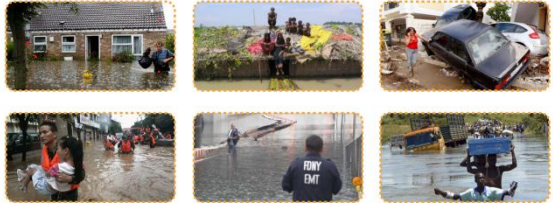
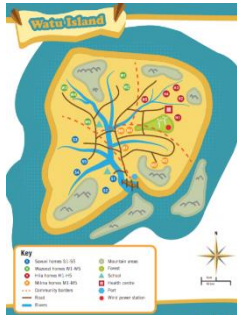



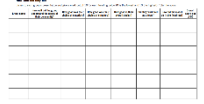


Beat the Flood Year 5 An Engineering Challenge

Shell and Frame structures, textiles

Curriculum Links: Year 5 Geography: Rivers and the Water Cycle
Year 3 Geography: Rainforest – climate zones

DESIGNING	MAKING	EVALUATING	TECHNICAL KNOWLEDGE
<p>Understanding contexts, users and purposes</p> <p>Pupils will use their knowledge and understanding of the physical and topographical features of river from their Year 5 geography studies. Memory links could be made to learning in Year 3 about climate zones when they studied rainforests.</p> <p>Pupils will learn about, evaluate, design and model, shell and frame structures.</p> <p>They will be learning about global issues around flooding and the role of development organisations that support communities to develop homes that reduce their vulnerability to changing climates.</p>  <p>Generating, developing, modelling and communicating ideas</p> <p>Set on the fictitious island of 'Watu', pupils are challenged to design a home for a community on Watu Island able to withstand the effects of flooding, then make a model of it and test it. This could be done in groups of 4-5 pupils.</p>  <p>Setting the scene: Use the Beat the Flood power point to set the global scene. Explore the Where in the World? Activity.</p> <p>Explore island maps of Watu, the community information associated with it. See pupil activity sheets.</p> <p>Watch video footage and image materials to research flood resistant homes. Pupils materials include a Learning from others sheet.</p> <p>Consider materials used/ available and structures. Pupils may also consider the costs involved through modelling. Introduce the idea of modelling 'real-life' materials – see materials cards.</p> <p>Pupils explore frame and shell structures. Explore relative advantages and disadvantages. See picture resources:</p>   <p>Design Specification</p> <p>Before developing your idea for your flood resistant home, think about the features that you want your home to have, and give a reason why these are important.</p> <p>Materials</p> <p>What properties do you need the materials in your home to have?</p> <p>Suitability for the environment</p> <p>What features do you want your home to have to make it suitable for the people who will live in it?</p> <p>Size</p> <p>What are the maximum and minimum dimensions of your design?</p> <p>Construction method</p> <p>What type of structure do you think best suits the conditions and materials available on the island?</p> <p>Environmental issues</p> <p>Will you consider the effect of your choice of materials on the environment?</p> <p>Cost</p> <p>What is the maximum cost you can spend on your design?</p> <p>As a class, create a design specification.</p> <p>Pupils develop their design ideas on paper as individuals and in groups. Detail hidden parts, fixings, opening, information about materials and size. Demonstrate that the design meets the specification.</p> 	<p>Planning</p> <p>Pupils gather materials to make their flood proof structure, in line with the design specification and their design.</p> <p>Pupil should formulate step-by-step plans as a guide to making.</p> <p>Take photographs to record the making process, the finished house and then the structure after the flood testing.</p> <p>Practical Skills and techniques</p> <p>Pupils select tools and equipment suitable for the task, and techniques they will be using. They will select materials and components suitable for the task.</p> <p>They should be asked to explain their choices of materials and components according to functional properties.</p> <p>Pupils will accurately measure, mark, cut out and shape materials and components. They will accurately assemble, join and combine materials.</p> <p>Pupils will demonstrate resourcefulness when tackling practical problems.</p>	<p>Existing products</p> <p>Explore existing designs and design principles: Venice, the Maldives, and China where flooding is an issue.</p> <p>Use the to 'flood' the structures. Stand structures in 5cm of water and squirt with water. Debris could be added to simulate a flood.</p> <p>Own ideas and products</p> <p>Evaluate in response to group presentations.</p>  <p>Key ideas and Individuals</p> <p>Explore architecture as a job. See the video resources.</p> <p>IMAGE and VIDEO RESOURCES</p> <p>https://www.youtube.com/watch?v=Ukmb0heGyJk</p> <p>amphibious house on the River Thames – a ground-breaking innovation</p> <p>http://www.youtube.com/watch?v=GICQpTOSxS8</p> <p>Beat the flood: Flood resistant homes in Bangladesh</p> <p>Beat the Flood power point and pupil sheets.</p>	<p>Making products work</p> <p>Pupils will learn how to use materials in a functional way. They will combine materials to create useful characteristics. They will learn how to reinforce and strengthen a 3D framework.</p> <p>Mathematics will be used to aid construction and costing.</p> <p>Design and technology vocabulary</p> <p>design brief consumer intended user data safety research functionality innovation innovative polypropylene bottles foil, straws, lolly sticks aluminium foil water resistant structural strength malleable non-recyclable non-biodegradable durable, strong hard to demolish liable to cracking prone to rust absorbent fragile polyurethane sheet polythene concrete steel softwood, hardwood dung/soil, clay glass corrugated iron bricks, reeds, bamboo</p>