

Topic	Rationale	Knowledge acquisition	Tasks - Notes	Key vocabulary	Skills and enrichment
<p style="text-align: center;"><b>Biomimicry</b></p>	<p>This project introduces Year 9 students to the concept of <b>biomimicry</b>—a design approach that looks to nature for inspiration in solving human challenges. Through a structured design process incorporating <b>research, sketching, computer-aided design (CAD), and physical modelling</b>, students will explore how natural forms, systems, and materials can influence innovative product design.</p>	<p>Lesson 1 – Brave Sketching (Double) To know that inspiration is used to create shape and form when designing.</p>	<p>Use circles as inspiration and redesign a water fountain twice. Explore fast idea generation using gone in 30 seconds Discuss design fixation Explore fast 3D idea generation create 10 perfume bottle ideas Experiment with shape and form techniques to create designs Enhance and render using light rule. <a href="#">Assessment and feedback on product analysis. Live marking opportunity</a></p>	<p>Design Fixation Inspiration Enhancement Render</p>	<p><b>Subject Specific Skills:</b></p> <ul style="list-style-type: none"> <li>• <b>Research skills:</b> Investigating natural forms, functions, and existing biomimicry examples.</li> <li>• <b>Creative and critical thinking:</b> Translating nature’s strategies into viable human design solutions.</li> <li>• <b>Drawing and communication:</b> Using sketching and technical drawing to express ideas.</li> <li>• <b>CAD skills:</b> Designing products in software like Tinkercad, SketchUp, or Fusion 360.</li> <li>• <b>Model-making skills:</b> Creating prototypes using card, Clay, or recycled materials.</li> <li>• <b>Evaluation and iteration:</b> Refining ideas based on testing and feedback.</li> </ul> <p><b>Numeracy</b></p> <ul style="list-style-type: none"> <li>• Measuring in MM</li> <li>• Calculating sizes</li> <li>• Scale</li> </ul> <p><b>Literacy</b></p> <ul style="list-style-type: none"> <li>• Key vocab, meanings and context</li> <li>• Comprehension of instructions for processes</li> </ul> <p><b>Cultural Capital</b></p> <ul style="list-style-type: none"> <li>• Real life designers, products and architecture</li> </ul> <p><b>Links to National Curriculum Design:</b></p> <ul style="list-style-type: none"> <li>• use research and exploration, such as the study of different cultures, to identify and</li> <li>• understand user needs</li> </ul>
	<p><b>Curriculum Links</b> This project aligns with key objectives in the <b>KS3 National Curriculum for Design and Technology</b>, including:</p> <ul style="list-style-type: none"> <li>• Understanding and applying the principles of <b>design, engineering, and sustainability.</b></li> <li>• Developing and communicating design ideas through <b>annotated sketches, CAD, and physical models.</b></li> </ul>	<p>Lesson 2 – Biomimicry (Double) To know that designers use inspiration from nature to develop functional ideas.</p>	<p><b>Homework 1</b> Match the product with inspiration from nature Look at where the inspiration came from, use questioning to discuss. Introduction to the term Biomimicry Use questioning to look at existing famous structures and how the designers have used Biomimicry. Design using the technique of Biomimicry – how to extract form Use plasticine to model a biomimicry inspired structure Present work as a development page.</p>	<p>Biomimicry Nature Design Development</p>	

## Year 9- Design and Technology

<ul style="list-style-type: none"> <li>Using research to inform and justify design decisions.</li> <li>Selecting from and using a wider range of <b>materials, tools, and technologies</b>.</li> </ul> <p>It also introduces <b>cross-curricular connections</b> with <b>Science</b> (biology, natural systems), <b>Geography</b> (sustainability), and <b>ICT</b> (CAD software).</p>	<p>Lesson 3 – Brave Sketching (double) Crating. To know how to use isometric crating as a tool to develop ideas in 3D</p>	<p><a href="#">Assessment and feedback on product analysis. Live marking opportunity</a></p> <p><b>Homework misconceptions</b> Start with recap of isometric – what do they know? Project irregular shapes onto crates Complete design challenge creating a biomimicry structure / architecture <a href="#">Assessment and feedback on product analysis. Live marking opportunity</a></p>	<p>Isometric Crating 3D</p>	<ul style="list-style-type: none"> <li>identify and solve their own design problems and understand how to reformulate</li> <li>problems given to them</li> <li>use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses</li> <li>develop and communicate design ideas using annotated sketches, detailed plans, 3-D</li> <li>and mathematical modelling, oral and digital presentations and computer-based tools</li> </ul> <p><b>Make</b></p> <ul style="list-style-type: none"> <li>select from and use specialist tools, techniques, processes, equipment and machinery</li> <li>precisely, including computer-aided manufacture</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>analyse the work of past and present professionals and others to develop and broaden their understanding</li> <li>investigate new and emerging technologies</li> <li>understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists</li> </ul> <p><b>Conclusion</b> This biomimicry project empowers Year 9 students to see the natural world as a rich source of design inspiration. It promotes sustainable thinking, enhances technical skill sets, and nurtures curiosity and creativity, all essential qualities for the designers and problem-solvers of tomorrow.</p>
	<p>Lesson 4 – Biomimicry, Using natural forms for inspiration(products) (double). To know what morphism is and how it is used in designing products</p>	<p>Gone in 30 seconds, new kettle Look at morphing Redesign kitchen objects. <b>Assessment: Show you know 1.</b> <a href="#">Assessment and feedback on product analysis. Live marking opportunity</a></p>	<p>Morphism Bio-morphing Alessi</p>	
	<p>Lesson 5 – Biomimicry -CAD (double). To be able to use CAD software as a 3D Design tool.</p>	<p><b>Homework 2</b> Recap of CAD techniques Go to CAD room complete initial challenge to draw a Battle opener Use CAD skills to create a 3D version of a previous hand drawn biomimicry sketch.</p>	<p>To be able to use CAD software as a 3D Design tool.</p>	