

Subjects: Engineering

Why Then? Why Now?	
Aim: <i>D&T at Birchwood we foster innovation and creativity by empowering students to think outside the box and tackle real-world problems with fresh perspectives. Through interdisciplinary learning, we'll blend D&T with other subjects for a well-rounded education. Practical skills development and a focus on sustainability will prepare our students to thrive in an ever-changing world.</i>	
Objectives: <i>To achieve this we will give students opportunity to work across several different creative and practical subjects.</i>	
Year 7 Overview	
Overview	Engineering
	<i>The Design and Technology (D&T) curriculum at Birchwood for Year 7 is designed to cultivate values that foster innovation and creativity, promote interdisciplinary learning, support practical skills development, and champion sustainability and adaptability. Throughout the academic year, students will engage in various hands-on activities such as technical drawing, constructing a wooden robot, and soldering a sensor LED circuit. These tasks not only enhance their technical skills but also nurture their problem-solving abilities and creativity. By focusing on these key areas, students are equipped with the necessary skills to excel in the ever-evolving landscape of D&T. For sustainability, we teach our students about the source of the materials we use, ethical practice, reducing waste in their projects, environmentally friendly alternatives, and the role that future designers will have. This sustainability focus is integrated into each year in KS3 and continues into KS4 if they opt to take the subject.</i>
	<i>As we transition students from primary education, where Design and Technology (D&T) may not have had the same level of resources and facilities, it is crucial to introduce them to the fundamentals of D&T early on in Year 7 at Birchwood Community High School. By starting with the basics, we lay a strong foundation for future learning and practical skills development in this subject. This early exposure not only equips students with essential knowledge but also fosters their creativity, problem-solving abilities, and practical understanding of design processes. Introducing D&T at this stage ensures a smoother progression and better integration into more advanced concepts in subsequent years.</i>
Building and revisiting from KS2	<ul style="list-style-type: none"> • Students will revisit mathematical types of drawing such as isometric drawing. • Students will build on general knowledge of classroom safety to develop awareness of the safe practices in a workshop. • Students will have the opportunity to build on materials knowledge and develop their understanding of properties of materials.



Curriculum Overview 2024-25
 Knowledge Rich Curriculum Map

Assessment	<ul style="list-style-type: none"> Recall of key words to retain key knowledge – Recall 5. RAP KAST test end of rotation Real time feedback
Year 8 Overview	
Overview	<i>In the Design and Technology curriculum at Birchwood, the Year 8 syllabus builds upon the foundational knowledge acquired in Year 7. A key focus is the exploration of the iterative design process through a hands-on catapult project. Students collaborate in pairs to test, refine, and enhance their designs, thereby strengthening their understanding of advanced mechanisms, forces, and material selection. This project not only cultivates creative thinking and problem-solving skills but also encourages critical analysis and teamwork. By delving into the intricacies of design and technology, students at Birchwood Community High School are equipped with the skills necessary for real-world application and innovation.</i>
Why	<i>The Catapult project is pivotal in providing students with a valuable introduction to an iterative process, prioritising the journey over the final outcome. This approach nurtures students' ability to innovate, take risks, and explore diverse solutions to problems. Furthermore, the exposure to advanced mechanisms and material selection within the project not only presents more complex challenges but also serves as a fundamental step in cultivating the development of future engineers. By engaging with the Catapult project, students are equipped with the necessary skills and mindset to excel in the field of engineering.</i>
Building and revisiting	<ul style="list-style-type: none"> Students build on the practical skills working on familiar materials. Students will revisit tools and equipment used in year 7. Students will revisit materials studied in year 7
Assessment	<ul style="list-style-type: none"> Recall of key words to retain key knowledge – Recall 5. RAP KAST test end of rotation Real time feedback
Year 9 Overview	
Overview	<i>The Year 9 curriculum at Birchwood builds upon the foundational knowledge acquired in Year 7 and the problem-solving skills honed in Year 8, allowing students the time to master what has been taught in these preceding years. The focus of this year is on</i>



	<p><i>designing and constructing a drag racer. Students will develop advanced freehand design skills, plan projects from start to finish, make informed judgments based on research, and enhance their problem-solving abilities within a practical context. This project integrates considerations of design concepts and aesthetics with the iterative process of selecting appropriate mechanisms and materials for optimal functionality. Furthermore, students will explore how Computer-Aided Design (CAD) can enhance their design capabilities. By the end of the year, students will have a comprehensive understanding of the various elements involved in the design and creation of products.</i></p>
<p>Why</p>	<p><i>The rationale for Year 9 Design and Technology (D&T) lies in its role as a vital stepping stone for students to hone their engineering skills. This subject serves as a platform for students to integrate and apply D&T principles, preparing them for more advanced projects in KS4. Furthermore, by delving into the intricacies of engineering at an early stage, students are not only equipped with foundational knowledge but are also exposed to potential careers in the engineering sector. Year 9 D&T thus acts as a bridge, connecting academic concepts with practical applications, fostering a holistic understanding that is essential for future academic and professional pursuits.</i></p>
<p>Building and revisiting</p>	<ul style="list-style-type: none"> • Students build on the practical skills working on familiar materials. • Students will build on their knowledge of mechanisms and forces. • Students will revisit tools and equipment used in year 8.
<p>Assessment</p>	<ul style="list-style-type: none"> • Recall of key words to retain key knowledge – Recall 5. • RAP • Topic Quiz • KAST test end of rotation • Real time feedback.

