

Designing

About designing

When designing, children need to understand the context they are working in, think about who their products will be for and decide what tasks they will perform. They need opportunities to generate, develop, model and communicate ideas in a variety of ways, including spoken language, drawings, templates, mock-ups, prototypes and pattern pieces.



KS1 What their products are for
Children should be able to clearly state the purpose of their products. The products children design and make at KS1 should perform clearly defined tasks e.g. a jacket to help keep Teddy safe at night.



KS1 Use knowledge of existing products
When children are generating ideas it is good practice for these to be informed by existing products they have explored and evaluated e.g. moving picture books

Designing	Key Stage 1	Key Stage 2
Understanding contexts, users and purposes	<p>Across KS1 pupils should:</p> <ul style="list-style-type: none"> work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment state what products they are designing and making say whether their products are for themselves or other users describe what their products are for say how their products will work say how they will make their products suitable for their intended users use simple design criteria to help develop their ideas 	<p>Across KS2 pupils should:</p> <ul style="list-style-type: none"> work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment describe the purpose of their products indicate the design features of their products that will appeal to intended users explain how particular parts of their products work <p>In early KS2 pupils should also:</p> <ul style="list-style-type: none"> gather information about the needs and wants of particular individuals and groups develop their own design criteria and use these to inform their ideas <p>In late KS2 pupils should also:</p> <ul style="list-style-type: none"> carry out research, using surveys, interviews, questionnaires and web-based resources identify the needs, wants, preferences and values of particular individuals and groups develop a simple design specification to guide their thinking
Generating, developing, modelling and communicating ideas	<p>Across KS1 pupils should:</p> <ul style="list-style-type: none"> generate ideas by drawing on their own experiences use knowledge of existing products to help come up with ideas develop and communicate ideas by talking and drawing model ideas by exploring materials, components and construction kits and by making templates and mock-ups use information and communication technology, where appropriate, to develop and communicate their ideas 	<p>Across KS2 pupils should:</p> <ul style="list-style-type: none"> share and clarify ideas through discussion model their ideas using prototypes and pattern pieces use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas use computer-aided design to develop and communicate their ideas <p>In early KS2 pupils should also:</p> <ul style="list-style-type: none"> generate realistic ideas, focusing on the needs of the user make design decisions that take account of the availability of resources <p>In late KS2 pupils should also:</p> <ul style="list-style-type: none"> generate innovative ideas, drawing on research make design decisions, taking account of constraints such as time, resources and cost

Late KS2 Carry out research
Children in late KS2 should carry out research, using surveys, interviews, questionnaires and web-based resources e.g. survey of favourite soups in Year 5



KS2 Prototypes and pattern pieces
Whilst continuing to carry out activities from KS1 where they are making templates and mock-ups, across KS2 children should also 'model' their ideas by using prototypes and pattern pieces e.g. for a bag or hat



Making

About making

When making, children should select from a range of tools and equipment, explaining their choices. They also need opportunities to choose the materials and components they will use, thinking about their working characteristics. They should follow procedures for safety and hygiene and develop a repertoire of practical skills and techniques, working with increasing accuracy.

KS1 Select from a range of materials and components

Children in KS1 should be able to select from a range of materials and components according to their characteristics. As they progress they should be able to do this with increasing independence.



KS1 Measure, mark out, cut and shape

Children in KS1 should be able to measure, mark out, cut and shape a range of materials and components including food ingredients, mechanical components, textiles and construction materials.

Making	Key Stage 1	Key Stage 2
Planning	<p>Across KS1 pupils should:</p> <ul style="list-style-type: none"> plan by suggesting what to do next select from a range of tools and equipment, explaining their choices select from a range of materials and components according to their characteristics 	<p>Across KS2 pupils should:</p> <ul style="list-style-type: none"> select tools and equipment suitable for the task explain their choice of tools and equipment in relation to the skills and techniques they will be using select materials and components suitable for the task explain their choice of materials and components according to functional properties and aesthetic qualities <p>In early KS2 pupils should also:</p> <ul style="list-style-type: none"> order the main stages of making <p>In late KS2 pupils should also:</p> <ul style="list-style-type: none"> 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	<p>Across KS1 pupils should:</p> <ul style="list-style-type: none"> follow procedures for safety and hygiene 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 	<p>Across KS2 pupils should:</p> <ul style="list-style-type: none"> follow procedures for safety and hygiene use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components <p>In early KS2 pupils should also:</p> <ul style="list-style-type: none"> 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 <p>In late KS2 pupils should also:</p> <ul style="list-style-type: none"> 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

KS2 Select tools and equipment suitable for the task

Building on their experience in KS1, across KS2 children should be able to select tools and equipment suitable for the task. The key word in this expectation is 'suitable' and children should make selections that are appropriately matched to the skills and techniques they will be using.



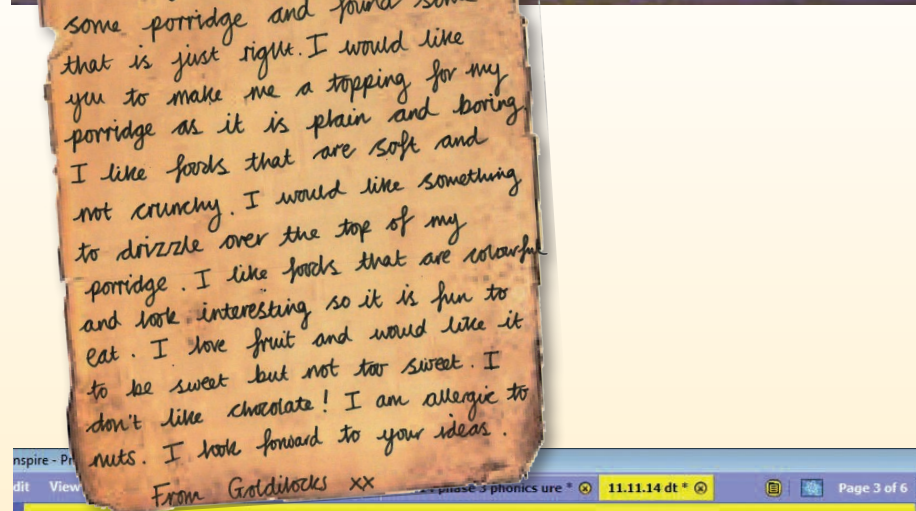
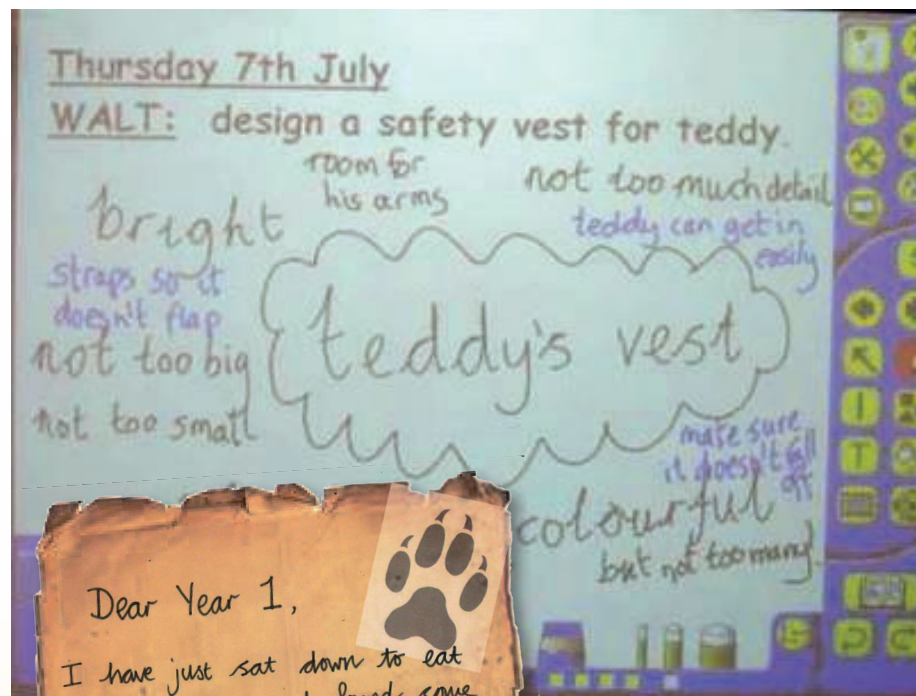
Late KS2 Accurately

In late KS2 children should work 'accurately' when they are measuring, marking out, cutting, shaping, assembling, joining, combining and applying finishing techniques. This is a higher level of expectation than in early KS2 where most children will be working with some accuracy.

Evaluating

About evaluating

When evaluating, children should make increasingly sophisticated judgements about their own ideas and products against design criteria. They should consider the views of others in order to improve their work. They should also investigate and evaluate existing products using a variety of questioning techniques and, in KS2, learn about important inventors and their inventions.



Talk in your pairs: What does Goldilocks like and not like?

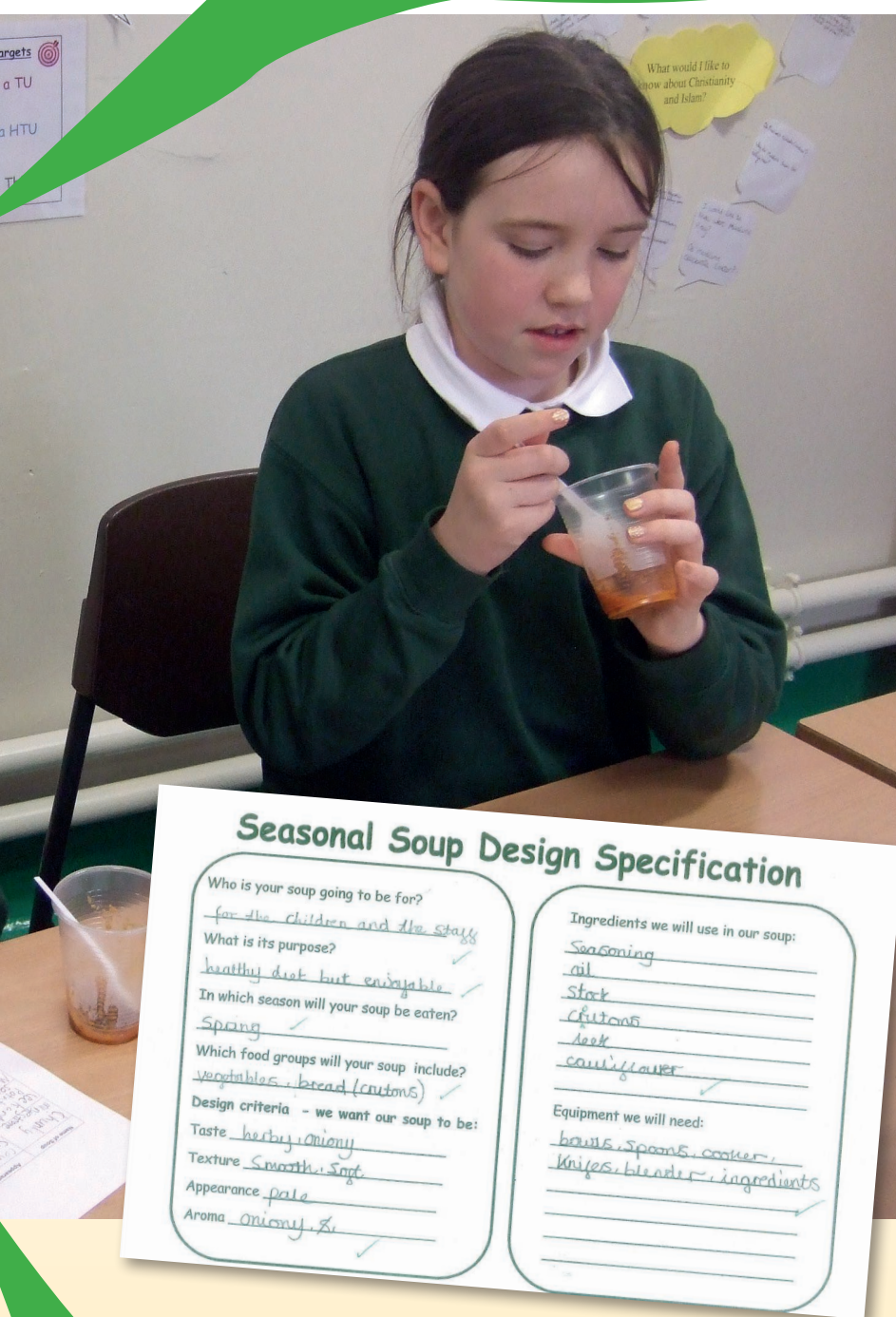
like	not like
<ul style="list-style-type: none"> foods that are soft. foods that drizzle. foods that are colourful. fruits 	<ul style="list-style-type: none"> crunchy foods. not too sweet. chocolate nuts (allergic).

Evaluating	Key Stage 1	Key Stage 2
Own ideas and products	<p>Across KS1 pupils should:</p> <ul style="list-style-type: none"> 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 	<p>Across KS2 pupils should:</p> <ul style="list-style-type: none"> identify the strengths and areas for development in their ideas and products consider the views of others, including intended users, to improve their work <p>In early KS2 pupils should also:</p> <ul style="list-style-type: none"> refer to their design criteria as they design and make use their design criteria to evaluate their completed products <p>In late KS2 pupils should also:</p> <ul style="list-style-type: none"> 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
Existing products	<p>Across KS1 pupils should explore:</p> <ul style="list-style-type: none"> 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 	<p>Across KS2 pupils should investigate and analyse:</p> <ul style="list-style-type: none"> 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 <p>In early KS2 pupils should also investigate and analyse:</p> <ul style="list-style-type: none"> 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 <p>In late KS2 pupils should also investigate and analyse:</p> <ul style="list-style-type: none"> 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
Key events and individuals	Not a requirement in KS1	<p>Across KS2 pupils should know:</p> <ul style="list-style-type: none"> about inventors, designers, engineers, chefs and manufacturers who have developed groundbreaking products

KS1 Talk about their design ideas
When considering their design ideas, children should refer to what their product is intended to do, who it will be for and how it will work e.g. discussing and evaluating ideas as a class.

KS1 Make simple judgements
Throughout the designing and making process, children in KS1 should make simple judgements about their products and ideas against design criteria e.g. thinking about Goldilocks likes and dislikes in relation to design criteria

Late KS2 Simple design specification
Building on work in early KS2 where children use their own design criteria, children in late KS2 should develop a simple design specification to guide their thinking when designing and making. They should also evaluate their ideas and products against their design specification.

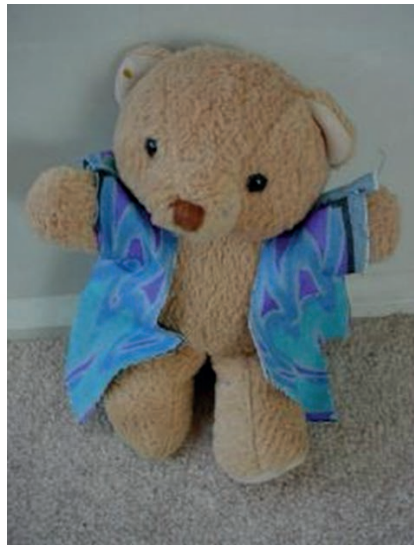


KS2 Inventors, designers, engineers, chefs and manufacturers
Across KS2 pupils should learn about inventors, designers, engineers, chefs and manufacturers who have developed groundbreaking products e.g. Mary Anderson, inventor of the windscreen wiper.

Technical knowledge

About technical knowledge

Technical knowledge is the body of knowledge and understanding that is specific to design and technology that needs to be developed and then applied when children are designing, making and evaluating products.



KS1 Two identical fabric shapes
Children in KS1 should understand that a 3-D textiles product can be assembled from two identical fabric shapes. This understanding should be applied when they are designing and making products e.g. glove puppet or simple bag.

Technical knowledge

Key Stage 1

Making products work

Across KS1 pupils should know:

- about the simple working characteristics of materials and components
- about the movement of simple mechanisms such as levers, sliders, wheels and axles
- how freestanding structures can be made stronger, stiffer and more stable
- that a 3-D textiles product can be assembled from two identical fabric shapes
- that food ingredients should be combined according to their sensory characteristics
- the correct technical vocabulary for the projects they are undertaking

KS1 Stronger, stiffer and more stable
Children in KS1 should know how free-standing structures can be made stronger, stiffer and more stable e.g. chair for Teddy.

Key Stage 2

Across KS2 pupils should know:

- 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 qualities
- that materials can be combined and mixed to create more useful characteristics
- that mechanical and electrical systems have an input, process and output
- the correct technical vocabulary for the projects they are undertaking

In early KS2 pupils should also know:

- 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 to make strong, stiff shell structures
- that a single fabric shape can be used to make a 3D textiles product
- that food ingredients can be fresh, pre-cooked and processed

In late KS2 pupils should also know:

- how mechanical systems such as cams or 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 to reinforce and strengthen a 3D framework
- 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



Early KS2 Create movement

In KS2, children should build on their understanding of the movement of simple mechanisms in KS1. In early KS2, children should know how mechanical systems such as levers and linkages or pneumatic systems create movement.



Late KS2 Create movement

In late KS2, children should know how mechanical systems such as cams, pulleys or gears create movement. Children should be able to explain why the mechanical components are suitable for the product they are designing and making according to the type of movement they produce.

Cooking and nutrition

About cooking and nutrition

Cooking and nutrition provides opportunities for children to learn about where food comes from, how food is grown, reared or caught and the effect of seasonality on the availability of food. They also learn about the principles of healthy eating and how to prepare and cook dishes safely and hygienically using a range of techniques. Cooking and nutrition is taught alongside designing and making within a D&T food project.



KS1 Cutting, peeling and grating
KS1 children should learn how to use skills and techniques such as cutting, peeling and grating. It is important that children understand that we need certain skills and techniques to be able to make food products.

Cooking & nutrition		Key Stage 1	Key Stage 2
Where food comes from	<p>Across KS1 pupils should know:</p> <ul style="list-style-type: none"> that all food comes from plants or animals that food has to be farmed, grown elsewhere (e.g. home) or caught 	<p>Across KS2 pupils should know:</p> <ul style="list-style-type: none"> 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 <p>In late KS2 pupils should also know:</p> <ul style="list-style-type: none"> that seasons may affect the food available how food is processed into ingredients that can be eaten or used in cooking 	
Food preparation, cooking and nutrition	<p>Across KS1 pupils should know:</p> <ul style="list-style-type: none"> how to name and sort foods into the five groups in The Guide 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 	<p>Across KS2 pupils should know:</p> <ul style="list-style-type: none"> how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking <p>In early KS2 pupils should also know:</p> <ul style="list-style-type: none"> that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The Eatwell Guide that to be active and healthy, food and drink are needed to provide energy for the body <p>In late KS2 pupils should also know:</p> <ul style="list-style-type: none"> that recipes can be adapted to change the appearance, taste, texture and aroma that different food and drink contain different substances – nutrients, water and fibre – that are needed for health 	

KS1 Five groups in the Eatwell Guide
In KS1 children should be able to name and sort foods into the five groups from the Eatwell Guide. They should know that a healthy diet comprises food and drinks from each of the food groups.

Early KS2 Variety and balance in The Eatwell Guide
Building on their previous experience in KS1, early KS2 children should know that we need to eat a variety and balance of food and drinks to stay healthy, as depicted in the Eatwell Guide.

KS2 Peeling, chopping, slicing, grating, mixing, spreading, kneading and baking
Across KS2 children should learn how to use skills and techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.

