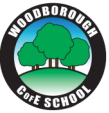


Design and Technology					Unit of Work: Structures				
		Design Process				Technical Knowledge	Focused Tasks	Key Vocabulary	Meaningful Links
		Prior Learning	Designing	Making	Evaluating				
Y2	Focus: Freestanding structures Product: Bridge for Billy Goats Gruff User: Goats Purpose: For goats to cross the river safely.	<ul style="list-style-type: none"> Experience of using construction kits to build walls, towers and frameworks. Experience of using of basic tools e.g. scissors or hole punches with construction materials e.g. plastic, card. Experience of different methods of joining card and paper. 	<ul style="list-style-type: none"> Generate ideas based on simple design criteria and their own experiences, explaining what they could make. Develop, model and communicate their ideas through talking, mock-ups and drawings. 	<ul style="list-style-type: none"> Plan by suggesting what to do next. Select and use tools, skills and techniques, explaining their choices. Select new and reclaimed materials and construction kits to build their structures. Use simple finishing techniques suitable for the structure they are creating. 	<ul style="list-style-type: none"> Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings. Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria. 	<ul style="list-style-type: none"> Know how to make freestanding structures stronger, stiffer and more stable. Know and use technical vocabulary relevant to the project. 	<ul style="list-style-type: none"> Practise measuring, marking out, cutting, shaping, joining and finishing techniques with a range of tools and new and reclaimed materials Build and explore a variety of freestanding structures using construction kits, such as wooden blocks, interconnecting plastic bricks and those that make frameworks Fold paper or card in different ways to make freestanding structures, using masking tape where necessary to make joins. 	Freestanding structure Frame structure Shell structure Stability Buttress Brick bonding Mock-up	English History - Isambard Kingdom Brunel
Y4	Focus: Shell structures Product: 3D packaging for a gift User: Family member Purpose: Celebration, packaging	<ul style="list-style-type: none"> Experience of using different joining, cutting and finishing techniques with paper and card. A basic understanding of 2D and 3D shapes in mathematics and the physical properties and everyday uses of materials in science. 	<ul style="list-style-type: none"> 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 and prototypes to model and communicate ideas. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Use kit parts with flat faces to construct nets. Practise making nets out of card, joining flat faces with masking tape to create 3-D shapes. Experiment with assembling in nets in numerous ways. Practise skills and techniques of scoring, cutting out and assembling using pre-drawn nets. Make a simple box. Practise different ways of stiffening and strengthening their shell structures e.g. folding and shaping, corrugating, ribbing, laminating. 	Cuboid Edge Face Font Net Prism Scoring Shell structure Vertex	Maths Computing
Y6	Focus: Frame structures using CAD Product: A chair for a cuddly toy User: Younger child Purpose: Entertainment	<ul style="list-style-type: none"> Experience of using different joining, cutting and finishing techniques with materials. 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 2D Primary by Techsoft, or 3D CAD such as Tinkercad. 	<ul style="list-style-type: none"> Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and the functional and aesthetic purposes of the product. Develop ideas through the analysis of existing frame structures and use computer-aided design to model and communicate ideas. 	<ul style="list-style-type: none"> Plan the order of the main stages of making. Select and use appropriate tools and software 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 computer-generated models suitable for the product they are creating. 	<ul style="list-style-type: none"> Investigate and evaluate a range of frame 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. 	<ul style="list-style-type: none"> Develop and use knowledge of box and frame structures and, where appropriate, more complex 3D structures. Develop and use knowledge of how to construct strong, stiff frame structures. Know and use technical vocabulary relevant to the project. 	<ul style="list-style-type: none"> Use simple 3D CAD software such as Tinkercad to practise drawing and manipulating shapes such as cubes, spheres, cylinders, and triangles. Use the inbuilt simulation tools to test their structures. Practise making structures from sections of wood, dowel or art straws, joining supporting structures with glue to create 3-D shapes. Experiment with assembling pre-drawn structures in numerous ways using cutting and assembling techniques. 	CAD Frame structure Handle Dimension Workplane Triangulation Compression Tension CAM	Computing - 3D modelling Art - Take a seat