Richmond School & Sixth Form College
Being the best we can be

Year 9 BTEC Engineering

In Year 9 Engineering, students will be introduced to the engineered world through small independent and teamwork challenges. The purpose of these challenges is to broaden students' knowledge of engineering products and sectors and to improve students' problem-solving skills. In each case, students will work either as a team or independently and will be given a brief or problem to solve. They will then have to, using the limited equipment provided, work on the best-possible solution to the given problem.

Methods of deepening and securing knowledge:	
Spaced practice	Students will use spaced practice by repeating the engineering problem-solving process. Over time, students will learn that when given a brief, it is important to investigate and design before making. It is also important to ensure evaluations are completed for all projects and results analysed. This ensures students can build this skill throughout the year in preparation for Year 10 and 11.
Retrieval practice	Students are encouraged to use the same process throughout Design and Technology and can apply this to their engineering problems/solutions. The ability to communicate a design and re-enforcing the importance of planning is used in Year 9 Engineering. Different design styles and techniques used in KS3 are used and developed in each engineering project.
Interleaving	Interleaving is evident through the repetition of processes, whilst introducing and focussing on key areas. Students will be assessed on their ability to investigate in one project and design on the next – however students will complete all sections of the process in each project, re-enforcing how the important parts can impact a successful final solution.
Concrete examples	Due to the nature of engineering, concrete examples are used through real-life engineering products, problems and sectors. Students enjoy the context of the challenges and link these to real-life scenarios, meaning students are learning more about the engineered world as well as developing their own skills.

	Autumn term 1	Autumn term 2	Spring term 1	Spring term 2	Summer term 1	Summer term 2
Topic(s)	**Engineering Basics** - Health and safety refresh - Aluminium vice clamps	**Aluminium Phone Holder** - Developing skills with sheet metal work	**Collapsible Platforms (Structures)** - Investigation of structures - Designing a solution to the brief	**Collapsible Platforms (Structures)** - Designing - Modelling using given resources - Evaluating and analysing	**Rockets (Aerospace)** - Modelling and testing - Recording results	**Rockets (Aerospace)** - Finalising models - Teamwork, testing models and working on final outcome
Assessment	- Practical outcome	- Practical outcome	- Investigation - Design skills	- Modelling skills	- Modelling skills	- Testing and analysing skills

			- Practical outcome - Analysing results	- Analysing outcomes	- Component 3 PPE will also take place during the term	- Quality of final outcome
CEIAG *(Careers that are linked to that topic)*	Aluminium Fabricator: - Use of tools and processes - Manufacturing methods	Aluminium Fabricator: - Use of tools and processes - Manufacturing methods	Civil Engineering: - Building things for people - Solving a problem using structures	Civil Engineering: - Working on solutions to help in high risk environments	Aerospace Engineering: - Rocket design - Rocket science - Parachute design/aviation	Aerospace Engineering: - Rocket design - Rocket science - Parachute design/ aviation

Homework:
Investigation and Research are essential skills when developing engineering products and increase students awareness of the engineered world: - Research of careers relating to the project - Looking at existing products or solutions to similar problems - Developing analysing skills by researching statistics, facts and figures - Ensuring outstanding work is complete - Revising for practise assessments