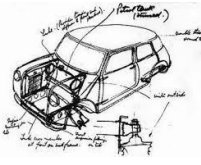









## Design & Technology (D.T.) - Curriculum Overview (Year B)

Year	Subject specific Vocabulary	'The Greats'	Autumn 2 Structures	Spring 2 Cooking and Nutrition (KS1) Electrical Systems (KS2) Structures (EYFS)	Summer 2 Mechanisms/Mechanical systems (KS1) Digital World (KS2) Structures (EYFS)
Nursery			<p><b><u>Personal, Social &amp; Emotional Development (PSED):</u></b>  <b>Managing Self</b></p> <ul style="list-style-type: none"> <li>Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen, or one which is suggested to them</li> </ul> <p><b><u>Physical Development (PD):</u></b>  <b>Gross Motor Skills</b></p> <ul style="list-style-type: none"> <li>Choose the right resources to carry out their own plan. For example, choosing a spade to enlarge a small hole they dug with a trowel</li> </ul> <p><b>Fine Motor Skills</b></p> <ul style="list-style-type: none"> <li>Use one-handed tools and equipment, for example, making snips in paper with scissors</li> </ul> <p><b><u>Understanding the World:</u></b>  <b>The Natural World</b></p> <ul style="list-style-type: none"> <li>Explore how things work</li> </ul> <p><b><u>Expressive Arts and Design:</u></b>  <b>Creating with Materials</b></p> <ul style="list-style-type: none"> <li>Make imaginative &amp; complex 'small worlds' with blocks &amp; construction kits, such as a city with different buildings and a park</li> <li>Explore different materials freely, in order to develop their ideas about how to use them and what to make</li> <li>Develop their own ideas and then decide which materials to use to express them</li> <li>Join different materials and explore different textures</li> <li>Draw with increasing complexity and detail, such as representing a face with a circle and including details</li> <li>Use drawing to represent ideas</li> </ul>		
Reception			<p><b><u>Physical Development (PD):</u></b>  <b>Fine Motor Skills</b></p> <ul style="list-style-type: none"> <li>Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Suggested tools: pencils for drawing and writing, paintbrushes, scissors, knives, forks and spoons.</li> </ul>	<p><b><u>Physical Development (PD):</u></b>  <b>Fine Motor Skills (ELG)</b></p> <ul style="list-style-type: none"> <li>Use a range of small tools, including scissors, paintbrushes and cutlery</li> </ul> <p><b><u>Expressive Arts and Design:</u></b>  <b>Creating with Materials (ELG)</b></p> <ul style="list-style-type: none"> <li>Safely use &amp; explore a variety of materials, tools &amp; techniques, experimenting with colour, design, texture, form &amp; function</li> <li>Share their creations, explaining the process they have used</li> </ul>	

<p><b>Year 1</b></p>	<p><b><u>Constructing a Windmill</u></b>          Client          Design          Evaluation          Net          Stable          Strong          Test          Weak          Windmill</p> <p><b><u>Fruit and Vegetables</u></b>          Blender          Carton          Fruit          Healthy          Ingredients          Peel          Peeler          Recipe          Slice          Smoothie          Stencil          Template          Vegetable</p> <p><b><u>Wheels and Axels</u></b>          Axle          Axle holder          Chassis          Design          Evaluation          Fix          Mechanic          Mechanism          Model</p>	<p><b>Alec Issigonis</b></p> 	<p><b><u>Constructing a Windmill</u></b>  <b>Design</b>          -Learning the importance of a clear design criteria          -Including individual preferences and requirements in a design  <b>Make</b>          -Making stable structures from card, tape and glue          -Following instructions to cut and assemble the supporting structure of a windmill          -Making functioning turbines and axles which are assembled into a main supporting structure  <b>Evaluate</b>          -Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't          -Suggest points for improvements  <b>Technical Knowledge</b>          -Describing the purpose of structures, including windmills          -Learning how to turn 2D nets into 3D structures          -Learning that the shape of materials can be changed to improve the strength and stiffness of structures          -Understanding that cylinders are a strong type of structure that are often used for windmills and lighthouses          -Understanding that windmill turbines use wind to turn and make the machines inside work          -Understanding that axles are used in structures and mechanisms to make parts turn in a circle          -Developing awareness of different structures for different purposes</p>	<p><b><u>Fruit and Vegetables</u></b>  <b>Design</b>          -Designing smoothie carton packaging by-hand or on ICT software  <b>Make</b>          -Chopping fruit and vegetables safely to make a smoothie          -Identifying if a food is a fruit or a vegetable          -Learning where and how fruits and vegetables grow  <b>Evaluate</b>          -Tasting and evaluating different food combinations          -Describing appearance, smell and taste          -Suggesting information to be included on packaging  <b>Technical Knowledge</b>          -Understanding the difference between fruits and vegetables          -Describing and grouping fruits by texture and taste</p>  	<p><b><u>Wheels and Axels</u></b>  <b>Design</b>          -Explaining how to adapt mechanisms, using bridges or guides to control the movement          -Designing a moving story book for a given audience          -Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move          -Creating clearly labelled drawings which illustrate movement  <b>Make</b>          -Following a design to create moving models that use levers and sliders          -Adapting mechanisms  <b>Evaluate</b>          -Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed          -Reviewing the success of a product by testing it with its intended audience          -Testing mechanisms, identifying what stops wheels from turning, knowing that a wheel needs an axle in order to move  <b>Technical Knowledge</b>          -Learning that levers and sliders are mechanisms and can make things move          -Identifying whether a mechanism is a lever or slider and determining what movement the mechanism will make          -Using the vocabulary: up, down, left, right, vertical and horizontal to describe movement          -Identifying what mechanism makes a toy or vehicle roll forwards          -Learning that for a wheel to move it must be attached to an axle</p>
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	<p>Test Wheel</p>				
<p>Year 2</p>	<p><b>Baby Bear's Chair</b>            Function            Man-made            Mould            Natural            Stable            Stiff            Strong            Structure            Test            Weak</p> <p><b>A Balanced Diet</b>            Alternative            Diet            Balanced diet            Evaluation            Expensive            Healthy            Ingredients            Nutrients            Packaging            Refrigerator            Sugar            Substitute</p> <p><b>Fairground Wheel</b></p>	<p>Marcel Breuer</p> 	<p><b>Baby Bear's Chair</b>  <u>Design</u>            -Generating and communicating ideas using sketching and modelling            -Learning about different types of structures, found in the natural world and in everyday objects  <u>Make</u>            -Making a structure according to design criteria            -Creating joints and structures from paper/card and tape  <u>Evaluate</u>            -Exploring the features of structures            -Comparing the stability of different shapes            -Testing the strength of own structures            -Identifying the weakest part of a structure            -Evaluating the strength, stiffness and stability of own structure  <u>Technical Knowledge</u>            -Identifying natural and man-made structures            -Identifying when a structure is more or less stable than another            -Knowing that shapes and structures with wide, flat bases or legs are the most stable            -Understanding that the shape of a structure affects its strength</p>	<p><b>A Balanced Diet</b>  <u>Design</u>            -Designing a healthy wrap based on a food combination which work well together  <u>Make</u>            -Slicing food safely using the bridge or claw grip            -Constructing a wrap that meets a design brief  <u>Evaluate</u>            -Describing the taste, texture and smell of fruit and vegetables            -Taste testing food combinations and final products            -Describing the information that should be included on a label            -Evaluating which grip was most effective  <u>Technical Knowledge</u>            -Understanding what makes a balanced diet            -Knowing where to find the nutritional information on packaging            -Knowing the five food groups</p> 	<p><b>Fairground Wheel</b>  <u>Design</u>            -Creating a class design criteria for a moving monster            -Designing a moving monster for a specific audience in accordance with a design criteria            -Selecting a suitable linkage system to produce the desired motions            -Designing a wheel Selecting appropriate materials based on their properties  <u>Make</u>            -Making linkages using card for levers and split pins for pivots            -Experimenting with linkages adjusting the widths, lengths and thicknesses of card used            -Cutting and assembling components neatly            -Selecting materials according to their characteristics            -Following a design brief  <u>Evaluate</u>            -Evaluating own designs against design criteria            -Using peer feedback to modify a final design            -Evaluating different designs            -Testing and adapting a design  <u>Technical Knowledge</u>            -Learning that mechanisms are a collection of moving parts that work together in a machine</p>



Axle  
Decorate  
Evaluation  
Ferris wheel  
Mechanism  
Stable  
Strong  
Test  
Waterproof  
Weak

-Using the vocabulary: strength, stiffness and stability  
-Knowing that materials can be manipulated to improve strength and stiffness  
-Building a strong and stiff structure by folding paper




-Learning that there is an input and output in a mechanism  
-Identifying mechanisms in everyday objects  
-Learning that a lever is something that turns on a pivot  
-Learning that a linkage is a system of levers that are connected by pivots  
-Exploring wheel mechanisms  
-Learning how axels help wheels to move a vehicle

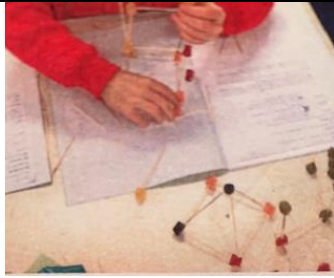
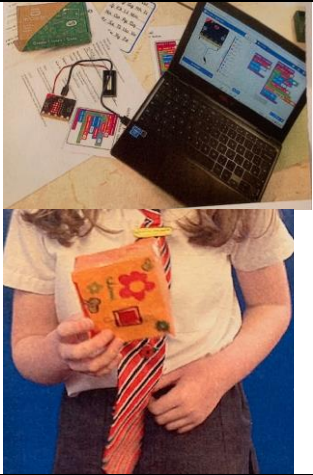





<p><b>Year 3</b></p>	<p><b><u>Constructing a castle</u></b>          2-D shapes          3-D shapes          Castle          Design criteria          Evaluate          Façade          Feature          Flag          Net          Recyclable          Scoring          Stable          Strong          Structure          Tab          Weak</p> <p><b><u>Electric Poster</u></b>          Battery          Bulb          Circuit          Circuit component          Crocodile wires          Electrical product          Electrical system          Final design          Information design          Initial ideas          Peer assessment          Research</p>	<p><b>Pieter van Musschenbroek</b></p> 	<p><b><u>Constructing a castle</u></b>  <b><u>Design</u></b>          -Designing a castle with key features to appeal to a specific person/purpose          -Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features          - materials need and colours          -Designing and/or decorating a castle tower on CAD software</p> <p><b><u>Make</u></b>          -Constructing a range of 3D geometric shapes using nets          -Creating special features for individual designs          -Making facades from a range of recycled materials</p> <p><b><u>Evaluate</u></b>          -Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison, to the original design          -Suggesting points for modification of the individual designs</p> <p><b><u>Technical Knowledge</u></b>          -Identifying features of a castle          -Identifying suitable materials to be selected and used for a castle, considering weight, compression, tension          -Extending the knowledge of wide and flat based objects are more stable          -Understanding the terminology of strut, tie, span, beam          -Understanding the difference between frame and shell structure</p>	<p><b><u>Electric Poster</u></b>  <b><u>Design</u></b>          -Carry out research based on a given topic (e.g. The Romans) to develop a range of initial ideas.          -Generate a final design for the electric poster with consideration to the client's needs and design criteria.          -Design an electric poster that fits the requirements of a given brief.          -Plan the positioning of the bulb (circuit component) and its purpose</p> <p><b><u>Make</u></b>          -Create a final design for the electric poster.          -Mount the poster onto corrugated card to improve its strength and allow it to withstand the weight of the circuit on the rear.          -Measure and mark materials out using a template or ruler.          -Fit an electrical component (bulb).          -Learn ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge).</p> <p><b><u>Evaluate</u></b>          -Learning to give and accept constructive criticism on own work and the work of others.          -Testing the success of initial ideas against the design criteria and justifying opinions.          -Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs.</p> <p><b><u>Technical Knowledge</u></b>          -To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit.          -To understand common features of an electric product (switch, battery or plug, dials, buttons etc.).          -To list examples of common electric products (kettle, remote control etc.).          -To understand that an electric product uses an electrical system to work (function).          -To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits</p>	<p><b><u>Digital World; Electronic Charm</u></b>  <b><u>Design</u></b>          -Problem solving by suggesting potential features on a Micro: bit and justifying my ideas          -Developing design ideas for a technology pouch          -Drawing and manipulating 2D shapes, using computer-aided design, to produce a point-of-sale badge</p> <p><b><u>Make</u></b>          -Using a template when cutting and assembling the pouch          -Following a list of design requirements          -Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch          -Applying functional features such as using foam to create soft buttons</p> <p><b><u>Evaluate</u></b>          -Analysing and evaluating an existing product          -Identifying the key features of a pouch</p> <p><b><u>Technical Knowledge</u></b>          -Identifying key product developments that occurred as a result of the digital revolution          -Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm          -Understanding what a loop is in programming          -Explaining the basic functionality of my eCharm program          -Understanding what is meant by 'point of sale display'</p> 
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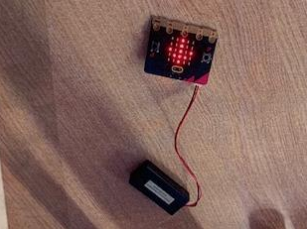


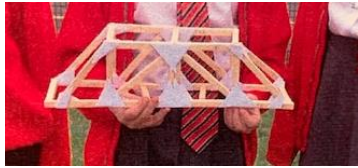
	<p>Self-assessment Sketch</p> <p><u>Digital World;</u> <u>Electronic Charm</u></p> <p>Analogue Badge CAD Control Develop Digital Digital revolution Digital world Display Electronic Feature Function Initiate Monitor Net Point of sale Product Product design Program Sense Simulator Smart wearables Technology Template Test User Layers Loops Micro: bit</p>				
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<p><b>Year 4</b></p> <p><b>Pavilions</b> Aesthetic Cladding Frame structure Function Inspiration Pavilion Reinforce Stable Structure Target Audience Texture Theme</p> <p><b>Torches</b> Battery Bulb Buzzer Cell Component Conductor Copper Electricity Insulator Series circuit switch</p> <p><b>Mindful moments timer</b> 2D Advantage Assemble Block Brand identity Branding Bug CAD</p>		<p><b>Pavilions</b> <u>Design</u> -Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect -Building frame structures designed to support weight <u>Make</u> -Creating a range of different shaped frame structures -Making a variety of free-standing frame structures of different shapes and sizes -Selecting appropriate materials to build a strong structure and for the cladding -Reinforcing corners to strengthen a structure -Creating a design in accordance with a plan -Learning to create different textural effects with materials <u>Evaluate</u> -Evaluating structures made by the class -Describing what characteristics of a design and construction made it the most effective -Considering effective and ineffective designs <u>Technical Knowledge</u> -Learning what pavilions are and their purpose -Building on prior knowledge of net structures and broadening knowledge of frame structures -Learning that architects consider light, shadow and patterns when designing -Implementing frame and shell structure knowledge -Considering effective and ineffective designs</p>	<p><b>Torches</b> <u>Design</u> -Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. <u>Make</u> -Making a torch with a working electrical circuit and switch -Using appropriate equipment to cut and attach materials -Assembling a torch according to the design and success criteria <u>Evaluate</u> -Evaluating electrical products -Testing and evaluating the success of a final product and taking inspiration from the work of peers <u>Technical Knowledge</u> -Learning how electrical items work -Identifying electrical products -Learning what electrical conductors and insulators are -Understanding that a battery contains stored electricity and can be used to power products -Identifying the features of a torch -Understanding how a torch works -Articulating the positives and negatives about different torches</p> 	<p><b>Mindful moments timer</b> <u>Design</u> -Writing design criteria for a programmed timer (Micro:bit) -Exploring different mindfulness strategies -Applying the results of my research to further inform my design criteria -Developing a prototype case for my mindful moment timer -Using and manipulating shapes and clipart, using computer-aided design (CAD), to produce a logo -Following a list of design requirements <u>Make</u> -Developing a prototype case for my mindful moment timer -Creating a 3D structure using a net <u>Evaluate</u> -Investigating and analysing a range of timers by identifying and comparing their advantages and disadvantages -Evaluating my micro:bit program against points on my design criteria and amending them to include any changes I made -Documenting and evaluating my project -Understanding what a logo is and why they are important in the world of design and business <u>Technical Knowledge</u> -Writing design criteria for a programmed timer (Micro:bit) -Programming a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press -Testing my program for bugs (errors in the code) -Finding and fixing the bugs (debug) in my code</p>
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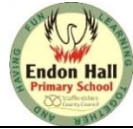
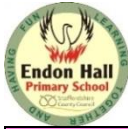
	<p>Clipart Coding Debug Disadvantage Ergonomic Logo Mindfulness Net Prototype Research Function Variable</p>				
<p><b>Year 5</b></p>	<p><b>Bridges</b> Abutment Accurate Arched bridge Beam bridge Bridge Compression Coping saw Evaluation Predict Reinforce Suspension bridge Tension Truss bridge</p> <p><b>Electronic Doodlers</b> Circuit component Configuration Current Develop DIY Investigate Motor Motorised Problem solve</p>	<p><b>Isambard Kingdom Brunel</b></p> 	<p><b>Bridges</b> <b>Design</b> -Designing a stable structure that is able to support weight -Creating frame structure with focus on triangulation <b>Make</b> -Making a range of different shaped beam bridges</p>  <p>-Using triangles to create truss bridges that span a given distance and supports a load</p>  <p>-Building a wooden bridge structure Independently measuring and marking wood accurately</p>	<p><b>Electronic Doodlers</b> <b>Design</b> -Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product. -Developing design criteria based on findings from investigating existing products. -Developing design criteria that clarifies the target user. <b>Make</b> -Altering a product's form and function by tinkering with its configuration. -Making a functional series circuit, incorporating a motor. -Constructing a product with consideration for the design criteria. -Breaking down the construction process into steps so that others can make the product. <b>Evaluate</b> -Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses. -Determining which parts of a product affect its function and which parts affect its form. -Analysing whether changes in configuration positively or negatively affect an existing product.</p>	<p><b>Monitoring Devices</b> <b>Design</b> -Researching (books, internet) for a particular (user's) animal's needs -Developing design criteria based on research -Generating multiple housing ideas using building bricks -Understanding what a virtual model is and the pros and cons of traditional and CAD modelling -Placing and manoeuvring 3D objects, using CAD -Changing the properties of, or combine one or more 3D objects, using CAD <b>Make</b> -Understanding the functional and aesthetic properties of plastics <b>Evaluate</b> -Stating an event or fact from the last 100 years of plastic history -Explaining how plastic is affecting planet Earth and suggesting ways to make more sustainable choices <b>Technical Knowledge</b> -Describing key developments in thermometer history</p>

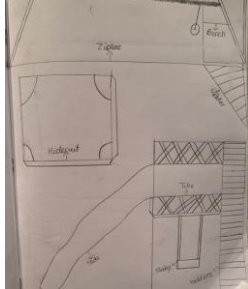
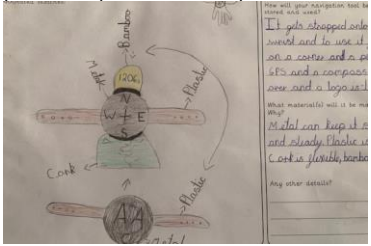


<p>Product analysis Series circuit Stable Target user</p> <p><b>Monitoring Devices</b> Alert Ambient Boolean Consumable Decompose Development Device Duplicate Durable Electronic Inventor Lightweight Man-made Manipulate Manoeuvre Micro plastics Monitoring device Plastic pollution Programming Reformed Replica Research Sensor Strong Sustainability Synthetic Thermometer Thermoscope Value Variable Versatile Water-resistant Workplane</p>		<ul style="list-style-type: none"> <li>-Selecting appropriate tools and equipment for particular tasks</li> <li>-Using the correct techniques to saws safely</li> <li>-Identifying where a structure needs reinforcement and using card corners for support</li> <li>-Explaining why selecting appropriating materials is an important part of the design process</li> <li>-Understanding basic wood functional properties</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>-Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary</li> <li>-Suggesting points for improvements for own bridges and those designed by others</li> </ul> <p><b>Technical Knowledge</b></p> <ul style="list-style-type: none"> <li>-Exploring how to create a strong beam Identifying arch and beam bridges and understanding the terms: compression and tension</li> <li>-Identifying stronger and weaker structures</li> <li>-Finding different ways to reinforce structures</li> <li>-Understanding how triangles can be used to reinforce bridges</li> <li>-Articulating the difference between beam, arch, truss and suspension bridges</li> </ul>	<ul style="list-style-type: none"> <li>-Peer evaluating a set of instructions to build a product</li> </ul> <p><b>Technical Knowledge</b></p> <ul style="list-style-type: none"> <li>-To know that series circuits only have one direction for the electricity to flow.</li> <li>-To know when there is a break in a series circuit, all components turn off.</li> <li>-To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.</li> <li>-To know a motorised product is one which uses a motor to function</li> </ul>	<ul style="list-style-type: none"> <li>-Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range</li> <li>-Explaining key functions in my program (audible alert, visuals)</li> <li>-Explaining how my product would be useful for an animal carer including programmed features</li> </ul>  
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<p><b>Year 6</b></p>	<p><b><u>Playgrounds</u></b> Adapt Apparatus Bench hook Cladding Coping saw Dowel Jelutong Landscape Modify Prototype Vice</p> <p><b><u>Steady Hand Game</u></b> Assemble Battery Battery pack Benefit Bulb Bulb holder Buzzer Circuit Circuit symbol Component Conductor Copper Fine motor skills Function Gross motor skills</p> <p><b><u>Navigating the world</u></b> 3D CAD Application (apps) Biodegradable Boolean</p>	<p><b>Antonio Gaudi</b></p> 	<p><b><u>Playgrounds</u></b> <b><u>Design</u></b> -Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs <b><u>Make</u></b> -Building a range of play apparatus structures drawing upon new and prior knowledge of structures -Measuring, marking and cutting wood to create a range of structures -Using a range of materials to reinforce and add decoration to structures <b><u>Evaluate</u></b> -Improving a design plan based on peer evaluation -Testing and adapting a design to improve it as it is developed -Identifying what makes a successful structure <b><u>Technical Knowledge</u></b> -Knowing that structures can be strengthened by manipulating materials and shapes -Identifying the shell structure in everyday life (cars, aeroplanes, tins, cans) -Understanding man made and natural structures</p>	<p><b><u>Steady Hand Game</u></b> <b><u>Design</u></b> -Designing a steady hand game - identifying and naming the components required -Drawing a design from three different perspectives -Generating ideas through sketching and discussion • Modelling ideas through prototypes -Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function' <b><u>Make</u></b> -Constructing a stable base for a game -Accurately cutting, folding and assembling a net -Decorating the base of the game to a high-quality finish -Making and testing a circuit Incorporating a circuit into a base <b><u>Evaluate</u></b> -Testing own and others finished games, identifying what went well and making suggestions for improvement -Gathering images and information about existing children's toys -Analysing a selection of existing children's toys <b><u>Technical Knowledge</u></b> -Learning that batteries contain acid, which can be dangerous if they leak -Identifying and naming the circuit components in a steady hand game</p>	<p><b><u>Navigating the world</u></b> <b><u>Design</u></b> -Writing a design brief from information submitted by a client -Developing design criteria to fulfil the client's request -Considering and suggesting additional functions for my navigation tool -Developing a product idea through annotated sketches -Placing and manoeuvring 3D objects, using CAD -Changing the properties of, or combine one or more 3D objects, using CAD <b><u>Make</u></b> -Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo) -Explaining material choices and why they were chosen as part of a product concept <b><u>Evaluate</u></b> -Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool -Developing an awareness of sustainable design -Identifying key industries that utilise 3D CAD modelling and explain why -Describing how the product concept fits the client's request and how it will benefit the customers <b><u>Technical Knowledge</u></b> -Programming an N,E, S,W cardinal compass -Explaining the key functions in my program, including any additions</p>



<p>Cardinal compass Client Compass Concept Convince Corrode Duplicate Environmentally friendly Equipment Feature Finite Function Functional Infinite Product lifespan Program Recyclable Smart Sustainable Sustainable Design Unsustainable design Variable Workplane</p>				<p>-Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool -Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch -Demonstrating a functional program as part of a product concept</p> 
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