# Design and Technology Progression Framework
# Whitehouse Primary School

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| **EYFS 2021**<br><br>**ELG - Physical Development** | **Fine Motor Skills** | • Hold a pencil effectively in preparation for fluent writing – using the tripod grip in almost all cases<br>• Use a range of small tools, including scissors, paint brushes and cutlery<br>• Begin to show accuracy and care when drawing. |
| **ELG – Expressive Arts and Design** | **Creating with Materials** | • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function<br>• Share their creations, explaining the process they have used |

## Design

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| **Design purposeful, functional, appealing products for themselves and other users based on design criteria.**<br><br>**Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.** | | **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.** | |
| **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Explore existing products**<br>*Exploring products helps us to understand how it works.*<br><br>**Create a design to meet simple design criteria.**<br>*Design criteria is what is needed to be included in a design.*<br><br>**Develop and communicate ideas through words, drawings, templates and mock-ups.**<br>*Pictures, words and labelled diagrams can show what* | **Generate ideas based on design criteria and their own experiences, explaining what they could make.**<br>*Ideas for designs should be based on the design criteria and our own experiences. More than one idea can be generated before deciding on the final design.*<br><br>**Develop, model and communicate their ideas through talking, drawing, templates, mock ups and, where appropriate, ICT.** | **Begin to carry out research into user needs and investigate existing products.**<br>*Research should be used as a tool to find out what the user needs. It can be used to investigate existing products to support our own designs.*<br><br>**Generate, develop and model ideas through discussion, prototypes and annotated sketches.**<br>*A prototype is a test or model of a product that is made to that improvements or* | **Research and investigate similar products to the one to be made to give starting points for a design.**<br>*Similar products to the one being made can be investigated to give a starting point for a design. This could include the size, appearance, key features or methods of construction.*<br><br>**Generate realistic ideas and their own design criteria through discussion, focussing on the needs of the user.** | **Research, investigate and begin to evaluate similar products/images to collect ideas.**<br>*It is important to evaluate similar products and images when collecting ideas to improve the quality of our own designs.*<br><br>**Generate realistic and innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification.** | **Carry out research and gather information about needs and wants of individuals/groups by carrying out research including surveys, interviews and questionnaires.**<br>*Designers carry out research to make decisions about how to design and make their product for the intended user or audience. They use the information gathered to create a design specification, making sure the product will be functional for its purpose and aesthetically pleasing.* |

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| *they want to design. A mock-up is a practice of your product or part of your product.* | *Ideas can be communicated in different ways. Computer aided design has advantages over paper design – it will show how finished products will look; different colours and textures can also be trialled.* | *fundamental changes can be made.*<br><br>**Generate and clarify ideas through discussion with peers and adults to develop design criteria.**<br>*Design criteria are the exact goals a project must achieve to be successful. These criteria might include use, appearance, cost and target user.* | *The needs of the user should be focussed on to ensure the product meets the design brief. Ideas that are generated should be realistic and meet the design criteria.*<br><br>**Produce annotated sketches, prototypes and pattern pieces.**<br>*Annotated sketches are used to communicate specific ideas of a design in a visual, detailed way. Pattern pieces templates (often made from paper) that are used to help cut out textiles.* | *Being innovative is the process of changing an idea into a product or service that creates value.*<br><br>**Model and communicate ideas through annotated sketches, prototypes and cross-sectional diagrams.**<br>*Cross-sectional diagrams help to build the entire picture of a product, including the inner workings and layers of materials or components.* | **Design innovative, functional, appealing products for the intended user that are fit for purpose based on a design specification.**<br>*When designing a product, the design specification must be used to ensure it meets the needs of the intended user.*<br><br>**Generate, model and communicate ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer aided design.**<br>*Ideas should be generated, modelled and communicated; this could through discussion, creating annotated sketches, cross-sectional and exploded diagrams or making prototypes and pattern pieces. Exploded diagrams show how the component parts of a product relate to each other.* |

| Make | | | | | |
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| **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing].**<br><br>**Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.** | | **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.** | |
| **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |

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| **Begin to name and select the tools they need.**<br>*Specific tools are used for particular purposes e.g. scissors are for cutting and joining with tape or glue.*<br><br>**Select materials from a limited range, beginning to explain their choices.**<br>*Different materials are suitable for different purposes, depending on their specific properties e.g. construction materials.* | **Name and select appropriate tools needed to work the materials.**<br>*Different tools can be used to cut and join a range of materials (ruler to cut on a straight line, join edge to edge using glue, use a hole punch and stapler).*<br><br>**Select appropriate materials from a range that will meet the design criteria.**<br>*Properties of components and materials determine how they can and cannot be used e.g. plastic is strong and shiny but can be difficult to paint.*<br><br>**Begin to select appropriate techniques explaining why they have chosen them.**<br>*Techniques should be selected and used carefully to either improve how things are built or decorated.* | **Begin to select and use a wider range of tools safely and appropriately to measure, mark out, cut shape and join with some accuracy.**<br>*Specific tools can be used for cutting e.g. saws. Wood can be joined using glue, nails or staples. Safety rules must be followed to prevent injury.*<br><br>**Begin to apply a wider range of finishing techniques with some accuracy.**<br>*Finishing techniques can include sanding wood to remove splinters and wiping away excess glue or ingredients as part of a food product.*<br><br>**Select appropriate materials that are fit for purpose.**<br>*Materials for a specific task must be selected on the basis of their properties, these include physical properties as well as availability and cost.*<br><br>**Work through a plan in order, with support.**<br>*When making a product, it is important to work follow the steps of a plan.* | **Use a wider range of tools safely and appropriately to measure, mark out, cut shape and join with growing accuracy.**<br>*Useful tools for cutting include, scissors, craft knives, junior hacksaw with pistol grip and bench hooks. Useful tools for joining include glue guns – some tools should be used with adult supervision.*<br><br>**Apply a wider range of finishing techniques with more accuracy, explaining why this is needed.**<br>*Finishing techniques are used to improve the safety, build or appearance of a product. With textiles, this may include trimming fabric and removing excess thread.*<br><br>**Select appropriate materials that are fit for purpose, explaining their choices.**<br>*Materials should be selected, cut and combined with precision e.g. pieces of fabric could be cut with sharp scissors and sewn together using a variety of stitching techniques.*<br><br>**Work through plan in order.**<br>*Working through a plan in order should mean that the product is successfully made.* | **Use tools/equipment with good level of precision and accuracy to measure, mark out, cut, shape assemble and join materials/components.**<br>*There are many rules for using tools safely and these vary depending on the tool e.g. a chisel should be used with the cutting edge pointing away from their body. All tools should be cleaned and put away after use and should not be used if they are loose or cracked. Using them with precision and accuracy will mean the product is of a higher quality.*<br><br>**Apply a range of finishing techniques mostly accurately, explaining confidently why this is needed.**<br>*Designers will use finishing techniques whilst making their product, checking and using them again once the main stages are complete.*<br><br>**Select appropriate materials that are fit for purpose, explaining their choices and considering functionality.**<br>*It is important to select the correct material or component for the specific purpose, depending on the design criteria e.g recipe ingredients have different tastes and appearances.* | **Select and use tools and equipment precisely and accurately to measure, mark out, cut, shape assemble and join materials/components**.<br>*Precision is important in producing a polished, finished product. Correct selection of tools and careful measurement can ensure the parts fit together correctly.*<br><br>**Accurately apply a range of finishing techniques.**<br>*Finishing techniques should be planned and applied accurately and thoroughly throughout the making stage, considering the needs of the user, the design specification and safety requirements.*<br><br>**Select appropriate materials that are fit for purpose; explaining choices and considering functionality and aesthetics.**<br>*It is important to understand the characteristics of different materials to select the most appropriate material for a purpose. This might include flexibility, waterproofing, texture, colour, cost and availability.*<br><br>**Explain how product will appeal to audience; make changes to improve quality during the making process.**<br>*Changes may be needed during the making process to improve the overall quality of the product; this may be for* |

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| | | | | | *the build of individual components or the aesthetics so that it appeals to the audience once complete.* |

| Evaluate | | | | | |
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| **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Explore and evaluate a range of existing products.**<br><br>**Evaluate their ideas and products against design criteria.** | | **Investigate and analyse a range of existing products.**<br><br>**Evaluate their ideas and products against their own design criteria.** | | **Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.**<br><br>**Understand how key events and individuals in design and technology have helped shape the world.** | |
| **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Begin to explain likes and dislikes about items they have made and attempt to explain why.**<br>*Designers have their own opinions about what they like and dislike about objects and products.*<br><br>**Begin to discuss designs as they develop and identify good and bad points.**<br>*It is important to discuss designs as we think of ideas so that we can think about what is good or bad about them.*<br><br>**Talk about their own and each others' work with support.**<br>*A strength is a good quality of a piece of work and a weakness is an area that can be improved.* | **Explain likes and dislikes about existing products, beginning to make comparisons.**<br>*Products can be compared by looking at the particular characteristics of each and deciding which is better suited to the purpose.*<br><br>**Discuss designs as they develop and identify successful and unsuccessful points.**<br>*Designs will be successful or unsuccessful based on the purpose of the product.*<br><br>**Evaluate designs at each stage**<br>*You should use the previous stage of design to inform the next stage to ensure you make the best product possible.* | **Begin to identify the strengths and weaknesses of existing products and their own design ideas.**<br>*Designers should identify strengths and weaknesses to ensure their product is more effective in its purpose.*<br><br>**Consider and explain how the finished product could be improved.**<br>*Finish products can be compared with design criteria to evaluate if it is fit for purpose and suggestions can be made to improve the design.*<br><br>**Begin to understand how key events and individuals in design and technology have helped shape the world.**<br>*Design and technology has helped to shape the world in* | **Identify and explain the strengths and weaknesses of their design ideas, showing how they have been influenced by existing products.**<br>*Designers are influenced by existing products, often taking what is most successful about it and adapting it in their own design. Products and packaging from different brands can be compared by assessing specific criteria, such as their visual impact, fitness for purpose and target market.*<br><br>**Discuss how well the finished product meets the design criteria, how well it meets the needs of the user and how it could be improved.**<br>*Evaluation includes suggesting improvements and explaining why they should be made.* | **Identify what does and does not work in the product, beginning to consider the views of others as to how their design could be improved.**<br>*Considering the view of others allows a broader and more balanced overview of how designs could be changed.*<br><br>**Begin to evaluate their ideas and products against their own design criteria to inform their decisions about ways to proceed.**<br>*Changes are often made to a design during manufacture.*<br><br>**Reflect on their work using design criteria stating how well the design fits the needs of the user.**<br>*Testing a product against a design criteria will highlight* | **Clearly identify what does and does not work in theirs and others' products, listening to and making suggestions as how designs could be improved.**<br>*Design is an iterative process, meaning alterations and improvements are made continually throughout the manufacturing process.*<br><br>**Fully reflect on their work using design criteria stating how well the design fits the needs of the user.**<br>*It is crucial to reflect fully on how well a product fits the needs of the user, especially before sharing the final product with the intended audience.*<br><br>**Justify their decisions about materials and methods of** |

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| | **Explain changes made during the making process and give reasons why.**<br>*It is important to make changes during the making process to improve the outcome e.g. remove stitching or part of an ingredient from a dish that is not required.*<br><br>**Discuss how closely their finished products meet their design criteria.**<br>*Finish products can be compared with design criteria to see how closely they match.* | *many ways. Everyday life is made easier by products that have been made or technology that has been developed.* | **Understand how key events and individuals in design and technology have helped shape the world.**<br>*Significant designers and inventors include Thomas Edison who invented the lightbulb and how the Greeks and Elizabethans impacted theatre design.* | *anything that need improvement or redesign.*<br><br>**Understand how designers and architecture from history have influenced society today**.<br>*Architecture is the science and art of designing buildings. People who practice architecture are called architects. Isambard Kingdom Brunel is famous for his work during the Industrial Revolution is credited for changing the look of modern England with his innovative designs, including for bridges.* | **construction with reasoned explanations.**<br>*Materials and methods that are chosen should be considered carefully to ensure the product will meet the design criteria in the most effective way.*<br><br>**Analyse how an invention or product has significantly changed or improved people's lives.**<br>People's lives have been improved in countless ways due to new inventions and designs. E.g. the Morrison shelter, designed by John Baker in 1941 or labour-saving devices in the home reduce the amount of housework. |

| Technical Knowledge – Structures, Materials, Mechanisms and Textiles | | | | | |
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| **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.**<br><br>**Build structures, exploring how they can be made stronger, stiffer and more stable.** | | **Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.**<br><br>**Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].** | | **Understand and use electrical systems in their products for example, series circuits incorporating switches, bulbs, buzzers and motors.**<br><br>**Apply their understanding of computing to program, monitor and control their products.** | |
| **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Explore and use a range of mechanisms including wheels and axels in their products.**<br>*A vehicle is a machine that helps to move people and things. Examples include cars, taxis, buses, skateboards and* | **Use sliders and levers to make a moving picture.**<br>*Sliders move from side to side or up and down and are often used to make moving parts in books.* | **Understand how to strengthen, stiffen and reinforce 3D frameworks.**<br>*A framework can be reinforced by adding new material or supports.* | **Explore and use a range of mechanisms (linkages and pulleys) in models or products.**<br>*Mechanisms can be used to add functionality to a model or product. Linkages are joined to one of more levers* | **Identify arch and beam bridge structures, understanding the terms compression and tension.**<br>*Arch bridges are bridges with a curved underside. They distribute the load (weight). A beam bridge is a horizontal* | **Use an electrical circuit in a product**.<br>*Electrical circuits can be used in certain products depending on their purpose. Computer programs can control electrical circuits that include a variety of components, such* |

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| *pushchairs. Vehicles have key parts which include wheels, axles and a chassis. Wheels are circle-shaped objects that are connected to an axle so they can roll on the ground to help vehicles move. The axle is a rod that connects to the centre of a wheel to help it move and stay in place. The chassis is a frame that supports the rest of the vehicle.*<br><br>**Understand how to join cut out materials together.**<br>*Materials that have been cut out can be joined together in different ways e.g. by using glue.* | **With support, begin to construct simple structures, models or other products using a range of materials.**<br>*A structure is a combination of materials and/or parts to create a 3D shape. Different materials can be used for different purposes, depending on their properties e.g. cardboard is a stronger material than paper.*<br><br>**Explore how a structure can be made stronger, stiffer and more stable.**<br>*Structures can be made stronger, stiffer and more stable by using cardboard rather than paper and triangular shapes rather than squares.*<br><br>**Begin to develop sewing techniques with simple stitches.**<br>*Running stitch is a simple needlework stitch consisting of a line of small even stitches which run back and forth through the cloth without overlapping.* | **Create shell or frame structures, strengthening frames with diagonal struts.**<br>*Diagonal struts or cross bracing can strengthen the structure.*<br><br>**Begin to understand that you can make structures more stable by giving them a wide base.**<br>*A broader base will make a structure more stable.*<br><br>**Make prototype frame and shell structures with 90 degree joins.**<br>*Frames and shell structures can be made with 90 degree joins. The pieces will be perpendicular to one another.* | *to provide movement e.g in moving puppets. Pulleys are simple machines which are useful in lifting things, such as cranes, cable cars or transport systems.*<br><br>**Create more complex shell or frame structures, selecting where to strengthen frames with diagonal struts.**<br>*Diagonal struts or cross bracing can strengthen the structure.*<br><br>**Understand how to securely join two pieces of fabric together using a range of sewing techniques.**<br>*A 3D textile structure can be made from more than one fabric shape and these can be sewn together using different stitches.*<br><br>**Begin to devise a template or pattern design.**<br>*A template or pattern design is often made out of paper that is meant to be laid onto fabric, traced, and cut out.*<br><br>**Use appropriate decoration techniques such as embroidery to add colour, texture and pattern to fabric**.<br>*Embroidery is a way of decorating fabric.* | *structure that rests on two end supports and is typically used for short spans. Compression is pressure being applied to an object and tension is when two pulling (opposing) forces stretch an object trying to pull it apart.*<br><br>**Identify stronger and weaker structures and explain why.**<br>*Observing the features of a structure can allow designers to assess its strength. This can include observing the base, shapes, materials and components that have been used.*<br><br>**Understand and explain why triangles are used to reinforce structures.**<br>*Triangles are used to reinforce structures because they evenly spread the force (load) that is being applied down each side.* | *as switches, lamps, buzzers and motors.*<br><br>**Think of ways in which adding a circuit would improve a product.**<br>*Circuits and their components can improve the aesthetics and functionality of a product or add interactive elements to it.*<br><br>**Apply their understanding of computing to program, monitor and control their products.**<br>*Remote control is controlling a machine or activity from a distance. Computers can be used to remotely control a device, such as a light, speaker or buzzer.*<br><br>**Pin and tack fabric pieces together.**<br>*Fabric pieces should be pinned or tacked together to secure them together before stitching them. This can help to keep them in the correct position.*<br><br>**Join fabrics using a variety of all taught stitches.**<br>*There are different stitching techniques include running stitch, back stitch, cross stitch and blanket stitches. Stitching techniques involve a needle and thread. Pins can be used as well if you need to combine components; tacking materials together can make the process easier. Each* |

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| | | | | | *technique looks different aesthetically and can be used for different purposes including securing components together or adding decoration.*<br><br>**Combine fabrics to create more useful properties.**<br>*Different fabrics can be used together to improve different properties including texture, aesthetics and durability.*<br><br>**Think about user's wants/needs and aesthetics when choosing textiles think about how product might be sold.**<br>*When designing a product, the design specification must be used to ensure it meets the needs of the intended user.*<br>*The aesthetics must be thought through which includes colours, fabric types, stitching techniques and any decoration.*<br><br>**Decorate textiles appropriately often before joining components.**<br>*Fabrics can be dyed to change their colour or add patterns, depending on the technique that is used. Fabric paint can also be used to change the aesthetics. Decorations, such as buttons, sequins or other fabrics, can be added by using glue or stitching techniques.* |

# Technical Knowledge – Cooking and Nutrition

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| **Understand where food comes from.**<br><br>**Use the basic principles of a healthy and varied diet to prepare dishes.** | | **Understand and apply the principles of a healthy and varied diet.**<br><br>**Prepare and cook a verity of predominantly savoury dishes, using a range of cooking techniques.** | | **Prepare and cook a verity of predominantly savoury dishes, using a range of cooking techniques.**<br><br>**Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed.** | |

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| | **Select healthy ingredients for a healthy snack.**<br>*Fruit and vegetables are an important part of a healthy meal. It is recommended to have 5 portions of fruit and vegetables a day).*<br><br>**Measure and weigh food items, using non-standard measures such as spoons and cups.**<br>*Tools, including cups and spoons, can be used to measure and weigh items.*<br><br>**Use basic tools to cut and mix.**<br>*There are various types and sizes of knives and spoons that can be used to cut and mix. These should be used carefully and safely.*<br><br>Understand where food comes from (animal or plant source).<br>*Some foods come from animals such as meat, fish and dairy, other foods come from plants, such a fruits, vegetables, grains, beans and nuts.* | **Design a bread-based product and use a range of cooking techniques to prepare.**<br>*Preparation techniques include peeling, chopping, deseeding, slicing, dicing, grating, mixing and skinning.*<br><br>**Identify and name foods that are produced in different places including the UK and beyond.**<br>*Certain foods are sourced from different countries and some are sourced locally. The types of food that will grow in a particular area depend on a range of factors, such as the rainfall, climate and soil type e.g. fruits like bananas need hot climates. Milk, wheat, potatoes and chicken are some of the most produced food items in the UK. Around the world, the most produced foods include sugar cane, corn, wheat and rice.* | | **Plan and make healthy meals, justifying why each meal contributes towards a balanced diet, considering organic produce and waste.**<br>*Eating a balanced diet is a positive lifestyle choice that should be sustained over time. Organic produce is food that has been grown without the use of man-made fertilisers and reducing waste can help the planet.*<br><br>**Use an increasing range of cooking techniques to cook dishes.**<br>*Cooking techniques include baking, boiling, frying, grilling and roasting.*<br><br>**Describe what seasonality means and explain some of the reasons why it is beneficial.**<br>*Seasonality is the time of year when the harvest or flavour of a type of food is at its best. Buying seasonal food is beneficial because the food tastes better, it is fresher* | |

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| | | | | *because it hasn't travelled as far, the carbon footprint is lower and it supports local growers.* | |