



Cut Nets

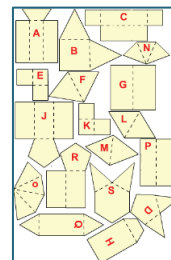
Stage	Strand	Strand Unit
4	Shape and Space	Shape

Learning Outcomes	Maths Concepts
Through appropriately playful and engaging learning experiences, children should be able to construct 3-D and 2-D models or structures given defined measurements and/ or specific conditions.	Shapes have minimal defining lists which define their properties. These can be used to deduce and make connections between classes of shapes.

Learning Maths

In this learning experience, learners will develop spatial reasoning to visualise and justify how flat (2D) shapes fold into solid (3D) shapes.

They are given the nets of 3D shapes (cube, pyramid etc) that have been cut in two. Learners must carefully examine the nets, select the correct pairs, visualise, justify and explain how the final 3D shape is combined and constructed using the nets (image courtesy of Nrich)



Understanding and Connecting	Communicating	Reasoning	Applying and Problem Solving
<i>The learner</i>			
Understands the relationship between 2-D nets and 3-D solids. Identifies possible connections based on matching edges, faces and angles.	Uses appropriate mathematical language to describe the constituent parts of 3-D shapes (<i>faces, edges, vertices, surface, adjacent...</i>) and 2-D nets (<i>sides, angles</i>)	Makes logical predictions based on shape properties, position of faces, and how the net folds. e.g. “If I attach this square to this triangle, when I fold it, the square will block the flap....”	Applies spatial reasoning skills in the context of solving real-world mathematical problems. Considers multiple possibilities, tests ideas, and refines thinking when a net does not work.



Teaching Maths		
Fostering Productive Disposition		Encouraging Playfulness with Mathematics
Normalise mistakes as part of the learning process. Encourage learners to explore 3D nets in everyday objects (packaging, architecture etc.)		Provide physical paper nets and encourage learners to tinker, test hypotheses, refine their thinking and construct the 3D shape.
	Emphasising Mathematical Modeling	
	Facilitate learners to use a variety of mathematical models to explore, record and refine their thinking.	
Using Cognitively Challenging Tasks		Promoting Maths Talk
Challenge learners to design a cube net with a specific pattern/ rule (e.g. What 3D shapes can you make using squares/ triangles? etc.)		Celebrate listening to and building on the ideas of others. Encourage learners to use spatial language to specify the minimal matching features required for 2 shapes to combine into a 3D form.
Assessing Maths		
• Can learners explain and justify their choices? • Do learners demonstrate an understanding of 2-D and 3-D geometry connections? • Can learners represent 3D figures using nets?		
Source		
Adapted from https://nrich.maths.org/problems/cut-nets		

