



# KS3 Curriculum Overview

# Design Technology

## Curriculum Intent

At Downham Market Academy the subject of design technology is broken down into smaller rotations throughout the year, these include theory, food, CAD, textiles, and product design. By the end of KS3 all students should have had an opportunity to carry out a variety of projects using a range of disciplines and master some key skills from each of these areas allowing them to flourish and understand the world around them.

Students will learn to:

- Use creativity and imagination to design and make products that solve real and relevant problems including those encountered in their everyday lives.
- Build resilience and confidence to face challenges whilst raising their self esteem and developing new personal interests.
- Be able to work within a range of contexts, considering their own and others' needs, wants and values.
- Acquire a broad range of subject knowledge whilst learning how to take risks and becoming a resourceful, innovative, enterprising and capable citizen in an increasingly technological world.

## How does the KS3 curriculum build on that from KS2?

The activities in design and technology lessons provide a broad range of opportunities and contexts for students to understand and use the properties of materials and ingredients in order to achieve functioning solutions to relevant problems. We are fully aware some students may have never encountered projects like these, whilst others are regularly tinkering in a workshop or cooking family meals. The projects are therefore accessible by all students no matter what background, ability or experience. The activities enable students to develop crucial life skills and express their own creativity, challenging students to push boundaries and work to their highest standards no matter what their DT experience at KS2.

The KS2 design and technology curriculum relies on staff teaching the basic principles of the design, make, evaluate cycle within a very limited range of materials. By the end of KS3 students have built on this to develop a deeper understanding and application of these basic skills, taking much more consideration of user needs, rather than just designing and making for themselves. KS3 builds on KS2 by moving on from using simple tools to using more specialist tools, techniques, processes and machinery. Students will also be expected to not only select materials and components for aesthetics like KS2, but to consider their properties, function and appeal. In terms of evaluation, at KS2, students will be expected to analyse existing products, compare their products against design criteria and understand how key events have shaped the world. By the end of KS3 this will have developed into analysis of professionals to broaden their own understanding, testing and refining ideas against design criteria as well as taking into account user views and

specifications. KS3 students should also be considering the impact of key events in the context of individuals, society and the environment, but also how problem solving is the responsibility of designers, engineers and technologists including themselves.

### What do students *do* with this knowledge or these skills?

- Students follow and adapt recipes, for predominantly savoury dishes, to be able to work safely and successfully in the kitchen.
- Students understand and apply the principles of nutrition and health to their own and others' diets.
- Students understand and use the properties of materials to achieve functioning solutions to a variety of problems.
- Students will develop creativity and insight through the design process by working to a range of briefs then evaluating and refining their own ideas.
- Students can go on to study GCSE product design or vocational courses in engineering or hospitality and catering, then pursue further study in this area including apprenticeships, A-Levels or workplace training.
- All students transfer their creativity, innovation and improved self-confidence to other aspects of the curriculum and to benefit their daily lives.

### How does the KS3 curriculum align to the National Curriculum?

- At KS3 we follow the structure of the National Curriculum by following the design, make, evaluate cycle. However we go over and above the National Curriculum expectations with the breadth of opportunities available to our students. By following practical projects in this manner students are able to understand the technical knowledge in context and apply it to real life situations rather than stand alone theory lessons which become a challenge to follow and apply.
- Projects may include the following aspects:
- Food – following and adapting recipes, health and safety, recipes with multiple elements, cooking from scratch, nutrition and cooking for dietary requirements.
- Engineering + Product Design – working with a variety of materials (including wood, metal, acrylic, HIPS), marking out and measuring accurately, finishing techniques, cold and vacuum forming, electronic components.
- Textiles – types of fibres, sustainability, fast fashion and ethics, hand sewing, machine sewing, pattern making, embellishment.
- CAD – 1 and 2 point perspective, CAD CAM, typography, isometric and orthographic drawing, influence of designers.

### What new knowledge or skills are students taught?

Term	Year 7	Year 8	Year 9
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<b>Theory</b>	<p>Knowledge is power.</p> <ul style="list-style-type: none"> <li>• Food groups and eatwell plate,</li> <li>• Cooking methods,</li> <li>• Tools and equipment,</li> <li>• Materials and their properties,</li> <li>• Fibres and fabrics,</li> <li>• Fashion ethics,</li> <li>• Sustainability.</li> </ul>	<p>More knowledge, more power.</p> <ul style="list-style-type: none"> <li>• Food hygiene,</li> <li>• Environmental Health Officers,</li> <li>• Machinery,</li> <li>• Design ideas,</li> <li>• Decorative textile techniques,</li> <li>• Fashion illustration,</li> <li>• Sustainability.</li> </ul>	<p>With great power comes great responsibility.</p> <ul style="list-style-type: none"> <li>• Diets and allergies,</li> <li>• Kitchen brigade,</li> <li>• The work of others – companies,</li> <li>• The work of others – designers,</li> <li>• Modern textiles,</li> <li>• Technical drawing,</li> <li>• Sustainability.</li> </ul>
<b>Food</b>	<p>Key skills and understanding.</p> <ul style="list-style-type: none"> <li>• Following health and safety.</li> <li>• Following and amending a recipe.</li> <li>• Weighing and measuring.</li> <li>• Eatwell guide, 5 a day, portion sizes.</li> <li>• Knife skills.</li> <li>• Using the hob, grill, oven.</li> </ul>	<p>Mastering skills and understanding.</p> <ul style="list-style-type: none"> <li>• Understanding food safety.</li> <li>• Developing recipes.</li> <li>• Accuracy and control.</li> <li>• Cooking methods for health, convenience and quality.</li> <li>• Presentation.</li> <li>• Heat control.</li> </ul>	<p>Applying skills and understanding.</p> <ul style="list-style-type: none"> <li>• Applying hygiene and safety.</li> <li>• Accompaniments and side dishes.</li> <li>• Dietary requirements.</li> <li>• Garnishes and plating up.</li> <li>• Specific equipment and techniques.</li> </ul>
<b>Product Design</b>	<p>Coat hook.</p> <ul style="list-style-type: none"> <li>• Card template, marking out, cut and sand MDF, marking and cutting steel, drilling, countersinking, self tapping, cold forming, finishing – painting, assembly, pilot hole.</li> <li>• Using machinery and hand tools with a degree of control.</li> <li>• Plan manufacturer’s processes.</li> <li>• Understand basic construction methods.</li> <li>• Understand the properties of basic materials (MDF, steel).</li> </ul>	<p>Trophy.</p> <ul style="list-style-type: none"> <li>• CAD, Coral Draw, using pine, plough plane, electrical components, solder, flow charts.</li> <li>• Using machinery and hand tools with a degree of control and accuracy.</li> <li>• Plan manufacturer’s specification.</li> <li>• Construction includes electrical elements.</li> <li>• Understand and apply the properties of materials (pine, acrylic).</li> </ul>	<p>Lamp.</p> <ul style="list-style-type: none"> <li>• Engineers square, odd leg calliper, die, die wrench, cutting compound, mould, vacuum forming, tin snips, finishing - Danish oil, hips, upcycled wood, wing nuts.</li> <li>• Apply quality control when using machinery and hand tools.</li> <li>• Use drawing boards accurately.</li> <li>• Construction includes advanced electrical systems.</li> <li>• Use the properties of materials to create functional parts.</li> </ul>
<b>CAD</b>	<p>2d Design. Designing for a brief. Egg Cup.</p> <ul style="list-style-type: none"> <li>• Introduction to 2d Design and use of tools,</li> <li>• The power of CAD,</li> <li>• Introduction to the design process,</li> <li>• Analysis and current solutions,</li> <li>• Design specifications and ideas,</li> <li>• Modelling,</li> <li>• Final design ideas.</li> </ul>	<p>On Shape. Concepts and Skills.</p> <ul style="list-style-type: none"> <li>• Introduction to OnShape and navigating documents.</li> <li>• Taking measurements, sketching, dimensioning, constraints, extrude, revolve.</li> <li>• Orthographic views, multi – part studios, On Shape assemblies.</li> <li>• Modelling basics, standard content.</li> </ul>	<p>On Shape. Collaboration and Work related CAD.</p> <ul style="list-style-type: none"> <li>• Collaboration.</li> <li>• In-context modelling, branching and merging, gears and gear relations, helix and sweep.</li> <li>• Engineering design process, reverse engineering.</li> <li>• Importing content.</li> <li>• Versions of documentation.</li> </ul>
<b>Textiles</b>	<p>Hanging decoration.</p> <ul style="list-style-type: none"> <li>• Understand fibres and the properties of materials.</li> <li>• Begin to consider their opinion on ethics in the fashion industry.</li> <li>• Produce, cut and use pattern pieces.</li> <li>• Hand sewing.</li> <li>• Embellishment – applique.</li> </ul>	<p>Pop art cushion.</p> <ul style="list-style-type: none"> <li>• Investigating influential designers and styles.</li> <li>• Applying the ideas of others to your own designs.</li> <li>• Using CAD to develop design ideas.</li> <li>• Using seam allowances when designing and using own patterns.</li> <li>• Begin to use machine sewing.</li> <li>• Embellishment including button holes.</li> </ul>	<p>Tote Bag.</p> <ul style="list-style-type: none"> <li>• Investigating current products and finding a design niche.</li> <li>• Hand embroidery.</li> <li>• Drawing, cutting and using pattern pieces.</li> <li>• Construction and embellishments.</li> <li>• French seams.</li> </ul>

<p><b>Rationale for this sequencing</b></p>	<p>The curriculum in year 7 exposes students to a range of basic technology skills that many will not have come across previously. We aim to build student confidence working in the unfamiliar kitchen/ workshop settings, instil appropriate hygiene, health and safety practises and unveil a sense of creativity. Students are given the opportunity to demonstrate existing knowledge, develop an understanding of new techniques and skills and experiment with a range of materials, ideas and experiences.</p>	<p>In year 8, students are building on the basics to ensure mastery of the essential skills and gain a comprehensive grounding in all aspects of the technology curriculum. This enables them to use accuracy and efficiency when working, but also to start applying their knowledge and understanding when making appropriate choices and developing their own ideas.</p>	<p>In year 9, students are expected be fully engaged in the design process, understanding problems in a range of contexts and creating inventive and appealing solutions. Students should consider the influence of design on their own ideas and be able to communicate using a range of techniques. Students should also be exposed to new and emerging technologies, understanding and experiencing how these can impact our modern lives.</p>
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### Additional support at home

<p><b>Additional reading</b> for enjoyment, enhancement and extension</p>	<ul style="list-style-type: none"> <li>• The Language of Things. Deyan Sudjic.</li> <li>• Stuff Matters. Mark Miodownik.</li> <li>• Why Shrink Wrap A Cucumber? Stephen Aldridge</li> <li>• No More Plastic. Martin Dorey.</li> <li>• The little inventors handbook: a guide to becoming an ingenious inventor. Dominic Wilcox.</li> <li>• Woodworking for kids. Vincent Martin.</li> <li>• Chews Your Own Tasty Adventure. Sai Pathmanathan.</li> <li>• The Complete Cookbook for Young Chefs. America’s Test Kitchen Kids.</li> <li>• <a href="#">V&amp;A museum crafts</a>. These are great projects to do at home.</li> <li>• My first hand sewing book. Alison McNichol.</li> <li>• Magazines – e.g. Crafts Magazine; Selvedge Magazine; Surface Design Journal.</li> </ul>
<p><b>Online resources</b> to practice, consolidate and revise</p>	<ul style="list-style-type: none"> <li>• Print The Legend – Netflix.</li> <li>• Abstract: The Art of Design – Netflix.</li> <li>• Great British Sewing Bee – BBC.</li> <li>• Design Matters – Debbie Millman podcast.</li> <li>• <a href="#">Tesco Recipes</a>.</li> <li>• <a href="#">Technologystudent.com</a></li> </ul>

**Workbooks & revision guides**

to practice, consolidate and revise

- [CGP Ks3 Design and Technology study guide.](#)
- [Design and Technology Dictionary.](#)
- [Food a Fact of Life.](#)