

Phase: 3/4

Subject: Design and Technology

Focus: Shell structures using CAD

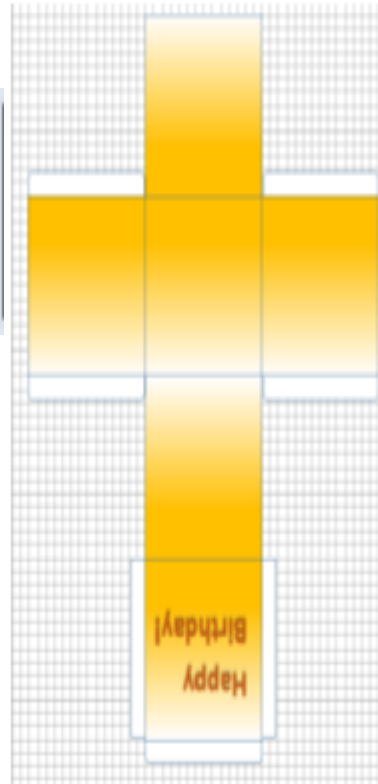
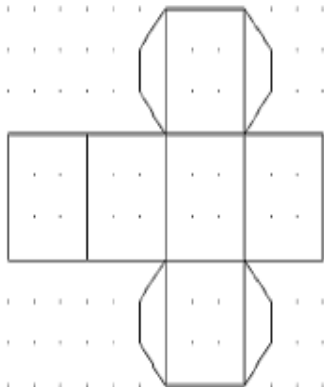
Term: Spring

What I should already know?

Experience of using different joining, cutting and finishing techniques with paper and card.

- A basic understanding of 2-D and 3-D shapes in mathematics and the physical properties and everyday uses of materials in science.
- Familiarity with general purpose software that can be used to draw accurate shapes, such as Microsoft Word, or simple computer-aided design (CAD), such as Purple Mash design tools.

Key Resources



By the end of the unit you will have

Designing

- Generated realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and the functional and aesthetic purposes of the product.
- Developed ideas through the analysis of existing shell structures and use computer-aided design to model and communicate ideas.

Making

- Planned the order of the main stages of making.
- Selected and used appropriate tools and software to measure, mark out, cut, score, shape and assemble with some accuracy.
- Explained your choice of materials according to functional properties and aesthetic qualities.
- Used computer-generated finishing techniques suitable for the product you are creating.

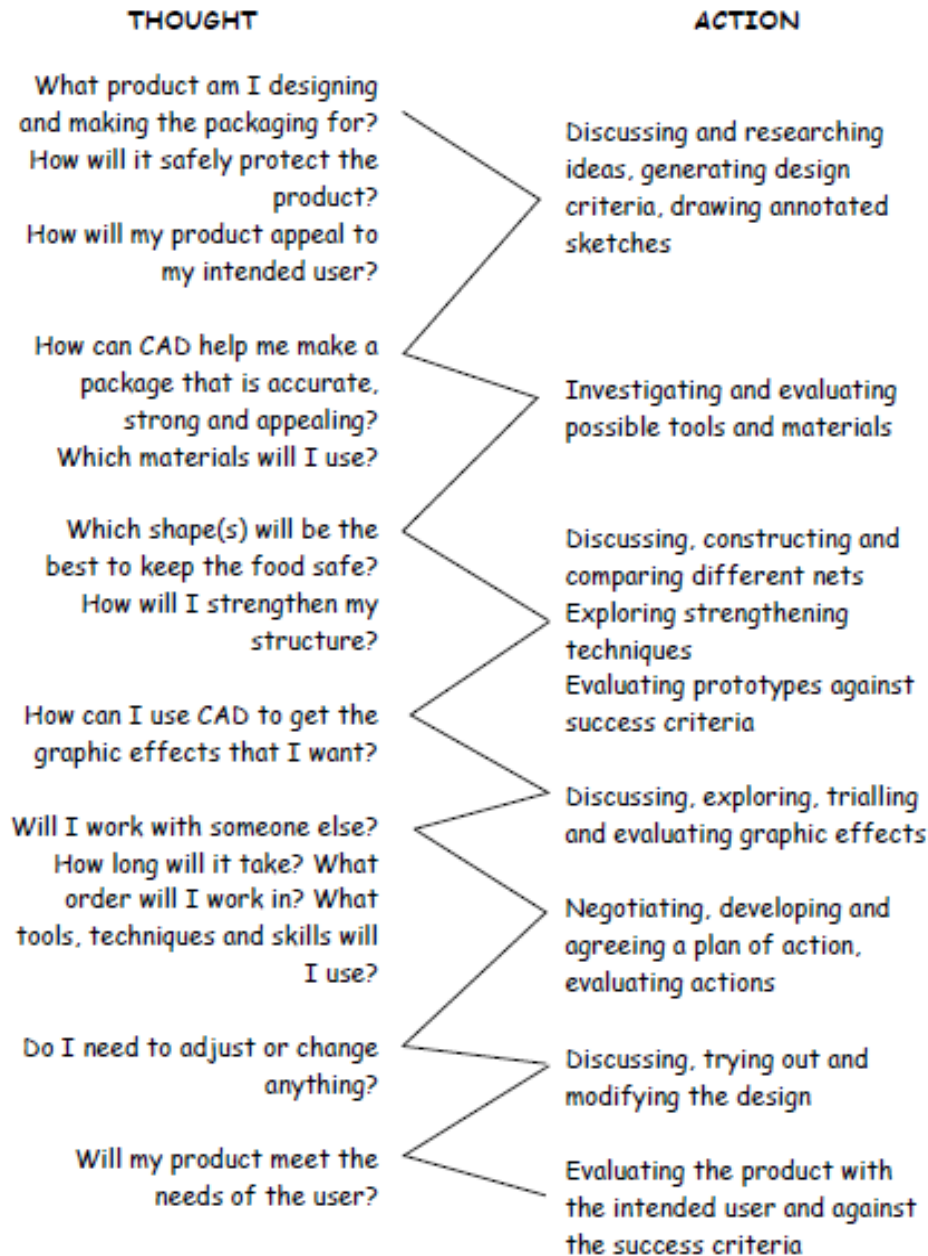
Evaluating

- Investigated and evaluate a range of shell structures including the materials, components and techniques that have been used.
- Tested and evaluated their own products against design criteria and the intended user and purpose.

Technical knowledge and understanding

- Developed and used knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes.
- Developed and used knowledge of how to construct strong, stiff shell structures.
- Know and used technical vocabulary relevant to the project.

Manufacturing process



<u>Vocabulary</u>	
CAD	computer-aided design.
Shell structure	a hollow structure with a thin outer covering.
Edge	where two surfaces meet at an angle.
Face	a surface of a geometric shape.
Vertex	the corners of a geometric shape where edges meet.
Font	printer's term meaning the style of lettering being used.
Net	the flat or opened-out shape of an object such as a box.
Cuboid	solid body with rectangular sides.
Prism	a solid shape.