

# Ashwell Primary School

## Design & Technology Curriculum

### Skills & Knowledge Organiser - Structures



#### Structures - Key Stage 1

		Year 1 – Constructing a windmill	Year 2 – Baby Bear's chair
Skills	Design	<ul style="list-style-type: none"> <li>Learning the importance of a clear design criteria</li> <li>Including individual preferences and requirements in a design</li> </ul>	<ul style="list-style-type: none"> <li>Generating and communicating ideas using sketching and modelling</li> <li>Learning about different types of structures, found in the natural world and in everyday objects</li> </ul>
	Make	<ul style="list-style-type: none"> <li>Making stable structures from card, tape and glue</li> <li>Learning how to turn 2D nets into 3D structures</li> <li>Following instructions to cut and assemble the supporting structure of a Windmill</li> <li>Making functioning turbines and axles which are assembled into a main supporting structure</li> </ul>	<ul style="list-style-type: none"> <li>Making a structure according to design criteria</li> <li>Creating joints and structures from paper/card and tape</li> <li>Building a strong and stiff structure by folding paper</li> </ul>
	Evaluate	N/A	<ul style="list-style-type: none"> <li>Exploring the features of structures</li> <li>Comparing the stability of different shapes</li> <li>Testing the strength of own structures</li> <li>Identifying the weakest part of a structure</li> <li>Evaluating the strength, stiffness and stability of own structure</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>To understand that the shape of materials can be changed to improve the strength and stiffness of structures</li> <li>To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses)</li> <li>To understand that axles are used in structures and mechanisms to make parts turn in a circle</li> <li>To understand that different structures are used for different purposes</li> <li>To know that a structure is something that has been made and put together</li> </ul>	<ul style="list-style-type: none"> <li>To know that structures with wide, flat bases or legs are most stable</li> <li>To understand that the shape of a structure affects its strength</li> <li>To know that materials can be manipulated to improve strength &amp; stiffness</li> <li>To know that a structure is something which has been formed from parts</li> <li>To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move</li> <li>To know that a 'strong' structure is one which does not break easily</li> <li>To know that a 'stiff' structure or material is one which does not bend easily</li> </ul>
	Additional	<ul style="list-style-type: none"> <li>To know that a client is the person I am designing for</li> <li>To know that design criteria is a list of points to ensure the product meets the client's needs and wants</li> <li>To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity</li> <li>To know that windmill turbines use wind to turn and make the machines inside work</li> <li>To know that a windmill is a structure with sails that are moved by wind</li> <li>To know the 3 main parts of a windmill are the turbine, axle &amp; structure</li> </ul>	<ul style="list-style-type: none"> <li>To know that natural structures are those found in nature</li> <li>To know that man-made structures are those made by people</li> </ul>

## Structures – Key Stage 2

		Year 3 – Constructing a castle	Year 6 – Playgrounds
Skills	Design	<ul style="list-style-type: none"> <li>▪ Designing a castle with key features to appeal to a specific person/purpose</li> <li>▪ Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours</li> <li>▪ Designing and/or decorating a castle tower on CAD software</li> </ul>	<ul style="list-style-type: none"> <li>▪ Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs</li> </ul>
	Make	<ul style="list-style-type: none"> <li>▪ Constructing a range of 3D geometric shapes using nets</li> <li>▪ Creating special features for individual designs</li> <li>▪ Making facades from a range of recycled materials</li> </ul>	<ul style="list-style-type: none"> <li>▪ Building a range of play apparatus structures drawing upon new and prior knowledge of structures</li> <li>▪ Measuring, marking and cutting wood to create a range of structures</li> <li>▪ Using a range of materials to reinforce and add decoration to structures</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>▪ Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design</li> <li>▪ Suggesting points for modification of the individual designs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Improving a design plan based on peer evaluation</li> <li>▪ Testing and adapting a design to improve it as it is developed</li> <li>▪ Identifying what makes a successful structure</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>▪ To understand that wide and flat based objects are more stable</li> <li>▪ To understand the importance of strength and stiffness in structures</li> </ul>	<ul style="list-style-type: none"> <li>▪ To know that structures can be strengthened by manipulating materials and shapes</li> <li>▪ To understand some different ways to reinforce structures</li> <li>▪ To understand how triangles can be used to reinforce bridges</li> <li>▪ To know that properties are words that describe the form and function of materials</li> <li>▪ To understand why material selection is important based on their properties</li> </ul>
	Additional	<ul style="list-style-type: none"> <li>▪ To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose</li> <li>▪ To know that a façade is the front of a structure</li> <li>▪ To understand that a castle needed to be strong and stable to withstand enemy attack</li> <li>▪ To know that a paper net is a flat 2D shape that can become a 3D shape once assembled</li> <li>▪ To know that a design specification is a list of success criteria for a product</li> </ul>	<ul style="list-style-type: none"> <li>▪ To understand what a 'footprint plan' is</li> <li>▪ To understand that in the real world, design , can impact users in positive and negative ways</li> <li>▪ To know that a prototype is a cheap model to test a design idea</li> </ul>