

Area	KS1	Lower KS2	Higher KS2
Designing	<p><b>Across KS1 pupils should:</b></p> <ul style="list-style-type: none"> <li>work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment</li> <li>state what products they are designing and making</li> <li>say whether their products are for themselves or other users</li> <li>describe what their products are for</li> <li>say how their products will work</li> <li>say how they will make their products suitable for their intended users</li> <li>use simple design criteria to help develop their ideas</li> <li>generate ideas by drawing on their own experiences</li> <li>use knowledge of existing products to help come up with ideas</li> <li>develop and communicate ideas by talking and drawing</li> <li>model ideas by exploring materials, components and construction kits and by making templates and mock-ups</li> <li>use information and communication technology, where appropriate, to develop and communicate their ideas</li> </ul>	<p><b>Across KS2 pupils should:</b></p> <ul style="list-style-type: none"> <li>work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment</li> <li>describe the purpose of their products</li> <li>indicate the design features of their products that will appeal to intended users</li> <li>explain how particular parts of their products work</li> <li>share and clarify ideas through discussion</li> <li>model their ideas using prototypes and pattern pieces</li> <li>use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas</li> <li>use computer-aided design to develop and communicate their ideas</li> </ul>	<p><b>Pupils should also:</b></p> <ul style="list-style-type: none"> <li>gather information about the needs and wants of particular individuals and groups</li> <li>develop their own design criteria and use these to inform their ideas</li> <li>generate realistic ideas, focusing on the needs of the user</li> <li>make design decisions that take account of the availability of resources</li> </ul> <p><b>Pupils should also:</b></p> <ul style="list-style-type: none"> <li>carry out research, using surveys, interviews, questionnaires and web-based resources</li> <li>identify the needs, wants, preferences and values of particular individuals and groups</li> <li>develop a simple design specification to guide their thinking</li> <li>generate innovative ideas, drawing on research</li> <li>make design decisions, taking account of constraints such as time, resources and cost</li> </ul>
	Making	<p><b>Planning</b></p> <p>Across KS1 pupils should:</p> <ul style="list-style-type: none"> <li>plan by suggesting what to do next</li> <li>select from a range of tools and equipment, explaining their choices</li> <li>select from a range of materials and components according to their characteristics</li> </ul> <p><b>Practical skills and techniques</b></p> <p>Across KS1 pupils should:</p> <ul style="list-style-type: none"> <li>follow procedures for safety and hygiene</li> </ul>	<p><b>Across KS2 pupils should:</b></p> <ul style="list-style-type: none"> <li>select tools and equipment suitable for the task</li> <li>explain their choice of tools and equipment in relation to the skills and techniques they will be using</li> <li>select materials and components suitable for the task</li> <li>explain their choice of materials and components according to functional properties and aesthetic qualities</li> <li>follow procedures for safety and hygiene</li> <li>use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components</li> </ul>

- use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components
- measure, mark out, cut and shape materials and components
- assemble, join and combine materials and components
- use finishing techniques, including those from art and design

Across KS1 pupils should:

- talk about their design ideas and what they are making
- make simple judgements about their products and ideas against design criteria
- suggest how their products could be improved

Across KS1 pupils should 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 products

**Planning**

- order the main stages of making

**Practical skills and techniques**

- measure, mark out, cut and shape materials and components with some accuracy
- assemble, join and combine materials and components with some accuracy
- apply a range of finishing techniques, including those from art and design, with some accuracy

Across KS2 pupils should:

- identify the strengths and areas for development in their ideas and products
- consider the views of others, including intended users, to improve their work

Across KS2 pupils should 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 purposes
- how well products meet user needs and wants

Across KS2 pupils should know:

- about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products

**Pupils should:**

- refer to their design criteria as they design and make
- use their design criteria to evaluate their completed products

**investigate and analyse:**

- who designed and made the products

**Planning**

- produce appropriate lists of tools, equipment and materials that they need
- formulate step-by-step plans as a guide to making

**Practical skills and techniques**

- accurately measure, mark out, cut and shape materials and components
- accurately assemble, join and combine materials and components
- accurately apply a range of finishing techniques, including those from art and design
- use techniques that involve a number of steps
- demonstrate resourcefulness when tackling practical problems

**Pupils should**

- critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make
- evaluate their ideas and products against their original design specification

Across KS1 pupils should know:

- that all food comes from plants or animals
- that food has to be farmed, grown elsewhere (e.g. home) or caught
- how to name and sort foods into the five groups in The Eat well plate
- that everyone should eat at least five portions of fruit and vegetables every day
- how to prepare simple dishes safely and hygienically, without using a heat source
- how to use techniques such as cutting, peeling and grating
- that food ingredients should be combined according to their sensory characteristics

Pupils should know:

- that a 3-D textiles product can be assembled from two identical fabric shapes
- about the simple working characteristics of materials and components

- where products were designed and made
- when products were designed and made
- whether products can be recycled or reused

Across KS2 pupils should know:

- that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world

**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

**Pupils should also know:**

- that seasons may affect the food available
- how food is processed into ingredients that can be eaten or used in cooking

Pupils should know:

- that a single fabric shape can be used to make a 3D textiles product

Pupils should know:

- that a 3D textiles product can be made from a combination of fabric shapes
- that a recipe can be adapted by adding or substituting one or more ingredients

## Structures

*Pupils should know:*

- *how freestanding structures can be made stronger, stiffer and more stable*
- *about the simple working characteristics of materials and components*

*Pupils should know:*

*how to make strong, stiff shell structures*

*Pupils should know:*

*how to reinforce and strengthen a 3D framework*

## Mechanical

*Pupils should know:*

*about the movement of simple mechanisms such as levers, sliders, wheels and axles*

*Pupils should know:*

*how mechanical systems such as levers and linkages or pneumatic systems create movement*

*Pupils should know:*

*how mechanical systems such as cams or pulleys or gears create movement*

## Computer programming

*Pupils should know:*

*how to program a computer to control their products*

*Pupils should know:*

*how to program a computer to monitor changes in the environment and control their products*

## Electrical systems

*Pupils should know:*

*how simple electrical circuits and components can be used to create functional products*

- *how more complex electrical circuits and components can be used to create functional products*