Alder Coppice Primary School — Knowledge Organiser

Design & Technology	Year: 3	Unit: Structures	Links to: Structures KS1

Subject Vocabulary:

Design - a picture to show what something will look like

Plan – a picture or words to show how something will be made

Function - what the object is for

Product - the object made

Join - where materials meet

Materials - things to be used to

Tools – something to help get the job done

Evaluate - does the product work

Test - find out if the product works

Test criteria – ways to test products linked to their design purpose and how effective they are.

What I Should Already Know:

What a free standing structure is

How to make a structure stronger

Know you can make structures from different materials

Know some names of different materials

Know two properties of materials

Know how to use scissors safely

What I should know by the end of the Unit:

To know what a shell structure is

To know how to create an annotated design

To know how to create and construct nets of cubes and where appropriate more complex shapes

To know how to select materials for a purpose

To know how to strengthen their design

To know how to test a product linked to the design criteria

Skills & Enquiry:

To generate ideas for design

To generate ideas through drawing and annotated sketches

To select material for purpose

To select appropriate tools/ techniques

To investigate existing products to aid design ideas

To investigate different structures to identify the purpose of them

To evaluate shell structures for their effectiveness

Unit Specific Vocabulary:

Structure *- a framework made to contain or support*

Freestanding structure *- not attached or supported by another structure*

Shell structure - structures with an outer surface that may be curved or flat and have a hollow inner area

Strong *- able to withstand force/ less likely to break*

Stable *- not likely to fall over or cave in*

Rigid - solid

Support *- something that will help the structure to stay up*

Join *- where materials meet*

Construct *- to make*

Materials *– wood, paper, metal, card, plastic, wool*

Base *- the bottom of the structure*

Layering *(can add strength) - adding more materials to make stronger*

Flexible *- is able to bend*

Durable – able to with stand pressure or wear

3 dimensional -

3D net – what the shape would look like if it was opened out flat

Marking out – transfer design or pattern to work piece

Corrugating – contract or cause to contract into wrinkles or folds

Recycle – to reuse or convert to reuse

Prototype – a first version or a product to develop

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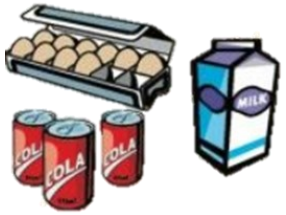
Designing

How does a shell structure contain, protect, present?

Shell structures may be used to contain things.

-The structures need to be able to take the weight of their contents.

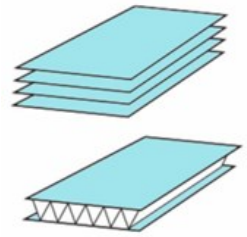


-Consider the 3-D shapes that are most appropriate for this purpose: cubes, cuboids, prisms, are all possibilities.

-Remember, curved shell structures are effective at spreading weight evenly.

Shell structures may be used to protect things.

-The materials used are important for protecting interior contents. Some shell structures can be shaped to fit their contents, protecting them from movement and damage (e.g. egg cartons).



-Shell structures can be stiffened through folding, layering, corrugating, ribbing or lamination.

Shell Structures may be used to present things.

-Shell structures are designed to be visually appropriate for their purpose and attractive to their audience.

-Whilst the shape needs to be strong & durable, it also needs to be appealing to the users. Designers should think about these stylistic choices.

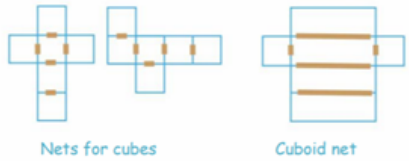
-For this reason, the choice of colour, the look, and the feel are all important.

-The use of logos and fonts (styles of lettering) should be considered.

Making

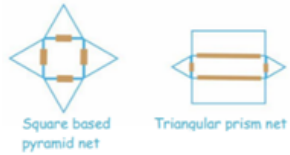
-Nets can be used to make 3D products.

-Nets can then be assembled using either CAD (computer aided design) systems or by hand.

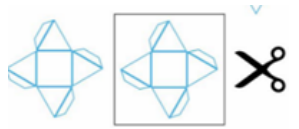


-Scoring is the process of marking a sheet to make it easier to fold.

-Outer edges of the net can be cut out (apparatus depends on material).



-Tabs are additional strips on the net that can be scored and folded to make a surface for sticking vertices together.



Evaluating - Things to consider

- How well does your structure work?
- Does it meet its purpose?
- How did you make your shell structure strong and durable? How could you make it more stable?
- Which materials did you use?
- Why did you make these choices?
- How does you product protect and contain?
- How could it do this more effectively?
- How does your product look?
- How could it look more appealing?