

Beamont Collegiate Academy Curriculum Map

Year: 9

Subject: Design & Technology



Intent	Implementation	Carousel 1 (9 weeks)	Carousel 2 (9 weeks)	Carousel 3 (9 weeks)	Carousel 4 (9 weeks)
Clarity around knowledge	Theme / topic	C.A.D Design Task - Design an adult training centre (Computing Hub)	Food - Ages and Stages	Remotely operated vehicles and autonomous systems	Food – Malnutrition
	Key substantive knowledge	<ul style="list-style-type: none"> • Autodesk Revit Basics: Understand Revit’s interface and tools for creating 3D models, floor plans, and elevations. Learn to navigate, set up projects, and use Revit’s drawing tools. • Space Planning and Layout: Design functional layouts for key spaces, including classrooms (25 pupils each), reception, kitchen, and toilets, ensuring each area meets required size and purpose. • Sustainable Energy Integration: Plan for renewable energy sources such as solar panels and wind turbines to power the building sustainably, promoting energy efficiency. • Building Regulations: Learn about building codes, particularly those related to accessibility (e.g., ramps, disabled WC) and safety, ensuring the design complies with relevant laws. • Designing Multi-functional Spaces: Ensure spaces like the canteen, meeting areas, and outdoor spaces are flexible and serve multiple functions, like dining and community meetings. • Natural Lighting and Ventilation: Plan for energy-efficient natural lighting and ventilation strategies, reducing 	<ul style="list-style-type: none"> • To understand the role nutrients in the body at different ages and stages of life • To be able to understand changing needs and implications on health • To handle different equipment safely and correctly, including cutting techniques. • To develop a range of different cooking skills including using the oven/hob. • Planning and preparing dishes • Create creative ideas to inspire their product/dishes • Literacy skills in using descriptive words to describe a product/dish/menu, etymology of cooking terminology • Numeracy skills in weighing out ingredients 	<ul style="list-style-type: none"> • To understand the Engineering Design Process and how engineers develop remotely operated vehicles to explore hostile environments. • Understand how to take risks and become resourceful and innovative citizens. • Understand how to develop and communicate design ideas. • Understand the importance of teamwork and project management skills. • Be able to critique and evaluate ideas to be able to respond constructively to feedback. • Understand how to apply computing and electronics and how to use programmable components to develop remotely operated vehicles. • Understand how to program components with python. • Oracy skills in presenting ideas to peers. 	<ul style="list-style-type: none"> • To understand the role of digestion and nutrients in the body and the impact of an inadequate diet • To be able to understand the causes, symptoms and treatment of various diseases related to malnutrition • To understand the role of the guts and microbiome in health and disease. • To handle different equipment safely and correctly, including cutting techniques. • To develop a range of different cooking skills including using the oven/hob. • Planning and preparing dishes • Create creative ideas to inspire their product/dishes • Literacy skills in using descriptive words to describe a product/dish/menu, etymology of cooking terminology • Numeracy skills in weighing out ingredients

		<p>reliance on artificial lighting and improving building comfort.</p> <ul style="list-style-type: none"> • BIM and Collaboration: Use Building Information Modelling (BIM) for integrated design, ensuring all elements (architecture, structure, MEP) work together seamlessly. • Cost and Sustainability Analysis: Apply Revit tools for estimating construction costs and conducting sustainability assessments to minimize environmental impact. 			
	Disciplinary knowledge	<ul style="list-style-type: none"> • Revit Software Skills: Learn how to effectively use Revit to design, model, and visualize 3D building structures, including floor plans, elevations, and sections. • Sustainable Design Practices: Understand how to incorporate renewable energy solutions (e.g., solar panels, wind turbines) into designs to reduce environmental impact. • Space and Functionality Planning: Develop the ability to design and allocate space for different functional areas (classrooms, canteen, bike storage) based on user requirements. • Building Codes and Accessibility: Apply knowledge of building regulations and accessibility standards to ensure the design is safe, inclusive, and compliant with legal requirements. • Environmental and Energy Efficiency: Learn how to incorporate energy-efficient elements like natural lighting, ventilation, and sustainable materials into the design. • Collaboration and BIM Integration: Work with others in a collaborative environment using Building 	<ul style="list-style-type: none"> • To be able to describe a nutrition intervention required at different ages and stages in life, such as infancy, pregnancy and old age. • To understand the impact of diet on life span and health span. • To understand the conditions that affect different ages and stages- e.g., anaemia in menstruation and osteoporosis post-menopause • To be able to apply the knowledge of nutrition to the planning of meals • To learn how to make healthy nutritious meals and snacks • To learn about food labelling; traffic light code, use by and best before date and what is required by law. 	<ul style="list-style-type: none"> • Develop knowledge of programmable components, python and AI. • Use computers and programmable components to make prototype ROVs or AUVs • Work with a range of materials and tools to develop the ROV/AUV. • Learn about the diverse world of engineering, robotics and autonomous systems and the responsibilities of engineers. 	<ul style="list-style-type: none"> • To be able to describe a range of conditions and diseases related to malnutrition • To understand the impact of diet on health- including consumption of processed foods. • To learn about the gut and microbiome and explain how optimum conditions for health can be achieved • To be able to apply the knowledge of nutrition to the planning of meals • To learn how to make healthy nutritious meals and snacks • To learn about food labelling; traffic light code, use by and best before date and what is required by law.

		Information Modelling (BIM) to integrate different design disciplines (architecture, structure, MEP).			
Clarity around sequencing	Main links across the curriculum	Production processes, use of tools, machines and CAD/CAM are all interlinked through focussed practical tasks: Year 7 - Materials Project, Year 8 – Hold It Project.	We will continue to add depth around the healthy eating message, and a focus on nutrition following on from Y8, but with a bigger focus on what ages and stages they are needed. Discussing our changing needs over time and how our diets need to change and adapt. This serves KS4 ready for the designing meals for certain groups of people.	Continue to build on skills developed in Yr 7 and 8 and be more adventurous in their problem-solving skills.	Following on from Y7 where students cover healthy lifestyles and sustainability, we will continue to add depth around the healthy eating message, discussing what makes food healthy (nutrients) and how to plan and prepare for healthy living, ensuring we get a variety of nutrients.
	Authentic cross curricular links	Science & Maths	Science, PE, Citizenship/PSHE,	Computer Science, Geography, English, Maths.	Science, PE, Citizenship/PSHE,
Vocabulary	Key words	<ul style="list-style-type: none"> Autodesk Revit Building Information Modelling (BIM) Sustainability Renewable Energy Solar Panels Wind Turbines Energy Efficiency Computing Hub Architecture Design Building Systems 	Nutrients Malnutrition Ages and stages: infancy, adolescence, adulthood, elderly	Remotely operated vehicles (ROV) Autonomous underwater vehicles (AUV) Python Micro:bit Raspberry Pi Prototype Hostile	Malnutrition Undernutrition Overnutrition Non-communicable disease Microbiome Probiotic Prebiotic
Assessment	Summative assessment	<p>Focused Practical Task:</p> <p>Formative Assessment Throughout: Making/Manufacturing Outcome</p> <p>Summative Assessment: 1 x end of project test/assessment</p>	<p>Formative Assessment Throughout: <u>Practical</u> lessons will be assessed ‘on the spot’ with detailed and specific feedback being given while students work. This is reactive and instant.</p> <p>Summative Assessment: 1 x end of project test/assessment</p>	<p>Formative assessment throughout.</p> <p>Peer review and WCF.</p> <p>Summative assessment 1 x end of unit assessment and evaluation</p>	<p>Formative Assessment Throughout: <u>Practical</u> lessons will be assessed ‘on the spot’ with detailed and specific feedback being given while students work. This is reactive and instant.</p> <p>Summative Assessment: 1 x end of project test/assessment</p>
Links to the real world / careers / PD		<ul style="list-style-type: none"> Architecture Career: Architect, Architectural Designer, Urban Planner Construction Career: Construction Manager, Site Engineer, Project Coordinator Engineering Career: Structural Engineer, Mechanical Engineer, Electrical Engineer Interior Design Career: Interior Designer, Space Planner, Furniture Designer 	Healthy eating and healthy lifestyles: life skill Hospitality industry Food and retail industry Health and healthcare	Engineering, robotics, design, mechatronics	Healthy eating and healthy lifestyles: life skill Hospitality industry Food and retail industry

		<ul style="list-style-type: none">• Urban Planning and Development Career: Urban Designer, Planner, Environmental Consultant• Sustainability and Green Building Career: Sustainability Consultant, LEED Consultant, Environmental Designer• Civil Engineering Career: Civil Engineer, Site Planner, Infrastructure Designer			
--	--	--	--	--	--