Design Technology

Milestones for progress

Because the threshold concepts are repeated in each year group it is important that students progress in their understanding of them. The curriculum at St Botolph's sets out this progression in the form of three 'Milestones'. Each Milestone contains a range of descriptors which give more detail to be discovered within the concept. Over a two year period students will become more and more familiar with these details by exploring them in a breadth of contexts. These descriptors are not exhaustive and should only be used as a guide for teachers. They should not be 'ticked off' as each one is covered: they should be repeated in as many different contexts as possible.

Threshold Concept	Milestone 1	Milestone 2	Milestone 3
Creativity	• Generate and communicate their ideas through a range of different methods. (Generation of ideas) • Explore how a structure can be made stronger, stiffer and more stable. (Structures)	• Use annotated sketches and exploded diagrams to test and communicate their ideas. (Generation of ideas) • Use design software to create a simple labelled design or plan. (Use of ICT) • Prototype shell and frame structures, showing awareness of how to strengthen, stiffen and reinforce them. (Structures)	• Use pattern pieces and computer-aided design packages to design a functional and appealing product that is fit for purpose, communicating ideas clearly in a range of ways. (Generation of ideas) • Use a sensor to monitor an environmental variable, such as temperature, sound or light. (Use of ICT) • Select the most appropriate materials and frameworks for different structures, explaining what makes them strong. (Structures)

Threshold Concept	Milestone 1	Milestone 2	Milestone 3
Investigation	• Select the appropriate tool for a task and explain their choice. (Investigation) • Explain how closely their finished products meet their design criteria and say what they could do better in the future. (Evaluate)	• Select, name and use tools safely for cutting and joining materials/components with adult supervision. (Investigation) • Identify what has worked well and what aspects of their products could be improved, acting on their own suggestions and those of others when making improvements. (Evaluate)	• Select appropriate tools for a task and use them safely and precisely. (Investigation) • Demonstrate modifications made to a product, as a result of ongoing evaluation by themselves and others. (Evaluate)

Threshold Concept	Milestone 1	Milestone 2	Milestone 3
Nature	• Measure and weigh food items using non-standard measures, i.e. spoons/cups and prepare ingredients by peeling, grating, chopping and slicing. (Food preparation and cooking) • Describe the types of food needed for a healthy and varied diet and apply the principles to make a simple, healthy meal. (Nutrition) • Identify the origin of some common foods - milk, eggs, some meats, common fruit and vegetables. (Origin of food)	• Identify and use a range of cooking techniques to prepare a simple meal. (Food preparation and cooking) • Design a healthy snack or packed lunch and explain why it is healthy, using main food groups - carbohydrates, protein, dairy, fruits and vegetables, fats and sugars. (Nutrition) • Identify and name foods that are produced in different places in the UK and beyond. (Origin of food)	• Follow a recipe that requires a variety of techniques and source the necessary ingredients independently. (Food preparation and cooking) • Plan a healthy weekly diet, justifying why each meal contributes towards a balanced diet. (Nutrition) • Explain how organic produce is grown and benefits behind it. (Origin of food)

Threshold Concept	Milestone 1	Milestone 2	Milestone 3
Materials	• Choose appropriate components and materials and suggest ways of manipulating them to achieve the desired effect. (Materials for purpose)	• Choose from a range of materials, showing an understanding of their different characteristics. (Materials for purpose)	• Choose the best materials for a task, showing an understanding of their working characteristics. (Materials for purpose)

Threshold Concept	Milestone 1	Milestone 2	Milestone 3
Processes	• Create an operational, simple series circuit and explain how it works. (Electricity) • Use a range of mechanisms - levers, sliders, wheels and axles - in models or products. (Mechanisms and movement)	• Incorporate circuits that use a variety of components into models or products. (Electricity) • Explore and use a range of mechanisms - levers, axles, cams, gears and pulleys - in models or products. (Mechanisms and movement)	• Understand and use electrical circuits that incorporate a variety of components - switches, lamps, buzzers and motors - and use programming to control their products. (Electricity) • Explain and use mechanical systems in their products to meet a design brief. (Mechanisms and movement)

Threshold Concept	Milestone 1	Milestone 2	Milestone 3
Comparison	• Compare different brands of the same product and explain their similarities and differences. (Compare and contrast)	• Create and complete a comparison table to compare two or more products. (Compare and contrast)	• Create a detailed comparative report about two or more products or inventions. (Compare and contrast)

Threshold Concept	Milestone 1	Milestone 2	Milestone 3
Humankind	• Explain how an everyday product could be improved. (Everyday products) • Work safely and hygienically in construction and cooking activities. (Staying safe)	• Investigate and identify the design features of a familiar product. (Everyday products) • Work safely with everyday chemical products under supervision, such as disinfectant hand wash and surface cleaning spray. (Staying safe)	• Analyse how an invention or product has significantly changed or improved people's lives. (Everyday products) • Demonstrate how their products take into account the safety of the user. (Staying safe)

Threshold Concept	Milestone 1	Milestone 2	Milestone 3
Significance	• Explain why a designer or inventor is important. (Significant people)	• Explain how and why a significant designer or inventor shaped the world. (Significant people)	• Present a detailed account of the significance of a favourite designer or inventor. (Significant people)