

Year Group: 4	Unit: Structures
National Curriculum Aims The national curriculum for design and technology aims to ensure that all pupils: <ul style="list-style-type: none"> ➤ develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world ➤ build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users ➤ critique, evaluate and test their ideas and products and the work of others 	Technical knowledge <ul style="list-style-type: none"> ➤ apply their understanding of how to strengthen, stiffen and reinforce more complex structures
	Product Outcome To design a building that is earthquake-proof.

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.

Curriculum	Learning Intention/possible activities	Knowledge and Key Vocabulary
Evaluate <ul style="list-style-type: none"> ➤ investigate and analyse a range of existing products 	<p>How do we make buildings earthquake-proof? Recap previous learning from the geography lessons on what happens during an earthquake. Investigate and analyse a range of existing earthquake proof buildings.</p> <p>How can we strengthen a structure? Investigate a range of strengthening techniques used to improve the integrity of a building.</p>	Knowledge: <ul style="list-style-type: none"> – A shell structure is a hollow structure with a thin outer layer – Name at least 3 famous shell structures in the UK – Know how to reinforce structures using corrugating, ribbing and laminating
Design <ul style="list-style-type: none"> ➤ 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, prototypes, pattern pieces and computer-aided design 	<p>How can we integrate strengthening techniques into a building? Design a three-story building that will withstand the vibrations created by an earthquake.</p>	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

<p>Make</p> <ul style="list-style-type: none"> ➤ select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately ➤ select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities 	<p>How can I make a strengthen building? Make a three-story building that will withstand the vibrations created by an earthquake.</p>	
<p>Evaluate</p> <ul style="list-style-type: none"> ➤ evaluate their ideas and products against their own design criteria and consider the views of others to improve their work ➤ understand how key events and individuals in design and technology have helped shape the world 	<p>Does my product meet my design criteria? Evaluate my final product against my design criteria.</p>	

Thinking Deeper: Would it be possible to create a building which is volcano-proof?

Links to other subjects:

- Subject Specific links- Science – discuss the properties and suitability of materials for particular purposes. Mathematics – compare and sort common 2-D and 3-D shapes in everyday objects. Recognise 3-D shapes in different orientations and describe them. Spoken language – ask relevant questions to extend knowledge and understanding. Build their technical vocabulary.
- Personal Development – resilience
- SMSC – cultural – learning about the culture of communities at risk of earthquake damage
- Cultural Capital – gaining an understanding into how everyday products are designed and produced.
- Careers – architect
- British Values – tolerance for different cultures
- Equality – considering equality of access