



# Design and Technology Progression

Our curriculum develops children's ability to design, make and evaluate products for a purpose. Through practical projects, children learn how materials, structures, mechanisms, electrical systems and food can be used to meet people's needs.

## How learning develops

| Phase                | Progression in learning                                                                                                                                                             |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Early Years</b>   | Explore products and materials through play. Build, join, make and talk about creations, with adult support to use tools and equipment safely.                                      |
| <b>Years 1 and 2</b> | Follow simple design criteria, choose tools and materials, develop basic making skills and explain how a finished product could be improved.                                        |
| <b>Years 3 and 4</b> | Plan with a user and purpose in mind. Apply knowledge of structures, mechanisms and materials, explain choices and improve designs through evaluation.                              |
| <b>Years 5 and 6</b> | Design with increasing independence and precision. Combine systems and techniques, test against detailed criteria and justify decisions about function, appearance and suitability. |

## Our values in practical learning

Design and Technology provides opportunities to practise respect, creativity, resilience and responsibility. Children share ideas, work safely, respond to challenges and consider the needs of the people who will use their products.

Planning, monitoring and reflecting run through this work. Children consider what they already know, check how well their approach is working and reflect on what they would change next time.

## Reading the progression

The following tables summarise the skills and key knowledge in the supplied progression, from Nursery foundations to Year 6. Nursery describes the early experiences on which Reception learning builds. Strands connect across projects and are revisited with increasing complexity and independence.

A dash means that the supplied progression does not give a separate statement for that year in that strand. It does not mean that related learning cannot be revisited.



## Products and the people behind them

Children progress from recognising familiar products to understanding how designers and inventions influence people's lives.

| Stage                      | Everyday products                                                                                                                               | Significant people and inventions                                                                                                                                               |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Nursery foundations</b> | Name everyday products and explore how they work, including books with moving parts.                                                            | Begin to talk about important products and how they help people.                                                                                                                |
| <b>Reception</b>           | Explore everyday products and talk about their specific uses.                                                                                   | Explore significant products, such as a scarecrow designed to protect crops.                                                                                                    |
| <b>Year 1</b>              | Describe how everyday products are used. Recognise parts such as axles and chassis, and the protective purpose of a shelter.                    | Describe why a product is important, linking its usefulness to the task it fulfils.                                                                                             |
| <b>Year 2</b>              | Explain how a product could be improved, for example by making it easier to use, stronger or more attractive. Recognise common fabric products. | Explain why a designer or inventor is important. Examples include the work of school kitchen staff and the recognisable designs of Cath Kidston.                                |
| <b>Year 3</b>              | Explain how a product benefits its user and why a specific task may need a specially designed product.                                          | Describe how key events and inventions in design and technology have changed people's lives.                                                                                    |
| <b>Year 4</b>              | Investigate design features and explain how particular features make a product suitable or durable.                                             | Explain how significant designers or inventors shaped the world. Explore William Morris and developments in food preservation associated with Louis Pasteur and Nicolas Appert. |
| <b>Year 5</b>              | Explain how design is influenced by culture and society, including the intended audience and influences such as ancient Greek architecture.     | Describe a designer's or inventor's social influence. Explore Vitruvius's principles of stability, usefulness and attractiveness in buildings.                                  |
| <b>Year 6</b>              | Analyse how inventions or products have changed lives. Examples include Make Do and Mend, processed food and changes in bridge construction.    | Present a detailed account of a chosen designer's or inventor's significance. Consider how engineering has improved travel, safety and trade, including notable bridges.        |



## Designing and evaluating

Children learn to communicate ideas, judge success and make improvements throughout the design and making process.

| Stage                      | Generating ideas                                                                                                                                                           | Evaluating and improving                                                                                                                                     |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Nursery foundations</b> | Develop ideas through blocks, construction kits and other resources, creating small worlds linked to interests.                                                            | Share creations and respond to questions and suggestions about what was made.                                                                                |
| <b>Reception</b>           | Create collaboratively, sharing ideas and resources. Draw on products, stories, interests and experiences.                                                                 | Adapt and refine work while constructing and making. Recognise that ideas can change.                                                                        |
| <b>Year 1</b>              | Create a design to meet simple criteria. Know that the product must meet these criteria to succeed.                                                                        | Talk about strengths and weaknesses in their own and others' work, offering support.                                                                         |
| <b>Year 2</b>              | Communicate ideas through writing, drawings, diagrams, modelling, speaking and digital methods.                                                                            | Explain how closely a finished product meets the design criteria and identify future improvements.                                                           |
| <b>Year 3</b>              | Develop design criteria, including a product's use, appearance, cost and intended user.                                                                                    | Suggest improvements, describe how to make them and begin to consider other people's views.                                                                  |
| <b>Year 4</b>              | Use annotated sketches and exploded diagrams to test and communicate ideas, showing parts and how a product works.                                                         | Identify successes and areas for improvement. Act on suggestions and those of others, considering purpose, appearance and changes made.                      |
| <b>Year 5</b>              | Use pattern pieces and computer aided design packages. Understand that specialised software supports design and can link to 3D printing.                                   | Test products against a detailed design specification and adapt them during development.                                                                     |
| <b>Year 6</b>              | Develop criteria for a functional, appealing product that is fit for purpose. Communicate through sketches, discussion, diagrams, prototypes, patterns and digital design. | Show modifications made through continuing evaluation by themselves and others. Understand the repeated cycle of creating, testing, reviewing and improving. |



## Tools and safe working

Children develop increasingly careful and precise practical skills, with appropriate supervision and an understanding of safety.

| Stage                      | Investigating and using tools                                                                                                                                | Staying safe                                                                                                                                  |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Nursery foundations</b> | Explore simple tools and experiment with joining materials. Recognise that tools have different purposes.                                                    | Understand that tools and equipment must be used safely. Listen to adults, follow simple rules and work together when moving large equipment. |
| <b>Reception</b>           | Choose appropriate tools for simple tasks. Explore ways to join materials, including sewing with a needle and thread.                                        | Follow rules and instructions to keep safe when using equipment.                                                                              |
| <b>Year 1</b>              | Select an appropriate tool for a simple practical task. Explore food preparation methods such as peeling, slicing, chopping and grating.                     | Follow safety rules during practical tasks, including listening carefully and using equipment only when instructed.                           |
| <b>Year 2</b>              | Select an appropriate tool and explain the choice, linking the tool's features to its purpose.                                                               | Work safely and hygienically when making and cooking: wash hands, clean surfaces, tie back long hair and store food appropriately.            |
| <b>Year 3</b>              | Use tools safely for cutting and joining materials and components. Follow rules for suitable equipment, including clamps, saws and drills under supervision. | Use appliances safely with adult supervision. Understand electrical safety, including keeping water away from plugs and sockets.              |
| <b>Year 4</b>              | Select, name and use tools with adult supervision. Understand the purpose of cutting and joining equipment and follow safety rules.                          | Use everyday chemical products, such as cleaning products, only under adult supervision.                                                      |
| <b>Year 5</b>              | Name and select increasingly appropriate tools and use them safely. Follow rules for carrying, cleaning and checking tools.                                  | Explain the purpose of safety features in products, such as seatbelts, child resistant caps and finger guards.                                |
| <b>Year 6</b>              | Choose tools and use them safely and precisely. Investigate how garments are constructed and recognise different hand stitches.                              | Demonstrate how a product's design takes account of the user's safety.                                                                        |



## Materials and structures

Children move from exploring and building to selecting materials and strengthening structures for a clear purpose.

| Stage                      | Materials for a purpose                                                                                                                                                                        | Structures                                                                                                                                          |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Nursery foundations</b> | Explore and choose freely from a variety of materials when making.                                                                                                                             | Make simple structures using different materials. Recognise a bridge as a structure that crosses a space.                                           |
| <b>Reception</b>           | Choose appropriate materials for construction and making. Recognise that different materials suit different purposes.                                                                          | Construct simple structures and models. Explore bridges and different kinds of puppets, including those with moving parts.                          |
| <b>Year 1</b>              | Select and use materials and begin to explain choices. Link suitability to properties, such as the transparency of glass.                                                                      | Construct structures, models and products using materials chosen for their properties.                                                              |
| <b>Year 2</b>              | Choose components and materials, suggesting how to change or manipulate them to achieve an effect.                                                                                             | Explore how structures can be stronger, stiffer and more stable, for example by choosing card or using triangular shapes.                           |
| <b>Year 3</b>              | Plan which materials are needed and explain why. Consider properties, availability and cost.                                                                                                   | Create shell or frame structures. Use diagonal struts to create triangular shapes that add strength and stability.                                  |
| <b>Year 4</b>              | Choose materials with an understanding of their characteristics, including rigidity, strength, smoothness, colour, elasticity, pattern and texture. Distinguish natural and synthetic fabrics. | Prototype shell and frame structures, showing how to strengthen, stiffen and reinforce them. Understand that a prototype models a proposed product. |
| <b>Year 5</b>              | Select and combine materials precisely, using suitable cutting, joining and stitching techniques.                                                                                              | Build frameworks to support mechanisms. Apply knowledge of triangles, columns and brickwork patterns to improve support and stability.              |
| <b>Year 6</b>              | Choose the best materials for a task, considering flexibility, waterproofing, texture, colour, cost and availability.                                                                          | Select suitable materials and frameworks and explain their strength. Explore layering and changes of shape, including triangular supports.          |



## Mechanisms and product comparison

Children explore movement and learn to compare products using increasingly detailed criteria and evidence.

| Stage                      | Mechanisms and movement                                                                                                                                            | Comparing and contrasting                                                                                                       |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Nursery foundations</b> | Explore and build with wheeled construction resources. Recognise that wheels help vehicles move.                                                                   | Share creations and notice similarities and differences between their work and that of others.                                  |
| <b>Reception</b>           | Explore and build with wheels and axles. Understand that an axle passes through the middle of a wheel and helps it stay in place.                                  | Describe what was made, why and how, and compare with other creations.                                                          |
| <b>Year 1</b>              | Use wheels and axles to make a moving model. Recognise the chassis and explore fixed and freely moving axles.                                                      | Describe similarities and differences between two products using a simple set of criteria.                                      |
| <b>Year 2</b>              | Use levers, sliders, wheels and axles in models. Know that mechanisms produce movement and components are individual machine parts.                                | Compare products from the same or different brands. Recognise a brand through its name, symbol or design.                       |
| <b>Year 3</b>              | Explore levers, sliders, axles, wheels and cams. Understand how a cam and follower turn rotation into up and down movement.                                        | Explain similarities and differences between two designers' work, considering appearance, purpose and target users.             |
| <b>Year 4</b>              | Use levers, axles, cams, gears and pulleys. Understand that simple machines change the strength or direction of a force and can be combined.                       | Create and complete an organised comparison table for two or more products.                                                     |
| <b>Year 5</b>              | Use mechanical systems such as pneumatics. Understand that compressed air can exert a force to lift loads, raise platforms or absorb shocks.                       | Survey users in focus groups and compare results, using questions that reveal how well a product meets its criteria.            |
| <b>Year 6</b>              | Explain and use mechanical systems to meet a design brief. Recognise systems including sliders, levers, linkages, gears, pulleys, cams, pneumatics and hydraulics. | Create a detailed comparative report about products or inventions, considering ease of use, appearance, value and wider impact. |



## Electrical systems and digital technology

Children progress from exploring switches and recording creations to designing and controlling more complex products.

| Stage                      | Electricity                                                                                                                                           | Using digital technology                                                                                                                                 |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Nursery foundations</b> | Explore battery powered objects and use switches to turn them on and off.                                                                             | With adult support, use digital devices to record creations, for example by taking photographs.                                                          |
| <b>Reception</b>           | Identify products that use electricity and recognise that appliances need power to work.                                                              | Take digital images or recordings of creations to share with others.                                                                                     |
| <b>Year 1</b>              | Identify electrical products and describe how to switch them on and off. Know that completing or breaking a circuit controls the flow of electricity. | Use design software to create a simple plan. Explore colours and textures and preview how a product could look.                                          |
| <b>Year 2</b>              | Create an operational simple series circuit with a power source, wires and a bulb. Know that the circuit must be complete for electricity to flow.    | Use design software to create a simple labelled design or plan, experimenting and identifying problems before making.                                    |
| <b>Year 3</b>              | Incorporate a simple series circuit into a model, such as a lighthouse, and control it using a switch.                                                | Write a program to make something move on a tablet or computer screen. Know that a program is a set of instructions for a computer.                      |
| <b>Year 4</b>              | —                                                                                                                                                     | —                                                                                                                                                        |
| <b>Year 5</b>              | Use increasingly complex electrical circuits and demonstrate control, including on and off switches and variable resistors.                           | Link a physical device to a computer or tablet so that a program can control it, for example changing motor speed or turning on an LED.                  |
| <b>Year 6</b>              | Use circuits with switches, lamps, buzzers and motors, and use programming to control products.                                                       | Use a sensor to monitor an environmental variable, such as temperature, sound or light. Recognise how programmable sensors are used in everyday devices. |



## Textiles

Children develop from simple joining and decoration towards accurate sewing, pattern work and functional fastenings.

| Stage               | Cutting and joining textiles                                                                                                             | Decorating and embellishing                                                                                      |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Nursery foundations | —                                                                                                                                        | —                                                                                                                |
| Reception           | —                                                                                                                                        | —                                                                                                                |
| Year 1              | Cut and join textiles using glue and simple stitches. Make running stitches by passing a needle in and out of fabric at equal intervals. | Decorate fabric using gluing, stapling or tying, including attaching buttons and sequins.                        |
| Year 2              | Join fabrics in different ways, including glue and running stitch.                                                                       | Add decorative details such as buttons, prints, sequins and appliqué.                                            |
| Year 3              | Cut and join wool, thread and other materials using a loom. Understand that weaving interlaces thread or yarn to make fabric.            | Decorate a loom weaving using embellishments such as natural materials, silk flowers, tassels and bows.          |
| Year 4              | Hand sew a hem or seam using running stitch. Understand how turning under and sewing a raw edge gives a neat finish.                     | Create detailed decorative patterns on fabric or paper using printing techniques, including repeated patterns.   |
| Year 5              | Combine stitches and fabrics imaginatively in a mixed media collage.                                                                     | Use appliqué to decorate a product or artwork by stitching pieces of fabric or other material onto a background. |
| Year 6              | Pin and tack fabrics in preparation for sewing and more complex pattern work. Understand that tacking temporarily holds fabric together. | Use fastenings for function and decoration, including press studs, hook and loop fastenings and buttons.         |



## Cooking and nutrition

Children develop practical cooking skills alongside an understanding of healthy food choices and balanced diets.

| Stage                      | Food preparation and cooking                                                                                                                 | Nutrition                                                                                                                                               |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Nursery foundations</b> | Explore measuring ingredients using cups and spoons.                                                                                         | Help to prepare a range of healthy snacks, including fruit and vegetables.                                                                              |
| <b>Reception</b>           | Follow instructions and simple recipes involving measures and ingredients. Know that a recipe explains how to make food.                     | Suggest healthy snack ingredients. Recognise fruit and vegetables as healthy foods and explore how heating changes food.                                |
| <b>Year 1</b>              | Measure and weigh using non standard measures such as spoons and cups. Combine fruit or vegetables to make a salad.                          | Select healthy ingredients for a fruit or vegetable salad and understand their place in a healthy diet.                                                 |
| <b>Year 2</b>              | Prepare ingredients by peeling, grating, chopping and slicing, choosing suitable techniques for different foods.                             | Describe the foods needed for a healthy, varied diet and apply this knowledge when making a simple healthy meal.                                        |
| <b>Year 3</b>              | Prepare and cook a simple savoury dish using techniques such as peeling, chopping, deseeding, slicing, dicing, grating, mixing and skinning. | Identify the main food groups and understand that a balanced diet includes a variety of foods, with foods high in fat, salt and sugar eaten less often. |
| <b>Year 4</b>              | Choose cooking techniques to prepare a simple meal or snack, including baking, boiling, frying, grilling and roasting.                       | Design a healthy snack or packed lunch and explain why it is healthy. Explore how packaging protects food and provides nutritional information.         |
| <b>Year 5</b>              | Use a growing range of preparation and cooking techniques to make sweet or savoury dishes.                                                   | Evaluate meals and consider their contribution to a balanced diet, with foods in suitable proportions.                                                  |
| <b>Year 6</b>              | Follow a recipe requiring several techniques and source ingredients independently from suitable shops or suppliers.                          | Plan a healthy daily diet and justify how each meal contributes to balance, using nutritional information where appropriate.                            |



## Where food comes from

Children learn about animal and plant sources, places of production, seasonal food and organic growing.

| Stage                      | Progression in skills                                                                      | Key knowledge                                                                                                                                                                    |
|----------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Nursery foundations</b> | Explore and try different foods and suggest where they come from.                          | Early exploration introduces questions about the origins of familiar foods.                                                                                                      |
| <b>Reception</b>           | Begin to identify the origins of some foods.                                               | Plants provide fruits, vegetables, nuts and seeds. Animals provide meat and foods such as milk, eggs and honey.                                                                  |
| <b>Year 1</b>              | Sort foods according to whether they come from an animal or a plant.                       | Meat, fish and dairy foods come from animals; fruit and vegetables come from plants.                                                                                             |
| <b>Year 2</b>              | Identify the origins of common foods such as milk, eggs, some meats, fruit and vegetables. | Foods come from animal and plant sources. Milk is mainly obtained from cows, but also from goats and sheep.                                                                      |
| <b>Year 3</b>              | Identify and name foods produced in different places.                                      | Climate, rainfall and soil affect what can be grown. Different regions of England support different crops.                                                                       |
| <b>Year 4</b>              | Identify foods produced in different places in the UK and beyond.                          | Different parts of the world have conditions suited to particular crops, such as coffee, citrus fruit or maize.                                                                  |
| <b>Year 5</b>              | Describe seasonality and explain some benefits of seasonal food.                           | Buying seasonal food can support local growers and may reduce the need for transport. Explore food miles and the reasons for choosing seasonal produce.                          |
| <b>Year 6</b>              | Explain how organic produce is grown.                                                      | Organic production restricts the use of artificial fertilisers and pesticides. Distinguish this from the separate idea of whole foods, which remain close to their natural form. |