

Design & Technology

Structures – Rainforest Dwellings

Year Six

Bishop's Waltham Junior School

Design & Technology

Year Six, Bishop's Waltham Junior School

	Learning Objectives	Key Skills	Concepts	Lesson Content
1	<ul style="list-style-type: none"> - To investigate a range of dwellings and their suitability for purpose. 	<ul style="list-style-type: none"> - Annotating drawings - Identifying materials used and construction methods. 	<ul style="list-style-type: none"> - Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. - Investigate and evaluate a range of existing frame structures. 	<p><u>Investigative and Evaluative Activities</u></p> <ul style="list-style-type: none"> - What is a dwelling? - How do dwellings differ across the world? Look at pictures of dwellings. - Discuss that dwellings can be temporary and permanent. - How does this affect their design? - How are buildings designed in this country? What are the constraints? Discuss need for modern buildings to be safe, warm, energy efficient, water tight etc. - Children to annotate pictures of dwelling from around the world – commenting on material use, how strength has been achieved, permanency, counties climate etc. How well does the frame structure meet users' needs and purposes? Why were materials chosen? What methods of construction have been used? How has the framework been strengthened, reinforced and stiffened? How does the shape of the framework affect its strength? How innovative is the design? When was it made? Who made it? Where was it made? - Discuss together how the climate and use influences the design brief. Link to work in rainforests. What do we know about the people's lifestyles? How will the climate influence the design? - Write design brief for a rainforest dwelling as a class.
2	<ul style="list-style-type: none"> - To investigate a well-known architect or engineer. 	<ul style="list-style-type: none"> - Research and précis or note taking skills 	<ul style="list-style-type: none"> - Research key events and individuals relevant to frame structures. 	<p><u>Investigative and Evaluative Activities – Influential designers / architects</u></p> <ul style="list-style-type: none"> - What is an architect? What skills do they need? List together. - In groups research a famous architect / well-known engineer. What made

				<p>them become well-known? What was innovative about their designs?</p> <ul style="list-style-type: none"> - Possible individuals to research;- Stephen Sauvestre (Eiffel Tower) French link!! Thomas Farnolls Pritchard (London Bridge) Local designer? Visit from local architect? <p>Link to literacy – précis findings to present to class?</p> <p>Consider how the architects designs met their brief – if possible in relation to climate?</p>
3	<ul style="list-style-type: none"> - To safely explore methods of joining and strengthening structures. 	<ul style="list-style-type: none"> - To SAFELY use a range of tools and equipment. - To develop a working knowledge of how materials and structures can be strengthened. - To practise different ways of joining materials together. 	<ul style="list-style-type: none"> - Understand how to strengthen, stiffen and reinforce 3-D frameworks. - Know and use technical vocabulary relevant to the project. 	<p><u>Focused Practical Tasks – Rotation of Activities / Several sessions?</u></p> <ul style="list-style-type: none"> - Read back through design brief created in session 1. Link design brief to techniques /exploration in today's session. How can we make the structure survive flash floods? How will we make it strong enough? - Use a construction kit consisting of plastic strips and paper fasteners to build 2-D frameworks. Compare the strength of square frameworks with triangular frameworks. Ask the children to reinforce square frameworks using diagonals to help develop an understanding of using triangulation to add strength to a structure. - Demonstrate how paper tubes can be made from rolling sheets of newspaper diagonally around pieces of e.g. dowel. Ask children to use these tubes and masking tape or paper straws with pipe cleaners to build 3-D frameworks such as cubes, cuboids and pyramids. <i>How could each of the frameworks be reinforced and strengthened?</i> - Demonstrate the accurate use of tools and equipment. Develop skills and techniques using junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to construct wooden frames, as appropriate. SAFETY - Demonstrate skills and techniques for accurately joining framework materials together e.g. paper straws, square sectioned wood. Ask children to practise these, mounting their joints onto card for future reference.
4	-	-	-	<p><u>Extra Optional Session</u></p> <ul style="list-style-type: none"> - Design team challenge

				<ul style="list-style-type: none"> - Using a limited range of resources e.g. dowling, newspaper, pipe cleaners who can make the strongest tower? - Test using weights suspended from top section. - Evaluate – Which construction methods produced the tallest? Strongest? Why do we think this is?
5	<ul style="list-style-type: none"> - To design and annotate a rainforest dwelling to meet the design brief. 	<ul style="list-style-type: none"> - Drawing and careful annotation of plan, considering techniques, fixings and materials. 	<ul style="list-style-type: none"> - Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. 	<p><u>Design</u></p> <ul style="list-style-type: none"> - Recap design brief. Who are our intended users? What is the purpose of the structure? - Children to create detailed annotated drawing – showing dimensions of design, materials to be used, joining and strengthening techniques. Annotations should state clearly how the design meets the brief e.g. Sloping roof for rain water run-off, stilts to avoid flooding. - Peer review against brief. Offer possible improvements. - As a class discuss / calculate project costings?? - If time, model prototype with paper/ card.
6	<ul style="list-style-type: none"> - To make and evaluate their rainforest dwelling. 	<ul style="list-style-type: none"> - Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. 	<ul style="list-style-type: none"> - Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. 	<p><u>Making</u></p> <ul style="list-style-type: none"> - REINFORCE SAFETY REQUIREMENTS – Tool use, moving around room etc. - How will they measure accurately? - Encourage children to make their products with accuracy. - Stop regularly to evaluate process so far. - What has gone well? - What problems have been encountered? - How have these been overcome? Encourage children to suggest solutions to each other's problems and share good practise / findings. <p><u>Evaluate</u></p> <ul style="list-style-type: none"> - How could we test our structures to see if they meet our design brief? Are there any weak points? How could we improve these further? - Evaluate completed product.