

## SUBJECT: Design & Technology

### Key Stage 3: Curriculum Intent (BRIEF):

2020-21	Year 7 Carousel	Year 8 Carousel	Year 9 Carousel
Autumn 1 & 2	<p><b>Topic: Cookie cutter project</b></p> <ul style="list-style-type: none"> <li>-Exploring plastics</li> <li>-Working with plastics</li> <li>-Testing the product in Food Technology</li> </ul> <p><b>Content covered, including knowledge and skills.</b></p> <ul style="list-style-type: none"> <li>-The source of plastics</li> <li>-How plastics are processed</li> <li>-Categories of plastics</li> <li>-Types of plastic and their uses</li> <li>-The vacuum forming process and profile cutting</li> <li>-Basic workshop safety</li> <li>-Baking cookies</li> </ul> <p><b>Links to prior learning.</b></p> <p>Progression from KS2 curriculum...</p> <ul style="list-style-type: none"> <li>-Basic design and making skills</li> <li>-Exploring and evaluating existing products</li> <li>-Basic cooking skills</li> </ul> <p><b>Links to British Values, SMSC and work-related learning</b></p> <ul style="list-style-type: none"> <li>-Environmental impact of the use of plastics</li> <li>-Recycling and re-using</li> <li>-Gaining user feedback in the development of products</li> </ul> <p><b>Literacy: Key words and terminology</b></p> <p><b>Health &amp; Safety:</b> Personal Protective Equipment (PPE), safety glasses, visor, goggles, dust mask, apron</p> <p><b>Plastics:</b> source, extraction, crude oil, chemical process, thermoplastics, thermosetting polymers</p>	<p><b>Topic: Chocolate mould project</b></p> <ul style="list-style-type: none"> <li>-Understanding how plastic products are manufactured</li> <li>-Understanding packaging design</li> </ul> <p><b>Content covered, including knowledge and skills.</b></p> <ul style="list-style-type: none"> <li>-Exploring plastic processes</li> <li>-Creating surface developments</li> <li>-Manufacturing formers and vacuum forming</li> <li>-Working with paper and board</li> <li>-Moulding chocolate</li> </ul> <p><b>Links to prior learning.</b></p> <ul style="list-style-type: none"> <li>-The sources and types of plastic (Cookie cutter project)</li> <li>-Building on the understanding of the design process - Confidence in workshop safety and practices i.e. vacuum forming &amp; profile cutting (Y7 cookie cutter)</li> </ul> <p><b>Links to British Values, SMSC and work-related learning</b></p> <ul style="list-style-type: none"> <li>-Sustainable packaging design</li> <li>-Reducing the impact of packaging</li> <li>-Designing a re-usable product</li> <li>-Considering the needs of the consumer</li> </ul> <p><b>Literacy: Key words and terminology</b></p> <p><b>Plastic processes:</b> vacuum forming, injection moulding, blow moulding, extrusion, mass production</p> <p><b>Packaging:</b> surface development, net, tab, crease, score, symbol, logo, slogan, pictogram</p>	<p><b>Topic: Pewter casting project</b></p> <ul style="list-style-type: none"> <li>-Exploring metals</li> <li>-Casting and shaping metals</li> </ul> <p><b>Content covered, including knowledge and skills.</b></p> <ul style="list-style-type: none"> <li>-Sources, categories and applications of metals</li> <li>-Exploring casting processes</li> <li>-Mould production using CAD/CAM</li> <li>-Using the pewter casting process</li> <li>-Finishing metals</li> </ul> <p><b>Links to prior learning.</b></p> <ul style="list-style-type: none"> <li>-Building on the understanding of the design process</li> <li>-Development of CAD/CAM skills (Y7 Novelty light)</li> <li>-Confidence in workshop safety and practices</li> </ul> <p><b>Links to British Values, SMSC and work-related learning</b></p> <ul style="list-style-type: none"> <li>-Environmental impact of mining</li> <li>-Exploring the origins of casting processes -How is casting used in industry?</li> <li>-What products have been made using the casting process?</li> </ul> <p><b>Literacy: Key words and terminology</b></p> <p><b>Metals:</b> Extraction, mining, Ferrous, Non-Ferrous, Alloy, properties, corrosion, rust, conductor</p> <p><b>Casting:</b> Die casting, sand casting, pewter casting, mould, cavity, brazing hearth, crucible, molten, ladle, pouring</p> <p><b>Process:</b> Computer Aided Design, Computer Aided Manufacture, 2D Designer, drilling, polishing, buffing</p>

	<b>Materials, components and processes:</b> Medium Density Fibreboard, former, vacuum forming, profile cutting, High Impact Polystyrene (HIPs)	<b>Environment:</b> Transportation, disposal, litter, land fill, reduce, recycle, biodegradable	<b>Environment:</b> Extraction, land use, impact, pollution, habitat damage
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	<b>Environment:</b> Landfill, microplastics, reuse, recycle, biodegradable		
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Spring 1 &  
2

**Topic: Novelty light project**

- Understanding the types and function of basic circuit components
- Constructing circuits
- Working with mixed materials
- Using CAD/CAM

**Content covered, including knowledge and skills.**

- Basic component identification and applications
- Circuit construction and PCB drilling
- Using CAD-Computer Aided Design (2D Designer)
- Using CAM-Computer Aided Manufacture (Laser cutting)
- Forming and shaping plastics

**Links to prior learning.**

- Progression from KS2 curriculum...
- Basic design and making skills
- Exploring and evaluating existing products

**Links to British Values, SMSC and work-related learning**

- Moving towards an energy efficient lighting solution (LED's)
- Product Life Cycle
- Sustainability
- Exploring target markets
- User feedback

**Literacy: Key words and terminology**

**Components:** Light Emitting Diode, resistor, switch, battery snap, Printed Circuit Board (PCB)

**Processes:** press forming, expanded polystyrene, plywood, acrylic, thermoplastic, Computer Aided Design, Computer Aided Manufacture, strip heating, plastic memory

**Environment:** Energy efficiency, energy consumption, life cycle, lifespan sustainability

**Topic: USB LED light project**

- Understanding circuit design and layout
- Working with mixed materials

**Content covered, including knowledge and skills.**

- Having a knowledge of electronic components and symbols
- Circuit design and layout
- Using the linisher and pillar drill
- Exploring themes

**Links to prior learning.**

- Basic electronic components (Y7 Novelty light)
- Building on the understanding of the design process - Confidence in workshop safety and practices i.e. PCB drilling and using the linisher (Y7 Novelty light)

**Links to British Values, SMSC and work-related learning**

- Environmental impact of batteries
- Reducing the impact (recharge/recycle)
- Sustainable power sources (solar/wind-up)
- Considering the social and cultural impact of a product

**Literacy: Key words and terminology**

**Circuit manufacture:** protective resistor, high power Light Emitting Diode (LED), Printed Circuit Board (PCB), PCB drill.

**Construction:** Medium Density Fibreboard (MDF), dowel, pine, pillar drill, linisher

**Environment:** Battery disposal, pollution, recycling, sustainable, recharge, renewable energy

**Topic: Design styles clock project**

- Exploring the history of product design
- Using CAD/CAM in product design

**Content covered, including knowledge and skills.**

- What are the main design styles?
- Who are the key designers within each period?
- What products did they design?
- How does a design style influence product design?

**Links to prior learning.**

- Former production and vacuum forming (Y8 chocolate mould)
- Building on the understanding of the design process
- Confidence in workshop safety and practices

**Links to British Values, SMSC and work-related learning**

- Design styles and periods through history
- Exploring the work of famous designers
- Cultural influences

**Literacy: Key words and terminology**

**History:** Timeline, Design style, design movement, Arts and Crafts, Art Nouveau, Art Deco, Memphis, Modernism

**Processes:** Vacuum forming, profile cutting, vinyl cutting

**Product Analysis:** form, function, utility, functionality, appearance, eye-catching, influence

<p>Summer 1 &amp; 2</p>	<p><b>Topic: Helicopter launcher project</b>          -Understanding the types of movement and mechanisms          -Working with mixed materials</p> <p><b>Content covered, including knowledge and skills.</b> -Exploring how toys and play has evolved</p>	<p><b>Topic: Cube calendar project</b>          -Exploring woods and timber          -Using wood joints and construction techniques -Working with woods and woodworking tools and equipment.</p> <p><b>Content covered, including knowledge and skills.</b></p>	<p><b>Topic: Sweet dispenser project</b>          -The environmental impact of products.          -Designing sustainable products with a focus on the 6 Rs.</p> <p><b>Content covered, including knowledge and skills.</b>          -What are the six Rs and why are they important?          -What do we mean by sustainability? Why is it important?</p>
	<p>-Types of motion (rotary, linear, oscillating and reciprocating)          -Types of basic mechanism (Gears, cams, pulleys etc.)          -Manufacturing a working toy</p> <p><b>Links to prior learning.</b>          -Progression from KS2 curriculum...          -Basic design and making skills          -Exploring and evaluating existing products</p> <p><b>Links to British Values, SMSC and work-related learning</b>          -Traditional toys and the evolution of play          -Considering the needs of the user          -Exploring fashions and trends</p> <p><b>Literacy: Key words and terminology</b></p> <p><b>Evolution:</b> Traditional, mechanical, physical, hands-on, social, interactive, fashion, trend</p> <p><b>Motion:</b> reciprocating, rotating, oscillating, linear</p> <p><b>Mechanisms:</b> pulley, cam, gear, linkage, chain and sprocket</p>	<p>-Exploring the source of woods          -Categories of woods          -The importance of a sustainable approach          -Working with jigs and templates          -Fabricating a wood-based product</p> <p><b>Links to prior learning.</b>          -Basic understanding of sustainability, material sources and energy efficiency (Y7 Cookie cutter and Novelty Light) - Building on the understanding of the design process - Confidence in workshop safety and practices i.e. linisher, coping saw (Y7 Novelty light)</p> <p><b>Links to British Values, SMSC and work-related learning</b>          -Responsible wood sources          -Deforestation          -Regulation and the FSC</p> <p><b>Literacy: Key words and terminology</b></p> <p><b>Woods and timber:</b> Sources, forestry, hardwoods, softwoods, man-made boards, deciduous, coniferous</p> <p><b>Construction:</b> wood joints, finger joint, dovetail, shoulder joint, dowel, halving joint, permanent, temporary fixing</p> <p><b>Environment:</b> Deforestation, habitat, regulation, Forestry Stewardship Council (FSC), sustainable</p>	<p>-What is upcycling? How can products be upcycled?</p> <p><b>Links to prior learning.</b>          -Building on the understanding of the design process          -Confidence in workshop safety and practices          -Developing wood working skills (Y8 cube calendar)</p> <p><b>Links to British Values, SMSC and work-related learning</b></p> <p><b>Literacy: Key words and terminology</b></p> <p><b>Environment:</b> Recycle, reuse, repair, rethink, refuse, reduce, sustainability, resources, source, finite, infinite, upcycling</p> <p><b>Materials, processes and techniques:</b> Pine, tenon saw, coping saw, pillar drill, linisher, disc sander</p>