Year Group: 5	**Term:** Spring	**Topic:** Structures
NC Links		
To 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. To generate, develop, model and communicate their ideas through discussion.		
Other Curriculum Links		
Mathematics		
Links to Caedmon Curriculum Drivers		
Aspirations and Careers -embracing challenges that help us to grow -understanding that resourcefulness can help us to be the best version of ourselves -understanding how our learning links to the wider world -having an awareness of the local labour market		
Links to Rights Respecting		
Article 28 – Every child has the right to an education. Primary education must be free and different forms of secondary education must be available to every child. Discipline in schools must respect children's dignity and their rights.		
Links to North East Ambition		
Link a lesson to the career of a structural engineer/welder/architect. What does the job entail? What skills are needed in the job? Why do people need these roles? What day to day tasks would you undertake in this job? Gatsby Benchmark 4 - Linking curriculum learning to careers		
Topic Overview		
By the end of this topic, children have explored strong and weak shapes and identified parts of a bridge. Children will explore how shapes can strengthen structures. They will use appropriate tools to cut and shape pieces to make a bridge.They will identify areas of strength and improvements within their model.		
Possible Visits/Visitors		
Quayside visit to bridges		

Essential Subject Skills to be covered
• Identify stronger and weaker shapes. • Recognise that supporting shapes can help increase the strength of a bridge, allowing it to hold more weight. • Identify beam, arch and truss bridges and describe their differences. • Use triangles to create simple truss bridges that support a load (weight). • Cut beams to the correct size, using a cutting mat. • Smooth down any rough cut edges with sandpaper. • Follow each stage of the truss bridge creation as instructed by their teacher. • Complete a bridge, with varying ranges of accuracy and finish, supported by the teacher. • Identify some areas for improvement, reinforcing their bridges as necessary.
Overall Learning Outcomes
By the end of this unit, children will have approached a design brief and developed an idea for a product based on this. They will have developed analytical and evaluative skills by looking at other bridges and using their skills to inform their work. They will understand how to successfully construct a bridge and which shapes reinforce the strength. They will discuss their ideas through talk and writing. They will develop a range of techniques then make their product safely. They will evaluate their product and discuss strengths and weaknesses of their work. They will adapt and refine their work throughout the design and making process.
Learning Intentions (for use in self assessment at end of topic)
• To explore how to reinforce a beam (structure) to improve its strength • To build a spaghetti truss bridge • To build a wooden truss bridge • To complete, reinforce and evaluate truss bridge

Sequence of lessons
• Children being to develop their understanding of structures by investigating how different shapes affect their strength. • They use the knowledge from the previous lesson to create spaghetti truss bridges, learning how different shapes can improve the strength of a structure. • Children learn about material properties and why they are important. They learn to use tools including saws to build a wooden bridge. • Pupils continue to build their truss bridges, reinforce and evaluate them.
Suggested Strategies for Recording Learning
• Design and sketch ideas • Explore truss structures using different materials • Test and reinforce structures; sharing with the class what is successful and unsuccessful • Write comments/teacher to write verbal feedback. • Annotate ideas • Photograph work