Design Technology at Penistone St John's

By the end of studying Design Technology at Penistone St John's, pupils should be able to answer questions such as:

Using a diverse range of inventors, designers, engineers, chefs, architects and manufacturers, what is the significance of their work?
What do you need to consider at the design stage of a project?
What do you need to consider at the make stage of a project?
Why is the evaluate stage of a project so important? Using examples, what impact does the evaluate stage have on the final outcome?
What do you need to consider when cooking?

Key concepts	Associated vocabulary
Design technologists	inventor, chef, engineer, manufacturer, maker, architect, designer, local, national, international
design	creativity, contexts, users, purpose, generating, modelling, communicating, innovative, functionality, decisions, risk taking, original, change, past, present
make	aesthetic, plan, order, construct, attach, combine, assemble, join, embellish, refine
evaluate	impact, critique, test, scrutinise, perspective, improvements, changes, analysing, fit for purpose
cooking and nutrition	cutting, peeling, grating, chopping, slicing, mixing, spreading, kneading, baking, seasonal, processed, ingredients, contamination, food hygiene, safety

Design Technologists: *Using a diverse range of inventors, designers, engineers, chefs, architects and manufacturers, what is the significance of their work?*

Each phase will aim to develop pupils' understanding of a diverse range of inventors, designers, engineers, chefs, architects and manufacturers from a range of time periods, who have developed ground-breaking products. By the time pupils leave Penistone St John's, they should have a solid understanding from a wide range of work from a diverse range of people.

Design: *what do you need to consider at the design stage of a project?*

In EYFS, children will begin to understand the concept of design through discussing what makes need in order to be successful, using pictures or stories to help explain their thinking. Planning and design sheets are available for children to use within continuous provision and the children know to find these in the building area. Within core units, children will practise basic elements of the design process, such as drawing a picture of their intended product, creating a whole class resource list, and writing simple steps to take. In KS1, children will further develop their understanding of design through links to various history, geography and RSHE topics, using a variety of contexts such as stories, home and the local and wider community. Children will begin to understand the importance of making their product suitable for the intended user, and will begin to verbalise what their product is for. Children will use existing products to help shape their thinking and they will share their thoughts through talking, drawing and modelling ideas such as making mock-ups. In LKS2, children will build on their concept of design by gathering information of from the needs and wants of particular individuals and groups. Through several units, such as Christmas cards and Christmas baubles, children will develop their own design criteria and use these to inform ideas. Children will refine their ideas through sharing and discussing initial thoughts. Children will build on the use of mock-ups as a way of refining their thoughts by using prototypes and pattern pieces to explore ideas. Children will begin to use annotated sketches, cross sectional drawings and exploded diagrams to communicate their ideas. Children will make decisions that take into account the availability of resources. In year 4, children will begin to investigate the use of Computer aided design in order to visualise their plans. In UKS2, children will further develop and embed their concept of design by carrying out research, such as surveys, interviews and questionnaires to identify needs, wants, preferences and values of particular individuals and groups. Using this information, pupils will develop a simple design specification to guide their thinking. Children will further embed their use of sketches and diagrams to communicate their ideas, and further explore how CAD can be used to enhance their work. They will also investigate how computer programming can be used to control a product. Children will begin to make design decisions that take into account constraints such as time, resources and cost. In all key stages, design, make and evaluate projects will follow iterative process – one which allows for continual testing and refinement.

Make: *what do you need to consider at the making stage of the project?*

In EYFS, children will begin to understand the importance of sequencing during the make stage of the project. They will think about the steps needed to create their products and the order those steps need to happen. They will have opportunity to select from a wide range of resources and practise their practical skills with equipment. Children will also apply their understanding of sequencing in KS1, where they will further understand that when they enter the make stage of a project, they need to plan the order of what happens next. Children will select from a range of tools and equipment and give some reasons for their choices. Children will choose materials and components from a range on offer according to their characteristics. During the make stage, pupils will measure, mark out, cut and shape materials, including food, paper and card. Children will assemble, combine and join materials using slits, folds, tabs, split-pins and tape, as well as combining ingredients to make sandwich fillings. Children will know about a range of finishing techniques to enhance their final products, such as neatening/trimming edges, making neat folds and using graphics to enhance a product. In LKS2, children will further develop their understanding of the make stage by ordering the main stages of a project. Children will select tools and equipment suitable for the task and explain their choices in relation to the skills and techniques they will be using. Pupils will explain the functional properties and aesthetic qualities when explaining their choice of materials. In UKS2, children will further develop their understanding of the make stage by producing detailed lists of tools, equipment and materials they need for the project. Children will also formulate step-by-step plans as a guide to making. Children will measure, mark out, cut, shape, assemble, join and combine materials accurately and they will apply a range of finishing techniques, including those from art and design, to their final products. In textiles, children will measure, mark out, cut, shape, assemble, join and combine materials with some accuracy. Children will build on the finishing techniques from KS1 and use these to enhance their final products e.g., the use of applique and embellishments.

Evaluate: *Why is the evaluate stage of a project so important? Using examples, what impact does the evaluate stage have on the final outcome?*

In EYFS, children will begin to evaluate their products using trial and error. Children will be able to say what has worked well and something that can be better next time. Some children will be able to look at their designs and compare. After the children have made their product, they are able to display it for others to see which provides opportunities for peer comments. In KS1, children will begin to understand the importance of the evaluate stage of a project by looking at existing products and those from history which relate to their project. Children will verbalise what the products are for, who they are for, how they work, the materials used to make them and what they like and dislike about them. Children will build on the idea of change and continuity when looking at product changes over time and the significance of designers in history. When evaluating their own ideas and products, children will talk about what they are making and make judgements about their ideas and project against the design criteria. Children will begin to talk about the improvements they could make to their product. In LKS2, children will further develop their understanding of the evaluate stage by analysing by discussing a range of existing products – from the past and present – remarking on who made them and why, where they were designed and made and what materials were used and why. Children will begin to consider whether materials used can be recycled or reused. In their own work, children will identify the strengths and areas for development in their ideas and products. Children will begin to seek out and consider the views of others, including the intended user, in order to improve their work. Children will refer to their original design criteria and use this to evaluate their completed product. In UKS2, children will deepen their understanding of the evaluate stage by analysing and discussing how much existing products cost to make, how innovative products are, how sustainable the materials are, and what impact products have beyond their intended purpose. In their own work, pupils will use the original design specification to evaluate their ideas and products from the perspective of both the designer and the consumer. Children will critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make. Children will use this knowledge to make considerable improvements in their final products.

Cooking and nutrition: *What do you need to consider when cooking?*

In EYFS, children will be introduced to the concept of cooking and nutrition through a number of food-based projects. Children will learn where many common foods come from, such as eggs, bacon and milk, and begin to explore those grown locally and are exposed to tools and equipment used for cooking, including knives, bowls and baking trays and safety equipment such as aprons. In KS1, pupils will build on their knowledge of cooking and nutrition through a range of food-based projects (including links to other subjects such as science, RSHE and English). Through these units, children will know that all food comes from plants, or animals and it has to be farmed, grown elsewhere or caught. In science, as well as other curriculum areas, children will name and sort foods into the 5 groups (fruits and vegetables, bread, rice, potatoes, pasta and other starch foods; milk and dairy foods; meat, fish, egg, beans and other non-dairy sources of protein; food and drink high in fat and/or sugar) and discuss the largest and smallest groups on the Eatwell plate, relating this to the food products children design and make. Children will build on their knowledge of hygiene in science by learning about the importance of using clean hands, clean surfaces and clean equipment when preparing and cooking food. Children will make a range of dishes without the use of a heat source e.g., making a fruit salad and making sandwiches, using a range of techniques such as cutting, peeling, spreading, grating and mixing. In LKS2, pupils will further develop their knowledge of cooking and nutrition through a range of food-based products carried out in the school kitchen. Children will deepen their knowledge of where food comes from by looking at food which is grown, reared and caught in the UK, Europe and wider world. Children will prepare and cook a variety of predominantly savoury dishes safely using a heat source. Children will build on the techniques from KS1 by refining these skills and learning to chop, slice and mix. In science, children will explore what makes a healthy diet and will understand the need for food and drink in terms of the energy it provides the body. In UKS2, pupils will deepen their knowledge of cooking and nutrition through a range of food-based projects carried out in class and in the school kitchen. Children will explore how seasons can affect the food available and how some foods are processed into ingredients that can be eaten or used in cooking. Children will develop their knowledge of recipe adaptation and refinement by making changes that affect the appearance, taste, texture and aroma of a dish. Children will extend their knowledge of food hygiene by looking at the issue of contamination, relating this to food storage and food prep. Children will make a range of predominantly savoury dishes using a mixture of techniques: cutting, peeling, grating, chopping, slicing, mixing, spreading, kneading and baking, building on their knowledge from KS1 and LKS2. In science, children will understand that food and drink contain different substances – nutrients, water and fibre – that are needed for health, which builds on the concepts introduced in KS1 and LKS2. In all phases, cooking projects will follow the iterative process of the St John's DT cycle. Links to English have been made during the design stage of the process where all children will write up a recipe for their food items.

Design Technology Glossary

aesthetic	relating to the enjoyment or study of beauty
applique	decorative work in which one piece of cloth is sewn or fixed onto another
criteria	a standard by which you judge, decide about or detail with something
critique	to review a person's ideas or work and provide a judgement
embellish	to make something more beautiful by adding something to it
embroidery	patterns or pictures that consist of stitches sewn directly onto cloth
food contamination	food that has become unfit and dangerous to eat
manufacture	something made from raw materials by hand or by machine
prototype	the first example of something, such as a machine or other product, from which all later forms are developed
seasonal	relating to or happening during a particular period in the year