

Year 8 - Design and Technology

| Topic | Rationale | Knowledge acquisition | Tasks - notes | Key vocab | Skills and enrichment |
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| STEM | This topic gives students the opportunity to acquire the required knowledge regarding forces and stresses acting of products. Students will be given the opportunity to compete in a series of STEM challenges and use workshop tools and equipment to create structures. | Lesson 1: Structures To know what a structure is and how to exploit material properties to create rigid structures. | Identification of structures Structure categories Tallest structure challenge: creation of a ridges self-standing structure | Structure Stability Strength | Subject specific Skills. <ul style="list-style-type: none"> Idea creation Graphical communication Using workshop tools and equipment Numeracy <ul style="list-style-type: none"> Measuring in MM Scale Literacy <ul style="list-style-type: none"> Key vocab, meanings, and context Comprehension of instructions for processes Cultural Capital <ul style="list-style-type: none"> The Tacoma Narrows Bridge World famous structures World famous bridges Alessi Links to National Curriculum Design: <ul style="list-style-type: none"> Identify and solve their own design problems. Use a variety of approaches to generate creative ideas. Develop and communicate design ideas using annotated sketches. Make: <ul style="list-style-type: none"> Select from and use specialist tools, techniques, processes, equipment, and machinery precisely. Select from and use a wider, more complex range of material, taking into account their properties. |
| | | Lesson 2: Forces To know the different types of forces and the ways they affect products. | Static and dynamic loads The 5 forces. Forces acting on products. Strong structure challenge: creation of a freestanding structure that holds a heavy weight. STEM homework 1 | Static Dynamic Load Tension Compression Torsion Bending Shear | |
| | | Lesson 3: Bridge Structures To know how to use CAD to stimulate real structures and force using west point design. | Homework misconceptions Types of bridges Triangulation West point bridge design challenge: creation of the cheapest working bridge | Member Triangulation Compression Tension | |
| | Lesson 4: Bridge Building To know how to make a stable structure using previous knowledge of forces and stresses acting on products. | Tires and struts Equilibrium Straw bridge design challenge: creation of a bridge structure with the best strength to weight ratio. Assessment: Show you know. Assessment and feedback on Show you Know 1. Live marking opportunity | Ties Stuts Equilibrium | | |
| | Links to..... KS2. Possible STEM workshops and challenges. KS3. Working safely in a workshop. Using creative thinking and teamwork. The relevance of DT - testing and development. | | | | |

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| | <p>Ladders towards.... Strength and reinforcement strategies in design. Collaborative working in the workshop. Design development process.</p> | <p>Lesson 5: Biomimicry To know what biomimicry is and how it is used in technology to develop design ideas.</p> | <p>Biomimicry definition Product inspired by nature. Morphing (Alessi) Design challenge: design a product using biomimicry. Assessment and feedback on biomimicry design. Live marking opportunity</p> | <p>Biomimicry Morphing Alessi</p> | <p>Evaluate:</p> <ul style="list-style-type: none"> Analyse the work of past and present professionals and others to develop and broaden their understanding. Test, evaluate and refine their ideas. Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers, and technologists. <p>Technical knowledge:</p> <ul style="list-style-type: none"> Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions. |
| | | <p>Lesson 6: Artificial Intelligence To know what AI is and how it is being utilised in a growing world of technology.</p> | <p>Products that use AI Advantages of AI Disadvantages of AI Design challenge: design a product using artificial intelligence. Assessment and feedback on biomimicry design. Live marking opportunity</p> | <p>AI Robots</p> | |