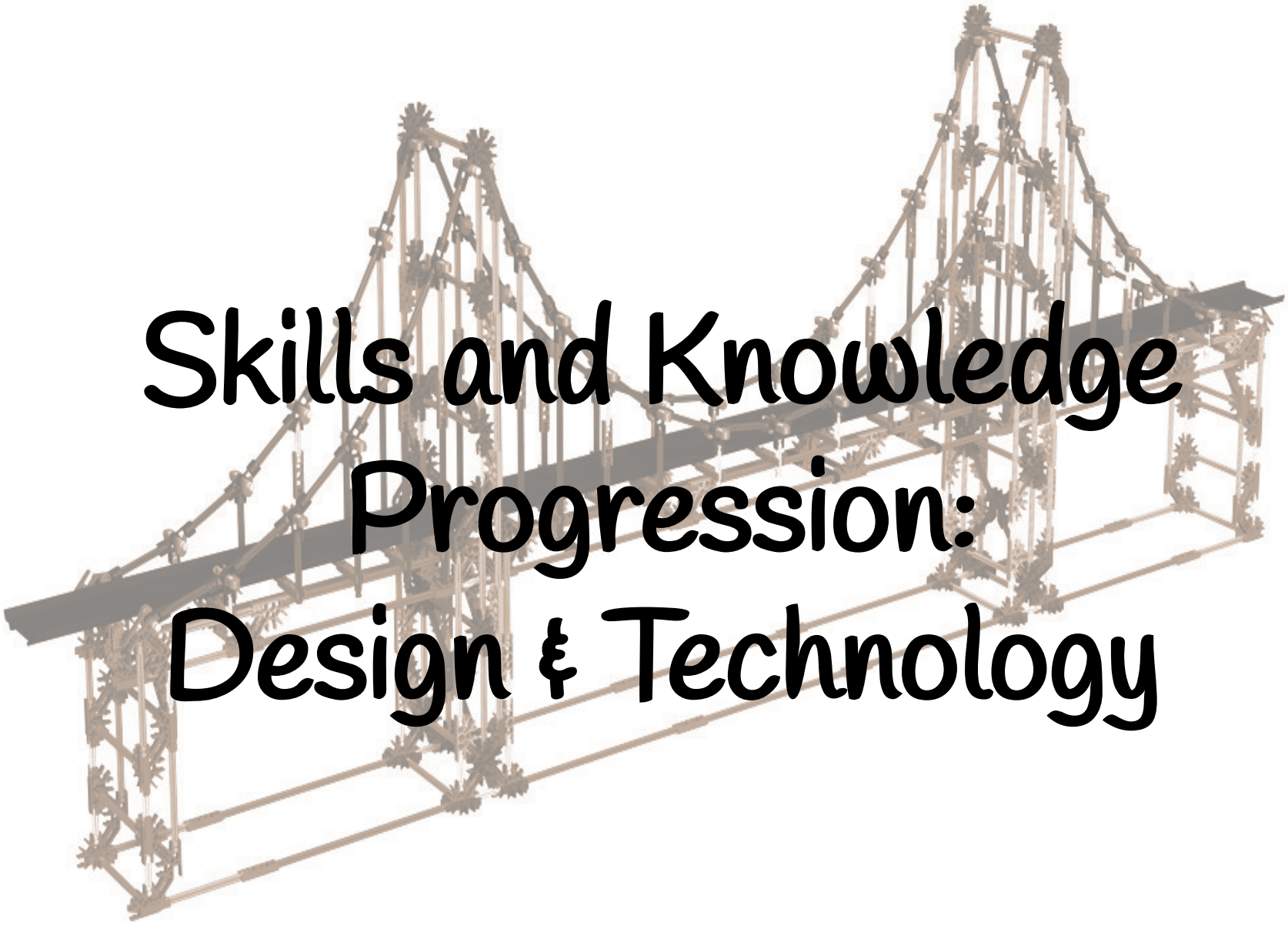
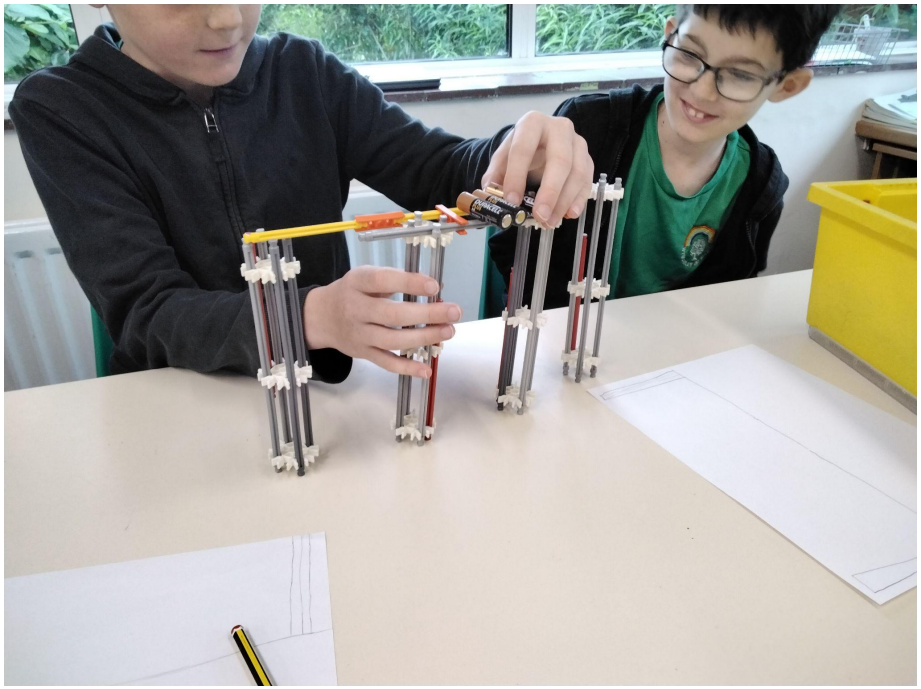
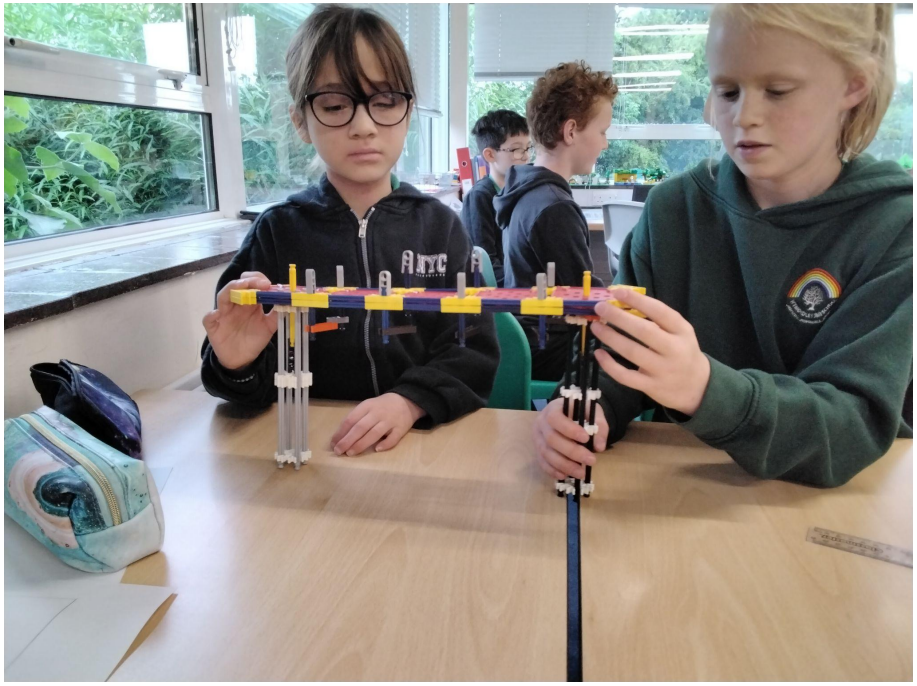
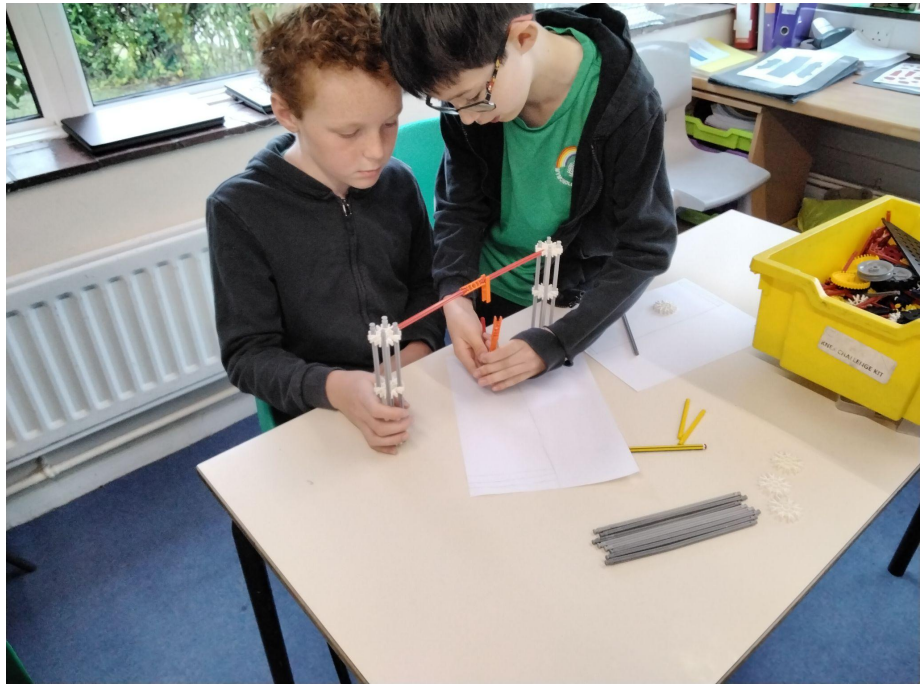
WYMONDLEY JMI SCHOOL



Skills and Knowledge Progression: Design & Technology







Designing and constructing collaboratively with K'nex – Year 5/6

Wymondley JMI School

Skills and Knowledge progression: Design and Technology

National Curriculum aims & purpose:	School aims – skills, attitudes and knowledge that we would like all children to develop on their journey through the school
Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact. Aims: Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate in an increasingly technological world Build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users Critique, evaluate and test their ideas and products and the work of others Understand the principles of nutrition and learn to cook.	At Wymondley, we want our children to become confident, independent problem solvers, who view challenges with curiosity and a 'what about trying...' mindset - both at school and in their wider life beyond. When presented with practical problems, our children will be able to combine their skills and prior knowledge to come up with a range of possible solutions, and then use their experience and understanding to focus in on what they consider to be the best design choice. They will have the practical and technical skills needed to put that idea into practice - and the ability to overcome whatever barriers may present themselves on the way to a completed solution to their initial problem. Children in every class will be given opportunities to explore new materials, tools and designs, to find both their potential and their limitations. Each unit of work will have a clear, practical goal as its outcome, accompanied by design criteria against which finished products can be tested and evaluated. Our children will also learn how to use these materials and tools safely and responsibly, and over time will begin to consider the impact that products (and material choices) can have on the wider world.

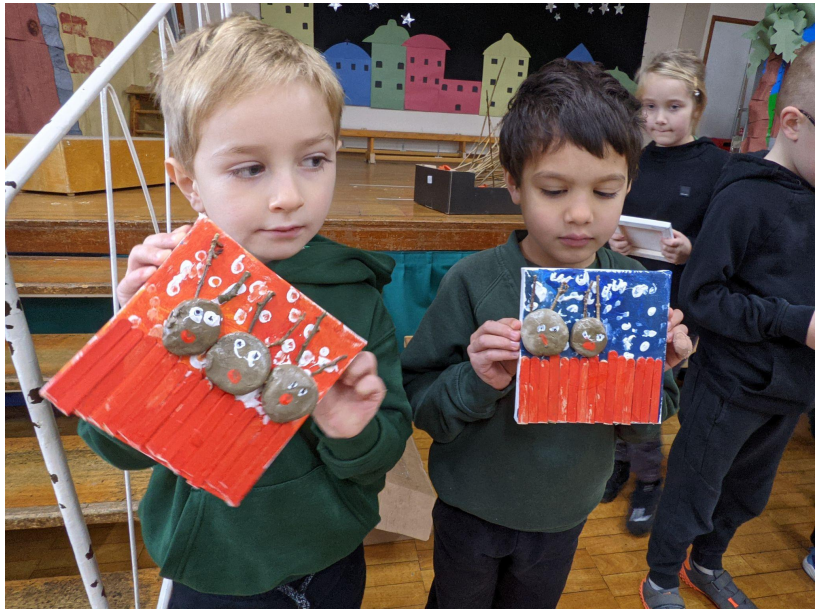
Links to learning in EYFS:	Links to other subjects / curriculum areas:	Experiences every child should have:
<u>Expressive Arts and Design and Physical Development</u> Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Share their creations, explaining the process they have used. Return to and build on their previous learning, refining ideas and developing their ability to represent them.	Solving problems linked to materials or contexts being explored in science Measuring, estimating and interpreting scales, calculating costs or capacities links to maths Exploring foods from different cultures and festivals links to geography and RE topics Use of electrical systems or discussion of forces involved in movement ties in with science Large crossover with art skills when considering finish, choice of materials & product appearance 'Learning to use equipment safely and independently' elements have strong PSHE link	Produce something of their own that makes them go, "Wow!" Have opportunities to use things they have made - recognising that their work really is purposeful and practical Take things to bits to find out how they're held together and how they work See something they have constructed move under its own power Use saws, hammers, hand drills and other 'grown-up' tools (and know how to use them safely) Be able to combine ingredients to create a finished food product to be proud of

Cooking and use of food across the school

Design and Technology Knowledge Progression

	Yr 1/2	Yr 3/4	Yr 5/6
Cycle A	**3D reindeer pictures** • Draw and discuss own design giving reasons for choices • Discuss making process as carrying it out, justifying choices • Cut lolly sticks using hacksaw • Shape clay using tools • Paint and decorate items • Assemble materials to create finished picture • Suggest improvements **Simple wooden toy** • Draw and discuss own design giving reasons for choices • Discuss making process as carrying it out, justifying choices • Cut wood using hacksaw • Assemble materials to create finished picture • Suggest improvements **Bunting** • Create own design based on given criteria • Cut and sew material • Suggest improvements	**Sweet boxes** • Explore a range of packaging for sweets • Identify recycled packaging • Identify main features of packaging for sweets • Draw and design own packaging • Explain design choices (suitability,product appeal etc) • Use specific vocabulary • Measure mark and cut accurately • Assemble materials to make sweet box • Evaluate design and suggest improvements **Cooking** • Investigate and analyse different types of biscuits • Design own criteria for the perfect biscuit • Create a recipe for biscuit to follow (link to English) • Follow a set of instructions • Follow safety and hygiene guidelines • Use a range of kitchen tools to chop, mix, measure and create their biscuits • Evaluate and suggest improvements **Mechanical toys** • Investigate and analyse a range of different mechanical devices (levers and linkages) • Make a mechanical system using a lever and linkage • Create a design criteria for a mechanical device • Design a mechanical product • Use a prototype to evaluate a design plan • Select and use the correct tools effectively • Name the different parts and functions of a mechanical device • Evaluate effectiveness	**Moving toys** • Investigate and analyse a range of different mechanical devices (axels, levers, wheels, cams) • Explain how parts of their product work • Communicate ideas using exploded diagrams • Create a step-by-step plan • Accurately measure, mark, cut and join materials (sawing, wood, glue) • Understand and demonstrate how to overcome problems at different stages • Evaluate the quality of the finished product against design ideas, purpose and specification. **Bags** • Purpose and design features • Communicate ideas using annotated sketches • Use pattern pieces to model ideas • Accurately measure, mark, cut and join materials, including using a sewing machine • Use tie-dye and lino-printing skills and techniques • Understand and demonstrate how to overcome problems at different stages of the making process • Evaluate the quality of the finished product against design ideas and purpose. **Cooking (Greek recipes)** • Tasting profiles of existing products • Measure & weigh ingredients • Where food comes from, food from different parts of the world, seasonality • Follow recipes which include a number of steps • Adapt recipes to suit different tastes • Prepare savoury dishes • Use a range of preparation techniques (grating, peeling, chopping, slicing, kneading, mixing, blending) • Evaluate the finished dish in terms of its taste and appearance

Cycle B	**Hand puppets** • Create own design • Select appropriate materials and accessories for own design • Join material together by sewing • Suggest and try other ways to attach accessories • Suggest improvements **Tudor houses** • Draw and discuss own design giving reasons for choices • Discuss making process as carrying it out, justifying choices • Cut wood using hacksaw • Assemble materials to create finished model house • Suggest improvements **Foods from other countries** • Discuss where foods come from • Find out about common foods from other countries • Prepare simple dishes from other countries • Cut, peel and grate different foods	**Cooking and Nutrition** • Explore how foods are part of different food groups • Taste different types of sandwiches, breads and fillers • Design and plan a sandwich for a particular purpose • Use equipment and tools to create a healthy sandwich • Evaluate finished product **Christmas Crafts** • Select tools and equipment suitable for a task • Develop skills in cutting and sewing **Mechanical devices with electrical components** • Explore how there have been advances in technology and how they've shaped the world • Make and represent different types of circuits • Make and use switches in a circuit • Design a game that uses a circuit to create a light or sound • Select materials and components to make a game • Ask others to evaluate game and give feedback	**Christmas decorations** • Communicate ideas using annotated sketches • Design a felt decoration, accounting for time and resources available • Evaluate the quality of the finished decoration against design ideas, purpose and specification. **Cooking (WW2)** • Measure & weigh ingredients • Recipes based on food available at the time during rationing • Follow recipes which include a number of steps • Adapt recipes to suit different needs • Prepare savoury dishes • Use a range of preparation techniques (grating, peeling, chopping, slicing, kneading, mixing, blending) • Evaluate the finished dish in terms of its taste and appearance **Moving moon buggies** • Communicate ideas using computer aided design and exploded diagrams • Explain how parts of their products work • Investigate and analyse a range of different mechanical devices (axels, levers, wheels, cams) • Accurately measure, mark, cut and join materials (sawing, wood, glue) • Understand and demonstrate how to overcome problems at different stages • Evaluate the quality of the finished product against design ideas, purpose and specification **Planters** • Purpose and design features • Create a step by step plan • Accurately measure, mark, cut and join materials (sawing, wood, nails, glue) • Strengthen corners • Understand and demonstrate how to overcome problems at different stages • Evaluate the quality of the finished product against design ideas, purpose and specification



3-D pictures being created in Year 1/2

Skills Progression in Design and Technology

	Key Stage 1 (Puffins and Toucans)	Lower Key Stage 2 (Peacocks)	Upper Key Stage 2 (Eagles)
Designing - Understanding contexts, users and purposes	Work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment.	Work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment.	
	Use simple design criteria to help develop their ideas. Describe what their products are for. State what products they are designing and making.	Describe the purpose of their products.	
	Say how they will make their products suitable for their intended users. Say whether their products are for themselves or other users.	Indicate the design features of their products that will appeal to intended users.	
	Say how their products will work.	Explain how particular parts of their products work.	
Designing - Generating, developing, modelling and communicating ideas.	Use knowledge of existing products to help come up with ideas. Model ideas by exploring materials, components and construction kits and by making templates and mock- ups. Develop and communicate ideas by talking and drawing. Use information and communication technology, where appropriate, to develop and communicate their ideas.	Share and clarify ideas through discussion. Model their ideas using prototypes and pattern pieces. Use annotated sketches, cross-sectional drawings, exploded diagrams and computer aided design to develop and communicate their ideas.	
	Generate ideas by drawing on their own experiences.	Generate realistic ideas, focusing on the needs of the user. Make design decisions that take account of the availability of resources.	Generate innovative ideas, drawing on research. Make design decisions, taking account of constraints such as time, resources and cost.
Making - Planning	Select from a range of tools and equipment, explaining their choices. Select from a range of materials and components	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.	

	according to their characteristics.	Explain their choice of materials and components according to functional properties and aesthetic qualities.	
	Plan by suggesting what to do next.	Order the main stages of making.	Produce appropriate lists of tools, equipment and materials that they need. Formulate step-by-step plans as a guide to making.
Making- Practical skills and techniques	Follow procedures for safety and hygiene. Use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components.	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.	
	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.	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.	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.
Evaluating 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 products. Consider the views of others, including intended users, to improve their work.	
	Make simple judgements about their products and ideas against design criteria. Suggest how their products could be improved.	Refer to their design criteria as they design and make. Use their design criteria to evaluate their completed 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
Evaluating existing products	Investigate and analyse: What products are. Who products are for. What products are for. How products work. How products are used. Where products might be used. What they like and dislike about products. What materials products are made from.	Investigate and analyse: How well products have been designed. How well products have been made. 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. Why materials have been chosen.	

		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. About inventors, designers, engineers, chefs and manufacturers who have developed groundbreaking products.
Cooking and Nutrition - Where food comes from	That all food comes from plants or animals. That food has to be farmed, grown elsewhere (e.g. home) or caught.	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.	
			That seasons may affect the food available. How food is processed into ingredients that can be eaten or used in cooking.
Cooking and Nutrition - Food preparation, cooking and nutrition	How to prepare simple dishes safely and hygienically, without using a heat source. How to use techniques such as cutting, peeling and grating.	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.	
	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.	That a healthy diet is made up from a variety and balance of different food and drink, as depicted in The Eat well Guide. That to be active and healthy, food and drink are needed to provide energy for the body.	That different food and drink contain different substances – nutrients, water and fibre – that are needed for health.
			That recipes can be adapted to change the appearance, taste, texture and aroma.