**Our Design and Technology**

**Journey through school**

|  |  |  |
| --- | --- | --- |
| STAGE | TOPICS AND THEMES | KNOWLEDGE |
| Early Years Foundation Stage | **Junk modelling** | Explore and investigate tools in the junk modelling area.  Investigate cutting different materials.  Learn how to plan and select the correct resources needed to make a model.  Verbally plan and create a junk model.  Share a finished model and talk about the processes in its creation.  Explore different ways to temporarily join materials together. |
| Key Stage One | Year 1  **Mechanisms- Making a Moving Story Book**  **Mechanisms- Wheels and Axles**  **Textiles - Puppets**  **Structures- Constructing a windmill**  **Food- Fruit and Vegetables**  Year 2  **Mechanisms- Fairground Wheel**  **Food- A Balanced Diet** | Explore making mechanisms.  Design a moving storybook.  Construct a moving picture.  Evaluate a finished product.  ***Key Vocabulary***  **sliders, mechanism, adapt, design criteria**  **design, input, model, template, assemble**  **test**  Understand how wheels move.  Identify what stops wheels from turning.  Design a moving vehicle.  Build a moving vehicle.  ***Key Vocabulary***  **axle, axle holder, chassis, diagram, dowel, equipment, mechanism, wheel**  Join fabrics together using different methods.  Use a template to create a design.  Join two fabrics together accurately.  Embellish a design using joining methods.  ***Key Vocabulary***  **Decorate, design, fabric, glue, model**  **hand puppet, safety pin, staple, stencil**  **template**  Include individual preferences and requirements in a design.  Make a stable structure.  Assemble the components of a structure.  Evaluate a project and adapt a design.  ***Key Vocabulary***  **Axle, bridge, design, design criteria, model**  **Net, packaging, structure, template, unstable, stable, strong, weak**  Identify if a food is a fruit or a vegetable.  Identify where plants grow and which parts we eat.  Taste and compare fruit and vegetables.  Make a fruit and vegetable smoothie.  ***Key Vocabulary***  **fruit, vegetable, seed, leaf, root, stem, smoothie, healthy, carton, design, flavour, peel, slice**  Explore wheel mechanisms and design a wheel.  Select appropriate materials.  Build and test a moving wheel.  Make and evaluate a structure with a moving wheel.  ***Key Vocabulary***  **design, design criteria, wheel, Ferris wheel, pods, axle, axle holder, frame, mechanism**  Know what makes a balanced diet.  Taste test food combinations.  Design a healthy wrap.  Make a healthy wrap.  ***Key Vocabulary***  **balanced diet, balance, carbohydrate, dairy, fruit, ingredients, oils, sugar, protein**  **vegetable, design criteria** |
| Lower Key Stage Two | Year 3  **Mechanical Systems- Pneumatic Toys**  **Electrical Systems- Electric Poster**  **Textiles- Cross-stitch and Applique**  **Egyptian Collars**  **Structures- Constructing a Castle**  **Digital World- Electronic Charm**  **Food- Eating Seasonally**  Year 4  **Mechanical systems- Making a Slingshot Car**  **Electrical Systems - Torches**  **Structures- Pavilions**  **Digital World- Mindful Moments Timer**  **Food- Adapting a Recipe** | Understand how pneumatic systems work.  Design a toy that uses a pneumatic system.  Create a pneumatic system.  Test and finalise ideas against design criteria.  ***Key Vocabulary***  **mechanism, lever, pivot, linkage system, pneumatic system**  **Input, output, component**  **thumbnail sketch, research**  **adapt, properties, reinforce**  **motion**  Understand the purpose of information design.  Research a set topic to develop a range of initial ideas.  Develop an initial idea into a final design.  Assemble a final product and input a simple circuit.  ***Key Vocabulary***  **information design, design, public**  **design criteria, research, initial ideas, sketch, bulb, self- assessment, peer assessment**  **feedback, develop, final design**  **electrical system, electric product**  **circuit, circuit component, bulb**  **battery, crocodile wires**  Learn how to sew cross-stitch and to applique.  Develop and use a template.  Assemble fabric parts into a fabric product.  Decorate fabric using applique and cross-stitch  ***Key Vocabulary***  **appliqué, cross-stitch, fabric**  **running stitch, patch, thread**  **embellish, template, cotton, silk**  **polyester, wrinkle, tear, water-resistant, breathable, matt, shiny**  **biodegrade**  Recognise how multiple shapes are combined to form a strong and stable structure.  Design a castle.  Construct 3D nets.  Construct and evaluate a final product.  ***Key Vocabulary***  **2D, 3D, castle, design, key features, net, scoring, shape**  **stable, stiff, strong, structure**  **tab**  Understand the impact of the digital revolution in the world of (D and T) product design.  Write a programme to initiate a flashing LED panel after button press and/ or automatically initiate using the Micro:bit light sensing as part of an eCharm.  Create and decorate a foam pouch for the eCharm, using a template.  Design a display badge and/ or stand using CAD (computer aided design) software for an eCharm product.  ***Key Vocabulary***  **smart wearables, product design**  **digital revolution, technology, analogue, digital, feature, function**  **digital world, Micro:bit**  **electronic products, program loops, initiate, simulator, control**  **monitor, sense, template, develop**  **fasten, test, user**  **CAD (computer-aided design)**  **point of sale, display, badge, stand, net**  **design requirements, layers**  Know that climate affects food growth.  Understand the advantages of eating seasonal foods grown in the UK.  Create a recipe that is healthy and nutritious.  Safely follow a recipe when cooking.  ***Key Vocabulary***  **climate, diet, imported, ingredients, natural, processed**  **reared, recipe, seasonal, seasons, sugar**  Build a car chassis.  Design a shape that reduces are resistance.  Make a model based on a chosen design.  Assemble and test a completed product  ***Key Vocabulary***  **chassis, energy, kinetic, mechanism, air resistance, design, structure, graphics, research, model, template**  Learn about electrical items and how they work.  Analyse and evaluate electrical products.  Design a product to fit a set of specific user needs.  Make and evaluate a torch.  ***Key Vocabulary***  **battery, bulb, buzzer, conductor**  **circuit, circuit diagram, electricity**  **insulator, series circuit, switch**  **component, design, design criteria, diagram, evaluation, LED**  **model, shape, target audience**  **input, recyclable, theme, aesthetics, assemble, equipment**  **Ingredients, packaging, properties, sketch, test**  Create a range of different shaped frame structures.  Design a structure.  Build a frame structure.  Add cladding to a frame structure.  ***Key Vocabulary***  **3D shapes, cladding, design criteria, innovative, natural, reinforce, structure**  Create a design criteria for an electronic timer based on analysis of existing products.  Apply understanding of computer programming to instruct and control a Micro:bit to function as a timer.  Design, make and develop a prototype case for my mindful moment timer.  Design a logo for a mindfulness company using computer-aided design.  ***Key Vocabulary***  **Research, advantage, disadvantage, criteria, design**  **ergonomic, timer, program, loop**  **coding, block, variable, pause**  **bug, debug, instructions, net**  **template, develop, join, assemble, test, form, function**  **prototype, process, cheap**  **user, model, evaluate, logo**  **Clipart, brand identity, branding**  **Sketchpad, computer-aided design (CAD), 2D**  **mindfulness**  Follow a baking recipe.  Make and test a prototype.  Design a biscuit to a given budget.  Make a biscuit that meets a given design brief.  ***Key Vocabulary***  **design criteria, research, texture**  **innovative, aesthetic, measure**  **cross-contamination, diet**  **processed, packaging** |
| Upper Key Stage Two | Year 5  **Mechanical Systems- Pop-up Book**  **Electrical Systems- Doodlers**  **Textiles- Stuffed Toys**  **Structures - Bridges**  **Digital World- Monitoring Devices**  **Food- What Could Be Healthier?**  Year 6  **Electrical Systems- Steady Hand Game**  **Textiles - Waistcoats**  **Structures- Playgrounds**  **Digital World- Navigating the World**  **Food - Come Dine With Me** | Design a pop-up book.  Follow my design brief to make my pop up book.  Use layers and spacers to cover the working of mechanisms.  Create a high-quality product suitable for a target user.  ***Key Vocabulary***  **design, input, motion, mechanism, criteria, research**  **reinforce, model**  Understand how motors are used in electrical products.  Investigate an existing product to determine the factors that affect the product's form and function.  Put findings from research into practice to develop an improved product.  Develop a DIY kit for another individual to assemble their product.  ***Key Vocabulary***  **circuit component, configuration**  **current, develop, DIY**  **investigate, motor, motorised**  **problem solve, product analysis**  **series circuit, stable**  **target user**  Design a stuffed toy.  Sew blanket stitch.  Create and add decorations to fabric.  Use a blanket stitch to assemble the components of a stuffed toy.  ***Key Vocabulary***  **accurate, annotate, appendage**  **blanket-stitch, design criteria**  **detail, evaluation, fabric, sew**  **shape, stuffed toy, stuffing**  **template**  Explore how to reinforce a beam (structure) to improve its strength.  Build a spaghetti truss bridge.  Build a wooden truss bridge.  Complete, reinforce and evaluate my truss bridge.  ***Key Vocabulary***  **beam bridge, arch bridge, truss bridge, strength, technique**  **corrugation, lamination**  **stiffness, rigid, factors, stability**  **visual appeal, aesthetics**  **joints, mark out, hardwood**  **softwood, wood file/rasp**  **sandpaper/glasspaper**  **bench hook/vice**  **tenon saw/coping saw**  **assemble, material properties**  **reinforce, wood sourcing**  **evaluate, quality of finish**  **accuracy**  Carry out research to develop design criteria.  Write a program to monitor the ambient temperature including an alert.  Generate creative and unique micro:bit case, stand and/or housing ideas.  Learn about and practise 3D CAD skills.  ***Key Vocabulary***  **monitoring device, electronic sensor**  **thermoscope, thermometer**  **research, design brief, design criteria**  **development, inventor, vivarium**  **programming loop, programming comment, alert, ambient, boolean**  **duplicate, copy, value, variable**  **model, sustainability, plastic, microplastics, decompose**  **plastic pollution, man-made**  **synthetic, molecules, reformed**  **moulded, transparent, opaque, versatile**  **lightweight, strong, water-resistant**  **durable, 3D models, consumables**  **CAD, shape properties**  **Tinkercad, workplane, group, ungroup**  Understand where food comes from.  Understand the term ‘healthy’.  Adapt a traditional recipe.  Complete a food product.  ***Key Vocabulary***  **beef, reared, processed**  **ethical, diet, ingredients**  **supermarket, farm**  **balanced**  Research and analyse a range of children’s toys.  Design a steady hand game.  Construct a stable base.  Assemble electronics and complete an electronic game  ***Key Vocabulary***  **assemble, battery, battery pack**  **benefit, bulb, bulb holder**  **buzzer, circuit, circuit symbol**  **component, conductor, copper**  **design, design criteria**  **evaluation, fine motor skills**  **fit for purpose, form, function**  **gross motor skills, insulator**  **LED, user**  Design a waistcoat.  Mark and cut fabric according to a design.  Assemble a waistcoat.  Decorate a waistcoat.  ***Key Vocabulary***  **annotate, decorate, design criteria, fabric, target customer**  **waistcoat, waterproof**  Design a playground with a variety of structures.  Build a range of structures.  Improve and add detail to structures.  Create the surrounding landscape.  ***Key Vocabulary***  **apparatus, design criteria**  **equipment, playground**  **landscape, features**  **cladding**  Write a design brief and criteria based on a client’s request.  Write a program to include multiple functions as part of a navigation device.  Develop a sustainable product concept.  Develop 3D CAD skills to produce a virtual model.  ***Key Vocabulary***  **Smart, smartphone, equipment**  **Navigation, cardinal compass**  **application (apps), pedometer**  **GPS tracker, design brief**  **design criteria, client, function**  **program, duplicate, replica**  **loop, variable, value,**  **if statement, boolean, corrode**  **mouldable, lightweight**  **sustainable design**  **environmentally friendly**  **biodegradable, recyclable**  **product lifecycle**  **product lifespan**  Research and design a three- course meal.  Prepare a meal using a recipe  Understand where their food comes from.  Write up a recipe.  ***Key Vocabulary***  **equipment, flavours**  **ingredients, method, research**  **recipe, bridge method**  **cookbook, cross-contamination**  **farm to fork, preparation**  **storyboard** |