



Design and Technology Knowledge & Skills Progression KS2

NATIONAL CURRICULUM

Aims

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts - for example, the home, school, leisure, culture, enterprise, industry and the wider environment.

Pupils should be taught to:

Design:

- 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.

Make:

- 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.

Evaluate:

- Investigate and analyse a range of existing products.
- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
- Understand how key events and individuals in design and technology have helped shape the world Technical knowledge.
- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.
- 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].
- Apply their understanding of computing to program, monitor and control their products.

Technical knowledge:

- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.
- 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].
- Apply their understanding of computing to program, monitor and control their products.

Cooking and nutrition:

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Pupils should be taught to:

- Understand and apply the principles of a healthy and varied diet.
- Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.
- Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Strands :				
Cooking and nutrition	- Use appropriate tools and equipment safely when preparing food - Measuring jugs and graters. - Demonstrate an increasing range of food preparation skills - Kneading, grating and measuring liquids. - Begin to understand why we need to work safely and hygienically e.g. handwashing, cleaning up regularly and keep work surfaces clean. - Begin to make healthy eating choices from an understanding of a balanced diet. - Understand seasonality of foods.	- Use appropriate tools and equipment safely when preparing food - Sharp knives, chopping boards. - Demonstrate an increasing range of food preparation skills - Fork secure (cutting), beating. - Understand why we need to work safely and hygienically e.g. handwashing, cleaning up regularly and keep work surfaces clean. - Make healthy eating choices from an understanding of a balanced diet. - Understand seasonality and know where and how ingredients are grown and captured.	- Use appropriate tools and equipment safely when preparing food- scales. - Demonstrate an increasing range of food preparation skills e.g. accurate weighing using scales. - Independently explain how and why we work safely and hygienically. - Begin to understand how to feed themselves and others affordably.	- Select and safely use appropriate equipment and tools, from a wide selection, when preparing and cooking food. - Demonstrate an increasing range of food preparation skills - Claw grip, independently choosing which is the most appropriate. - Prepare and cook a range of predominantly savoury dishes using a range of cooking techniques. - Know that food safety means preventing contamination, spoilage and decay when handling and storing food, so that it is safe to eat. - Understand how to feed themselves and others affordably.
Design	- Share and clarify ideas through discussions. - Use a design criteria to develop ideas - using labels to show what materials are used and how joins are made. - Model ideas using pre-made pattern pieces. - Describe the purpose of their products.	- Share and clarify ideas through use of annotated sketches. - Gather information about needs and wants of particular individuals and groups. - Create and use a class/group criteria with annotations to show how things are to be joined, shaped and formed. - Model ideas using some pre-made prototypes. - Use Computer Aided Design (2design and make) to develop and communicate ideas. - Explain how particular parts work.	- Share and clarify ideas through use of cross-sectional drawing. - Identify need, wants, preferences and values of particular individuals and groups. - Develop own design criteria and use these to inform their ideas. - Model ideas using own pattern pieces and a mock up. - Use ICT, where appropriate, to generate and communicate ideas. - Indicate the design feature of their product that will appeal to the intended user.	- Share and clarify ideas through use of exploded diagrams to develop and communicate ideas. - Carry out research using surveys, interviews, questionnaires and web based resources. - Develop a simple design specification to guide their thinking. - Model ideas using some own prototypes to test suitability. - Generate innovative ideas, drawing on the research. - Design innovative, functional, appealing products that are fit for purpose that are aimed at particular individuals or groups.
Make	- Order the main stages of making. - Assemble join and combine materials and components with some accuracy. - Select tools and equipment, from a large range, suitable for the task. - Select materials and components suitable for the task and say why they are suitable. - Measure, mark out and cut with	- Create a plan of design including decisions that take account of the availability of resources. - Assemble, join and combine materials and components with increased accuracy. - Select tools and equipment suitable for the task and explain why they are suitable. - Select materials and components	- Formulate step by step plans as a guide to making. - Accurately assemble, join and combine materials and components. - Explain their choice of tools in relation to the technique they will be using. - Explain their choices of materials and components according to functional properties and aesthetic qualities. - Accurately Measure and mark out cut	- Make a clear guide to making and consider design decisions, taking account of constraints such as time, resources and cost. - Use techniques that need a number of steps to join, combine materials and components. - Produce appropriate lists of tools, equipment and materials needed. - Use wider range of materials and

	- some accuracy. - Apply a range of finishing techniques.	- suitable for the task, include some which are not suitable and why. - Measure and mark out cut and shape with some accuracy. - Apply a range of finishing techniques with some accuracy.	- materials and components. - Apply a range of finishing techniques with increased accuracy.	- components than KS1, including construction materials and kits, textiles, food ingredients, mechanical and electrical components - Accurately Measure and mark out cut and shape materials and components. - Accurately apply a range of finishing techniques, include those learned from Art and Design.
Evaluate	- In existing products, investigate and analyse what materials have been used and why materials have been chosen. - Identify whether the materials in a product are recyclable or not. - Discuss how closely their finished products meet their design criteria. - Talk about changes made during the making process.	- In existing products, investigate and analyse how well products work. - Identify whether the products can be recycled or reused, suggest alternatives. - Use their design criteria to evaluate completed products. - Refer to the design criteria as they design and recognise differences.	- In existing products, investigate and analyse how well they meet user needs and wants and how well products have been designed. - Know how sustainable the materials in the product are. - Begin to evaluate ideas and products against the original design specification. - Refer to the design criteria as they make and recognise changes which occur and why.	- In existing products, investigate and analyse how well products have been made and how well products achieve their purpose. - Investigate and analyse how much the product cost. - Identify the strength and areas for development in their ideas and products. - Consider the views of others, including intended users, to improve their work. - Evaluate their ideas and products against the original design specification. - Critically evaluate the quality of design, manufacture and fitness for purpose of their products.
Technical Knowledge	- Know that mechanical systems have an input, process and output. - Know how mechanical systems such as pneumatic systems create movement. - Understand that that a single fabric shape can be used to make a textile product. - Use the correct technical vocabulary for the project - e.g. fixing, tubing, syringe, plunger, pneumatic system, movement, compression, inflate and deflate.	- Understand that electrical systems have an input, process and output - Know how mechanical systems such as levers and linkages systems create movement. - Know how simple electrical components can be used to create functional products. - Use the correct technical vocabulary for the project -e.g. mechanism, linkage, system, input, process,	- Understand that materials can be combined and mixed to create more useful characteristics. - Know how mechanical systems, such as cams, create and transfer movement from rotary to linear movement. - Know how to reinforce and strengthen a 3d framework. - Use the correct technical vocabulary for the project - e.g. cam, snail cam, off-centre cam, peg cam, pear shaped cam.	- Understand how more complex electrical circuits and components can be used to create functional products. - Understand that mechanical systems such as pulley or gears create movement. - Know that textile products can be made from a combination of shapes. - Use the correct technical vocabulary for the project - e.g. pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor.