Design and Technology Long Term Map and Interleaving of Skills

Design and Technology

	Reception (all 4 aspects developed throughout year in continuous provision -focus tasks below)	Y1	Y2	Y3	Y4	Y5	Y6
Autumn	**Mechanisms** Paper, card joining, tape, glue **Structures** Range of Construction kits, large and small	**Food** Cutting, grating, peeling fruit and veg	**Mechanisms** Connect wheels with axles	**Textiles** Create templates and patterns, learn range of stitches to join fabric, learn decorative techniques. Create a purse or wallet	**Structures** Explore nets, make nets and 3D boxes. Strengthen and stiffen care. Join with tabs	**Food** Use range of implements to prepare vegetables. Know about seasonality.	**Food** Explore raising agents. Make yeast -based product.
Spring	**Mechanisms** Paper, card joining, split pins, hole punch	**Mechanisms** Make Sliders and leavers	**Food** Cutting, grating, peeling, hygiene, healthy plate	**Mechanical Systems** Levers, linkages, pop-ups. Accurate measuring, cutting, marking, finishing **Structures** Bridge building. Explore strong 3D skeleton structures, and strengthening card techniques	**Electrical Systems** Children to explore a range of switches, made, bought and control boxes.	**Structures** Children to explore the strength of a variety of frame structures, compare square with triangulation. Learn how to make tubes of paper to create strength. Accurate measuring.	**Electrical Systems** Use crumble kits to monitor and control (focussed tasks only)
Summer	**Food** mixing, chopping **Textiles** Simple stitch	**Structures** Freestanding structures. Use construction kits to explore freestanding structures. Learn to join and strengthen card.	**Textiles** Use simple template. Learn a variety of ways to join fabric, stitch, pin, staple, glue etc	**Food** Grating cheese, spreading, sandwiches	**Food** Mixing, kneading, rainforest friendly muffins **Textiles** 2D to 3D shapes, using templates and joins to create reusable shopping bag.	**Mechanical Systems** Cams: explore types of cams, make Cams, learn how to saw wood and how to drill **Textiles** Skills taught through art project fashion design. **Electrical systems** Learn to use a Crumble kit for monitor and control, simple programming.	**Mechanical Systems** Develop an understanding of pulleys and gears. **Textiles** Explore a range of fasteners, zips, velcro, toggles, buttons to create product

Summary and Progression			Designing
Reception	**Y1 and Y2**	**Y3 and Y4**	**Y5 and Y6**
• Create collaboratively, sharing ideas, resources and skills. • Discuss design ideas and investigate suitable materials to use	• 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. • 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 mockups. • Use information and communication technology, where appropriate, to develop and communicate their ideas.	• Gather information about the needs and wants of particular individuals and groups. • Develop their own design criteria and use these to inform their idea. • Generate realistic ideas, focusing on the needs of the user • Make design decisions that take account of the availability of resources. • 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. • 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.	• 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. • 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. • Generate innovative ideas, drawing on research. • Make design decisions, taking account of constraints such as time, resources and cost. • 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.
Summary and Progression			**Making**
Reception	**Y1 and Y2**	**Y3 and Y4**	**Y5 and Y6**
• Manipulates materials to achieve a planned effect. • Constructs with a purpose in mind, using a variety of resources • Uses simple tools and techniques competently and appropriately. • Selects appropriate resources and adapts work where necessary	• 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. • 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.	• Order the main stages of making. • 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. • 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. • 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.	• Produce appropriate lists of tools, equipment and materials that they need. • Formulate step-by-step plans as a guide to making. • 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. • 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 problem. • 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.
Summary and Progression			**Evaluating**
Reception	**Y1 and Y2**	**Y3 and Y4**	**Y5 and Y6**

• Return to and build on their previous learning, refining ideas and developing their ability to represent them. • Be proud of what they have created • Discuss what they have created giving reasons for their choices	• 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. • Understand **what** products are. • Understand **who** products are for. • Understand what products are for. • Know how products work. • Know how products are used. • Understand where products might be used. • Know what materials products are made from. • Know what they like and dislike about products.	• Refer to their design criteria as they design and make. • Use their design criteria to evaluate their completed products. • Understand who designed and made the products. • Understand where products were designed and made. • Understand when products were designed and made. • Know whether products can be recycled or reused. • Identify the strengths and areas for development in their ideas and products. • Consider the views of others, including intended users, to improve their work. • Understand how well products have been designed. • Understand how well products have been made. • Understand why materials have been chosen. • Know what methods of construction have been used. • Understand how well products work. • Understand How well products achieve their purposes. • Understand How well products meet user needs and wants. • Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.	• 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. • Identify the strengths and areas for development in their ideas and products. • Consider the views of others, including intended users, to improve their work. • Understand how much products cost to make. • Understand how innovative products are. • Understand how sustainable the materials in products are. • Know what impact products have beyond their intended purpose. • Understand how well products have been designed. • Understand how well products have been made. • Know why materials have been chosen. • Understand what methods of construction have been used. • Understand how well products work. • Understand how well products achieve their purposes. • Understand how well products meet user needs and wants. • Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.
Summary and Progression			**Technical Knowledge**
Reception	**Y1 and Y2**	**Y3 and Y4**	**Y5 and Y6**
• Key Vocabulary Smooth, shiny, rough, prickly, flat, patterned, bumpy, soft, hard, design, ideas, create, make, cut, materials, tools, fold, join, fix, build	• Understand the simple working characteristics of materials and components. • Understand the movement of simple mechanisms such as levers, sliders, wheels and axles. • Know how freestanding structures can be made stronger, stiffer and more stable. • Understand that a 3-d textiles product can be assembled from two identical fabric shapes. • Understand the correct technical vocabulary for the projects they are undertaking.	• Understand how mechanical systems such as levers and linkages or pneumatic systems create movement. • Understand how simple electrical circuits and components can be used to create functional products. • Know how to program a computer to control their products. • Know how to make strong, stiff shell structures. • Understand that a single fabric shape can be used to make a 3d textiles product. • Understand that food ingredients can be fresh, pre-cooked and processed. • Know how to use learning from science to help design and make products that work. • Know how to use learning from mathematics to help design and make products that work. • Understand that materials have both functional properties and aesthetic qualities. • Understand that materials can be combined and mixed to create more useful characteristics. • Know that mechanical and electrical systems have an input, process and output. • Understand the correct technical vocabulary for the projects they are undertaking.	• Understand how mechanical systems such as cams or pulleys or gears create movement. • Understand more complex electrical circuits and components can be used to create functional products. • Know how to program a computer to monitor changes in the environment and control their products. • Know how to reinforce and strengthen a 3D framework. • Understand that a 3D textiles product can be made from a combination of fabric shapes. • Understand that a recipe can be adapted by adding or substituting one or more ingredients. • Know how to use learning from science to help design and make products that work. • Know how to use learning from mathematics to help design and make products that work. • Understand that materials have both functional properties and aesthetic qualities. • Understand that materials can be combined and mixed to create more useful characteristics. • Know that mechanical and electrical systems have an input, process and output. • Understand the correct technical vocabulary for the projects they are undertaking.
Summary and Progression			**Cooking and Nutrition**
Reception	**Y1 and Y2**	**Y3 and Y4**	**Y5 and Y6**

Healthy Me from PHSE curriculum • Understand that I need to exercise to keep my body healthy. • Understand how moving and resting are good for my body. • Know which foods are healthy and not so healthy and can make healthy eating choices. • Know how to help myself go to sleep and understand why sleep is good for me. • Wash my hands thoroughly and understand why this is important especially. • Know what a stranger is and how to stay safe if a stranger approaches me.	• Know that all food comes from plants or animals. • Know that food has to be farmed, grown elsewhere (e.g. Home) or caught. • Know how to name and sort foods into the five groups in The Eatwell Plate. • Know that everyone should eat at least five portions of fruit and vegetables every day. • Understand how to prepare simple dishes safely and hygienically, without using a heat source. • Know how to use techniques such as cutting, peeling and grating Know that food ingredients should be combined according to their sensory characteristics.	• Know that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The Eatwell Plate. • Know that to be active and healthy, food and drink are needed to provide energy for the body. • 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. • Know how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source. • Know how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.	• Understand that seasons may affect the food available. • Understand how food is processed into ingredients that can be eaten or used in cooking. • 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. • Understand that recipes can be adapted to change the appearance, taste, texture and aroma. • Know that different food and drink contain different substances – nutrients, water and fibre – that are needed for health. • Know how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source. • Know how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.

Year EYFS EAD- expressive art and design

Educational Program

The development of children's artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe.

Early Years End Points:	Knowledge for Reception	Key Texts for Reception
Expressive Arts and Design ELG: Creating with Materials Children at the expected level of development will: - Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; - Share their creations, explaining the process they have used; - Make use of props and materials when role playing characters in narratives and stories.	Design • Create collaboratively, sharing ideas, resources and skills. • Discuss design ideas and investigate suitable materials to use	<u>Key Texts</u> Non-fiction texts and artefacts/objects and real life objects <u>Vocabulary</u> Smooth, shiny, rough, prickly, flat, patterned, bumpy, soft, hard, design, ideas, create
	Make • Manipulates materials to achieve a planned effect. • Constructs with a purpose in mind, using a variety of resources • Selects tools and techniques needed to shape, assemble and join materials they are using • Selects appropriate resources and adapts work where necessary	<u>Key Texts</u> Non-fiction texts and artefacts/objects and real life objects <u>Vocabulary</u> make, cut, materials, tools, fold, join, fix, build
	Evaluate • Return to and build on their previous learning, refining ideas and developing their ability to represent them. • Be proud of what they have created • Discuss what they have created giving reasons for their choices	<u>Key Texts</u> Non-fiction texts and artefacts/objects and real life objects <u>Vocabulary</u> Discuss (teacher led questions > I wonder what you might have created? I wonder how you make it even better?)
	<u>Possible provision</u> • various construction materials (e.g cardboard, paper, tubes, boxes, plastic, straws) • Various joining materials (e.g. tape, blutac, glue, treasury tags, staples, paper clips, string) • Decorative resources (e.g. feathers, sequins, glitter, pens, googly eyes, poms poms, pipe cleaners) • Provide resources for mixing colours, joining things together and combining materials • Small world resources • Construction kits • Blocks (small and big) • Cooking and baking resources DT considerations ✓ Children's learning in D&T should include planned, purposeful play and child-initiated and adult-led activities. ✓ Encourage children to think about what their product is for, e.g. fruit drink for a party. ✓Designing is typically intuitive i.e. children design as they make ✓ Designing should not necessarily entail drawing, but children may retrospectively draw what they have made. ✓ Designing includes physically arranging and re-arranging materials and components and orally communicating what they are doing and have done.	DT enquiry **<u>Reception</u>** • Ask questions to find out more, and gives reasons for their choices • Talk about what they see using a wide vocabulary • Children to answer who, where and when questions first before answering 'why' and 'I wonder/how do you know' questions (questions to use in design brief and evaluations of creations) • Explore the environment around them • Connect one idea or action to another

Year 1 and 2

Areas to be covered in Year 1:
- Structures – Freestanding Structures
- Mechanisms – Sliders and Levers
- Food – Preparing Fruit and Vegetables

Areas to be covered in Year 2:
- Mechanisms – Wheels and Axles
- Textiles – Templates and Joining Techniques
- Food – Preparing Fruit and Vegetables

National Curriculum End Points for Key Stage 1	Key Learning – what children must know, do and remember		Vocabulary	Possible evidence to demonstrate working at the Expected Standard for Year 2
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.	**Designing** • 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. • 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 mockups. • Use information and communication technology, where appropriate, to develop and communicate their ideas.	**Year 1:** design, design criteria, user, purpose, product, function, ideas, circle, triangle, square, rectangle, cuboid, cube, cylinder **Year 2:** design, design criteria, user, purpose, function, ideas, names of existing products, features, suitable, quality mock-up, design brief	**Understanding contexts, users and purposes** Use simple design criteria; state what their products are, who and what they are for and how they will work. **Generating, developing, modelling and communicating ideas** Generate ideas using their own experiences and existing products; use talk, drawing, templates, mock-ups and, where appropriate, computers.
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.	**Making** • 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. • 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.	**Year 1:** make, measure, mark out, cut, materials, card, masking tape, paper fastener, join, tools, fold, join, fix, metal, wood, plastic **Year 2:** template, pattern pieces, mark out, join, decorate, finish, tools, finishing techniques, fabrics, components, assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism, names of tools, equipment, materials	**Planning** Plan by suggesting what to do next; select from a range of tools, equipment, materials and components. **Practical skills and techniques** Follow procedures for safety and hygiene; measure, mark out, cut, shape, assemble, join, combine and finish a range of materials and components.
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.	**Evaluating** • 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.	• Know how products work. • Know how products are used. • Understand where products might be used. • Know what materials products are made from. • Know what they like and dislike about products.	**Year 1:** evaluate, user, product, ideas, design criteria, function **Year 2:** evaluate, user, product, ideas, design brief, design criteria, function	**Own ideas and products** Make simple judgements about their products and ideas against design criteria. **Existing products** Explore who and what products are for, how they work and are used, what

Understand how key events and individuals in design and technology have helped shape the world.	• Understand what products are. • Understand who products are for.			materials they are made from and what they like and dislike about them.
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 linkage). 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.	**Technical Knowledge**  • Understand the simple working characteristics of materials and components. • Understand the movement of simple mechanisms such as levers, sliders, wheels and axles. • Know how freestanding structures can be made stronger, stiffer and more stable.	• Understand that a 3-d textiles product can be assembled from two identical fabric shapes. • Understand the correct technical vocabulary for the projects they are undertaking.	**Year 1:** slider, lever, pivot, slot, bridge/guide, pull, push, up, down, straight, curve, forwards, backwards, structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved **Year 2:** vehicle, wheel, axle, axle holder, chassis, body, cab	**Making products work** Know about the simple working characteristics of materials and components, the movement of simple mechanisms, how freestanding structures can be made stronger, stiffer and more stable; use the correct technical vocabulary.
Cooking and Nutrition Use the basic principles of a healthy and varied diet to prepare dishes. Understand where food comes from.	**Cooking and Nutrition**  • That all food comes Know that all food comes from plants or animals. • Know that food has to be farmed, grown elsewhere (e.g. Home) or caught. • Know how to name and sort foods into the five groups in The Eatwell Plate.	• Know that everyone should eat at least five portions of fruit and vegetables every day. • Know that food ingredients should be combined according to their sensory characteristics. • Understand how to prepare simple dishes safely and hygienically, without using a heat source. • Know how to use techniques such as cutting, peeling and grating.	**Year 1:** fruit and vegetable names, names of equipment and utensils, sensory vocabulary, e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard, flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating tasting, arranging, popular, design, evaluate, criteria **Year 2:** fruit and vegetable names, names of equipment and utensils, sensory vocabulary, e.g. soft, juicy, crunchy, sweet, smooth, sharp, crisp, sour, hard, flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating tasting, arranging, popular, design, evaluate, criteria	**Where food comes from** Now that food comes from plants or animals and that it is farmed or caught. **Food preparation, cooking and nutrition** Know how to prepare simple dishes safely and hygienically without a heat source, name and sort foods into groups; know that everyone should eat at least five portions of fruit and vegetables a day.

Year 3 and 4

Areas to be covered in Year 3:	**Areas to be covered in Year 4:**
• Mechanical Systems – Levers and Linkages • Textiles – 2-D Shape to 3-D Product -joining fabircs • Food – Healthy and Varied Diet-sandwiches/wraps • Bridge building-structures	• Structures – Shell Structures Using Computer-Aided Design (CAD) • Electrical Systems – Simple Circuits and Switches • Food – Healthy and Varied Diet-baking, making muffins • pnuematics

National Curriculum End Points for Key Stage 2	Key Learning – what children must know, do and remember	Vocabulary	Possible evidence to demonstrate working at the Expected Standard for Year 4
Design Gather information about user needs; develop their own design criteria; describe the user, purpose and design features of their products and explain how they will work. Generate realistic ideas based on user needs; use a range of drawing skills, discussion, prototypes, pattern pieces and computer-aided design.	**Designing** • Gather information about the needs and wants of particular individuals and groups. • Develop their own design criteria and use these to inform their idea. • Generate realistic ideas, focusing on the needs of the user. • Make design decisions that take account of the availability of resources. • 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. • 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.	**Year 3:** system, input, process, output, prototype, model, innovative user, purpose, function, design criteria, fabric, names of fabrics, fastening, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics **Year 4:** series circuit, fault, connection, shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity	**Understanding contexts, users and purposes** Gather information about user needs; develop their own design criteria; describe the user, purpose and design features of their products and explain how they will work. **Generating, developing, modelling and communicating ideas** Generate realistic ideas based on user needs; use a range of drawing skills, discussion, prototypes, pattern pieces and computer-aided design.
Make Order the main stages of making; select suitable tools, equipment, materials and components and explain their choices. Follow procedures for safety and hygiene; use a wider range of materials and components; measure, mark out, cut, shape, assemble, join, combine and finish with some accuracy.	**Making** • Order the main stages of making. • 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. • 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. • 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.	**Year 3:** mechanism, linear, rotary, oscillating, reciprocating, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance **Year 4:** toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip, marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating	**Planning** Order the main stages of making; select suitable tools, equipment, materials and components and explain their choices. **Practical skills and techniques** Follow procedures for safety and hygiene; use a wider range of materials and components; measure, mark out, cut, shape, assemble, join, combine and finish with some accuracy.
Evaluate Evaluate their ideas and products against their design criteria.	**Evaluating** • Refer to their design criteria as they design and make. • Understand how well products have been designed. • Understand how well products have	**Year 3:** user, purpose, function, prototype, appealing, design brief	**Own ideas and products** Evaluate their ideas and products against their design

Investigate how well products have been designed and made, whether they are fit for purpose and meet user needs; why materials have been chosen, the methods of construction used and how well they work. Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.	• Use their design criteria to evaluate their completed products. • Understand who designed and made the products. • Understand where products were designed and made. • Understand when products were designed and made. • Know whether products can be recycled or reused. • Identify the strengths and areas for development in their ideas and products. • Consider the views of others, including intended users, to improve their work.	been made. • Understand why materials have been chosen. • Know what methods of construction have been used. • Understand how well products work. • Understand how well products achieve their purposes. • Understand How well products meet user needs and wants. • Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.	**Year 4:** user, purpose, function, prototype, design criteria, innovative, appealing, design brief	criteria. **<u>Existing products</u>** Investigate how well products have been designed and made, whether they are fit for purpose and meet user needs; why materials have been chosen, the methods of construction used and how well they work. **<u>Key events and individual</u>** Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.
<u>Technical Knowledge</u> Know that materials have functional and aesthetic qualities; that systems have an input, process and output; how to program a computer to control their products; how to make strong, stiff shell structures; use the correct technical vocabulary.	**<u>Technical Knowledge</u>** • Understand how mechanical systems such as levers and linkages or pneumatic systems create movement. • Understand how simple electrical circuits and components can be used to create functional products. • Know how to program a computer to control their products. • Know how to make strong, stiff shell structures. • Understand that a single fabric shape can be used to make a 3d textiles product. • Understand that food ingredients can be fresh, pre-cooked and processed.	• Know how to use learning from science to help design and make products that work. • Know how to use learning from mathematics to help design and make products that work. • Understand that materials have both functional properties and aesthetic qualities. • Understand that materials can be combined and mixed to create more useful characteristics. • Know that mechanical and electrical systems have an input, process and output. • Understand the correct technical vocabulary for the projects they are undertaking.	**Year 3:** lever, linkage, pivot, slot, bridge, guide **Year 4:** control, program, system, input device, output device, font, lettering, text, graphics, decision	**<u>Making products work</u>** Know that materials have functional and aesthetic qualities; that systems have an input, process and output; how to program a computer to control their products; how to make strong, stiff shell structures; use the correct technical vocabulary.
<u>Cooking and Nutrition</u> Know that food is grown, reared and caught in the UK, Europe and the wider world. Know how to prepare a variety of dishes safely and hygienically; that a healthy diet is made from a variety and balance of different food and drink; that food and drink are needed to provide energy for	**<u>Cooking and Nutrition</u>** • Know that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The Eatwell Plate. • Know that to be active and healthy, food and drink are needed to provide energy for	• Know how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source. • Know how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.	**Year 3:** 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, planning, design criteria, purpose,	**<u>Where food comes from</u>** Know that food is grown, reared and caught in the UK, Europe and the wider world. **<u>Food preparation, cooking and nutrition</u>** Know how to prepare a variety of dishes safely and

the body.	the body. • 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.	user, annotated sketch, sensory evaluations **Year 4:** 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, planning, design criteria, purpose, user, annotated sketch, sensory evaluations	hygienically; that a healthy diet is made from a variety and balance of different food and drink; that food and drink are needed to provide energy for the body.

Year 5 and 6

Areas to be covered in Year 5:
- Food – Celebrating Culture and Seasonality
- Structures – Frame Structures
- Electrical Systems – More Complex Switches and Circuits
- Cams

Areas to be covered in Year 6:
- Food – Celebrating Culture -yeast based product
- Mechanical Systems – Pulleys or Gears
- Textiles – Combining Different Fabric Shapes with fasteners

National Curriculum End Points for Key Stage 2	Key Learning – what children must know, do and remember	Vocabulary	Possible evidence to demonstrate working at the Expected Standard for Year 6
Design Carry out research; develop a simple design specification; describe the user, purpose and design features of their products and explain how they will work. Generate innovative ideas drawing on research; use a range of drawing skills, discussion, prototypes, pattern pieces and computer-aided design.	**Designing** • 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. • 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. • Generate innovative ideas, drawing on research. • Make design decisions, taking account of constraints such as time, resources and cost. • 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.	**Year 5:** design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, function, series circuit, parallel circuit, names of switches and components, flowchart, components, equipment, materials **Year 6:** design criteria, annotate, design decisions, functionality, innovation, authentic, user, purpose, mock-up, prototype, innovative, research, develop, model, communicate, templates, purposeful, functional, appealing, annotated drawings, exploded diagrams, design specification, design brief	**Understanding contexts, users and purposes** Carry out research; develop a simple design specification; describe the user, purpose and design features of their products and explain how they will work. **Generating, developing, modelling and communicating ideas** Carry out research; develop a simple design specification; describe the user, purpose and design features of their products and explain how they will work.
Make Formulate lists of resources and step-by-step plans; select suitable tools, equipment, materials and components and explain their choices. Follow procedures for safety and hygiene; use a wider range of materials and components; measure, mark out, cut, shape, assemble, join, combine and finish with accuracy.	**Making** • Produce appropriate lists of tools, equipment and materials that they need. • Formulate step-by-step plans as a guide to making. • 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. • 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. • Follow procedures for safety and hygiene. • Use a wider range of materials and components than KS1, including construction materials and kits, textiles, food	**Year 5:** frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent, input device, output device, system, monitor, control, program, create, modify **Year 6:** seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces, equipment, fabrics, assemble, pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor, circuit, switch, circuit diagram, mechanical system, electrical system, input, process, output	**Planning** Formulate lists of resources and step-by-step plans; select suitable tools, equipment, materials and components and explain their choices. **Practical skills and techniques** Follow procedures for safety and hygiene; use a wider range of materials and components; measure, mark out, cut, shape, assemble, join, combine and finish with accuracy.

		ingredients, mechanical components and electrical components.		
Evaluate Identify strengths and areas to develop in their ideas and products against their design specification; consider the views of others to make improvements. Investigate how well products have been designed and made, whether they are fit for purpose and meet user needs; why materials have been chosen, the methods of construction used, how well they work, and how innovative and sustainable they are. Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.	**Evaluating** ♡ • 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. • Identify the strengths and areas for development in their ideas and products. • Consider the views of others, including intended users, to improve their work. • Understand how much products cost to make. • Understand how innovative products are. • Understand how sustainable the materials in products are.	• Know what impact products have beyond their intended purpose. • Understand how well products have been designed. • Understand how well products have been made. • Know why materials have been chosen. • Understand what methods of construction have been used. • Understand how well products work. • Understand how well products achieve their purposes. • Understand how well products meet user needs and wants. • Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.	**Year 5:** investigate, evaluate, frame structure, critically evaluate, intended user, purpose, strengths, areas for development, research, reliable, functional, investigate **Year 6:** investigate, analyse, compare, test, intended user, critically evaluate, quality of design, manufacture, functionality, fitness for purpose	**Own ideas and products** identify strengths and areas to develop in their ideas and products against their design specification; consider the views of others to make improvements. **Existing products** Investigate how well products have been designed and made, whether they are fit for purpose and meet user needs; why materials have been chosen, the methods of construction used, how well they work, and how innovative and sustainable they are. **Key events and individuals** Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.
Technical Knowledge Know that materials have functional and aesthetic qualities; that systems have an input, process and output; how to program a computer to control and monitor their products; how to reinforce and strengthen a framework; use the correct technical vocabulary.	**Technical Knowledge** 📖 • Understand how mechanical systems such as cams or pulleys or gears create movement. • Understand more complex electrical circuits and components can be used to create functional products. • Know how to program a computer to monitor changes in the environment and control their products. • Know how to reinforce and strengthen a 3D framework. • Understand that a 3D textiles product can be made from a combination of fabric shapes.	• Know how to use learning from science to help design and make products that work. • Know how to use learning from mathematics to help design and make products that work. • Understand that materials have both functional properties and aesthetic qualities. • Understand that materials can be combined and mixed to create more useful characteristics. • Know that mechanical and electrical systems have an input, process and output. • Understand the correct technical	**Year 5:** strengthen, stiffen, reinforce, triangulation, series circuit, parallel circuit, names of switches and components, input device, output device, system, monitor, control, program, flowchart **Year 6:** seam, seam allowance, wadding, reinforce, hem, template, pattern pieces, name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, iron transfer paper, pulley, drive	**Making products work** Know that materials have functional and aesthetic qualities; that systems have an input, process and output; how to program a computer to control and monitor their products; how to reinforce and strengthen a framework; use the correct technical vocabulary.

		vocabulary for the projects they are undertaking.	belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor circuit, switch, circuit diagram, mechanical and electrical systems, input, process, output, gears, pulleys	
Cooking and Nutrition Know that food is grown, reared and caught in the UK, Europe and the wider world; that seasons may affect the food available; how food is processed into ingredients. Know how to prepare and cook a variety of dishes safely and hygienically using, where appropriate, a heat source; that different food and drink contain nutrients, water and fibre that are needed for health.	**Cooking and Nutrition** • Understand that seasons may affect the food available. • Understand how food is processed into ingredients that can be eaten or used in cooking. • 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. • Understand that a recipe can be adapted by adding or substituting one or more ingredients.	• Understand that recipes can be adapted to change the appearance, taste, texture and aroma. • Know that different food and drink contain different substances – nutrients, water and fibre – that are needed for health. • Know how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source. • Know how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.	**Year 5:** ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs, fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality, utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble **Year 6:** ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs, fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality, utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble	**Where food comes from** Know that food is grown, reared and caught in the UK, Europe and the wider world; that seasons may affect the food available; how food is processed into ingredients. **Food preparation, cooking and nutrition** Know how to prepare and cook a variety of dishes safely and hygienically using, where appropriate, a heat source; that different food and drink contain nutrients, water and fibre that are needed for health.