Thameside Primary School – Design Technology Progression KS1 and KS2 (Adapted from: STEM Learning https://www.stem.org.uk/)

Intent:

Design and Technology is an inspiring, rigorous and practical subject. Design and Technology encourages children to learn to think and intervene creatively to solve problems both as individuals and as members of a team. At Thameside Primary, we encourage children to use their creativity and imagination, to design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. Opportunities are given to discuss the design and evaluation of projects and then review their planning before assembling their end product. We aim to, wherever possible, link work to other disciplines such as mathematics, science, engineering, computing and art. The children are also given opportunities to reflect upon and evaluate past and present design technology, its uses and its effectiveness and are encouraged to become innovators and risk-takers.

Early Years Framework- Expressive Arts and Design
Expressive Arts and Design 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

DESIGNING	**Key Stage 1**	**Key Stage 2**
Understanding contexts, users and purposes	Across KS1 pupils should: • 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	Across KS2 pupils should: • 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 In lower KS2 pupils should also: • gather information about the needs and wants of particular individuals and groups • develop their own design criteria and use these to inform their ideas In upper KS2 pupils should also: • 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	Across KS1 pupils should: • 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 ICT, where appropriate, to develop and communicate their ideas	Across KS2 pupils should: • 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 In lower KS2 pupils should also: • generate realistic ideas, focusing on the needs of the user *• make design decisions that take account of the availability of resources* In upper KS2 pupils should also: • generate innovative ideas, drawing on research *• make design decisions, taking account of constraints such as time, resources and cost*
MAKING	**Key Stage 1**	**Key Stage 2**
Planning	Across KS1 pupils should: *• 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	Across KS2 pupils should: • 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 In lower KS2 pupils should also: *• order the main stages of making* In upper KS2 pupils should also: *• 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	Across KS1 pupils should: • 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	Across KS2 pupils should: • 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 In lower KS2 pupils should also: • 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 In upper KS2 pupils should also: • 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	**Key Stage 1**	**Key Stage 2**

Own ideas and products	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 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 In lower KS2 pupils should also: • refer to their design criteria as they design and make • use their design criteria to evaluate their completed products In upper KS2 pupils should also: • 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	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	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 In lower KS2 pupils should also 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 In upper KS2 pupils should also 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
Key events and individuals	Not a requirement in KS1	Across KS2 pupils should know: • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products
TECHNICAL KNOWLEDGE	**Key Stage 1**	**Key Stage 2**
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	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*

	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*	In lower 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 upper 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*
COOKING & NUTRITION	**Key Stage 1**	**Key Stage 2**
Where food comes from	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	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 In late KS2 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
Food preparation, cooking and nutrition	Across KS1 pupils should know: • 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	Across KS2 pupils should know: • 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 In lower KS2 pupils should also know: • that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The eat well plate • that to be active and healthy, food and drink are needed to provide energy for the body In upper KS2 pupils should also know: *• 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

Year 1	Year 2	Year 3	Year 4/5	Year 5 /6
Term 6 3D houses	**Term 6** 3D houses	**Term 2** Mechanisms – What can you power with water? **Term 6** Pop-up Artefacts	**Term 4** Electrical project	**Term 3** Electrical project

Year 1	Year 2	Year 3	Year 4/5	Year 5 Year 6
	Term 2 Textiles - tapestries – wall hanging – weaving - eco link use plastic to weave			

Year 1	Year 2	Year 3	Year 4/5	Year 5/6 Year 6	
Term 3 Cooking	**Term 3** Cooking	**Term 4** Cooking	**Term 3** Cooking –Mexican food	**Term 1** Cooking – Mexican food **Term 3** Cooking - Keeping healthy	
Healthy sandwiches LtL: Making Links (DT/Science/PSHE)		Salad plate LtL: Making Links (DT/Science/PSHE)		Healthy Smoothies LtL: Making Links (DT/Science/PSHE)	

Skills and Knowledge Progression

Development Matters 2021- Nursery	Development Matters 2021- Reception
Explore different materials freely, in order to develop their ideas about how to use them and what to make.	Return to and build on their previous learning, refining ideas and developing their ability to represent them.

Develop their own ideas and then decide which materials to use to express them. Join different materials and explore different textures. Create closed shapes with continuous lines, and begin to use these shapes to represent objects.	Create collaboratively, sharing ideas, resources and skills.

KS1		KS2			
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Designing					
I can explain to someone else how I want to make my product. I can make a simple plan before making. I can choose appropriate resources and tools. I can describe how my idea works. I can explain to someone else how they want to make their product and make a simple plan before making. Know how to design something. Know how to design a product which moves.	I can think of an idea and plan what to do next. I can explain why I have chosen specific textiles. Know that weaving is forming fabric by interlacing threads. Know that you can create different textures and patterns by interlacing threads.	I can prove that my design meets some set criteria. I can design a product and make sure that it looks attractive. I can choose a textile for both its suitability and appearance. Know that a mechanism is within a machine. Know that a mechanism is a tool which controls motions.	I can use ideas from other people when I am designing. I can produce a plan and explain it. I can persevere and adapt work when original ideas do not work I can communicate ideas in a range of ways, including by sketches and drawings which are annotated. Know that a battery is a source of energy, Know that an electric circuit is when the battery pushes the electricity along the wires from the positive terminal, through the bulb and back to the negative terminal.	I can come up with a range of ideas after collecting information from different sources. I can produce a detailed, step-by-step plan. I can suggest alternative plans; outlining the positive features and draw backs. .I can come up with a range of ideas after collecting information from different sources. I can produce a detailed, step-by-step plan. I can explain how a product will appeal to a specific audience. I can design a product that requires pulleys or gears. Know that an	I can use market research to inform my plans and ideas. I can follow and refine my plans. I can justify my plans in a convincing way. I can show that I consider culture and society in my plans and designs. I can use market research to inform plans and ideas. •follow and refine original plans I can justify planning in a convincing way. I can show that culture and society is considered in plans and designs. Know that an electric circuit is when the battery pushes the electricity along the wires from the positive terminal,

				electric circuit is when the battery pushes the electricity along the wires from the positive terminal, through the bulb and back to the negative terminal. Know that a switch breaks or completes a circuit.	through the bulb and back to the negative terminal. Know that a switch breaks or completes a circuit. Know which materials conduct electricity.
Making					
I can use my own ideas to make something. I can describe how something works. I can use own ideas to make something. I can make a product which moves. I can choose appropriate resources and tools. Know that joining is putting two materials together.	I can choose tools and materials and explain why I have chosen them. I can join materials and components in different ways. I can measure materials to use in a model or structure. I can explain what went well with my work. I can choose tools and materials and explain why they have chosen them. I can join materials and components in different ways. I can measure materials to use in a model or structure. Know that joining is putting two materials together. Know that measuring is finding the length, width or height of something.	I can follow a step-by-step plan, choosing the right equipment and materials. I can follow a step-by-step plan, choosing the right equipment and materials. I can select the most appropriate tools and techniques for a given task. I can make a product which uses both electrical and mechanical components. I can work accurately to measure, make cuts and make holes. Know that a mechanism is within a machine. Know that a mechanism is a tool	I can measure accurately. I can persevere and adapt my work when my original ideas do not work. I can select which tools to use for a particular task and show knowledge of handling the tool. I can measure accurately. Know which material is likely to give the best outcome. Know that a battery is a source of energy, Know that an electric circuit is when the battery pushes the electricity along the wires from the positive terminal, through the	I can use a range of tools and equipment competently. I can make a prototype before I make a final version. I can use range of tools and equipment competently. I canmake a prototype before making a final version. I can make a product that relies on pulleys or gears. Know that an electric circuit is when the battery pushes the electricity along the wires from the positive terminal, through the bulb	I can follow and refine my plans. I can justify my plans in a convincing way. I can choose which tool to use for a specific practical task. I can explain why a specific tool is best for a specific action. Know how to use any tool correctly and safely. Know what each tool is used for. Know that an electric circuit is when the battery pushes the electricity along the wires from the positive terminal,

		which controls motions.	bulb and back to the negative terminal.	and back to the negative terminal. Know that a switch breaks or completes a circuit.	through the bulb and back to the negative terminal. Know that a switch breaks or completes a circuit. Know which materials conduct electricity.
Evaluating					
I can describe how something works. I can explain what works well and not so well in the model I have made. Know that joining means putting two materials together. Know that evaluate means looking what worked well and what they would improve next time. Know what materials products are made from.	I can explain why I have chosen specific textiles. I can explain what went well with my work. Know that joining is putting two materials together. Know that measuring is finding the length, width or height of something. Know that evaluate means looking what worked well and what they would improve next time. Know what materials products are made from. Know that the iterative process means repeating steps and tweaking.	I can prove that my design meets some set criteria. I can design a product and make sure that it looks attractive. I can choose a textile for both its suitability and appearance. I can explain how to improve a finished model. I can say why a model has, or has not, been successful. Know that a mechanism is within a machine. Know that a mechanism is a tool which controls motions. Know that the purpose of a product is thinking about what it is meant to be used for.	I can evaluate and suggest improvements for my designs. I can evaluate products for both their purpose and appearance. I can explain how I have improved my original design. I can present a product in an interesting way. I can evaluate and suggest improvements for design. I can evaluate products for both their purpose and appearance. I can explain how the original design has been improved. I can present a product in an interesting way. Know what materials or ingredients products are made from, Know which material is likely to give the best outcome.	I can explain how a product will appeal to a specific audience. I can evaluate appearance and function against original criteria. I can suggest alternative plans; outlining the positive features and draw backs. I can evaluate appearance and function against original criteria/ Know that an electric circuit is when the battery pushes the electricity along the wires from the positive terminal, through the bulb and back to the negative terminal. Know that a switch breaks or	I can justify my plans in a convincing way. I can show that I consider culture and society in my plans and designs. I show that I can test and evaluate my products. I can explain how products should be stored and give reasons. I can work within a budget. I can evaluate my product against clear criteria. I can test and evaluate designed products. I can explain how products should be stored and give reasons. I can evaluate product against clear criteria. Know how to use

			Know that a battery is a source of energy. Know that an electric circuit is when the battery pushes the electricity along the wires from the positive terminal, through the bulb and back to the negative terminal.	completes a circuit. Know the key events and designs of individuals in design and technology that have helped shaped the world.	any tool correctly and safely. Know what each tool is used for. Know that an electric circuit is when the battery pushes the electricity along the wires from the positive terminal, through the bulb and back to the negative terminal. Know that a switch breaks or completes a circuit. Know which materials conduct electricity.
Technical Knowledge					
I can make my own model stronger.	I can make a model stronger and more stable. I can use wheels and axles, when appropriate to do so.	I can strengthen a product by stiffening a given part or reinforce a part of the structure. I can use a simple IT program within the design.	I can make links to scientific knowledge by using lights, switches or buzzers. I can use electrical systems to enhance the quality of the product. I can use IT, where appropriate, to add to the quality of the product.	I can make links to scientific knowledge to design by using pulleys or gears. I can use more complex IT program to help enhance the quality of the product produced.	I can use electrical systems correctly and accurately to enhance a given product. I can choose which IT product would further enhance a specific product. I can use knowledge to improve a made product by strengthening, stiffening or reinforcing.
Food Technology					
I can cut food safely.	I can weigh ingredients to use in	I can describe how	I can be both hygienic	I can be both	I can explain how

I can use appropriate equipment and utensis to prepare and combine food. Know where a range of fruit and vegetables come from. Know and use technical and sensory vocabulary relevant to the project	a recipe. I can describe the ingredients used when making a dish or cake. Know how to use utensils and equipment including heat sources to prepare and cook food. Know the basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of The eatwell plate	food ingredients come together. I can weigh out ingredients and follow a given recipe to create a dish. I can talk about which food is healthy and which food is not. I can talk about when food is ready for harvesting. Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught. • Know and use relevant technical and sensory vocabulary appropriately.	and safe when using food. I can bring a creative element to the food product being designed. Know how to be both hygienic and safe when using food. Know that food is processed into ingredients that can be eaten or used in cooking.	hygenic and safe in the kitchen. I can prepare a meal by collecting the ingredients in the first place. Know about which season various foods are available for harvesting. Know that food contains different substances such as protein.	food ingredients should be stored and give reasons. I can work within a budget to create a meal. Know the difference between a savoury and sweet dish. Know that adapting a dish by changing one element changes texture, taste and aroma.