The DT Curriculum at Crowthorne – Key Stage 2

Through a variety of creative and practical activities, pupils 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].

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.

	Year 3	**Year 4**	**Year 5**	**Year 6**
NC Objective	Mechanisms: Moving Monsters (SP2) Structures: Board Games (SU1) Cooking and Nutrition: Pizzas (SU2)	Structures: Chairs (AU1) Electronics and control: Steady Hand Game (Micro:bits) (SP2) Mechanisms: Pop-up books (SU2)	Mechanisms : Cam Toys (AU2) Cooking and nutrition: Greek Food (SP1) Electronics and control: Burglar Alarm (SU2)	Enterprise (AU2) Structures: Shelters (SP2) Textiles: Cushion (SU2)
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,	**Moving Monsters**: Design a pneumatic dragon to scare away Lord Pellinore (SP2) Draw and annotate a picture of their moving monster (SP2) Plan the order of work needed to make their dragon. (SP2) Make a simple paper prototype to trial the addition of decorative features.(SP2) **Board Games**:	**Chairs:** Research different chairs by looking at the materials used and the features they have. Design a strong and stable chair for a movie character to use on set. (AU1) Draw a labelled design of a chair for their chosen character. (AU1) Plan the order of work needed to make their chair. (AU1) **Steady Hand Game:**	**Cam toys:** Research cam toys and investigate how rotary motion coverts to linear motion and how the type of cam used in the design effects the output. (AU2) Design a moving cam toy for a KS1 or KS2 child. (AU2) Produce annotated sketches of design ideas from different viewpoints, including 3-dimensional drawings. (AU2)	**Enterprise:** Design an appealing product to sell at the Christmas Fayre to raise funds for the school. (AU2) Investigate potential products suitable for sale at a Christmas Fayre drawing on experience from previous years. (AU2) Carry out market research to help decide which products are most popular with potential buyers. (AU2) Collaborate in a small group to decide on which

pattern pieces and computer-aided design	Design a game for a child in Year 3 to revise an area of learning. (SU1) Draw and annotate a design for their board game. (SU1) Plan to use appropriate equipment, components and techniques. (SU1) Plan the order of work for making their game. (SU1) Practise making 3D shapes prior to making their board game. (SU1) **Pizzas**: Design a healthy pizza a supermarket's new Healthy Eating range. (SU2) Create an exploded diagram of their pizza to plan toppings. (SU2) Plan the order of work needed to make their pizza. (SU2) Combine food to make a tasty pizza, taking flavour and texture into account. (SU2)	Design a steady hand tester game (using an electrical circuit) to raise money at the school fair. (SP2) Draw a labelled diagram for their steady hand tester. (SP2) Plan the order of work for making their game. (SP2) Understand that their design must have "customer appeal" in order to raise money (ie. be fun to play, not too easy, not too hard) (SP2) **Pop-up books:** Design a pop-up book for a Reception child to teach them a phonics sound. (SU2) Recognise that text and pictures need to be educational as well as fun. (SU2) Draw labelled diagrams to explain how the moving pictures on each page will work. (SU2)	Use the internet to research ideas for the aesthetic appeal of their toy. (AU2) Use the correct vocabulary to describe different parts of the cam mechanism. Create simple prototypes to test how their toy will work and practise assembling and dismantling a cam mechanism. (AU2) **Greek food:** Design a well-balanced meal to impress a food critic visiting the Y5 Greek Restaurant. (SP1) Research foods eaten in ancient and modern day Greece. (SP1) Food tasting of ingredients and dishes currently on the market. (SP1) Develop a food vocabulary in order to describe the foods they taste. (SP1) Produce a cross sectional diagram of a dish on the market. (SP1) Demonstrate an awareness of the need for a balanced diet and the importance of using foods which are in season when designing their menu. (SP1) Produce labelled diagrams of the dishes they design. (SP1)	product to make and produce a design annotated with possible material choices and costings. (AU2) Make prototypes to test whether the product is functional and aesthetically pleasing. (AU2) **Shelters:** Investigate a range of different shelters designed to withstand extreme weather conditions and make annotated sketches. (SP2) Use research to design a shelter which can support a given weight and which will stay dry to protect a family made homeless following an earthquake. (SP2) **Cushions:** Design a cushion to remind you of your time at Crowthorne C of E Primary. (SU2) Investigate different types of cushions from different periods in history and different cultures. (SU2) Name and know the properties of some common fabrics (SU2) Explore different fastenings: secure, durable,

			Produce step-by-step plans for making the dishes on their menu. (SP1) **Burglar alarm:** Design a light sensitive burglar alarm that could be used by a museum to alert staff if an artefact was removed from its stand. (SU2) Research into how different burglar alarms are triggered eg. movement/light sensor, broken connection in an electrical circuit, laser beam etc. (SU2) Produce an annotated circuit diagram for their burglar alarm. (SU2) Produce step by step instructions for making their burglar alarm using the correct technical vocabulary. (SU2)	part of design/hidden, use of envelope fold, snap fasteners and buttons (SU2). Use research to inform the design of the cushion, ensuring that it is both functional and aesthetically pleasing. (SU2) Generate several designs before choosing the most appropriate option. (SU2) Produce a clearly annotated design drawing giving details of materials required. (SU2) Use correct technical vocabulary when describing materials, sewing techniques and equipment. (SU2)
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	**Moving Monsters**: Cut (shapes, fringing), score and fold card accurately (eg. nets for 3-d shapes, including those with curved edges) (SU1) Use a glue gun with 1:1 supervision to secure the syringe part of their pneumatic system. (SP2) Use strong card for structure of monster;	**Chairs:** Cut wood with a hacksaw to 10mm accurately. (AU1) Sand wood evenly to create a smooth finish. (AU1) Select appropriate materials/components to decorate their chair appropriately. (AU1) **Steady Hand Game:**	**Cam toy:** Measure and cut wood neatly to 1mm accuracy. (AU2) Sand wood to shape it for a purpose. (AU2) Use a hand drill to drill holes in wood. (AU2) Join materials with glue, including use of a glue gun under supervision. (AU2)	**Enterprise:** Select appropriate materials from the following options: wood, felt, wool, card. (AU2) Make use of previously learned skills (eg.sanding, measuring, sawing, joining) to make a quantity of products. (AU2)

construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities	syringes, tubing and levers to create their pneumatic system and thinner card, textiles for their decorations. **Board Games**: Use pre-drawn nets to make 3-d card pieces for their board game. (SU1) Cut, score and fold card accurately. (SU1) **Pizzas**: Cut, chop, peel and slice food safely and hygienically. (SU2) Use an oven under close supervision. (SU2) Choose healthy ingredients to top their pizzas with and design the pizza to include a variety of colours, textures and flavours.	Select the appropriate electrical components needed to construct their steady hand tester. (SP2) **Pop-up books:** Accurately cut, score and fold the card components needed to make their book. (SU2) Use a hole punch with accuracy when making holes for split pins in cardboard levers and linkages. (SU2) Cut slots and windows in card. (SU2)	Use cams to make an up/down mechanism. (AU2) Work carefully to achieve a high quality finish. (AU2) **Greek food:** Weigh ingredients using kitchen scales. (SP1) Cut, slice, peel and grate foods as appropriate (SP1) Cook foods on a stove or in an oven as appropriate. (SP1) Prepare foods safely and hygienically. (SP1) **Burglar Alarm:** Select appropriate materials to make the stand for their artefact. (SU2) Select the appropriate electrical components needed to construct their burglar alarm. (SU2)	Ensure that all products are finished to saleable quality. (AU2) **Shelters:** Practise joining using appropriate fixings and methods for reinforcing materials. (SP2) Make prototypes to test their designs using straws, wire, pipe cleaners, paper, card, fabric, plastic, sticky tape, string, blu-tack. (SP2) **Cushions:** Use appropriate equipment to construct their design (eg correct sized needle, sharp scissors, paper templates, pins etc). (SU2) Cut fabrics accurately using pattern pieces. (SU2) Understand the need for a seam allowance. (SU2) Pin (and tack) materials together before sewing. (SU2) Join fabrics using a variety of stitches (ie. hidden stiches: running, back, over, zigzag and visible stiches: over or blanket.) (SU2) Choose appropriate decorative materials and adornments to ensure a high quality finish. (SU2)

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	**Moving Monsters:** Recognise what isn't working and suggest a modification. (SP2) Learn about Dunlop pneumatic tyres and the develop of air power (SP2) Investigate use of air power and different systems (SP2) **Board Games:** Research the history of board games (SU1) Trial current marketed games and games with errors to discuss and evaluate successful and unsuccessful elements of games (SU1) Play completed board games with another group to evaluate the success of the design. (SU1) Evaluate how well their game helps a Year 3 child to revise an area of learning. (SU1) Suggest where their board game could be changed for the better. (SUM1) **Pizzas:** Taste test pizzas and use a star graph to evaluate different elements. (SU2)	**Chairs:** Look at a range of existing chairs and evaluate their suitability for different purposes. (AU1) Evaluate how well their finished chair meets the design brief. (AU1) Identify where the design brief has not been met and suggest a modification. (AU1) Show where they have changed their design for the better. (AU1) Learn about the invention of plastic and how this facilitated the mass production of cheap, lightweight products. (AU1) **Steady Hand Game:** During the production process, recognise what isn't working and suggest a modification. (SP2) Show where they have changed their design for the better. (SP2) Test their game by playing it with their peers and evaluate how well it meets the design brief. (SP2) Find out about how Alessandro Volta invented the battery and made it possible to create portable electronic devices. (SP2)	**Cam toy:** Be able to make modifications to their toy during manufacture and explain why. (AU2) Critically evaluate appearance and function of their finished toy, including advice for the next class of Y5's Understand how the invention of gears in China in 300BC has enabled the development of machines. (AU2) **Greek food:** Develop their own criteria for evaluation. (SP1) Critically evaluate the appearance and taste of their Greek dishes in addition to how well the design brief has been met. (SP1) Understand how the invention of the refrigerator enabled perishable foods to be preserved for longer so that people could eat fresh foods all year round. (SP1) **Burglar Alarm:** Be able to make modifications to their burglar alarm during manufacture and explain why. (SU2)	**Enterprise:** Be able to make modifications to their design based on information gained from market research and making prototypes. (AU2) Develop their own criteria for evaluating the function, construction and customer appeal of their product. (AU2) Evaluate the overall success of the project by calculating the profit made from the sale of their products at the Fayre. (AU2) Learn about the lives and business achievements of two famous entrepreneurs:- Sarah Bredelove and Richard Branson. (AU2) **Shelters:** Make modifications to their structures during manufacture and explain why. (SP2) Develop tests to evaluate the strength and waterproofness of their shelters. (SP2) Compare their finished shelter with those of their peers,

	Repeat the use of this graph to evaluate their own pizza when cooked. (SU2) Evaluate how well their pizza meets the requirement to be healthy. (SU2) Learn about the invention of the canning process and how this extended the shelf life of many foods. (SU2)	Learn about the invention of the 3-position traffic light by Garret Morgan. **Pop-up books:** Explore the range of different pop-up mechanisms in a selection of published pop-up books. (SU2) Test their finished book with Reception children and evaluate how well it met the design brief. (SU2) Learn about the invention of paper in China in 250AD. (SU2)	Develop their own criteria for evaluating the success of their burglar alarm. (SU2) Understand the role played by Ada Lovelace in the development of the first computers. (SU2) Learn about the invention of closed-circuit television security by Marie Van Britten Brown. (SU2)	evaluating each against the design criteria. (SP2) Use peer evaluation to suggest improvements to a friend's shelter. (SP2) Learn about the work of Renzo Piano who designed sliding joints which are used in the construction of earthquake proof buildings. (SP2) **Cushions:** Modify their plan if they make changes during sewing and explain why. (SU2) Critically evaluate the appearance and function of their cushion. (SU2) Analyse any problems during construction, and explain how these were overcome and how they might alter future designs. (SU2) Understand the how the Industrial Revolution led to the mechanisation of textile production which had previously been a cottage industry. (SU2)
Technical knowledge • apply their understanding of how to strengthen, stiffen and reinforce more complex structures	**Moving Monsters:** Understand how to make their monster move with the use of a pneumatic system – using a balloon and syringe. (SP2)	**Chairs:** Understand how to strengthen and reinforce a wooden framework (eg using strengthening struts, jinks corners) (AU1)	**Cam toys:** Use construction kits (K'nex) in Science to explore different mechanisms (levers, gears and pulleys). (AU2)	**Enterprise:** Apply knowledge of different joining, stiffening and strengthening techniques to ensure their

• 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.	**Board Games:** Know how to strengthen/stiffen the card used to make their board games (eg by gluing several layers together or adding a lollypop stick behind) (SP2)	**Steady Hand Game:** Build a circuit with a micro:bit, battery and switch. (SP2) Program a micro:bit to monitor a players performance and give appropriate feedback (eg LED display with smiley face which turns to a sad face after 3 mistakes) (SP2) **Pop-up books:** Use card and split pins to make a system of levers and linkages to make a figure move. (SU2)	**Burglar Alarm:** Create an electrical circuit which incorporates a micro:bit. (SU2) Be able to trouble shoot a circuit which isn't working properly. (SU2) Programme a micro:bit to monitor light levels and sound an alarm if a given light level is reached. (SU2)	products are sturdily constructed. (AU2) **Shelters:** Use their knowledge of 3D shapes to construct strong and stable frameworks. (SP2)
Cooking and nutrition Pupils should be taught to: • 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.	**Pizzas:** Learn about the 'Eatwell plate' and how this applies to planning their cooking. (SU2) Create a 'healthy' pizza and be able to explain their choices based on this criteria. (SU2) Follow a simple pizza recipe. (SU2)		**Cam toys:** Build on learning in KS1 (The Eatwell plate) by revising the different food groups and how much of each food group we need to stay healthy. (SP1) Prepare and cook dishes for a Greek savoury meal including a meat and or veg kebab with a homemade marinade, a traditional Greek salad and a dip. (SP1) Know about how some of the foods used to make their dishes are grown, reared, caught or processed. (SP1)	

			Understand the concept of seasonality and know which of the foods used to make their dishes are in season. (SP1)	