

A Guide to Design & Technology At Carlinghow Academy



This document outlines the expectations of how we teach and monitor Design Technology at Carlinghow Academy: progression across year groups and consistency across school.

Intent

Carlinghow Academy's curriculum is driven by the academy's vision that all children 'can and will succeed'.

We provide an ambitious knowledge engaged curriculum that offers exciting and meaningful learning opportunities that motivate and inspire. The curriculum is underpinned by the National Curriculum and ensures that, at each stage of their learning journey, each child acquires a rich bank of knowledge and skills. This knowledge and these skills in all curriculum subjects are learned, practised, retrieved and remembered at every stage of their journey through school.

Our curriculum is not narrowed, we have designed an ambitious curriculum based on the knowledge of our learners that includes a high proportion of disadvantaged and SEND pupils to ensure that they are equipped with the knowledge and cultural capital they need to succeed in life. Where appropriate a bespoke and highly personalised curriculum offer is made to individual pupils.

Our cross curriculum approach is designed so that subject specific skills are taught within an exciting topic each half term and enables our children to make meaningful links and become passionate about their own learning and wellbeing. Hooks, enrichment activities and extra-curricular opportunities supplement each topic to enable our children to make connections in their learning and acquire a deep understanding. We ensure that the links we make are real, not contrived and choose areas where genuine connections between subjects occur naturally. Ensuring that the connections make sense to the children.

We are determined that every child, will have a lifelong love of reading, and will be able to comprehend and read fluently by the end of Year 6. Our curriculum is led by the high quality and diverse texts that we choose to support learning.

We have created an environment where children are motivated to learn together in a respectful, safe and trusted learning environment where individual success are celebrated.

Implementation

The curriculum is a knowledge engaged curriculum based on good quality resources.

This Design Technology guide explains how the DT curriculum is implemented at Carlinghow Academy.

The school has adapted the curriculum to help reflect and represent the diversity of our pupils. Creativity and teacher expertise, underpinned by high quality research informed CPD, is woven into the curriculum with specialist teachers and outside agencies working with pupils and teachers, sharing good practice and ensuring that learners learn from the best.

Impact

The impact of providing such an ambitious curriculum driven by the academy's vision and values and taught by skilled teachers ensures that the children of Carlinghow Academy leave prepared for the next stage of their education and able to succeed in life. Knowledge, understanding and skills are secured and embedded so that children attain highly. They take pride in all that they do, always striving to do their best. They demonstrate emotional resilience and the ability to persevere when they encounter challenge. They develop a sense of self-awareness and become confident in their own abilities. They are kind, respectful and honest, demonstrate inclusive attitudes and have a sense of their role in our wider society. They have strong communication skills, both written and verbal, and listen respectfully and with tolerance to the views of others. They take risks and are emotionally resilient recognising that we make mistakes and learn from them. They dream big and have high aspirations fostered by the belief that with determination and hard work anything is possible.

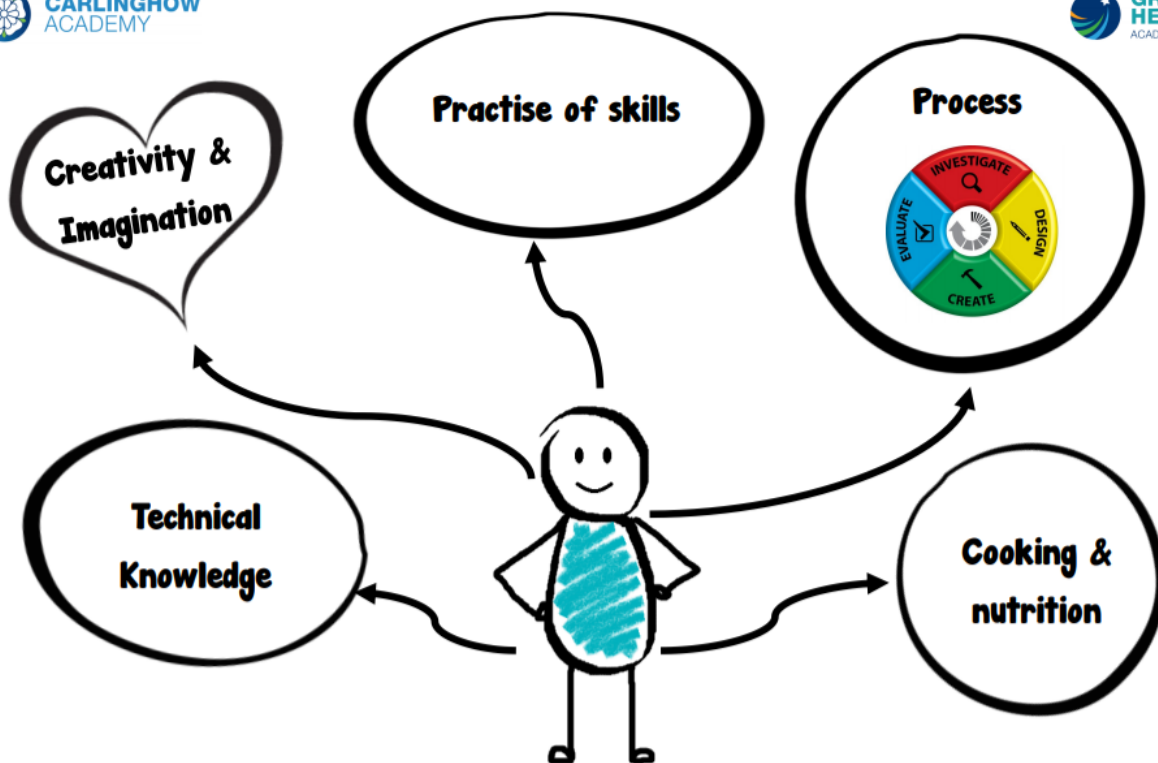
Teaching Design and Technology at Carlinghow:

The Design and Technology curriculum at Carlinghow Academy follows the National Curriculum and Early Years Foundation Stage Curriculum and is linked directly to the topic and text for the half term following a clear progression of skills.

From the Early Years the Design and Technology curriculum is inspiring and practical encouraging pupils to use their creativity and imagination to design and make products that solve real problems within a variety of contexts. Pupils learn through the evaluation of past and present design and develop a critical understanding of its impact on daily life and the wider world.

The curriculum also equips pupils with the knowledge, skills and understanding to participate successfully in an increasingly technological world and understand and apply the principles of nutrition and learn how to cook

The curriculum ensures that we help to nurture confident, independent, resilient designers.



Successful Product Designer

Our curriculum aims to insure that all children:

- Develop imaginative thinking to enable them to talk about what they like and dislike when designing and making.
- Can talk about how things work, and to draw and model their ideas.
- Are encouraged to select appropriate tools and techniques for making a product, whilst following safe procedures.
- Explore attitudes towards the 'made' world and how we live and work within it.
- Develop an understanding of technological processes, products, and their manufacture, and their contribution to our society.
- Foster enjoyment, satisfaction and purpose in designing and making.

Attainment Targets:

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Nursery & Reception EYFS:

During the EYFS our children will explore and use a variety of media and materials through a combination of child initiated and adult directed activities. DT forms part of the learning children acquire under the 'Understanding of the World', 'Physical Development' and the 'Expressive Arts and Design' branch of the Foundation stage Curriculum

Our pupils are given opportunities to:

- Learn how to use simple tools such as scissors and hammers.
- Use a range of techniques such as sticking and folding, to shape, assemble and join work where necessary.
- Build with a wide range of objects, selecting appropriate resources and adapting their work where necessary.
- Think about uses and purposes of materials.
- Experiment with colour, design, texture, form and function.
- Discuss reasons that make activities safe or unsafe, for example; hygiene, electrical awareness and appropriate use of senses when tasting different flavourings.
- They will learn how to record their experiences by, for example, drawing, and making a tape or model.
- Have specific foci for creative designs/purpose.
- Combine and change their creation purposefully reflecting and reviewing their work.
- Talk about the ideas and processes they have used in their own and others work.
- Recognise the strengths of their own work and others.

Key Stage 1:

Through a variety of creative and practical activities, our children 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 and school, gardens and playgrounds, the local community, industry and the wider environment).

When designing and making, our children should be taught to:

Design:

- Design purposeful, functional, appealing products for themselves and other users based on design criteria.

- Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.

Make:

- Select from and use a range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing).
- Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.

Evaluate:

- Explore and evaluate a range of existing products.
- Evaluate their ideas and products against design criteria.

Technical Knowledge:

- Build structures, exploring how they can be made stronger, stiffer and more stable
- Explore and use mechanisms (for example, levers, sliders, wheels and axles), in their products.

Cooking and Nutrition:

As part of their work with food, our children 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.

- Use the basic principles of a healthy and varied diet to prepare dishes.
- Understand where food comes from.

Key stage 2:

Through a variety of creative and practical activities, our children 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.

When designing and making, our children 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.

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.

- 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



Progression of skills throughout the school

<p>EYFS- Reception and Nursery</p>	<ul style="list-style-type: none"> • Children can safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture and form. • Children to develop their small motor skills so that they can use a range of tools competently,, safely and confidently.EG; pencils, paintbrushes, scissors and cutlery. • Children represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories. • Children to explore, use and refine variety of artistic effects to express their ideas and feelings. • Children will return to and build on previous learning, refining ideas and developing their ability to represent them. • Children to create collaboratively, sharing ideas, resources and skills. • Children to make use of props and materials when role playing characters in narratives and stories. • Children to share their creations, explaining the process they have used.
<p>Year 1</p>	<p>As above plus:</p> <ul style="list-style-type: none"> • I can understand that all food has to be farmed, grown or caught. • I can use the basic principles for a healthy and varied diet to prepare dishes. • I can design useful, pleasing products for myself and other users based on a design brief. • I can generate, develop, model and communicate my ideas through talking, drawing, templates, mock-ups and IT. • I can select from and use a range of tools and equipment to perform practical tasks. • I can select from and use a range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.

	<ul style="list-style-type: none"> • I can evaluate and assess existing products and those that I have made using a design criteria. • I can investigate different techniques for stiffening a variety of materials and explore different methods of enabling structures to remain stable. • I can explore and use mechanisms such as levers, sliders, wheels and axles in products.
Year 2	<p>As above plus:</p> <ul style="list-style-type: none"> • I can design useful, pleasing products for myself and other users based on a design brief. • I can select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.
Year 3	<p>As above plus:</p> <ul style="list-style-type: none"> • I can talk different food groups and name food from each group • I can create designs using exploded diagrams. • I can use my knowledge of existing products to design my own functional product. • I can safely measure, mark out, cut, assemble and join with some accuracy. • I can create designs using annotated sketches, cross sectional diagrams and simple computer programmes.
Year 4	<p>As above plus:</p> <ul style="list-style-type: none"> • I can understand what makes a healthy and balanced diet, and that different foods and drinks provide different substances the body needs to be healthy and active. • I can use techniques which require more accuracy to cut, shape, join and finish my work e.g. cutting internal shapes, slots. • I can consider how existing products and my own finished products might be improved and how well they meet the needs of the intended user. • I can apply techniques I have learnt to strengthen structures and explore my own ideas. • I can understand and use electrical systems in my products.
Year 5	<p>As above plus:</p> <ul style="list-style-type: none"> • I can understand the main food groups and the different nutrients that are important for health. • I can use my research into existing products and my market research to inform the design of my own Innovative product. • I can make detailed evaluations about existing products and my own considering the views of others to improve my work. • I can build more complex 3D structures and apply my knowledge of strengthening techniques to make them stronger or more stable. • I can understand how to use more complex mechanical and electrical systems.
Year 6	<p>As above plus:</p> <ul style="list-style-type: none"> • I can confidently plan a series of healthy meals based on the principles of a healthy and varied diet. • I can generate, develop, model and communicate my ideas through discussion, annotated sketches,

	<p>cross-sectional and exploded diagrams, prototypes, pattern pieces and computer aided design.</p> <ul style="list-style-type: none"> • I can use research I have done into famous designers and inventors to inform my designs. • I can use my knowledge of famous designs to further explain the effectiveness of existing products and products I have made. • I can apply my understanding of computing to programme, monitor and control my products.
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What is expected to be seen when teaching Design Technology?

- To prepare for lessons and create your own exemplary practical piece prior to teaching so that there is an understanding of the process the children will experience.
- Ensure background reading about project.
- Ensure there are cross curricular links where possible.
- Create a demonstration area in the classroom for showing the children the practical parts of the lesson.
- The design process to be recorded in a Design Technology book which will show progression. This includes photographs of the process and finished product.
- Design Technology displays should inspire and motivate our children as well as celebrate their success in DT. Ideally, DT displays should show the whole design process, e.g. examples of the children's research, their designs, and products, (photographs) and evaluations. They should also support children in their learning by displaying key vocabulary, key questions and, where viable, an interactive aspect that engages children and gets them thinking.
- Trips to museums, science museums (focusing on inventions, architecture cars etc.), virtual experiences and visiting experts is encouraged to enhance the children's learning experience. These should be planned in advance of the topic and take place at the start of each half term.
- Knowledge organisers need to be present in DT workbooks at the beginning of each new topic. These give the children key facts and are a reminder of what they have learnt and will be learning. They will include information about the product, key vocabulary and definitions, learning journey and inspirational ideas and useful websites and health and safety measures. Skills to be assessed. (See appendix 1 for an example).

- DT themed days planned in advance to showcase DT and problem solving with hands on classroom activities that allow children to explore their creative side. Examples: Cook off, survival, games, puppet show, book week, racing vehicles.
- Key Vocabulary to be used in every lesson and displayed along with artworks. Vocabulary for each unit will be in knowledge organisers.
- It is essential that resources and tools are properly supervised and managed so that **Design and Technology** provides safe and enjoyable activities for the children who will gain much from the experience.
- In the interests of safety, it is important when using resources that the children are clear which tools and equipment are:
 1. Available for general use.
 2. Can be used only with direct adult supervision.
 3. Provided for adult use only.



Resources and Materials:

Materials and resources for units of work in all year groups will be kept in the DT storeroom. They will be shared across year groups and key stages. Knowledge organisers will state what is needed to teach the lessons and will be ordered by subject coordinator. Any new requests for resources or materials must be made through subject coordinator well in advance of teaching a unit of work and approved by SLT.

- The school library has a good selection of books to support the teaching of DT and has many related subject specific books that can support research and knowledge, e.g. science- 'Forces' - pulleys and levers.
- Non practical resources can be found on server under DT.

Monitoring:

- Books will be taken for scrutiny to look for coverage and progression in each class. The variety of activities will also be observed through these scrutinies.
- Planning will be looked at termly to ensure the short term planning relates to MTP/LTP.

- The school target tracker will be used to monitor progress on a termly basis and will be used to address gaps in learning and inform future planning. Seesaw will inform home learning progress.
- Pupil interviews/voice questionnaires will be conducted and analysed to inform future teaching/experiences.
- Think about the six pointers below when assessing skills and knowledge. Are the children:
 - Understanding by explaining how things work?
 - Naming tools and materials correctly?
 - Able to discuss the properties of materials?
 - Being able to use tools and materials safely and accurately?
 - Following their plans?
 - Evaluating their work?
 - Identifying and trying to solve problems?
 - Using key vocabulary?

Differentiation:

- Differentiated learning objective/outcome and or success criteria.
- Differentiated tasks, e.g. one group might be taking part in a skills activity, while another group is researching whilst another group is designing or making their product.
- Differentiated tools e.g. type of scissors, measuring equipment, recording format.
- Level of support: Scaffolding, guided/modelled etc.

Marking Feedback and assessment:

- When assessing watch for how the children are using the tools and materials and address misconceptions.
- Give children, when appropriate, support or verbal prompts to improve their technique.

- Work should be marked as per the school marking policy.
- Please ensure that all lessons have an objective at the top of the children's work in DT books. Allow for opportunities for children to be able to self-assess.
- Keep the DT LO (from the MTP), in mind when marking at the work and giving feedback.
- Give feedback about effort, use phrases like, "I noticed..." or, "I see that you...." ...Don't judge the work, encourage next steps to develop problem solving skills and Growth Mind-set to enable children to be positive critical thinkers that will allow them to improve their products and the DT process.
- Remember that when writing green comments, think pinks and next steps, they should be related to learning DT and the DT process. Be specific. Avoid using general language like 'that looks great' or 'its fab'. Always describe the specific part of the work or skill for which you are providing feedback, for example: 'I like how you have thought about your join but I have noticed that it is missing some of the skills we have been practicing.

Assessing Design and evaluation skills.

Allow for opportunities to assess children's written work through their design ideas and their evaluations.

Assessing design skills.

- Has the design been drawn using appropriate techniques such as cross-sectional or explode diagrams?
- Is there a realistic order/sequence to the assembly?
- Have correct materials and tools been selected?
- Has the appropriate technical vocabulary been used?
- Is there evidence of research?
- Was a mock-up or prototype made? If so, has it informed the design process?
- Does the finished product match the final design?

Assessing evaluation skills.

When assessing an evaluation, look or listen for comments from the children covering the following points:

- Does the product do what it should? If not, have the children been able to explain why and have they mentioned modifications to their design?
- Have the needs of users been identified and met? If not, is there a comment about how to rectify the problems?
- Have all changes which were made during the making process been noted down and explained?
- Is there a comment about the look of the finished product?
- Have the children been able to point out where their design was too ambitious or complex?

- Have the children thought about how to improve their product?
- Pupil interviews/voice questionnaires.



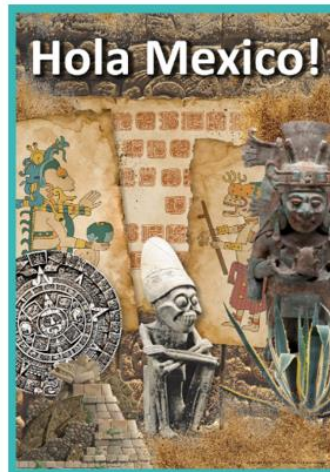
Think pinks should:

- To move children on to their next step of learning by reminding children as to how to improve a skill and make progress.
- Be constructive yet helpful.
- Be related to the work they have been doing in the lesson.
- Challenge the children further and allow them to question more.
- Develop their understanding of the meaning of specific vocabulary related to DT and the focus, e.g. mechanisms, food etc.

Appendix 1

Hola Mexico!-Year 5

Key Skills	SA	TA
I can use my research into existing products and my market research to inform the design of my own innovative product.	○ ○ ○	○ ○ ○
I can build more complex 3D structures and apply my knowledge of strengthening techniques to make them stronger and more stable.	○ ○ ○	○ ○ ○



Design Brief

We will be heading back in time to explore the achievements of ancient civilisations.

By the end of this project we will have designed, created and evaluated a traditional style Mexican mask that can be worn.

Key Vocabulary

Papier Mache

Acrylic paint

Aesthetic

Strengthening Technique

