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| **Year:** 3 **Program of Study:** Structures – Shell Structures  **N.C POS:**   * *Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.* * *Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams and prototypes.* * *Select from tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] accurately.* * *Investigate and analyse a range of existing products.* * *Evaluate their ideas and products against their own design criteria.* * *Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.*   **Concept:** technology, impact, legacy, change, inventions, innovation, application, cause and effect.  **Key Vocabulary:** Shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity, marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating, font, lettering, text, graphics, decision, evaluating, design brief, design criteria, innovative, prototype.  **Prior Learning:** 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. |
| **Core Knowledge- non-negotiable**  **Explore**   * Children investigate a collection of different shell structures including packaging. Use questions to develop children’s understanding e.g. What is the purpose of the shell structure – protecting, containing, presenting? What material is it made from? How has it been constructed? Are the materials recyclable or reusable? How has it been stiffened i.e. folded, corrugated, ribbed, laminated? What size/shape/colour is it? What information does it show and why? How attractive is the design?   **Designing**   * Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product. * Develop ideas through the analysis of existing products and use annotated sketches ad prototypes to model and communicate ideas.   **Making**   * Order the main stages of making. * Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy. * Explain their choice of materials according to functional properties and aesthetic qualities. * Use finishing techniques suitable for the product they are creating.   **Evaluating**   * Investigate and evaluate a range of existing shell structures including the materials, components and techniques that have been used. * Test and evaluate their own products against design criteria and the intended user and purpose. |
| **Wider Influences**   * Shapes and space * Going green * Festivals * Celebrations * Healthy eating * Our school * Toy and games |
| **Enduring Understanding**   * Develop and use knowledge of how to construct strong, stiff shell structures. * Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. * Know and use technical vocabulary relevant to the project. |