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| **ALL SAINTS UPTON PROGRESSION GRID – DT** | | | | |
| **SKILLS** | Designing | Making | Evaluating | Technical Knowledge  Know that… |
| **EYFS** | * Junk modelling- Explore and investigate the tools and materials in the junk modelling area. * To investigate cutting different materials.   To learn how to plan and select the correct resources needed to make a model.  To verbally plan and create a junk model.  Food- Design a fruit and vegetable soup recipe.  Design food packaging.  Textiles- Use threading or sewing to design a product. | Junk modelling- To develop scissor skills.  To explore different ways to temporarily join materials together.  Food-Learn how to use a knife safely.  Safely use tools to prepare ingredients.  Textiles- Develop threading and weaving skills.  Create a textiles product following their own design. | Junk modelling- To share a finished model and talk about the processes in its creation.  Textiles- Reflect on how they achieved their aims. | Food- Explore fruits and vegetables using our 5 senses and know the differences between them. |
| **YEAR 1** | Structures- Learning the importance of a clear design criteria.  Including individual preferences and requirements in a design.  Cooking and Nutrition  Designing smoothie carton packaging by-hand or on ICT software.  Textiles  Using a template to create a design for a puppet. | Structures- Making stable structures from card, tape and glue.  Learning how to turn 2D nets into 3D structures.  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.  Cooking and Nutrition  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.  Textiles  Cutting fabric neatly with scissors. Using joining methods to decorate a puppet. Sequencing steps for construction | Structures- 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.  Cooking and Nutrition  Tasting and evaluating different food combinations. Describing appearance, smell and taste. Suggesting information to be included on packaging.  Textiles  Reflecting on a finished product, explaining likes and dislikes | Structures- the shape of materials can be changed to improve the strength and stiffness of structures. - cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). - axles are used in structures and mechanisms to make parts turn in a circle. - different structures are used for different purposes. - a structure is something that has been made and put together. - a client is the person I am designing for. - design criteria is a list of points to ensure the product meets the clients needs and wants. - a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. - windmill turbines use wind to turn and make the machines inside work. - a windmill is a structure with sails that are moved by the wind. - the three main parts of a windmill are the turbine, axle and structure  Cooking and Nutrition  - difference between fruits and vegetables. - some foods typically known as vegetables are actually fruits (e.g. cucumber). - a blender is a machine which mixes ingredients together into a smooth liquid. - a fruit has seeds and a vegetable does not. - fruits grow on trees or vines. - vegetables can grow either above or below ground. - vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).  Textiles - ‘joining technique’ means connecting two pieces of material together. - there are various temporary methods of joining fabric by using staples. glue or pins. - different techniques for joining materials can be used for different purposes. -a template (or fabric pattern) is used to cut out the same shape multiple times. - drawing a design idea is useful to see how an idea will look. |
| **YEAR 2** | Structures- Generating and communicating ideas using sketching and modelling.  Mechanisms-  Selecting a suitable linkage system to produce the desired motions.  Designing a wheel Selecting appropriate materials based on their properties.  Creating a class design criteria for a moving monster. Designing a moving monster for a specific audience in accordance with a design criteria. | Structures- Making a structure according to design criteria.  Creating joints and structures from paper/card and tape.  Building a strong and stiff structure by folding paper.  Mechanisms-  Selecting materials according to their characteristics.  Following a design brief.  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. | Structures- Testing the strength of own structures.  Identifying the weakest part of a structure.  Evaluating the strength, stiffness and stability of own structure.  Mechanisms-  Evaluating different designs.  Testing and adapting a design.  Evaluating own designs against design criteria.  Using peer feedback to modify a final design. | Structures- materials can be manipulated to improve strength and stiffness.  - a structure is something which has been formed or made from parts.  - a ‘stable’ structure is one which is firmly fixed and unlikely to change or move.  - a ‘strong’ structure is one which does not break easily.  - a ‘stiff’ structure or material is one which does not bend easily.  Mechanisms-  - different materials have different properties and are therefore suitable for different uses  - mechanisms are a collection of moving parts that work together as a machine to produce movement.  - there is always an input and output in a mechanism.  - an input is the energy that is used to start something working.  - an output is the movement that happens as a result of the input.  - a lever is something that turns on a pivot.  - a linkage mechanism is made up of a series of levers.  - the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder.  - that it is important to test my design as I go along so that I can solve any problems that may occur.  - some real-life objects that contain mechanisms. |
| **YEAR 3** | Structures- 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 needed and colours.  Designing and/or decorating a castle tower on CAD software.  Cooking and Nutrition  Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.  Digital world  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. | Structures- Constructing a range of 3D geometric shapes using nets.  Creating special features for individual designs.  Making facades from a range of recycled materials.  Cooking and Nutrition  Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination. Following the instructions within a recipe.  Digital world  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. | Structures- 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.  Cooking and Nutrition  Establishing and using design criteria to help test and review dishes. Describing the benefits of seasonal fruits and vegetables and the impact on the environment. Suggesting points for improvement when making a seasonal tart.  Digital world  Analysing and evaluating an existing product • Identifying the key features of a pouch | Structures- wide and flat based objects are more stable.  - the importance of strength and stiffness in structures.  - what a frame structure is.  - a ‘free-standing’ structure is one which can stand on its own.  Cooking and Nutrition  - not all fruits and vegetables can be grown in the UK.  - climate affects food growth.  - vegetables and fruit grow in certain seasons.  - cooking instructions are known as a ‘recipe’.  - imported food is food which has been brought into the country.  - exported food is food which has been sent to another country.  - imported foods travel from far away and this can negatively impact the environment.  - each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre.  - vitamins, minerals and fibre are important for energy, growth and maintaining health.  - safety rules for using, storing and cleaning a knife safely.  - similar coloured fruits and vegetables often have similar nutritional benefits.  Digital world  - in programming a ‘loop’ is code that repeats something again and again until stopped.  - a Micro:bit is a pocket-sized, codeable computer.  - Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm.  - what the ‘Digital Revolution’ is and features of some of the products that have evolved as a result.  - in Design and technology the term ‘smart’ means a programmed product.  - the difference between analogue and digital technologies.  - what is meant by ‘point of sale display’.  - CAD stands for Computer-aided design. |
| **YEAR 4** | Structures- Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect.  Building frame structures designed to support weight.  Mechanisms-  Designing a shape that reduces air resistance.  Drawing a net to create a structure from.  Choosing shapes that increase or decrease speed as a result of air resistance. Personalising a design.  Electrical Systems  Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. | Structures- 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.  Mechanisms-  Measuring, marking, cutting and assembling with increasing accuracy.  Making a model based on a chosen design.  Electrical Systems  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. | Structures- Evaluating structures made by the class.  Describing what characteristics of a design and construction made it the most effective.  Considering effective and ineffective designs.  Mechanisms-  Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.  Electrical Systems  Testing and evaluating the success of a final product and taking inspiration from the w | Structures- following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose.  - a façade is the front of a structure.  - a castle needed to be strong and stable to withstand enemy attack.  - a paper net is a flat 2D shape that can become a 3D shape once assembled.  - a design specification is a list of success criteria for a product.  - a pavilions is a decorative building or structure for leisure activities.  - cladding can be applied to structures for different effects.  - aesthetics are how a product looks.  - a product’s function means its purpose.  - the target audience means the person or group of people a product is designed for.  - architects consider light, shadow and patterns when designing.  Mechanisms-  - air resistance is the level of drag on an object as it is forced through the air.  - the shape of a moving object will affect how it moves due to air resistance.  - aesthetics means how an object or product looks in design and technology.  - a template is a stencil you can use to help you draw the same shape accurately.  - a birds-eye view means a view from a high angle (as if a bird in flight).  - graphics are images which are designed to explain or advertise something.  - it is important to assess and evaluate design ideas and models against a list of design criteria.  Electrical Systems  - an electrical circuit must be complete for electricity to flow.  - a switch can be used to complete and break an electrical circuit.  - features of a torch: case, contacts, batteries, switch, reflector, lamp, lens.  - facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison. |
| **YEAR 5** | Mechanisms-  Designing a pop-up book which uses a mixture of structures and mechanisms.  Naming each mechanism, input and output accurately.  Storyboarding ideas for a book.  Electrical Systems  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 finding from investigating existing products. Developing design criteria that clarifies the target user.  Cooking and Nutrition  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. | Mechanisms-  Following a design brief to make a pop up book, neatly and with focus on accuracy.  Making mechanisms and/or structures using sliders, pivots and folds to produce movement.  Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.  Electrical Systems  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.  Cooking and Nutrition  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. | Electrical Systems  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. Peer evaluating a set of instructions to build a product.  Cooking and Nutrition  Identifying the nutritional differences between different products and recipes. Identifying and describing healthy benefits of food groups. | Mechanisms- mechanisms control movement.  - mechanisms that can be used to change one kind of motion into another.  - how to use sliders, pivots and folds to create paper-based mechanisms.  - a design brief is a description of what I am going to design and make.  - designers often want to hide mechanisms to make a product more aesthetically pleasing.  Electrical Systems  - series circuits only have one direction for the electricity to flow.  - when there is a break in a series circuit, all components turn off.  - an electric motor converts electrical energy into rotational movement, causing the motor’s axle to spin.  - a motorised product is one which uses a motor to function.  - product analysis is critiquing the strengths and weaknesses of a product.  - ‘configuration’ means how the parts of a product are arranged.  Cooking and Nutrition  - where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues.  - I can adapt a recipe to make it healthier by substituting ingredients.  - I can use a nutritional calculator to see how healthy a food option is.  - ‘cross-contamination’ means that bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects. |
| **YEAR 6** | Structures- Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.  Textiles  Designing a waistcoat in accordance to specification linked to set of design criteria to fit a specific theme. Annotating designs.  Digital world  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. | Structures- 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.  Textiles  Using a template when pinning panels onto fabric. Marking and cutting fabric accurately, in accordance with a design. Sewing a strong running stitch, making small, neat stitches and following the edge. Tying strong knots. Decorating a waistcoat -attaching objects using thread and adding a secure fastening. Learning different decorative stitches. Sewing accurately with even regularity of stitches.  Digital world  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. Programming an N,E, S,W cardinal compass. | Structures- 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.  Textiles  Evaluating work continually as it is created.  Digital world  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. Explaining the key functions in my program, including any additions. 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. | Structures- structures can be strengthened by manipulating materials and shapes.  - what a 'footprint plan' is.  - in the real world, design , can impact users in positive and negative ways.  - a prototype is a cheap model to test a design idea.  Textiles  - it is important to design clothing with the client/ target customer in mind.  - using a template (or clothing pattern) helps to accurately mark out a design on fabric.  - the importance of consistently sized stitches.  Digital world  - accelerometers can detect movement.  - sensors can be useful in products as they mean the product can function without human input.  - designers write design briefs and develop design criteria to enable them to fulfil a client’s request.  - ‘multifunctional’ means an object or product has more than one function.  - magnetometers are devices that measure the Earth’s magnetic field to determine which direction you are facing. |