

Subject: Design & Technology - RM **Year** 7 **Ability** All

Term / Date(s)	4 Weeks – Research/design	7 Weeks – Making	3 Weeks – CAD/CAM
Topic	The importance of the design Process	Understanding safety through practical outcomes Pop Art Gumball Machine	Technical knowledge: An introduction to mechanisms, CAD and CAM
Students will learn...	<p>How to use the design process in order to produce simple products in the workshop.</p> <p>How to sketch 2D and 3D in order to convey an idea or concept.</p> <p>How to gather simple research to improve the products we use. Students should know the key features and characteristics of the Pop Art movement and how these can be implemented in their own work</p> <p>How to model an idea through a variety of media with an introduction to CAD – 2D Design</p>	<p>How to conduct themselves safely in a workshop.</p> <p>How to use the design process in order to produce simple products in the workshop.</p> <p>How to work safely to mark out, cut, file and sand using the workshop tools and machinery to join materials to make a product</p> <p>How to use finishing techniques such as stain and acrylic paint accurately.</p>	<p>How to identify a specific mechanism and recognise its key parts.</p> <p>How to identify the characteristics and uses of a range of mechanisms.</p> <p>How to apply mechanisms into a product.</p> <p>Understand what mechanisms are, and understand the differences between pulleys, gears, cams and levers and their applications</p>
Components	<p>Students will understand how to use the Pop Art design movement as a theme to ensure a design concept model is correctly designed to a specific user. Students to understand the importance of analysing a suitable design brief to identify considerations for the needs and wants of a user.</p> <p>Students should know the key features and characteristics of the Pop Art movement and how these can be implemented in their own work</p> <p>Students will explore and understand why a user or client have specific needs. This will be essential when tailoring a product to a specific client.</p> <p>Students will explore the work of a range of designers to understand how they have contributed to society. Students will be able to analyse the work of existing artists looking into composition and media used.</p> <p>Students will work from a basic specification in order to create suitable ideas.</p> <p>Students will be able to annotate their design ideas and provide reflections and justifications suggesting ways the design could be developed in order for it to be improved.</p>	<p>Students understand how to use a basic range of tooling and machinery to work independently in the workshop.</p> <p>Students will understand how to work safely to mark out, cut, file and sand using the workshop tools and machinery to join materials to make a product.</p> <p>Students will be able to identify the key elements of PPE that they will use for specific tasks.</p> <p>Students will apply their learned knowledge of working in a workshop to produce an accurate model suitable for a specific client.</p> <p>Students to have a basic understanding of how we source materials sustainably to ensure they understand the importance of being eco-conscious, self-sufficient citizens.</p> <p>Students will use and combine materials to increasing confidence and independence in the workshop.</p> <p>Students to understand the purpose of templates and jigs in order to produce a product using finer tolerances.</p> <p>Students will use a range of tools and machinery to manufacture a mechanical device in order to efficiently launch an object over a distance.</p> <p>Students will understand a range of different adhesives and what they can be used for.</p>	<p>Students will use the knowledge of design to produce a range of suitable design ideas.</p> <p>Students to explore CAD by experimenting with a range of design solutions based around a given specification.</p> <p>Students will be able to use the basic functions of a CAD package (2D Design).</p> <p>Students will be able to recognise and characterise mechanisms used in their project to produce a successful working outcome.</p> <p>Students should know how to create a design using CAD and produce this using CAM in an accurate way.</p> <p>Students will understand what mechanisms are, they will understand the differences between pulleys, gears, cams and levers and their applications.</p>
What pupils should already know (prior learning components)	<p>Using basic pencil sketches to create simple 2D designs</p> <p>Basic drawing and rendering (presentation) skills evident.</p>	<p>Basic understanding of Health and Safety within a workshop – be able to identify simple hazards and how to reduce the risks.</p> <p>Using a selection of hand tools to create products.</p>	<p>To be able to identify hazards in a workshop in order to keep safe. To be able to identify simple mechanisms used in DT.</p>

	How to annotate and explain designs, identifying key features.	Using simple hand tools such as coping saw, tenon saw, bench hook, tri-square and files. Using tooling safely & confidently in order to produce an outcome.	To be able to evaluate focusing on what processes went well or didn't go well.
Golden Knowledge	Golden Knowledge: Designing Golden Threads <ul style="list-style-type: none"> • Annotation • 2D / 3D drawings (Isometric) • How to develop an idea 	Golden Knowledge Safety and making: Golden Threads <ul style="list-style-type: none"> • Health and Safety in the workshop • Safety using hand tools • Safety using machines • Safety using adhesives • Safety using finishing techniques • Applying safe working practice 	Golden Knowledge: Mechanisms Golden Threads <ul style="list-style-type: none"> • Different categories of Levers • Pulleys • Gears and cogs • Accurate use of tools to make a mechanism
Transferrable knowledge (skills)	How to use the design process in order to produce a product suitable for a specific user or client. Analyse and evaluate their work. Basic use of a CAD package to produce a concept model	How to use a range of tools and machinery confidently in order to keep safe in a practical environment. How to design products that are suitable for a specific user.	The use of mechanisms in products around us, how they work and why they are used. Understanding about Mechanical Advantage and how this helps the end user to do otherwise impossible jobs.
Key vocabulary pupil will know and learn	Design brief, Context, Research – mechanisms, Initial Ideas, Computer Aided Design (CAD), rendering, Annotation, ACCESS FM.	Risk, Hazard, Brief, sustainable, Hardwood, Softwood, MDF, Belt / disc sander, Adhesives , Health & safety, Tenon saw, bench hook, file, pillar drill, sand paper, wet and dry paper, templates and jigs, coping saw, rasp, needle files, wet and dry paper, CAM – Computer Aided Manufacture (CAM), Acrylic.	Effort, load, fulcrum, 1 st class/ 2 nd class / 3 rd class levers, Pulleys, compound pulleys, linkages, Cams – Heart, eccentric, pear, snail. Gears, cogs, gear trains.
Assessment activities	Milestone formative assessment – covers all design and development work as a collective. Assessment is based around design and presentation skills and covers: <ol style="list-style-type: none"> 1. Ability to use the Pop Art theme to create a series of creative designs 2. Designs are well presented with accurate rendering 3. Quality of graphic communication 4. Importance of CAD/ CAM 	Practical outcome assessed - summative. Formative ongoing assessments used throughout the project in the form of verbal feedback and EBI.MRIs Assessment of: <ol style="list-style-type: none"> 1. importance safe working practice. 2. identification of tools, machinery and processes. 3. Use tool effectively and accurately. 4. Be aware of relevant health and safety issues and awareness of suitable control measures. 5. Application of finishes. 6. Final Outcome 	Formative ongoing assessments used throughout the project in the form of verbal feedback and EBI.MRIs Assessment of: <ol style="list-style-type: none"> 1. Be able to recognise and identify a range of movements. 2. Understand the function of a mechanism. 3. Be able to list uses for each mechanism. 4. Final outcome.
Resources available	Design booklet – Y7 , CAD packages (Techsoft-2D). https://sharemulti.sharepoint.com/sites/TCADT/Shared Documents/KS3 Design Technology/KS3 Design Technology/Y7 gumball machine	Design booklet – Y7, Practical Do Now activities. https://sharemulti.sharepoint.com/sites/TCADT/Shared Documents/KS3 Design Technology/KS3 Design Technology/Y7 gumball machine	Design booklet – Y7, exemplar linkages, videos embedded in PPT's. https://sharemulti.sharepoint.com/sites/TCADT/Shared Documents/KS3 Design Technology/KS3 Design Technology/Y7 gumball machine