

## Knowledge and Skills Progression for Design & Technology

	<b>Design</b> <b>Conceptual Knowledge</b> “The interrelationships among the basic elements within a larger structure that enable them to function together”	<b>Make</b> <b>Procedural Knowledge</b> “How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods”	<b>Evaluate</b> <b>Metacognitive Knowledge</b> “The knowledge of thinking processes”	<b>Technical Knowledge</b> <b>Factual Knowledge</b> “The basic elements students must know to be acquainted with a discipline or solve problems in it”
<b>EY FS</b>	I can recognise that a range of technology is used in places such as homes and schools	I can select and use technology for particular purposes		
<b>Year 1</b>	Learning the importance of a clear design criteria Including individual preferences and requirements in a design Designing smoothie carton packaging by-hand or on ICT software Using a template to create a design for a puppet	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 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 Cutting fabric neatly with scissors Using joining methods to decorate a puppet Sequencing steps for construction	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 Tasting and evaluating different food combinations Describing appearance, smell and taste Suggesting information to be included on packaging Reflecting on a finished product, explaining likes and dislikes	Understanding the difference between fruits and vegetables Describing and grouping fruits by texture and taste 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 Learning different ways in which to join fabrics together: pinning, stapling, gluing
<b>Year 2</b>	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 Designing a pouch	Making a structure according to design criteria Creating joints and structures from paper/card and tape 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 Selecting and cutting fabrics for sewing Decorating a pouch using fabric glue or running stitch	Evaluating own designs against design criteria Using peer feedback to modify a final design Evaluating different designs Testing and adapting a design Troubleshooting scenarios posed by teacher Evaluating the quality of the stitching on others' work Discussing as a class, the success of their stitching against the success criteria Identifying aspects of their peers' work that they particularly like and why	Learning that mechanisms are a collection of moving parts that work together in a machine 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 Joining items using fabric glue or stitching Identifying benefits of these techniques Threading a needle Sewing running stitch, with evenly spaced, neat, even stitches to join fabric Neatly pinning and cutting fabric using a template

Year 3	<p>Designing a castle with key features to appeal to a specific person/purpose</p> <p>Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features – materials need and colours</p> <p>Designing and/or decorating a castle tower on CAD software</p> <p>Creating a healthy and nutritious recipe for a savoury tart</p> <p>Using seasonal ingredients, considering the taste, texture, smell and appearance of the dish</p>	<p>Constructing a range of 3D geometric shapes using nets</p> <p>Creating special features for individual designs</p> <p>Making facades from a range of recycled materials</p> <p>Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination</p> <p>Following the instructions within a recipe</p>	<p>Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design</p> <p>Suggesting points for modification of the individual designs</p> <p>Establishing and using design criteria to help test and review dishes</p> <p>Describing the benefits of seasonal fruits and vegetables and the impact on the environment</p> <p>Suggesting points for improvement when making a seasonal tart</p>	<p>Learning that climate affects food growth</p> <p>Working with cooking equipment safely and hygienically</p> <p>Learning that imported foods travel from far away and this can negatively impact the environment</p> <p>Learning that vegetables and fruit grow in certain seasons</p> <p>Learning that each fruit and vegetable gives us nutritional benefits</p> <p>Learning to use, store and clean a knife safely</p> <p>Identifying features of a castle</p> <p>Identifying suitable materials to be selected and used for a castle, considering weight, compression, tension</p> <p>Extending the knowledge of wide and flat based objects are more stable</p> <p>Understanding the terminology of strut, tie, span, beam</p> <p>Understanding the difference between frame and shell structure</p>
Year 4	<p>Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect</p> <p>Building frame structures designed to support weight</p> <p>Designing a shape that reduces air resistance</p> <p>Drawing a net to create a structure from</p> <p>Choosing shapes that increase or decrease speed as a result of air resistance</p> <p>Personalising a design</p> <p>Writing design criteria for a product, articulating decisions made</p> <p>Designing a personalised Book sleeve</p>	<p>Creating a range of different shaped frame structures</p> <p>Making a variety of free standing frame structures of different shapes and sizes</p> <p>Selecting appropriate materials to build a strong structure and for the cladding</p> <p>Reinforcing corners to strengthen a structure</p> <p>Creating a design in accordance with a plan</p> <p>Learning to create different textural effects with materials</p> <p>Measuring, marking, cutting and assembling with increasing accuracy</p> <p>Making a model based on a chosen design</p> <p>Making and testing a paper template with accuracy and in keeping with the design criteria</p> <p>Measuring, marking and cutting fabric using a paper template</p> <p>Selecting a stitch style to join fabric, working neatly</p> <p>sewing small neat stitches</p> <p>Incorporating fastening to a design</p>	<p>Evaluating structures made by the class</p> <p>Describing what characteristics of a design and construction made it the most effective</p> <p>Considering effective and ineffective designs</p> <p>Evaluating the speed of a final product based on the effect of shape on speed and the accuracy of workmanship on performance</p> <p>Testing and evaluating the success of a final product and taking inspiration from the work of peers</p> <p>Testing and evaluating an end product against the original design criteria</p> <p>Deciding how many of the criteria should be met for the product to be considered successful</p> <p>Suggesting modifications for improvement</p>	<p>Learning that products change and evolve over time</p> <p>Learning that all moving things have kinetic energy</p> <p>Understanding that kinetic energy is the energy that something (object person) has by being in motion</p> <p>Learning what pavilions are and their purpose</p> <p>Building on prior knowledge of net structures and broadening knowledge of frame structures</p> <p>Learning that architects consider light, shadow and patterns when designing</p> <p>Implementing frame and shell structure knowledge</p> <p>Considering effective and ineffective designs</p> <p>Understanding that there are different types of fastenings and what they are</p> <p>Articulating the benefits and disadvantages of different fastening types</p>

<p style="text-align: center;"><b>Year 5</b></p>	<p>Designing an electronic greetings card with a copper track circuit and components          Creating a labelled circuit diagram showing positive and negative parts in relation to the LED and the battery          Writing design criteria for an electronic greeting card          Compiling a moodboard relevant to my chosen theme, purpose and recipient          Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients          Writing an amended method for a recipe to incorporate the relevant changes to ingredients          Designing appealing packaging to reflect a recipe          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</p>	<p>Making a functional series circuit          Creating an electronics greeting card, referring to a design criteria          Mapping out where different components of the circuit will go          Cutting and preparing vegetables safely          Using equipment safely, including knives, hot pans and hobs          Knowing how to avoid cross-contamination          Following a step by step method carefully to make a recipe</p>	<p>Identifying the nutritional differences between different products and recipes          Identifying and describing healthy benefits of food groups          Evaluating a peer's product against design criteria and suggesting modifications that could be made to improve the reliability or aesthetics of it or to incorporate another type of circuit component          Stating what Sir Rowland Hill invented and why it was important for greeting cards          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</p>	<p>Understanding where food comes from - learning that beef is from cattle and how beef is reared and processed          Understanding what constitutes a balanced diet          Learning to adapt a recipe to make it healthier          Comparing two adapted recipes using a nutritional calculator and then identifying the healthier option          Exploring how to create a strong beam          Identifying arch and beam bridges and understanding the terms: compression and tension          Identifying stronger and weaker structures          Finding different ways to reinforce structures          Understanding how triangles can be used to reinforce bridges          Articulating the difference between beam, arch, truss and suspension bridges          Learning the key components used to create a functioning circuit          Learning that copper is a conductor and can be used as part of a circuit          Understanding that breaks in a circuit will stop it from working          Explaining how a series circuit will work in my card          Identifying the negative and positive leg of an LED          Drawing a series circuit diagram and symbols          Describing key developments in thermometer history          Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range          Explaining key functions in my program (audible alert, visuals)          Explaining how my product would be useful for an animal carer including programmed features</p>
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