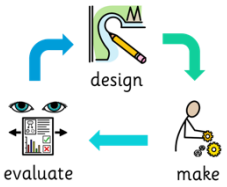
Year 4 – Autumn – DT – Pupil Knowledge Organiser

What do I already know?

- Freestanding structures stand on their own foundation or base.
- Centre of Gravity impacts a structure's stability.
- Structures can be made more stable by giving them a wide base.
- The weight of the structure needs to be evenly spread to make it secure.
- A prototype is a first model of something we design to see if it works.

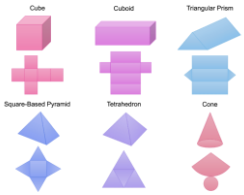
What am I learning now?

1. What is a shell structure?
2. Can we make simple 3D shell structures from 2D nets?
3. How do we strengthen shell structures?
4. Can we design protective product packaging?
5. Can we follow our design to make a prototype product?
6. How well does our product meet the design criteria?



Key Knowledge: Structures

A shell structure is a hollow structure made from a thin outer layer.



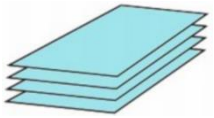
A net is a flat, 2D shape that can be folded to make a 3D object.

Stronger shell structures are better at protecting what is inside.

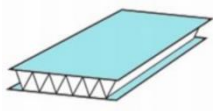
Shell structures are often used for protection.

To make a 3D shell structure, we need to cut out and fold a net.

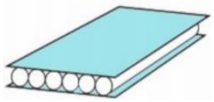
Strengthening methods include:



laminating,



corrugating,



and ribbing.

Shell structures include, product packaging, igloos and the O2 Arena.

Scoring the folds on a net helps create clean edges when making 3D shapes.

Key Knowledge: Design, Make, Evaluate

In Design and Technology we follow a process:

Develop a range of ideas based on who will use our product and what for.

Safely assemble, join and combine materials.

Learn from existing products.

Discuss what is good and what can be improved about our products, based on our design criteria.

Key Vocabulary

cuboid	A solid 3D shape with rectangular sides.
face	A flat surface of a geometric shape.
edge	Where two surfaces meet at an angle.
net	The flat or opened-out shape of an object such as a box.
prism	A prism is a 3D shape with flat sides, the 2 ends are an equal shape and size and the cross-section is identical.
scoring	Cutting a line or mark into sheet material to make it easier to fold.
vertex	The corners of a solid geometric shape, where edges meet.
laminating	Glueing together several layers of card.
corrugating	Glueing concertinaed (folded) paper between two pieces of card.
ribbing	Glueing a layer/layers of straws between two pieces of card.