

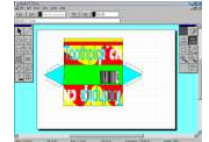


Design and Technology Knowledge Organiser

Year 4: Summer Term – Structures

Shell Structures using Computer-Aided Design (CAD)

Design, make and evaluate a perfume or aftershave gift box for a family member as a celebration gift.

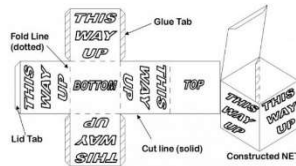


Key Knowledge

Learn this information

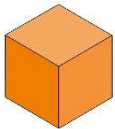
Shell Structure:

Shell structures are usually made from fairly thin sheet material. The strength of the 'shell' is generated by its shape (how the sheet material is formed by folding or curving).

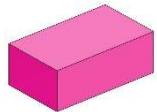


3D shapes:

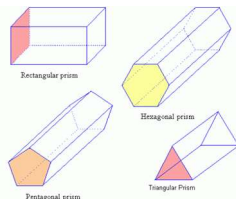
Cube



Cuboid

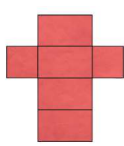


Prisms

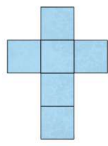


2D nets can create 3D shapes.

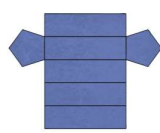
A 2D net can be folded so it creates a hollow 3D shape. This is how packaging is created.



cuboid



cube



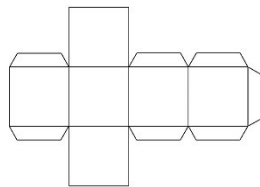
pentagonal prism



triangular prism

Tabs:

In order for the 3D shape to be secure, it needs tabs to stick it together. This helps to strengthen the shape.



Key Skills

Practise and perform these skills

Use a ruler to measure and accurately mark out a net.

This is very important to ensure the shell structure is strong and fits together properly.



Cut, score, shape and assemble nets.

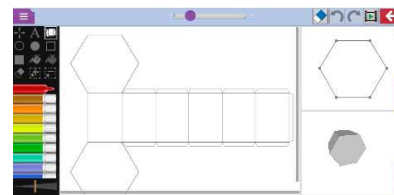
This skill is equally as important as drawing out the net accurately as it ensures the shell structure will fit together accurately.

Create an acetate window

Add a 'window' to one of the faces of your shell structure and add acetate.



Use CAD '2Design and Make'

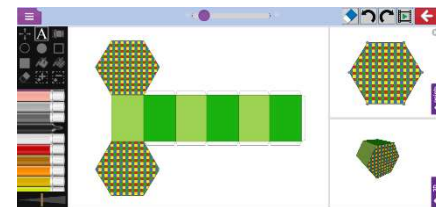


Create a net:

Use the CAD software to digitally create your net design.

Graphic Design:

Use the graphic design aspects of the CAD software to achieve the desired appearance of their packaging. Use the fill and font tools.



Key Vocabulary

Understand these key words

Vocabulary	Definition
Assemble	To put something together.
CAD	Computer-aided design – the use of computers to help with the design process.
Capacity	The maximum amount that something can contain.
Cube	A 3D shape with square faces.
Cuboid	A 3D box shape with rectangular faces.
Edge	Where two surfaces meet at an angle.
Face	A flat surface of a 3D shape.
Font	The style of lettering being used
Graphic Designer	Graphic designers create visual branding, adverts, brochures, website designs and product packaging by creating graphics. They often use CAD for their graphic design.
Graphics	Written, drawn or printed images, shapes, pictures or text.
Net	The flat or opened-out shape of an object such as a box.
Prism	A 3D shape with ends which are the same shape e.g. a triangular prism
Scoring	The process of making a crease in paper or card so it will fold more easily.
Shell Structure	A hollow structure with a thin outer covering.
Vertex	The corners of a shape where edges meet.