develop imaginative stories around their constructions. Listen for children using their own words to describe blocks and watch for blocks being chosen for purposes on the basis of their shape. A triangular prism, for example, may be used as a roof, a tent or a slide.

And more ways into the same mathematics and other resources that may be used.

Other activities that complement this one could be:

- Stacking box-modeling materials and other containers
- Stacking shoe boxes in a role-play shoe shop
- Stacking cuboid boxes or cylinders as tins in a role play grocery shop.
- Making large scale constructions using crates, large boxes and cylinders
- Stacking stones or sticks in a forest school environment
- Making a pile of real bricks.
- Tackling group challenges such as building a castle for a mouse, a house for a teddy or a giant's castle.

Song and rhymes links

- London Bridge is Falling Down
- Humpty Dumpty
- Build a house with five bricks

Story links

- Titch By Pat Hutchins
- Rapunzel
- Jack and the Beanstalk
- How big is a pig? Clare Beaton
- All shapes and sizes. Shirley Hughes