
# DESIGN & TECHNOLOGY

# PROGRESSION FRAMEWORK

| EYFS | | |
|---|---|---|
| ELG- Physical Development | Fine Motor Skills | Children at the expected level of development will<br>Use a range of small tools, including scissors, paint brushes and cutlery |
| | Health and Self Care | Children at the expected level of development will:<br>Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. |
| ELG – Expressive Arts and Design | Creating with Materials | Children at the expected level of development will:<br>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 |

| Key Stage 1 National Curriculum Expectations | Key Stage 2 National Curriculum Expectations |
|---|---|
| Pupils should be taught about:<br><u>Design</u><br>- Design purposeful, functional, appealing products for themselves and others based on design criteria.<br>- Generate, develop, model and communicate their ideas through talking, drawing, templates, mock ups and, where appropriate, ICT.<br><u>Make</u><br>- Select from and use a range of tools and equipment to perform practical tasks, for example cutting, shaping, joining and finishing.<br>- Select from and use a wide range of materials and components, including construction materials, textiles and ingredients according to their characteristics.<br><u>Evaluate</u><br>- Explore and evaluate a range of existing products.<br>- Evaluate their ideas and products against a design criteria.<br><u>Technical Knowledge</u><br>- Build structures, exploring how they can be made stronger, stiffer and more stable.<br>- Explore and use mechanisms, for example levers, sliders, wheels and axels.<br>- Use the basic principles of a healthy and varied diet to prepare dishes.<br>- Understand where food comes from. | Pupils should be taught about:<br><u>Design</u><br>- 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.<br>- Generate, develop. Model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer aided design.<br><u>Make</u><br>- Select from and use a wider range of tools and equipment to perform practical tasks, for example cutting, shaping, joining and finishing accurately.<br>- 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.<br><u>Evaluate</u><br>- Investigate and analyse a range of existing products.<br>- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.<br>- Understand how key events and individuals in design and technology have helped shape the world.<br><u>Technical Knowledge</u><br>- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.<br>- Understand and use mechanical systems in their products, e.g gears, pulleys, cams, levers and linkages.<br>- Understand and use electrical systems in their products for example, series circuits incorporating switches, bulbs, buzzers and motors.<br>- Apply their understanding of computing to program, monitor and control their products.<br>- Understand and apply the principles of a healthy and varied diet.<br>- Prepare and cook a verity of predominantly savoury dishes, using a range of cooking techniques.<br>- Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed. |

| DESIGN | | | | | | |
|---|---|---|---|---|---|---|
| **Year** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| Skills | Create a design to meet simple design criteria. | Generate and communicate their ideas through a range of methods.<br>Use design software to create a simple labelled design or plan. | Develop design criteria to inform a design. | Use annotated sketches and exploded diagrams to test and communicate their ideas. | Use prototypes to generate, develop and model ideas. | Use pattern pieces and computer aided design packages to generate and develop ideas. |
| Knowledge | Pictures, words and labelled diagrams can show what I want to design. | Computer aided design has advantages over paper design – it will show how finished products will look; different colours and textures can also be trialled. | Design criteria are the exact goals a project must achieve to be successful. These criteria might include use, appearance, cost and target user. | Annotated sketches and exploded diagrams show specific parts of a design, highlight sections or show functions. They communicate ideas in a visual, detailed way. | A prototype is a test, or original, model of a product or a technology from which improvements, upgrades or fundamental changes can be made. | A pattern piece is a drawing or shape used to guide how to make something. There are many different computer aided design packages for designing products. |

| MAKE | | | | | | |
|---|---|---|---|---|---|---|
| **Year** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| Skills | Select the appropriate tool for a simple practical task.<br><br>Select and use a range of materials, beginning to explain their choices. | Select the appropriate tool for a task and explain their choice.<br><br>Choose appropriate components and materials and suggest ways of manipulating them to achieve the desired effect. | Use tools safely for cutting and joining materials and components.<br><br>Plan which materials will be needed for a task and explain why. | Select, name and use tools with adult supervision.<br><br>Select and combine materials with precision. | Name and select increasingly appropriate tools for a task and use them safely.<br><br>Choose from a range of materials showing their understanding of their characteristics. | Select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics<br><br>Select appropriate tools to mark out, cut and assemble multiple components and use them safely and precisely. |
| Knowledge | Specific tools are used for particular purposes e.g. scissors are for cutting and joining with tape or glue.<br><br>Different materials are suitable for different purposes, depending on their specific properties e.g. construction materials | 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>Select from a range a finish to improve the appearance of a product.<br><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. | 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>Materials for a specific task must be selected on the basis of their properties, these include physical properties as well as availability and cost. | Useful tools for cutting include, scissors, craft knives, junior hacksaw with pistol grip and bench hooks. Useful tools for joining include glue guns – tools should be used with adults supervision.<br><br>Materials should be 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. | There are many rules for using tools safely and these vary depending on the tools. E.g. A chisel should be used with the cutting edge pointing away from their body. All tools should be cleaned and out away after use and should not be used if they are loose or cracked.<br><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 | 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>Precision is important in producing a polished, finished product. Correct selection of tools and careful measurement can ensure the parts fit together correctly. |

| EVALUATE | | | | | | |
|---|---|---|---|---|---|---|
| **Year** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| Skills | Name and explore a range of everyday products and evaluate the product against the purpose.<br><br>Describe why an inventor or designer is important.<br><br>Talk about their own and each other's work, identifying strengths or weaknesses, with support. | Compare different brands of the same product and explain their similarities and differences.<br><br>Explain the similarities and difference between two designs.<br><br>Explain how closely their finished products meet their design criteria | Create and complete a comparison table to compare two or more products.<br><br>Describe how and why key events in design and technology have shaped the world.<br><br>Prove how their finished product meets the design criteria and evaluate areas of improvement. | Explain how an existing product and brands benefits the user and appeals to target audience.<br><br>Explain how designers and architecture from history have influenced society today.<br><br>Identify what has worked well and what aspects of their produces could be improved, acting on their own suggestions and those of others when making improvements. | Explain how the design of a product has been influenced by the culture or society in which it was designed or made.<br><br>Describe the social influence of a significant designer or inventor – Karl Benz, Henry Ford.<br><br>Test and evaluate products against a detailed design specification and make adaptations as they develop the product. | Analyse how an invention or product has significantly changed or improved people's lives<br><br>Present a detailed account of the significance of a favourite designer or inventor<br><br>Demonstrate modifications made to a product as a result of ongoing evaluation by themselves and to others. |
| Knowledge | Everyday products are objects that are used routinely at home and school, such as a toothbrush. All products are designed for a specific purpose.<br><br>Inventors such as Isambard Kingdom Brunel helped to shape the world.<br><br>A strength is a good quality of a piece of work and a weakness is an area that can be improved. | Products can be compared by looking at the particular characteristics of each and deciding which is better suited to the purpose.<br><br>Finish products can be compared with design criteria to see how closely they match | A comparison table can be used to compare products or food by listing specific criteria on which each product can be judged or scored<br><br>Levers were first described about 260 BC by the ancient Greek mathematician Archimedes and is used in everyday life.<br><br>Finished products can be compared with design criteria to evaluate if it is fit for purpose and | 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>Evaluation also includes suggesting improvements and explaining why they should be made.<br><br>Significant designers and inventors include Thomas Edison who invented the | Culture affects the design of some products e.g. knives and forks are used in the western world, whereas chopsticks are mainly used in China or Japan, clothing choices or odes of transport.<br><br>Key inventions in design and technology have changed the way we live including Karl Benz and Henry Ford.<br><br>Testing a product against | 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.<br><br>The significance of a designer or inventor may enhance culture such as the first mechanical computer by Charles Babbage and |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | suggestions can be made to improve the design. | lightbulb and how the Greeks and Elizabethans impacted theatre design. | a design criterion will highlight anything that need improvement or redesign. Changes are often made to a design during manufacture. | Tim Berners-Lee who invented the World Wide Web.<br><br>Design is an iterative process, meaning alterations and improvements are made continually throughout the manufacturing process. |

| TECHNICAL KNOWLEDGE – Materials and Structures | | | | | | |
|---|---|---|---|---|---|---|
| **Year** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| Skills | Construct simple structures, models or other products using a range of materials. | Explore how a structure can be made stronger, stiffer and more stable. | Create shell or framed structures, using diagonal struts to strengthen them. | Prototype shell and frame structures show an awareness of how to strengthen, stiffen and reinforce them. | Build a framework using a range of materials to support mechanisms | Understand and use electrical systems in their structures [series circuits incorporating switches, bulbs, buzzers and motors]. |
| Knowledge | Different materials can be used for different purposes, depending on their properties e.g cardboard is a stronger material than paper. | Structures can be made stronger, stiffer and more stable by using cardboard rather than paper and triangular shapes rather than squares, a broader base will also make a structure more stable. | Diagonal struts or cross bracing can strengthen the structure. | Shell and frame structures can be strengthened by gluing several layers of card together using triangular shapes rather than squares, adding diagonal support struts and using jinks corners. | Various methods can be used to support a framework, these include cross braces, guy ropes and diagonal struts | Computer programs can control electrical circuits that include a variety of components, such as switches, lamps, buzzers and motors |

| TECHNICAL KNOWLEDGE – Mechanisms | | | | | | |
|---|---|---|---|---|---|---|
| **Year** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| Skills | Use sliders and levers to make a moving picture. | Use a range of mechanisms including wheels and axels to make a moving vehicle. | Explore and use a range of mechanisms (levels) in models or products | Explore and use a range of mechanisms (linkages and pulleys) in models or products. | Use mechanical systems in their products such as pneumatics and hydraulics. | Apply their understanding of computing to program, monitor and control their products. |
| Knowledge | . Sliders move from side to side or up and down and are often used to make moving parts in books. | An axel is a rod or spindle that passes through a centre of a wheel to connect two wheels. | Levers consist of a rigid bar that rotates around a fixed point – called a fulcrum. They reduce the amount of work needed to lift a heavy object. | Mechanisms can be used to add functionality to a model, linkages in moving puppets or pulleys in cable cars or transport systems | Pneumatic systems use energy that is stored in compressed air to do work Hydraulic systems work in a similar way, but instead of air the system is filled with liquid. – | 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. |

| TECHNICAL KNOWLEDGE - Textiles | | | | | | |
|---|---|---|---|---|---|---|
| **Year** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| Skills | | Measure, cut and join a 3D textile structure with some support<br><br>Give reasons for the selection of fabrics and techniques based on knowledge of characteristics. | | Sew using a range of stitches and techniques such as embroidery to add colour, texture and pattern to fabric.<br><br>Begin to devise a template or pattern design. | | Join fabrics in a range of different ways.<br><br>Create increasingly complex patterns and templates with more than one part that are accurately measured. |
| Knowledge | | A 3D textile structure can be made from two identical fabric shapes and can be sewn together using a running stitch. | | Stitches include, backstitch and split stitch and embroidery is a way of decorating fabric.<br><br>A template is made out of paper that is meant to be laid onto fabric, traced, and cut out. | | Fabric can be joined using various stitches as well as zips, tie clasp, toggles, press-studs and buttons.<br><br>A pattern is the template from which the parts of a garment are traced onto woven or knitted fabrics before being cut out and assembled |

| TECHNICAL KNOWLEDGE – Cooking and Nutrition | | | | | | |
|---|---|---|---|---|---|---|
| **Year** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| Skills | Measure and weigh food items, using non-standard measures such as spoons and cups and use basic tools to cut and mix.<br><br>Select healthy ingredients for a fruit salad or sandwich.<br><br>Understand where food comes from (animal or plant source) | | Identify the main food groups (carbs, protein, dairy, fruit and vegetables, fats and sugars).<br><br>Design a healthy snack and use a range of cooking techniques to prepare.<br><br>Identify and name foods that are produced in different places including the UK and beyond. | | Plan a healthy weekly diet, justifying why each meal contributes towards a balanced diet, considering organic produce and waste.<br><br>Use an increasing range of cooking techniques to cook a sweet or savoury dish.<br><br>Describe what seasonality means and explain some of the reasons why it is beneficial. | |
| Knowledge | Cooking tools include cups and spoons to measure and cutters and whisks to prepare food.<br><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>Some foods come from animals such as meat, fish and dairy, other foods come from plants, such a fruits, vegetables, grains, | | There are five main food groups that should be eaten regularly as part of a balanced diet. **Fruit and vegetables, carbs proteins dairy, and fats (oils and spreads).**<br>Foods high in fat, salt and sugar should only be eaten occasionally.<br><br>Preparation techniques include peeling, chopping, deseeding, slicing, dicing, grating, mixing and skinning. | | **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 and is cheaper.<br><br>Cooking techniques include baking, boiling, frying, grilling and roasting.<br><br>Seasonality is the time of | |

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