Wentworth Primary School
Key Skills & Knowledge Progression Map
'Striving for Excellence'
Design and Technology: Structures

For EYFS please see EYFS Progression of Skills Knowledge map

	Foundation	Year 1 Constructing a windmill	Year 2 A chair for baby bear	Year 3 Constructing a Longhouse	Year 4 Stone age Dwellings	Year 5 Playground	Year 6 Bridges
Planning & Designing		Thinking about what others might want from a design. Beginning to recognise how products and designs in the world around us solve certain needs. Considering who they are designing for – identifying the user. Stating what they intend to make and why – identifying the purpose. Talking about ideas, with purpose an user in mind.	Using a simple design brief that outlines the intended use, target user, and key features of the product, to create simple design criteria. Creating ideas with design criteria in mind. Referring to specific parts of existing products when generating ideas.	Designing a longhouse with key features to appeal to a specific person / purpose. Drawing and labelling a longhouse design using 2D shapes, labelling: - the 3D shapes that will create the features - materials needed and colours.	Designing a stable stone age dwelling structure that is aesthetically pleasing and selecting materials to create a desired effect. Building frame structures designed to support weight.	Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.	Designing a stable structure that is able to support weight. Creating a frame structure with a focus on triangulation.

		Talking about existing products when generating ideas. Using basic drawing skills to communicate ideas.					
Working with tools		Making stable structures from card. Following instructions to cut and assemble the supporting structure of a windmill. Requesting equipment appropriate to the purpose. (e.g. scissors for cutting, glue for joining) Making functioning turbines and axles which are assembled into a main supporting structure. Creating supporting structures. Cutting straight evenly and carefully.	Choosing materials, ingredients or components from a wider range of materials, ingredients or components. Explaining their choices based on the properties of materials and components. Looking for ways to make cutting easier, like turning the material they are cutting, not fully closing scissors etc. Choosing known geometric shapes when making. Beginning to shape objects to improve how they work.	Constructing a range of 3D geometric shapes using nets. Creating special features for individual designs. Making facades from a range of recycled materials.	Creating a range of different shaped frame structures. Making a variety of free standing frame structures of different shapes and sizes. Selecting appropriate materials to build a strong structure and cladding. Reinforcing corners to strengthen a structure. Creating a design in accordance with a plan. Learning to create different textural effects with materials.	Building a range of play apparatus structures drawing upon new and prior knowledge of structures. Measuring, marking and cutting wood to create a range of structures. Using a range of materials to reinforce and add decoration to structures.	Making a range of different shaped beam bridges. Using triangles to create truss bridges that span a given distance and support a load. Building a wooden bridge structure. Independently measuring and marking wood accurately. Selecting appropriate tools and equipment for particular tasks. Using the correct techniques to saws safely. Identifying where a structure needs reinforcement and using card corners for support. Explaining why selecting appropriating materials is an

							important part of the design process. Understanding basic wood functional properties.
Evaluating		Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if needed. Suggest points for improvements. Saying what they like about their peers' designs and products. Accepting feedback and understanding it is meant to improve their work.	Discussing a range of existing products and saying what they like and dislike about them. Comparing a range of products and explaining why some better meet different design criteria than others. Evaluating their ideas and creations against simple design criteria.	Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. Suggesting points for modification of the individual designs.	Evaluating structures made by the class. Describing what characteristics of a design and construction made it the most effective. Considering effective and ineffective designs.	Improving a design plan based on peer evaluation. Testing and adapting a design to improve it as it is developed. Identifying what makes a successful structure.	Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary. Suggesting points for improvements for own bridges and those designed by others.
Technical Knowledge		understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). understand that axles are used in structures to make parts turn in a circle.	Recognising that different structures are used for different purposes. Exploring the features of structures. Making stable structures from card.	understand that wide and flat based objects are more stable. understand the importance of strength and stiffness in structures. know the features of a longhouse and their purpose.	understand what a frame structure is. know that a 'free-standing' structure is one which can stand on its own. know that aesthetics are how a product looks. know that a product's function means its purpose.	know that structures can be strengthened by manipulating materials and shapes. understand what a 'footprint plan' is. understand that in the real world, design, can impact users in positive and negative ways.	understand some different ways to reinforce structures. understand how triangles can be used to reinforce bridges. know that properties are words that describe the form and function of materials. understand why material selection is

		know that a structure is something that has been made for a purpose. know that the sails or blades of a windmill are moved by the wind. know that design criteria are a list of points to ensure the product meets the clients needs and wants.	Creating supporting structures to aid stability. Using stable objects like cylinders to create structures. Building a strong and stiff structure by folding paper. Folding to strengthen or stiffen. Comparing the stability of different shapes. Identifying the weakest part of a structure.	know that a façade is the front of a structure. understand that a longhouse needed to be strong and stable. know that a paper net is a flat 2D shape that can become a 3D shape once assembled. know that a design specification is a list of success criteria for a product.	understand that the target audience means the person or group of people a product is designed for.	know that a prototype is a cheap model to test a design idea.	important based on properties. understand the material (functional and aesthetic) properties of wood. understand the difference between arch, beam, truss and suspension bridges. understand how to carry and use a saw safely.
Key Vocabulary		• Base • Centre • Design • Equal • Evaluate • Rotate • Rotor • Rotor Blades • Sails • Same • Stable • Strong • Structure • Test • Weak • Wind • Windmill	• Design brief • Design criteria • Evaluate • Flexible • Improve • Select • Stiff • Strong • Thicker • Thinner • Weak	• 2D shapes • 3D shapes • Longhouse • Design criteria • Evaluate • Feature • Net • Recyclable • Scoring • Stable • Strong • Structure • Tab • Weak	• Aesthetic • Design criteria • Evaluation • Frame structure • Function • Inspiration • Reinforce • Stable • Structure • Target audience • Target customer • Texture • Theme	• Adapt • Apparatus • Bench hook • Cladding • Coping saw • Design • Dowel • Evaluation • Feedback • Idea • Jelutong • Landscape • Mark out • Measure • Modify • Natural materials • Plan view • Playground • Prototype • Reinforce	• Abutment • Accurate • Arched bridge • Beam bridge • Coping saw • Evaluation • File • Mark out • Material properties • Measure • Predict • Reinforce • Research • Sandpaper • Set square • Suspension bridge • Tenon saw • Test • Truss bridge • Wood

						• Sketch • Strong • Structure • Tenon saw • Texture • User • Vice • Weak	