Year Group: 5	Unit: Frame Structures
National Curriculum Aims ➢ The national curriculum for design and technology aims to ensure that all pupils: ➢ 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** ➢ apply their understanding of how to strengthen, stiffen and reinforce more complex structures **Product Outcome** Model play equipment

Prior Learning: Experience of using measuring, marking out, cutting, joining, shaping and finishing techniques with construction materials. Basic understanding of what structures are and how they can be made stronger, stiffer and more stable.

Curriculum	Learning Intention/possible activities	Knowledge and Key Vocabulary
Evaluate ➢ investigate and analyse a range of existing products **Design** ➢ 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	**What does 'free-standing' mean?** Investigate and analyse a range of existing products in the context of free-standing structures. Compare playground structures from different countries. Understand Health and Safety Laws must be followed in the construction of playground equipment. **How can free-standing structures be strengthened?** Investigate the strength of prisms. Look at existing playground equipment, investigate shapes and strengthening techniques. **How do designers know what will appeal to their audience?** Children design a questionnaire for younger children (LK2) in school to complete. **How can my research help me?** Use survey results to inform what to include in design	**Knowledge:** – Knows that tension pulls of a frame or structure – The use of triangular shapes can strengthen a structure. – A frame structure is made from thin components e.g. a tent frame **Vocabulary:** Geodome, 3 dimensional prism, attachment, flange, slot, tie, L-brace, tabs, fold, framework, prototype, annotations, reinforcing

	Create a prototype by exploring different frames (Geodome, 3D prisms) and attachment techniques. Create a design of each structure to be included Create a plan view of the playground (see perfect plans resource) Consider components to be joined. Consider which materials will be most functional. Consider strengthening and finish.	
Make ➢ 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	**How can I make my finished product look appealing?** Construct my final product. Ensure that the finish of the product is appealing.	
Evaluate ➢ 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	**Does my product meet my design criteria?** Complete an evaluation form: how the product meets the criteria/audience; safety issues, how aesthetically pleasing/appropriate the product is and improvements. Test the strength of structures by adding a load (toy figures)	

Thinking Deeper: Which professionals would be involved in the real-life building of this project? If my design was built now, would it still be standing in 10 years' time? (think not only about durability but also about its appeal to the audience)

Links to other subjects:

- Subject Specific links – maths – measures, Reading, Art,
- Personal Development – resilience (designs not always working out they way we had planned)
- SMSC – designing a project aimed to be inclusive of all children
- Cultural Capital – explore outdoor equipment from different cultures
- Careers –market research, designers,
- British Values – consider Health and Safety Laws needed to ensure suitability of playground equipment
- Equality – designing with consideration of disabilities