Design-Technology Curriculum

2020-21

Northbourne CE (A) Primary School
Cockcroft Road,
Didcot
OX11 8LJ

Design and Technology Curriculum

'Design creates culture. Culture shapes values. Values determine the future' - Robert L. Peters

' 'Tell me and I forget – show me and I may remember – let me do it, and I learn': Learning through making works!' - Prue Leith

1. The aims of our Design and Technology curriculum

Our Design Technology curriculum aims to harness and develop pupils' creativity and imagination through designing and making products that solve real and relevant problems within a variety of contexts. When planning for learning, teachers are guided by the understanding that DT is about designing and making **something**, for **someone**, with **some purpose**; this is what makes it distinct from other subjects, where creating may be more driven by aesthetics.

In line with the National Curriculum, our approach to DT aims to ensure that all pupils:

- Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world;
- Build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users;
- Critique, evaluate and test their ideas and products and the work of others;
- Understand and apply the principles of nutrition and learn how to cook.

All units cover the strands of designing, making, evaluating and building technical knowledge, and cover a range of contexts (home and school, gardens and playgrounds, the local community, industry and the wider environment).

At Northbourne, we follow the approach advocated by the Design and Technology Association and aim to apply their D&T Essentials whenever children make and design products.

- **User:** Pupils are provided with a clear idea of who they are designing and making products for, considering their wants, needs, interests and preferences. Teachers plan for a range of 'users' for pupils – themselves, an imaginary character, another person, a 'client', consumer or specific target audience.
- **Purpose:** Pupils know what the products they design and make are intended for. Each product performs a clearly defined task that can be evaluated in use.
- **Functionality:** Teachers aim for pupils to design and make products that function in some way. They may often combine aesthetic qualities with functional characteristics. In DT, projects do not involving designing and making products that are purely aesthetic.
- **Design decisions:** When designing and making, pupils are given opportunities to make informed decisions, such as selecting materials, components and techniques and deciding what form products will take, how they will work, what task they will perform and who they are for.
- **Innovation:** Teachers plan for pupils to have scope to be original with their thinking. Projects encourage innovation by using engaging, open-ended starting points; as a result, a range of design ideas and products are developed.
- **Authenticity:** Pupils are asked to design and make products that are believable, real and meaningful to themselves – not replicas, reproductions or models which do not provide opportunities for pupils to make design decisions.

Some units of work are 'weighted' more towards meeting and reflecting these essentials than others, through their nature. Over the course of each age phase, teachers ensure each essential is adequately addressed.

2. Teaching sequences within Design and Technology

In line with guidance from the D&T Association, each unit of work includes three types of activity planned into the sequence of teaching:

- **Investigative and Evaluative Activities (IEAs):** Learning about a range of existing products and finding about the role Design and Technology plays in the wider world;
- **Focused Tasks (FTs):** Pupils are taught specific technical knowledge, design skills and making skills;
- **Design, Make and Evaluate Assignments (DMEA):** Pupils create functional products with users and purposes in mind.

Each unit begins with pupils learning about what they will design, make and evaluate before they undertake any activities. However, while IEAs and FTs inform the DMEA, they are not necessarily followed in a set sequence; rather, they are dipped in and out of and cycled through to meet children's needs as the unit of work develops.

3. Breadth of the DT Curriculum

Over the course of each age phase, pupils are exposed to a range of contexts for their learning in Design and Technology. This ensures pupils continue to build skills and knowledge, rather than repeating those they have learned previously.

	Key Stage One	Lower Key Stage Two	Upper Key Stage Two
Mechanisms	Sliders and Levers Wheels and axles *Where Do We Live?*	Levers and Linkages Pneumatics *Why Don't Penguins Feet Freeze?*	Pulleys and gears Cams *Kensuke's Kingdom*
Structures	Freestanding structures	Shell structures *Opposites Attract*	Frame structures *Ancient Greece*
Food	Fruit and vegetables (no heat source) *Chocolate*	Healthy and varied diet *Opposites Attract*	Culture and seasonality *Exploring Eastern Europe*
Textiles	Templates and joining techniques *Where Do We Live?*	2d shape to 3d product *Walk On the Wild Side*	Combining different fabric shapes *Countdown to Extinction*
Electrical systems		Circuits and switches Simple programming and control *Light It Up!*	Complex circuits and switches *Ancient Greece* Monitoring and control *Read All About It*

4. Progression in knowledge and skills

<table>
<tr><th></th><th>Key Stage One</th><th>Lower Key Stage Two</th><th>Upper Key Stage One</th></tr>
<tr><td rowspan="4">Designing</td><td rowspan="2">Understanding contexts, users and purposes
Work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment.
State what products they are designing and making.
Say whether products are for themselves or other users.
Describe what their products are for.
Say how their products will work.
Say how they will make their product suitable for their intended users.
Use simple design criteria to help develop their ideas.</td><td colspan="2">Understanding contexts, users and purposes
Work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment.
Describe the purpose of their products.
Indicate the design features of their products that will appeal to intended users.
Explain how particular parts of their products work.</td></tr>
<tr><td>Gather information about the needs and wants of particular individuals and groups.
Develop their own design criteria and use these to inform their ideas.</td><td>Carry out research about need and preference, using, for example, surveys, interviews, questionnaires and web-based resources.
Identify the needs, wants, preferences and values of particular individuals and groups.
Develop a simple product specification to guide their thinking.</td></tr>
<tr><td rowspan="2">Generating, developing, modelling and communicating ideas
Generate ideas by drawing on their own experiences.
Use knowledge of existing products to help come up with ideas.
Develop and communicate ideas by talking and drawing.
Model ideas by exploring materials, components and construction kits and by making templates and mock-ups
Use information and communication technology, where appropriate, to develop and communicate their ideas.</td><td colspan="2">Generating, developing, modelling and communicating ideas
Share and clarify ideas through discussion.
Model ideas using prototypes and pattern pieces.
Use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate ideas.</td></tr>
<tr><td>Generate realistic ideas, focusing on the needs of the user.
Make design decisions that take account of the availability of resources.</td><td>Generate innovative ideas, drawing on research.
Make design decisions, taking account of constraints such as time, resources and cost.</td></tr>
<tr><td rowspan="2">Making</td><td rowspan="2">Planning
Plan by suggesting what to do next.
Select from a range of tools and equipment, explaining their choices.
Select from a range of materials and components according to their characteristics.</td><td colspan="2">Planning
Select tools and equipment suitable for the task.
Explain choice of tools and equipment in relation to the skills and techniques they will be using.
Select materials and components suitable for the task.
Explain their choices of materials and components according to functional properties and aesthetic qualities.</td></tr>
<tr><td>Order the main stages of making.</td><td>Produce appropriate lists of tools, equipment and materials that they need.
Formulate step-by-step plans as a guide to making.</td></tr>
</table>

<table>
<tr><td rowspan="6">Evaluating</td><td rowspan="2">Practical skills and techniques

Follow procedures for safety and hygiene.

Use a range of materials and components including construction materials and kits, textiles, food ingredients and mechanical components.

Measure, mark out, cut and shape materials and components.

Use finishing techniques, including those from art and design.</td><td colspan="2">Practical skills and techniques

Follow procedures for safety and hygiene.

Use a wider range of materials and components including construction materials and kits, textiles, food ingredients, mechanical components and electrical components.</td></tr>
<tr><td>Measure, mark out, cut and shape materials and components with some accuracy.

Assemble, join and combine materials and components with some accuracy.

Apply a range of finishing techniques, including those from art and design, with some accuracy.</td><td>Accurately measure, mark out, cut and shape materials and components.

Accurately assemble, join and combine materials and components.

Accurately apply a range of finishing techniques, including those from art and design.

Use techniques that involve a number of steps.

Demonstrate resourcefulness when tackling practical problems.</td></tr>
<tr><td rowspan="2">Own ideas and products

Talk about their design ideas and what they are making.

Make simple judgements about their products and ideas against design criteria.

Suggest how their products could be improved.</td><td colspan="2">Own ideas and products

Identify the strengths and areas for development in their ideas and products.

Consider the views of others, including intended users, to improve their work.</td></tr>
<tr><td>Refer to their design criteria as they design and make.

Use their design criteria to evaluate their completed products.</td><td>Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make.

Evaluate their ideas and products against their original design specification.</td></tr>
<tr><td rowspan="2">Existing products

Explore:
• What products are;
• Who products are for;
• What products are for;
• How products work;
• How products are used;
• Where products might be used;
• What materials products are made from;
• What they like and dislike about products.</td><td colspan="2">Existing products

Investigate and analyse:
• How well products have been designed;
• How well products have been made;
• Why materials have been chosen;
• What methods of construction have been used;
• How well products work;
• How well products achieve their purposes;
• How well products meet user needs and wants.</td></tr>
<tr><td>Investigate and analyse:
• Who designed and made the products;
• Where products were designed and made;
• When products were designed and made;
• Whether products can be recycled or reused.</td><td>Investigate and analyse:
• How much products cost to make;
• How innovative products are;
• How sustainable the materials in the products are;
• What impact products have beyond their intended purpose.</td></tr>
<tr><td colspan="2">Key events and individuals

Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products,</td></tr>
</table>

Technical knowledge	**Making products work** Know about the simple working characteristics of materials and components. Know about the movement of simple mechanisms such as levers, sliders, wheels and axles. Know how freestanding structures can be made stringer, stiffer and more stable. Know that a 3d textile product can be assembled from two identical fabric shapes. Know that food ingredients should be combined according to their sensory characteristics. Know the correct technical vocabulary fro the projects they are undertaking.	**Making products work** Know how to use learning from science to help design and make products that work. Know how to use learning from mathematics to help design and make products that work. Know that products can have non functional properties and aesthetic qualities. Know that materials can be combined and mixed to create more useful characteristics. Know that mechanical and electrical systems have an input, process and output. Know the correct technical vocabulary for the projects they are undertaking.	
		Know how mechanical systems such as levers and linkages or pneumatic systems create movement. Know how simple electrical circuits and components can be used to create functional products. Know how to program a computer to control their products. Know how to make strong, stiff shell structures. Know that a single fabric shape can be used to make a 3d textile product. Know hat food ingredients can be fresh, pre-cooked and processed.	Know how mechanical systems such as cam, pulleys or gears create movement. Know how more complex electrical circuits and components can be used to create functional products. Know how to program a computer to monitor changes in the environment and control their products. Know how to reinforce and strengthen a 3d framework. Know that a 3d textiles product can be made from a combination of fabric shapes. Know that a recipe can be adapted by adding or substituting one or more ingredients.
Cooking and nutrition	**Where food comes from** Know that all food comes from plants or animals. Know that food has to be farmed, grown elsewhere (eg home) or caught	**Where food comes from** Know that food is grown (such as tomatoes, wheat and potatoes), reared (pigs, chickens, cattle) or caught (fish) in the UK, Europe and the wider world.	
			Know that seasons may affect the food available. Know how food is processed into ingredients that can be eaten or used in cooking.
	Food preparation, cooking and nutrition Name and sort foods into the five groups in the Eatwell plate and know that everyone should eat at least five portions of fruit and vegetables every day. Know how to prepare simple dishes safely and hygienically, without using a heat source. Know how to use techniques such as cutting, peeling and grating.	**Food preparation, cooking and nutrition** Know how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source. Know how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.	
		Know a healthy diet is made up from a variety and balance of different food and drink, as depicted in the Eatwell plate. Know that be active and healthy, food and drink are needed to provide energy for the body.	Know that recipes can be adapted to change the appearance, taste, texture and aroma. Know different food and drink contain different substances – nutrients, water and fibre – that are needed for health.