Hazelwood Schools

Design and Technology

Knowledge and Skills Progression

Designing	
EYFS (Nursery and Reception)	
Substantive Knowledge **Children will know…**	**Practical Knowledge** **Children will know how to…**
• They can design something for a purpose or person • They can draw what they want to make	**Designing Skills** • Speak in a small group or class and one to one, offering own ideas • Talk about design **Drawing Skills** • Begin to show accuracy and care when drawing.

Designing	
KS1 (Year 1 and Year 2)	
Substantive Knowledge **Children will know…**	**Practical Knowledge** **Children will know how to…**
• A product is something that is made to do a job or fulfil and need. • A design brief describes the product that is to be made • A product is made for a person known as the client • Drawing out design ideas is useful to see how the product will look. • Using model and construction kits can help to develop their ideas and designs.	**Designing Skills** • Research similar existing products, including online research. • Use knowledge of existing products to help with generating their own ideas. • Explain what their product is and how it will work. **Drawing Skills** • Generate and communicate ideas using sketches, drawing and digital • software. • Create clearly labelled drawings to explain how their product works.

Designing	
LKS2 (Year 3 and Year 4)	
Substantive Knowledge **Children will know…**	**Practical Knowledge** **Children will know how to…**
● The difference between a design brief and design specifications. ● Design specifications describe how a product should be made, how it works or what it should do. ● How making models of their intended product can help in the design process. ● There can be a range of people and places that can be clients for a product. ● How computer-aided design software can help in the design process (Year 3 – Desk tidy)	**Designing Skills** ● Conduct research, including consumer surveys to find out needs and wants of the client ● Generate ideas for a product, considering its purpose and who the client is. ● Design a product that meets client's needs and the design brief. ● Use design specifications as a guide to the making process. ● List the design features that will appeal to the client. **Drawing Skills** ● Communicate and draw out their designs using three-dimensional techniques such as 'crating' and isometric drawing. ● Use computer software to show what their final product will look like.

Designing	
UKS2 (Year 5 and Year 6)	
Substantive Knowledge **Children will know…**	**Practical Knowledge** **Children will know how to…**
● Creating a prototype of a design is useful for checking ideas and seeing how well they work. ● Different types of drawing can be used to help with designing and communicating ideas about a product. ● How labels and annotated drawings can be used to explain and communicate how a product is made and how it will work. ● Surveys, interviews and questionnaires are used to find out the needs and wants of clients.	**Designing Skills** ● Carry out different surveys and questionnaires for research and to help with the design process. ● Write step by step instructions and recipes to make a product they have designed. ● List the materials and tools that will be needed to make a product they have designed. **Drawing Skills** ● Communicate their ideas using cross-sectional drawings and cut-away drawings. ● Use computer-aided design software to develop and communicate their ideas

Making	
EYFS (Nursery and Reception)	
Substantive Knowledge **Children will know…**	**Practical Knowledge** **Children will know how to…**
• Some risks when using tools such as scissors • They should wash their hands before handling food • They can use a range of materials	• Select tools for purpose • Select resources and activities, with help, in order to make something • Show increasing controls in holding a varity of objects *such as jugs for pouring and mark making tools* • Use scissors to make snips to paper • Join different materials and explore different textures • Use a variety of tools with accuracy for example paintbrushes, pencils, tweezers and scissors • Safely use tools

Making	
KS1 (Year 1 and Year 2)	
Substantive Knowledge **Children will know…**	**Practical Knowledge** **Children will know how to…**
• To keep themselves safe when making things. • Simple procedures for working hygienically with food. • About a range of materials and their properties and how they can be used when making a product. • Improving a product whilst making it is an important part of design technology.	• Follow instructions to make a product from a design. • Select and use tools most appropriate for a practical task. • Measure and mark out different materials when working with them. • Cut and shape a range of materials using different tools and techniques. • Assemble, join, and combine a range of materials using different methods and techniques. • Apply a range of different finishing techniques to their made product.

Making	
LKS2 (Year 3 and Year 4)	
Substantive Knowledge **Children will know…**	**Practical Knowledge** **Children will know how to…**
• Rules and procedures for keeping themselves safe when making products. • The properties of materials that they are working with and how these determine the tools and techniques that they use. • That a list of the main stages of turning a design into a product will aid the making process. • What different components of a system do and how these can be incorporated into their product to make them work.	• Follow instructions to ensure that they work safely. • Select suitable tools, equipment, materials, and components for the task. • Explain their choices of materials, techniques and tools when making a product. • Measure, mark out, cut and shape materials with increasing accuracy. • Select and apply a finishing technique to create a quality product. • Identify and implement ways of improving a product whilst making it.

Making	
UKS2 (Year 5 and Year 6)	
Substantive Knowledge **Children will know…**	**Practical Knowledge** **Children will know how to…**
• Choosing materials, tools and equipment is dependent upon the skills and techniques to be used. • Step-by-step action plans should be created and followed when making complex products. • A range of different finishing techniques and choose ones that are suitable to create a quality product.	• Work responsibly using guidelines to ensure they keep themselves and others safe. • Write an action plan for the making process including lists of tools, equipment and materials needed. • Accurately assemble, join and combine materials and components to ensure a quality finish to a product. • Apply a range of decorative and finishing techniques following the product design.

Evaluating	
EYFS (Nursery and Reception)	
Substantive Knowledge **Children will know…**	**Practical Knowledge** **Children will know how to…**
● Talking about what they have made can help them make it even better	● Give meaning to what they have made ● Refine ideas and improve design with support ● Share what they have made and explain the process they have used.

Evaluating	
KS1 (Year 1 and Year 2)	
Substantive Knowledge **Children will know…**	**Practical Knowledge** **Children will know how to…**
● Evaluating existing products can help them to design and make their own product ideas. ● When evaluating existing products; they explore what it does, how it works, what materials it is made of and who it has been made for. ● Evaluating a product is about identifying what is good about the product and ways it could be made better.	● Explore and identify how products have been created, including the materials that have been used to make the product. ● Taste and evaluate different foods using a taste test. ● Evaluate a finished product against their design. ● Reflect on a finished product explaining their likes, dislikes and suggesting improvements.

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Evaluating	
LKS2 (Year 3 and Year 4)	
Substantive Knowledge **Children will know…**	**Practical Knowledge** **Children will know how to…**
• Design specifications are a list of success criteria for the product. • When evaluating products, it is important to use the design brief and the design specifications as a guide. • The client can be used to evaluate the success of a product. • Peer review of their product is useful in identifying ways in which it could be improved. • To use a range of information sources to identify areas in which their product could be improved. • Stories about iconic designs and designers that have helped to shape the world in which we live.	• Identify the characteristics of a design which makes the product useful and successful. • Test for the strength and stability of different structures • List the ways in which a finished product meets the design specifications. • Evaluate their product using a range of sources including client review, peer review, design brief and the design criteria. • Use consumer surveys to evaluate their finished product.

Evaluating	
UKS2 (Year 5 and Year 6)	
Substantive Knowledge **Children will know…**	**Practical Knowledge** **Children will know how to…**
• To continually reflect on and evaluate their work throughout the stages of designing and making. • As part of the evaluation process, the designer can consider the cost (time and money) of making the finished product. • That evaluating the whole project is an important part of design technology. • About a range of inspirational designs and designers throughout history and use this knowledge to support their own work as designers.	• Identify strengths and areas for development in their own ideas and products. • List ways of improving a product considering the views of others and intended users. • Evaluate a product against specific design specifications. • Evaluate whether products can be recycled, reused, or repurposed and how sustainable the materials used are.

TECHNICAL KNOWLEDGE - Mechanisms**/Mechanical systems**	
EYFS	
Nursery	**Reception**
Substantive Knowledge **Children will know…**	
● That toy vehicles with wheels move when pushed	● That there are different parts that can be added to their vehicles
Practical Knowledge **Children will know how to…**	
● Explore moving vehicles through play.	● Assembled vehicles with moving wheels using construction kits.

TECHNICAL KNOWLEDGE – Mechanisms/Mechanical Systems			
KS1		**LKS2**	**UKS2**
Year 1	**Year 2**	**Year 3**	**Year 5**
Substantive Knowledge Children will know…		**Substantive Knowledge Children will know…**	**Substantive Knowledge Children will know…**
● Know that mechanisms cause things to move. ● Linear movement is movement in a straight line. ● Rotational movement is circular movement. ● A lever is something that turns on a pivot.	● A wheel needs to be attached to an axel to rotate.	● How pop-up mechanisms can be adapted in mechanical books ● Levers and linkages work together to create different movements in mechanical books.	● Gear systems and pulley systems are used to change the speed and direction of movement in a mechanical system. ● Different mechanisms are used to change rotational movement into other forms of motion.
Practical Knowledge Children will know how to…		**Practical Knowledge Children will know how to…**	**Practical Knowledge Children will know how to…**
● Use sliders to create linear motion in mechanical products. ● Use levers and a pivot to create rotational movement in products. ● Create simple folding mechanisms in pop up books.	● Add wheels and axles to a frame or chassis to create a moving vehicle.	● Create pop-up mechanisms for mechanical books. ● Create different types of movement in pop up books using a range of mechanical systems, including levers and linkages.	● Create systems that can change the speed and direction of rotational movement using either gears or pulleys. ● Combine a structure with a mechanism to create a product with motion/movement. ● Use a cam mechanism in a product to change the motion within the product

TECHNICAL KNOWLEDGE - Structures	
EYFS	
Nursery	**Reception**
Substantive Knowledge Children will know…	
• The purpose of tools e.g scissor cut and glue sticks	• Different methods of joining card and paper
Practical Knowledge Children will know how to…	
• explore construction kits to build walls, towers and frameworks. • Use basic tools e.g. scissors or hole punches with construction materials e.g. plastic, card.	• Use simple cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape.

TECHNICAL KNOWLEDGE - Structures		
KS1	**LKS2**	**UKS2**
Year 1 and Year 2	**Year 3 and Year 4**	**Year 5**
Substantive Knowledge Children will know…	**Substantive Knowledge Children will know…**	**Substantive Knowledge Children will know…**
• Different types of structures that are found in the natural world and in the man-made world. • Different structures are used for different purposes. • A large base can make a structure stable.	• Whether a structure is a frame structure or a shell structure • Suitable techniques to strengthen materials. • Suitable techniques of making structures more stable	• Different properties of some common materials and how these properties are used when designing and making structures. • Ways of reinforcing structures, including using triangulation techniques
Practical Knowledge Children will know how to…	**Practical Knowledge Children will know how to…**	**Practical Knowledge Children will know how to…**
• Join different materials to create a structure. • Create a simple rectangular framework with corner struts for added strength. • Use shape to increase the strength and stiffness of a structure	• Choose suitable materials, techniques, and tools to construct or repair products. • Apply a range of techniques to create shell structures using paper. • Apply a range of practical skills and techniques to create stable and strong frame structures. (Year 4)	• Make frame structures that can support mechanical systems within a product.

TECHNICAL KNOWLEDGE – Materials/Textiles	
EYFS	
Nursery	**Reception**
Substantive Knowledge **Children will know…**	
● There are different materials	● That we can use fabric glue to join fabric ● That we can sew to join fabric
Practical Knowledge **Children will know how to…**	
● Explore and use different fabrics	● Cut and join fabrics with simple techniques.

TECHNICAL KNOWLEDGE – Materials/Textiles					
KS1		**LKS2**		**UKS2**	
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Substantive Knowledge Children will know…		**Substantive Knowledge Children will know…**		**Substantive Knowledge Children will know…**	
Materials ● Sheet materials refers to materials that are flat. ● Sheet materials can be folded to create three-dimensional shapes.	Textiles ● Some joining techniques are permanent and others are temporary. ● Temporary joining techniques might be used when pinning fabric to hold it together (so it doesn't move around whilst cutting or sewing) ● Permanent joining technique might be used to finish a products so it can be used without falling apart. ● A template (or fabric pattern) can be used to cut out the same shape multiple times.	Materials ● That products are made of materials that are chosen because of their properties.	Textiles ● That 'joining technique' means connecting two pieces of fabrics together and the methods that are permanent or temporary. ● A range of joining techniques to connect two pieces of fabrics together such as sewing and gluing. ● Joining two edges of fabrics together creates a seam. ● A range of sewing techniques (such as a running stitch for making seams and cross stitch for decoration) ● Applique is a way of decorating textiles by adding smaller pieces of fabric to create a picture or a pattern	Materials ● The different properties of materials and how they are considered when designing and making a product.	Textiles ● Blanket stitch is used to strengthen edges and when joining to fabrics. ● The importance of using a template (pattern) to accurately mark out a design on a fabric.

TECHNICAL KNOWLEDGE – Materials/Textiles					
KS1		**LKS2**		**UKS2**	
Year 1	**Year 2**	**Year 3**	**Year 1**	**Year 2**	**Year 3**
Practical Knowledge Children will know how to…		**Practical Knowledge Children will know how to…**		**Practical Knowledge Children will know how to…**	
Materials ● Measure and mark out to the nearest centimetre. ● Cut sheet materials safely using tools provided. ● Shape sheet materials through folding, creasing, and curling. ● Use shape to increase the strength and stiffness of a structure. ● Join materials through gluing and by making slots.	Textiles ● Thread a needle. ● Cut fabrics neatly for sewing. ● Pin and cut fabric using a template. ● Join fabrics using an evenly spaced running stitch. ● Colour and decorate textiles using techniques such as painting, printing and simple stitching.	Materials ● Measure, mark-out, cut and shape a wide range of materials. ● Cut internal shapes and joining slots in sheet materials. ● Join and combine materials and components using a variety of methods. ● Manipulate different materials to create different effects by cutting, creasing, and folding.	Textiles ● Measure, mark out and cut fabric using a paper template (pattern) ● Join fabrics together using a range of different sewing techniques (such as running stitch and cross stitch) including allowing for a seam. ● Create a 3D fabric product by combining fabric pieces and using a seam allowance. ● Apply a range of decorative techniques, including embroidery stitches, to different fabric materials.	Materials ● Measure and cut materials with precision and refine the finish with appropriate tools.	Textiles ● Join textiles with a combination of stitching techniques (such as blanket stitch, back stitch for seams and running stitch to attach decoration). ● Create products by joining several fabric pieces that employ a seam allowance. ● Use the qualities of materials to create suitable visual and tactile effects in the decoration of masks and textile products.

TECHNICAL KNOWLEDGE – Electrical and Program systems		
LKS2	**UKS2**	
Year 4	**Year 5**	**Year 6**
Substantive Knowledge **Children will know…**	**Substantive Knowledge** **Children will know…**	
• Components of an electric product such as a switch, battery, motors, and buzzer • The importance of a complete circuit when using a series circuit. • Electrical circuits are used in products to make them work.	• Program systems have an input and an output. • Microcontrollers are small computer processors that turn inputs into outputs and are controlled through computer code. • *An electric motor can be incorporated into a product to create movement.*	• Program systems have an input and an output. • Microcontrollers are small computer processors that turn inputs into outputs and are controlled through computer code • A sensor is a tool that monitors, detects, and responds to changes.
Practical Knowledge **Children will know how to…**	**Practical Knowledge** **Children will know how to…**	
• Build simple circuits, including bulbs and switches, into their products. • Use tools and equipment to attach components when creating a simple circuit. • Create products that include simple circuits to make them work. • Troubleshoot a simple circuit to identify components that may be faulty	• Test a circuit to make sure it functions correctly before including it in a product. • Write procedures and/or computer code to control and monitor models or products. • Make a product that allows the user to control and monitor the device including lights, sounds and motion. • *Create a product with a mechanical system that can operate at varying speeds and with changes in direction controlled through computer code.*	• Write procedures and/or computer code to control and monitor models or products. • Make a product that allows the user to control and monitor the device including lights, sounds and motion. • *Make a product device that includes a sensor to monitor change.*

TECHNICAL KNOWLEDGE – Cooking and Nutrition	
EYFS	
Nursery	**Reception**
Substantive Knowledge **Children will know…**	
• They need to take care when using scissors or a knife • Some healthy and unhealthy foods	• The importance of healthy food choices • They should wash their hands before handling food

TECHNICAL KNOWLEDGE – Cooking and Nutrition	
EYFS	
Nursery	**Reception**
Practical Knowledge **Children will know how to…**	
• Wash and dry hands • Behave safely when using a knife or scissors • Use a knife, fork and spoon	• Manage their own basic hygiene and personal needs • Use scissors to cut or cutters to make shapes from dough • Effectively, safely and confidently use scissors, knives, forks and spoon

TECHNICAL KNOWLEDGE – Cooking and Nutrition				
KS1		**LKS2**		**UKS2**
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5 and Year 6**
Substantive Knowledge Children will know…		**Substantive Knowledge Children will know…**		**Substantive Knowledge Children will know…**
• Names of a range of different fruit and vegetables • Fruit and vegetables come from different parts of the plant. • That eating fruit and vegetables forms part of a healthy diet. • Ingredients refers to the items in a food mixture or a recipe.	• What is meant by a healthy and balanced diet. • Where some common foods originate from. • Some information that is found on food labelling. • That nutrients are substances in foods that living things need to make energy, grow, and develop.	• Different foods are grown around the world and that some food is dependent on the seasons. • The importance of food preparation routines that are safe and hygienic.	• Food is either grown, reared, or caught for food. • The different food groups in the Eatwell Guide and how they feature as part of a healthy balanced diet. • That nutrients are substances in foods that living things need to make energy, grow, and develop. • The principles of a healthy and varied diet, particularly the importance of fruit and vegetables.	• The importance of correct storage and handling of ingredients using knowledge of micro-organisms to promote hygiene and prevent cross contamination. • Processed food is food that has undergone multiple changes in a food factory. • People have different food diets for health, religious, cultural, and personal reasons. • Some people are intolerant and/or allergic to certain food substances and that precautions are needed to keep them safe.

TECHNICAL KNOWLEDGE – Cooking and Nutrition					
KS1		**LKS2**		**UKS2**	
Year 1 and Year 2		**Year 3 and Year 4**		**Year 5 and Year 6**	
Practical Knowledge Children will know how to…		**Practical Knowledge Children will know how to…**		**Practical Knowledge Children will know how to…**	
Cooking and Nutrition:	Food Preparation Skills:	Cooking and Nutrition:	Food Preparation Skills:	Cooking and nutrition	Food Preparation Skills
● Describe the taste, texture, and smell of fruit and vegetables	● Cut foods with a vegetable knife using the claw grip. ● Cut foods with a vegetable knife using the bridge hold. ● Grate soft foods. (Squeeze the juice from fruit or vegetables. ● Peel with a swivel peeler with adult support ● Mix with increasing thoroughness to combine ingredients (Year 2) ● Crush garlic using a garlic press or the back of a spoon. (Year2)	● Prepare food in a safe and hygienic way using appropriate utensils. ● Create a healthy recipe considering the taste, texture, smell, and appearance of the dish. ● Create visually appealing products by shaping and moulding food. ● Measure ingredients accurately ● Follow a recipe to assemble or cook ingredients. ● Shape food with accuracy for a desired effect. ● Make bread, and the role of yeast in bread-making (Year 3)	● Use a table knife to cut equal dough portions. (Year 3) ● Fold ingredients together carefully ● Use measuring jugs, spoons and scales to measure ingredients with increasing accuracy. ● Use a range of food preparation techniques when following recipes.	● Follow a recipe accurately. ● Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. ● Demonstrate a range of baking and cooking techniques. ● Create and refine recipes, including ingredients, methods, cooking times and temperatures. ● Choose and adapt recipes for dietary reasons.	● Cut higher resistance foods using the claw grip or the bridge grip ● Use different weighing scales with increasing accuracy. ● Use a measuring jug independently and accurately. ● Cook using a range of different methods