

Progression of Skills and Knowledge in Design Technology



Design Technology

Progression of Skills and Knowledge in Design Technology

DT Overview written by Andrew Shaw, Subject leader

Curriculum Intent

At Elton, we believe that Design and Technology is an inspirational, practical and meaningful subject. Our children are encouraged to be critical thinkers; learning how to creatively solve problems, both as individuals and in collaboration with others.

We encourage children to develop their imagination and creativity during the designing, making and building process. They are challenged in solving a variety of real and relevant problems within a variety of contexts, considering the needs, wants and values of others.

We aim to, wherever possible, link work to other subjects such as Science, Mathematics, Computing and Art - often under the theme of our 'Big Question.'

Children are exposed to a variety of appropriate technical vocabulary, building on key skills developed specifically to ensure progress across year groups.

Our children are also given opportunities to reflect upon and evaluate projects undertaken. Critiquing their successes and striving to consider the next step as designers.

Our children will have a secure understanding of how real-life designers have shaped the world in which we live, enabling our children to gain a deeper understanding of the skills and traits of a successful designer.

At Elton, we believe that learning how to cook is a crucial life skill that enables children to feed themselves and others affordably and well, now and in later life. Therefore, as part of our curriculum, we teach the children some basics on how to cook and apply the principles of nutrition and healthy eating. Furthermore, we believe that instilling a love of cooking throughout the school will also open a door to one of the great expressions of human creativity.

During their time at Elton, children will

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

Progression of Skills and Knowledge in Design Technology

Curriculum Implementation

The Design Technology teaching throughout Elton follows the National Curriculum design, make and evaluate cycle. Through this, the children acquire a broad range of technical knowledge and vocabulary whilst also drawing on disciplines such as Mathematics, Science, Engineering, Computing and Art.

Evidence of each of these strategies is found in each class's 'floor book' and photographs and shows clear progression across the Key Stages.

Rooted in real-life, relevant contexts, children design products with a purpose and an intended user of the products in mind. They use research and develop design criteria to inform the design of innovative, functional, appealing and fit-for-purpose products.

Children plan through annotated sketches, patterns/templates, communicating ideas verbally and prototypes/'mock-ups'. In some cases, designs will be computer aided.

Whilst making, children will be given a wide range of tools, materials and components including textiles, construction equipment and ingredients. They build and apply a repertoire of knowledge, understanding and skills in order to make high-quality prototypes and products for a range of users.

Children at Elton learn to critique, evaluate and test their ideas and products as well as the work of others. They investigate and analyse a range of existing products to understand how individuals and key events have shaped design and technology globally. In addition, they learn to evaluate their work against their own design criteria and consider the views of others in order to improve their work.

Curriculum Impact

Assessment of children's learning in Design Technology takes the form of ongoing monitoring of children's understanding, knowledge and skills using key questioning skills built into lessons by the class teacher.

Child-led assessment such as success criteria are also used to inform the support and challenge required by the children.

Summative assessment is conducted termly by class teachers across each year group and is aimed at targeting next steps in learning as well as informing the subject leader of progress and skills/knowledge still to be embedded.

Design Technology is also monitored by the subject leader throughout the year in the form of collection of evidence (photos), floor book monitoring, looking at outcomes measured against age-based progression and pupil interviews to discuss their learning. This tangible evidence aids understanding and establishes the impact of the teaching taking place. The impact of using the full range of tools and resources, will be seen across the school with an increase in the profile of Design and Technology. Children will know more, remember more and understand more about DT.

By the time children leave our school they will have:

Progression of Skills and Knowledge in Design Technology

- An excellent attitude towards learning and independent working.
- The ability to use time efficiently and work constructively and productively with others.
- The ability to carry out thorough research, show initiative and ask questions to develop a detailed knowledge of users' needs.
- The ability to act as responsible designers and makers, working ethically, using a range of materials carefully and working safely.
 - A thorough knowledge of which tools, equipment and materials to use to make their products.
 - The ability to apply mathematical knowledge and skills accurately.
 - The ability to manage risks, be resourceful, innovative and enterprising to manufacture products safely and hygienically.
 - A passion for the subject.

Children will be equipped with skills and knowledge that will enable them to be ready for the curriculum at Key Stage 3 and for life as a capable citizen in the wider world.

Extra-Curricular Opportunities

Over recent years the children have had the opportunity to work alongside a number of STEM ambassadors on a variety of projects where they apply their DT skills and knowledge

- Green Goblins racing car project – in conjunction with Perkins Engines
- Lego League Challenge – working alongside Whirlpool
- Mammals Project – Manchester University and The Royal Society
- Knex Challenge – with Stempoint
- Battery Workshops – Cambridge University

Progression of Skills and Knowledge in Design Technology

| EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|--|---|--|---|--|
| Design | | | | | | |
| <p>(Managing Self) Be confident to try new activities and show independence, resilience and perseverance in the face of challenge</p> <p>(Self Regulation) Set and work towards simple goals, being able to wait for what they want and control their immediate impulses when appropriate</p> <p>(Creating with Materials) Safety use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function</p> | <p>Design simple products that work and look appealing</p> <p>Discuss and draw ideas and use ICT to communicate</p> | <p>Design products for others and themselves that are purposeful, functional and appealing</p> <p>Generate, develop, model and communicate ideas through talking, drawing, templates and ICT</p> | <p>Communicate ideas using different strategies eg <i>discussion, sketch</i></p> <p>Use research to inform design</p> <p>Take risks to become innovative and resourceful</p> | <p>Communicate, generate and develop ideas using a range of strategies eg prototypes, pattern pieces</p> <p>Use research to inform design and develop design criteria</p> <p>Take risks to become innovative and resourceful</p> | <p>Communicate, generate, develop and model ideas using a range of strategies eg computer-aided design, cross-sectional and exploded diagrams</p> <p>Use research to inform design and generate own design criteria</p> <p>Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing</p> <p>Confidently take calculated risks to become innovative, resourceful and enterprising</p> | <p>Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing</p> <p>Use research to inform innovative design and generate own design criteria</p> <p>Confidently take calculated risks to become innovative, resourceful and enterprising</p> |
| Evaluate | | | | | | |
| <p>(Speaking) Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate</p> <p>(Creating with Materials) Share their creations, explaining the process they have used</p> | <p>Explore existing products eg <i>home, school</i> Discuss own ideas and designs</p> | <p>Explore and evaluate a range of existing products eg <i>home, school</i></p> <p>Evaluate own ideas and designs against given design criteria</p> | <p>Evaluate own ideas and designs against given design criteria and consider the views of others to improve their work</p> <p>Investigate a range of existing products that address real/relevant problems, in a range of relevant contexts eg <i>home, leisure, school</i></p> | <p>Evaluate own and others' work suggesting improvements and consider the views of others to improve their work</p> <p>Investigate a range of existing products in a range of relevant contexts eg <i>culture, industry</i></p> | <p>Generate own design criteria and evaluate ideas and products against these</p> <p>Investigate and analyse a range of existing products that address real/relevant problems, in a range of relevant contexts</p> <p>Understand how key events and individuals in D&T helped to shape the world</p> | <p>Generate own design criteria and critique ideas and products against these</p> <p>Explain and understand how key events and individuals in D&T helped to shape the world</p> |

Progression of Skills and Knowledge in Design Technology

| EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|----------------------------|---|---|---|---|--|---|
| Technical Knowledge | | | | | | |
| | <p>Start to build structures, exploring ways to stiffen, stable and strengthen</p> <p>Explore simple mechanisms</p> | <p>Build structures, exploring ways to stiffen, stabilise and strengthen</p> <p>Explore and use mechanisms eg <i>levers, wheels and axles</i></p> | <p>Apply understanding of how to strengthen, stiffen and reinforce structures</p> <p>Identify range of mechanical systems and how they work (gears, pulleys, cams, levers and linkages)</p> | <p>Apply understanding of how to strengthen, stiffen in order to reinforce more complex structures</p> <p>Use computing to program, monitor and control products</p> <p>Identify wider range of mechanical systems and how they work (gears, pulleys, cams, levers and linkages)</p> <p>Use understanding of electrical systems (series circuits, switches, bulbs and motors)</p> | <p>Construct more complex structures by applying range of strategies in order to solve real/ relevant problems</p> <p>Drawing on disciplines & making connections to wider subject areas, apply understanding of computing to program, monitor and control products</p> <p>Making connections to real & relevant problems, apply understanding of wider range of mechanical systems (gears, pulleys, cams, levers and linkages)</p> <p>Making connections to real & relevant problems, apply understanding of electrical systems (series circuits, switches, bulbs and motors)</p> | <p>Construct more complex structures by applying range of strategies in order to solve real / relevant problems</p> <p>Drawing on disciplines & making connections to wider subject areas, apply understanding of computing to program, monitor and control products</p> <p>Making connections to real & relevant problems, apply understanding of wider range of mechanical systems (gears, pulleys, cams, levers and linkages)</p> <p>Making connections to real & relevant problems, apply understanding of electrical systems (series circuits, switches, bulbs and motors)</p> |

Progression of Skills and Knowledge in Design Technology

| EIFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|--|--|--|---|
| Make | | | | | | |
| <p>(Fine Motor) Hold a pencil effectively in preparation for fluent writing – using the tripod grip in almost all cases</p> <ul style="list-style-type: none"> - Use a range of small toys, including scissors, paint brushes and cutlery - Begin to show accuracy and care when drawing (Creating with Materials) Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function | <p>Use a range of materials and components eg construction, textiles and Ingredients</p> <p>Use a range of tools and equipment to perform practical tasks eg <i>cut, shape, join and finish</i></p> | <p>Select from and use a wide range of materials and components (according to their characteristics) eg <i>construction, textiles and Ingredients</i></p> <p>Select from and use a wide range of tools and equipment to perform practical tasks eg <i>cut, shape, join and finish</i></p> | <p>Select from and use a wide range of tools, equipment, materials and components accurately</p> | <p>Select from and use a wider range of tools, equipment, materials and components accurately to make prototypes</p> | <p>According to their functional properties and aesthetic qualities, select from and use a wide range of tools, equipment, materials and components accurately to make high quality prototypes</p> | <p>According to their functional properties and aesthetic qualities, select from and use a wide range of tools, equipment, materials and components accurately to make high quality prototypes</p> |
| Food Technology | | | | | | |
| | <p>Begin to understand where food comes from</p> <p>Prepare simple dishes using knowledge of healthy food</p> | <p>Use basic principles of a healthy and varied diet to prepare dishes</p> <p>Understand where food comes from</p> | <p>Apply principles of a healthy, varied diet when preparing variety of savoury dishes</p> <p>Apply understanding of seasonality and its link to ingredients</p> | <p>Know where and how a variety of ingredients is grown, reared, caught and processed</p> | <p>Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques</p> | <p>Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques</p> <p>Know where and how a variety of ingredients are grown, reared, caught and processed and its impact on meal design</p> <p>Develop crucial life skill of feeding themselves and others affordably and well</p> |