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| **DESIGNING** | **KEY STAGE 1** | **LOWER KEY STAGE 2** | **UPPER KEY STAGE 2** |
| Understand contexts, users and purpose | Work confidently within a range of contexts including:* imaginary eg story based
* familiar eg home, school, community
* the wider environment
* industry
 | Work confident within a range of contexts (home, school, leisure, culture, enterprise, industry and the wider environment) |
| State what products they are designing and making |
| Say whether their product is for themselves or another user | Gather information about the needs and wants of particular individuals and groups | Carry out research using surveys, interviews, questionnaires and web-based resources |
| Describe what their products are for | Describe the purpose of their products |
| Say how their products will work | Explain how particular parts of their products work |
| Say how they will make their products suitable for the intended users | Indicate the design features of their products that will appeal to intended users | Identify the needs, wants, preferences and values of particular individuals and groups |
| Use simple design criteria to help develop their ideas | Develop their own design criteria and use these to inform their ideas | Develop a simple design specification to guide their thinking |
| Generating, developing, modelling and communicating ideas | Generate ideas by drawing on their own experiences | Share and clarify ideas through discussion |
| Generate realistic ideas focusing on the needs of the user | Generate innovative ideas, drawing on research |
| Use knowledge of existing products to help come up with ideas | Make design decisions that take account of the availability of resources | Make design decisions, taking account of constraints such as time, resources and cost |
| Develop and communicate ideas by talking and drawing | Use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas |
| Model ideas by exploring materials, components and construction kits and by making templates and mock-ups | Model their ideas using prototypes and pattern pieces |
| Use ICT, where appropriate, to develop and communicate their ideas | Use CAD to develop and communicate their ideas |
| **MAKING** | **KEY STAGE 1** | **LOWER KEY STAGE 2** | **UPPER KEY STAGE 2** |
| Planning | Plan by suggesting what to do next | Sequence the main stages of making | Formulate step-by-step plans as a guide to making |
| Produce appropriate lists of tools, equipment and materials that they need. |
| Select from a range of tools and equipment, explaining their choices | Select tools and equipment suitable for the taskExplain their choice of tool and equipment in relation to the skills and techniques they will be using |
| Select from a range of materials and components, according to their characteristics | Select materials and components suitable for the task.Explain their choice of materials and components, according to functional properties and aesthetic qualities. |
| Practical skills and techniques | Follow procedures for health and safety |
| Use a range of materials and components, including construction materials and kits, textiles and mechanical components. | Use a wider range of materials and components than in KS1, including construction materials and kits, textiles, mechanical components. |
| Measure, mark out, cut and shape materials and components | Measure, mark out, cut and shape materials and components with some accuracy | Accurately measure, mark out, cut and shape materials and components |
| Assemble, join and combine materials and components | Assemble, join and combine materials and components with some accuracy | Accurately assemble, join and combine materials and components |
| Use finishing techniques, including those from Art & Design | Apply a range of finishing techniques, including those from Art & Design, with some accuracy | Accurately apply a range of finishing techniques, including those from Art & Design |
| Use techniques that involve a number of steps |
| Demonstrate resourcefulness when tackling practical problems |

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| **EVALUATING** | **KEY STAGE 1** | **LOWER KEY STAGE 2** | **UPPER KEY STAGE 2** |
| Own ideas and products | Talk about their design ideas and what they are making | Identify the strengths and areas for development in their ideas and productsConsider the view of others, including intended users, to improve their work |
| Make simple judgements about their products and ideas against the design criteria | Refer to their design criteria as they design and make | Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make |
| Suggest how their products could be improved | Use their design criteria to evaluate their completed products | Evaluate their ideas and products against their original design specification |
| Existing products | Explore:* what products are
* who products are for
* What products are for
* How products work
* How products are used
* Where products might be used
* What materials products are made from
* What they like and dislike about a product
 | Investigate and analyse:* Who designed and made the products
* Where products were designed and made
* When products were designed and made
* Whether products can be recycled or reused
 | Investigate and analyse:* How much products cost to make
* How innovative products are
* How sustainable the materials in products are
* What impact products have beyond their intended purpose
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| Investigate and analyse:* How well products have been designed
* How well products have been made
* Why materials have been chosen
* What methods of construction have been used
* How well products work
* How well products achieve their purpose
* How well products meet user needs and wants
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| Key events and individuals |  | Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products |

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| **TECHNICAL KNOWLEDGE** | **KEY STAGE 1** | **LOWER KEY STAGE 2** | **UPPER KEY STAGE 2** |
| Making products work | The simple working characteristics of materials and components | How to use learning from science to help design and make products that work.How to use learning from mathematics to help design and make products that work.That materials have both functional properties and aesthetic qualitiesThat materials can be combined and mixed to create more useful characteristics |
| The movement of simple mechanisms such as levers, sliders, wheels, axles | That mechanical and electrical systems have an input, process and output |
| How mechanical systems such as levers and linkages or pneumatic systems create movement.How simple electrical circuits and components can be used to create functional products.How to program a computer to control their products. | How mechanical systems such as cams, pulleys or gears create movement.How more complex electrical circuits and components can be used to create functional products.How to program a computer to monitor changes in the environment and control their products. |
| How freestanding structures can be made stiffer and more stable | How to make strong, stiff shell structures. | How to reinforce and strengthen a 3D framework. |
| That a 3-D textile product can be assembled from 2 identical fabric shapes | That a single fabric shape can be used to make a 3D textiles product. | That a 3D textiles product can be made from a combination of fabric shapes. |