


HJS Curriculum Skills Progression – DT

 DT Skills	Year 3	Year 4	Year 5	Year 6
<p>DT projects are based on Structures, Mechanisms, Food, Textiles and Electrical. There are at least 2 projects for each theme, 2 years apart. Where it is appropriate to do so, DT projects are linked to the Humanities topics we study. Teachers will plan their own units of work based on this skills progression sheet. They may draw on the DATA “Projects On A Page” for additional inspiration and support.</p>				
Topics	Brilliant Bristol, Awesome Ancestors, Ancient Egypt	Ancient Influences, Earth Explorers, Our World Our Future	Invaders, Explorers, Rainforests	America, WW2, Africa Big Picture
DT1 Design See appendix 2	a) Use research to develop design criteria that is fit for purpose. b) Supported discussions about plans and designs completed with relevant information.	a) Generate plans and designs based on research and ideas that take account of the user’s views and the intended purpose. b) Designs include commentary and simple measurements. c) Link discussions about ideas, plans and designs to investigation, disassembly and evaluation of a range of products describing in detail their parts and their function.	a) Clarify and justify plans, designs and ideas by drawing upon and using a range of relevant sources of information. b) Discuss ways in which ideas, plans and designs are formed and modified to ensure that the design criteria are met effectively.	a) Use research and exploration, such as the study of different cultures, to identify and understand user needs. b) Use a variety of approaches when designing, whilst considering a range of constraints. This may inc. ordered sequences and budget information.

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<p>DT2 Make</p> <ul style="list-style-type: none"> • Select and use tools and equipment to measure, mark out and shape materials and components. • Select from and use a wide range of materials and components according to both functional and aesthetic qualities. • Make increasingly complex paper models, mock ups and templates using different joining and cutting methods. • Select the most effective finish to enhance the appearance of a product. • Follow procedures for safety and hygiene. 	<ul style="list-style-type: none"> a) Measure accurately using a ruler b) Strengthen newspaper by rolling c) Use decorative and finishing techniques 	<ul style="list-style-type: none"> a) Score card for accurate folds. b) Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing. e) Select from and use textiles according to their characteristics. f) Threading a needle g) Using a running stitch h) Gluing fabric i) Over stitch j) Stapling k) Simple series circuits 	<ul style="list-style-type: none"> a) Use a hack saw and bench hook safely. b) Use a glue gun c) Select a range of appropriate tools to cut, shape and join paper, card and wood and components with accuracy and precision. d) Join wood to wood e) Measure mark and cut dowel 	<ul style="list-style-type: none"> a) Select from and use tools, techniques, processes, equipment and machinery precisely. b) parallel circuits c) wider range of components d) wire strippers
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<p>DT3</p> <p>Evaluate</p> <ul style="list-style-type: none"> • Critically evaluate their own products against criteria: • intended user & purpose • strengths & weaknesses • areas for development • Evaluate existing, new and emerging technologies against their own design criteria. • Gain an understanding of the way in which the work of famous inventors, designers, engineers, chefs and manufacturers have impacted on the development of product design and function. Use this understanding to inform and support evaluation and further development of own product. 	<p>a) Use knowledge of the similarities and differences between products with the same function to support identification of the most effective product.</p> <p>b) Evaluate ideas and products against own design criteria, whilst considering the views of others.</p>	<p>a) Investigate and use analysis of existing products to inform own work.</p> <p>b) Identify from a range the key features and functions needed to create an effective and efficient working product.</p> <p>c) Give reasons, supported by factual evidence, for the success of aspects of a product.</p>	<p>a) Use analysis of existing products, supported by accurate factual information, to inform own work. Test and evaluate products to identify the variants which may affect the function of a product.</p> <p>b) Give reasons, supported by factual evidence, for the success of aspects of a product and provide considered solutions to resolve those parts that could be improved.</p>	<p>a) Understand developments in DT, its impact on individuals, society and the environment.</p> <p>b) Test, evaluate and refine ideas and products against a specification, whilst considering the views of intended users.</p> <p>c) Analyse the work of past and present professionals and others to develop and broaden understanding.</p>
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<p>DT4 Technical knowledge / mechanisms (see below for technical vocabulary)</p>	<p><u>Bridges</u> a) Understand how to strengthen / stiffen and reinforce a 3D product</p> <p><u>Food</u> b) Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared, or caught.</p> <p><u>Pneumatics</u> c) Understand and use pneumatic mechanisms</p>	<p><u>Textiles</u> a) How to join fabrics b) Using a template c) Finishing techniques</p> <p><u>Paper engineering</u> d) Understand and use lever and linkage mechanisms. e) Distinguish between fixed and loose pivots. f) Understand how to strengthen / stiffen and reinforce a 3D product</p> <p><u>Electrical</u> g) Understand and use electrical systems in products, such as series circuits incorporating switches, bulbs and buzzers. h) Apply understanding of computing to program and control products.</p>	<p><u>Mechanisms</u> a) Understand how to strengthen / stiffen and reinforce a 3D product</p> <p><u>Food</u> b) Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared, or caught.</p>	<p><u>Textiles</u> a) Know that a product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics. b) Fabrics can be strengthened, stiffened and reinforced where appropriate.</p> <p><u>Food</u> c) Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared, or caught.</p> <p><u>Electrical / Structures</u> d) Understand how to strengthen / stiffen and reinforce a 3D product e) Understand and use electrical systems in their products. Series and parallel f) Apply understanding of computing to program, monitor and control their products.</p>
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<p>DT5</p> <p>Cooking and Nutrition</p> <ul style="list-style-type: none"> • Use equipment safely with an awareness of food hygiene. • 	<p>a) Understand that good products are made of several components and that a variety of food is needed for a healthy diet.</p> <p>b) Combine components according to taste, texture and appearance</p> <p>c) Draw a simple design specification for intended user and purpose, considering specific elements such as:</p> <ul style="list-style-type: none"> • appearance • taste / texture • aroma 		<p>a) Measure and weigh ingredients appropriately.</p> <p>b) Analyse the taste, texture, smell and appearance of a range of food.</p> <p>c) Join and combine a range of ingredients.</p> <p>d) Draw a simple design specification for intended user and purpose, considering specific elements such as:</p> <ul style="list-style-type: none"> • appearance • taste / texture • aroma 	<p>a) Select and prepare foods for a particular purpose.</p> <p>b) Experience a range of food ingredients and cooking methods.</p> <p>c) Show awareness of a healthy diet from understanding a balanced diet.</p> <p>d) Join and combine food ingredients appropriately whilst using correct equipment.</p>
<p>DT6</p> <p>Key people, events and products</p>	<p>Isambard Kingdom Brunel and the Clifton Suspension Bridge - designs for Clifton Bridge</p> <p>Science Museum: Pneumatic camera shutter</p> <p>Otto von Guericke German physicist</p>	<p>Science Museum: model signal pivot and Early pivot eyeglasses</p>	<p>Cam invention: Al-Jazari in 1206 Weblink</p>	<p>Science Museum: spinning mule</p> <p>History of Velcro also here</p> <p>First form of electric light, Humphrey Davy</p>

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<p>DTV Vocabulary</p>	<p>design brief design specification prototype annotated sketch purpose user innovation research functional</p> <p><u>Bridges</u> Frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape join</p> <p><u>Food</u> names of utensils texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury, hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet</p> <p><u>Pneumatics</u> components, fixing, attaching, tubing, syringe, plunger, split pin, paper fastener, pneumatic system, input, movement, process, output movement, control, compression, pressure, inflate, deflate, pump, seal, air-tight</p>	<p>design brief design specification prototype annotated sketch purpose user innovation research functional</p> <p><u>Paper engineering</u> Mechanism, lever, linkage, pivot, slot, bridge, guide system, input, process, output linear, rotary, oscillating, reciprocating</p> <p><u>Textiles</u> joining and finishing techniques, tools, fabrics and components template, pattern, pattern pieces, mark out, join, decorate, finish, needle</p> <p><u>Electrical</u> Series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip control, program, system, input device, output device</p>	<p>design brief design specification prototype annotated sketch purpose user innovation research functional</p> <p><u>Mechanisms</u> As Year 3, plus: pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, cam, snail cam, off-centre cam, peg cam, pear shaped cam follower, axle, shaft, crank, handle, housing, framework rotation, rotary motion, oscillating motion, reciprocating motion</p> <p><u>Food</u> As Year 3, plus: utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble</p>	<p>design brief design specification prototype annotated sketch purpose user innovation research functional</p> <p><u>Food</u> As Year 3 and 5, plus: fat, sugar, carbohydrate, protein, vitamins, knead, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality</p> <p><u>Structures</u> As Year 3, plus:</p> <p><u>Textiles</u> As Year 4, plus: Seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces name of textiles and fastenings used, pins, needles, thread, pinking shears, fastening</p> <p><u>Electrical</u> As Year 4, plus: monitor, parallel circuit, names of switches and components,</p>
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Appendix 1: National Curriculum Key stage 2

When designing and making, pupils should be taught to:

Design

- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

- select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

Evaluate

- investigate and analyse a range of existing products
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand how key events and individuals in design and technology have helped shape the world

Technical knowledge

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- apply their understanding of computing to program, monitor and control their products.

Cooking and nutrition

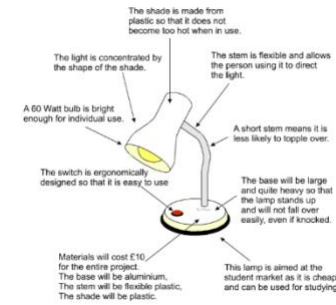
- understand and apply the principles of a healthy and varied diet
- prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques
- understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

Appendix 2:

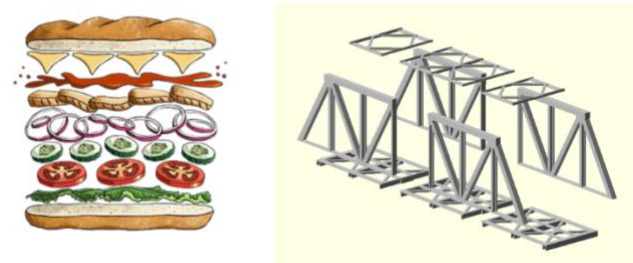
Learning in design technology - Designing

- Explore existing products/designs inc. disassembling
- Research into user needs:
 - discussion
 - questionnaires
 - survey
 - interviews
 - web based resources
- Draw a simple design specification for intended user and purpose, inc:
 - appearance / taste / texture / aroma / time constraints / budget / resources available / [Generate, model and develop innovative ideas](#) (link to examples)
 - annotated drawings
 - exploded diagrams
 - cross section
 - pattern pieces
 - computer aided design
 - 3D modelling
 - oral and digital presentations
 - ordered sequences and schedules for manufacturing of products
 - Detailed resources required
 - Using costings

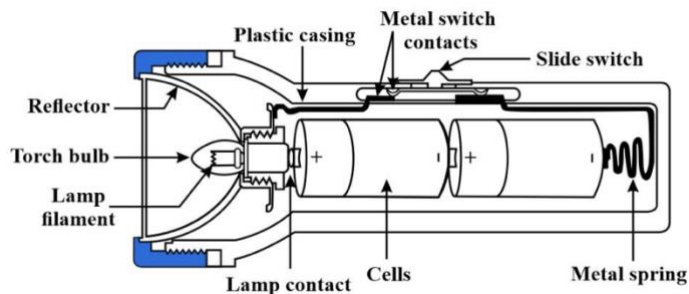
Annotated drawings



Exploded diagram:



Cross section diagram:



Pattern pieces:

