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|  Design and Technology EYFS  |
| Junk Modelling Puppets |
| Skills  | Design | • Making verbal plans and material choices. • Developing a junk model. | * Discussing what a good design needs
* Designing a simple paper pattern
* Choosing from avilaible materials
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| Make  | • Improving fine motor/scissor skills with a variety of materials. • Joining materials in a variety of ways (temporary and permanent). • Joining different materials together. • Describing their junk model, and how they intend to put it together. | * Developing fine motor and cutting skills with scissors
* Exploring fine motor / threading with a variety of materials
* Finding ways to join materials
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| Evaluate  | • Giving a verbal evaluation of their own and others’ junk models with adult support. • Checking to see if their model matches their plan. • Considering what they would do differently if they were to do it again. • Describing their favourite and least favourite part of their model. | * Reflecting on finished product and compare with design
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| Knowledge  | Technical  | • To know there are a range to different materials that can be used to make a model and that they are all slightly different. • Making simple suggestions to fix their junk model. | To know that design is a way of planning before we startTo know that threading is putting one material through an objectTo know that joining attaches 2 parts / materials  |  |
| Additional | Continuous provision  |
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|  Design and Technology progression of skills and knowledge **STRUCTURES**  |
|  Year 1 constructing a windmill Year 2 Baby bears chair  |
| Skills  | Design | • Learning the importance of a clear design criteria. • Including individual preferences and requirements in a design. | • Generating and communicating ideas using sketching and modelling. • Learning about different types of structures, found in the natural world and in everyday objects |
| Make  | • Making stable structures from card. • 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. • Finding the middle of an object. • Puncturing holes. • Adding weight to structures. • Creating supporting structures. • Cutting evenly and carefully. | • 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. |
| Evaluate  | • 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. | • 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. |
| Knowledge  | Technical  | • To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). • To understand that axles are used in structures and mechanisms to make parts turn in a circle. • To begin to understand that different structures are used for different purposes. • To know that a structure is something that has been made and put together. • To know that the sails or blades of a windmill are moved by the wind. • To know that a structure is something built for a reason. • To know that stable structures do not topple. • To know that adding weight to the base of a structure can make it more stable. | • To know that shapes and structures with wide, flat bases or legs are the most stable. • To understand that the shape of a structure affects its strength. • To know that materials can be manipulated to improve strength and stiffness. • To know that a structure is something which has been formed or made from parts. • To know that a ‘stable’ structure is one which is firmly fixed and unlikely to change or move. • To know that a ‘strong’ structure is one which does not break easily. • To know that a ‘stiff’ structure or material is one which does not bend easily  |
| Additional | • To know that design criteria is a list of points to ensure the product meets the clients needs and wants. • To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. • To know that windmill turbines use wind to turn and make the machines inside work. • To know that a windmill is a structure with sails that are moved by the wind. • To know the three main parts of a windmill are the turbine, axle and structure. • To know that windmills are used to generate power and were used for grinding flour. | • To know that natural structures are those found in nature. • To know that man-made structures are those made by people. |
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|  Design and Technology  Mechanisms and mechanical systems  |
|  | Year 2 making a moving monster  |  | Year 3 mechanical systems Pneumatic toys  |
| Skills  | Design | • Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria. | • Designing a toy which uses a pneumatic system. • Developing design criteria from a design brief. • Generating ideas using thumbnail sketches and exploded diagrams. • Learning that different types of drawings are used in design to explain ideas clearly |
| Make  | • 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. | • Creating a pneumatic system to create a desired motion. • Building secure housing for a pneumatic system. • Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy. • Selecting materials due to their functional and aesthetic characteristics. • Manipulating materials to create different effects by cutting, creasing, folding and weaving. |
| Evaluate  | • Evaluating own designs against design criteria. • Using peer feedback to modify a final design. | • Using the views of others to improve designs. • Testing and modifying the outcome, suggesting improvements. • Understanding the purpose of exploded-diagrams through the eyes of a designer and their client. |
| Knowledge  | Technical  | • To know that mechanisms are a collection of moving parts that work together as a machine to produce movement. • To know that there is always an input and output in a mechanism. • To know that an input is the energy that is used to start something working. • To know that an output is the movement that happens as a result of the input. • To know that a lever is something that turns on a pivot. • To know that a linkage mechanism is made up of a series of levers. | • To understand how pneumatic systems work. • To understand that pneumatic systems can be used as part of a mechanism. • To know that pneumatic systems operate by drawing in, releasing and compressing air. |
|  | Additional | • To know some real-life objects that contain mechanisms. | • To understand how sketches, drawings and diagrams can be used to communicate design ideas. • To know that exploded-diagrams are used to show how different parts of a product fit together. • To know that thumbnail sketches are small drawings to get ideas down on paper quickly. |

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|  Design and Technology  |
|  | **Year 5 mechanical pop-up book**  |  | **Year 6 mechanical systems automated toys**  |
| Skills  | Design | • 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. | ● Noticing wider-reaching problems or needs in the community. ● Coming up with a broader range of ideas and deeper innovation, requiring pupils to think critically about their ideas’ practicality and originality. ● Beginning to use more complex annotated sketches, such as cross-sectional and exploded diagrams and pattern pieces in design |
| Make  | • 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. | ● Producing lists of equipment, materials and tools that they need for a task. ● Selecting materials, components or ingredients based on research or user needs.● Explaining their choices, referring to their research. ● Considering which equipment will work well together. ● Choosing from the known range of equipment available to them with little guidance. ● Assessing risks associated with different tools and equipment. ● Understanding and explaining the importance of each safety rule. ● Consistently apply safety instructions. ● Cutting jelutong or other harder wood with a coping saw or a tenon saw in small groups. ● Cutting in a back-and-forth sawing motion where appropriate. ● In supervised groups, using hot glue guns safely. ● Recognising that hot glue is useful for joining materials that need a strong bond that sets quickly |
| Evaluate  | • Evaluating the work of others and receiving feedback on own work. • Suggesting points for improvement. | ● Assessing their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost. ● Providing feedback that is helpful, specific and encouraging. ● Incorporating feedback from peers or users to improve their product further, explaining the changes they made and the impact they had. |
| Knowledge  | Technical  | • To know that mechanisms control movement. • To understand that mechanisms can be used to change one kind of motion into another. • To understand how to use sliders, pivots and folds to create paper-based mechanisms. | • To know that the mechanism in an automata uses a system of cams, axles and followers. • To know that different shaped cams produce different outputs. ● To know which mechanisms are working together to make a mechanical system. ● To know that there are different directions of movement. ● To know that mechanisms can change one type of movement to another |
| Additional | • To know that a design brief is a description of what I am going to design and make. • To know that designers often want to hide mechanisms to make a product more aesthetically pleasing. | • To know that an automata is a hand powered mechanical toy. • To know that a cross-sectional diagram shows the inner workings of a product. |
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|  Design and Technology Electrical systems  |
|  |  | Steady hand game year 6  |  |  |
| Skills  | Design | • 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’. |
|  | Make  | • 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. |
|  | Evaluate  | • 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. |
| Knowledge  | Technical  | • To know that batteries contain acid, which can be dangerous if they leak. • To know the names of the components in a basic series circuit, including a buzzer. |
|  | Additional | •To know that ‘form’ means the shape and appearance of an object. •To know the difference between 'form' and 'function'. •To understand that 'fit for purpose' means that a product works how it should and is easy to use. • To know that form over purpose means that a product looks good but does not work very well. • To know the importance of ‘form follows function’ when designing: the product must be designed primarily with the function in mind. • To understand the diagram perspectives 'top view', 'side view' and 'back'. |
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|  Design and Technology Cooking and nutrition  |  |
|  |  | EYFS General cooking tasks  | Year 1 smoothies  | Year 3Cooking and nutrition-Eating seasonally- soup | Year 4 /5 Adapting a recipe  |
| Skills  | Design | To talk about a recipe as a class Make packaging  | • Designing smoothie carton packaging by-hand. | • Designing a recipe for a soup | • Designing a biscuit within a given budget, drawing upon previous taste testing judgements. • Designing packaging for a biscuit that targets a specific group. |
|  | Make  | Learn to chop safely eg. Play dough / plasticine Chop ingredients safely with supervision  | • Chopping fruit and vegetables safely to make a smoothie. • Juicing fruits safely to make a smoothie. | • Following the instructions within a recipe. • Tasting seasonal ingredients. • Selecting seasonal ingredients. • Peeling ingredients safely. • Cutting safely with a vegetable knife | • Following a baking recipe, including the preparation of ingredients. • Cooking safely, following basic hygiene rules. • Adapting a recipe to meet the requirements of a target audience. • Using a cuboid net to create packaging. |
|  | Evaluate  | Taste the product• Describing some of the following when tasting food: look, feel, smell and taste. • Choosing their favourite packaging design and explaining why. | • Tasting and evaluating different food combinations. • Describing appearance, smell and taste. • Suggesting information to be included on packaging. • Comparing their own smoothie with someone else’s | • 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 soup | • Evaluating a recipe, considering: taste, smell, texture and appearance. • Describing the impact of the budget on the selection of ingredients. • Evaluating and comparing a range of food products. • Suggesting modifications to a recipe (e.g. This biscuit has too many raisins, and it is falling apart, so next time I will use less raisins). |
|  | Knowledge | To know what they have made and the ingredients usedTo know that some ingredients are grownTo name some common fruits / vegetables if usedTo know what is healthy to eat• To discuss why different packages might be used for different foods. | • To know that a blender is a machine which mixes ingredients together into a smooth liquid. • To know that a fruit has seeds. • To know that fruits grow on trees or vines. • To know that vegetables can grow either above or below ground. • To know that vegetables is any edible part of a plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber). | • To know that not all fruits and vegetables can be grown in the UK. • To know that climate affects food growth. • To know that vegetables and fruit grow in certain seasons. • To know that cooking instructions are known as a ‘recipe’. • To know that imported food is food which has been brought into the country. • To know that exported food is food which has been sent to another country.. • To know that eating seasonal foods can have a positive impact on the environment. • To know that similar coloured fruits and vegetables often have similar nutritional benefits. • To know that the appearance of food is as important as taste. | • To know that the amount of an ingredient in a recipe is known as the ‘quantity.’ • To know that safety and hygiene are important when cooking. • To know the following cooking techniques: sieving, measuring, stirring, cutting out and shaping. •To understand the importance of budgeting while planning ingredients for biscuits. • To know that products often have a target audience. |
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|  Design and Technology  Textiles |  |
|  |  | Year 1 puppets  | Year 2 pouches  | Textiles: Cross stitch and applique- Egyptian collars. | Year 4 /5 Fastenings  |
| Skills  | Design | • Using a template to create a design for a puppet. | • Designing a pouch. | • Designing and making a template from an existing cushion and applying individual design criteria. | • Writing design criteria for a product, articulating decisions made. • Designing a personalised book sleeve. |
|  | Make  | • Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing steps for construction. | • Selecting and cutting fabrics for sewing. • Decorating a pouch using fabric glue or running stitch. • Threading a needle. #• Sewing running stitch, with evenly spaced, neat, even stitches to join fabric. • Neatly pinning and cutting fabric using a template | • Following design criteria to create a cushion or Egyptian collar. • Selecting and cutting fabrics with ease using fabric scissors. • Threading needles with greater independence. • Tying knots with greater independence. • Sewing cross stitch to join fabric. • Decorating fabric using appliqué. • Completing design ideas with stuffing and sewing the edges (Cushions) or embellishing the collars based on design ideas (Egyptian collars). | • Making and testing a paper template with accuracy and in keeping with the design criteria. • Measuring, marking and cutting fabric using a paper template. • Selecting a stitch style to join fabric. • Working neatly by sewing small, straight stitches. • Incorporating a fastening to a design. |
|  | Evaluate  | • Reflecting on a finished product, explaining likes and dislikes. | • 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. | • Evaluating an end product and thinking of other ways in which to create similar items. | • Testing and evaluating an end product against the original design criteria. • Deciding how many of the criteria should be met for the product to be considered successful. • Suggesting modifications for improvement. • Articulating the advantages and disadvantages of different fastening types |
|  | Knowledge | • To know that ‘joining technique’ means connecting two pieces of material together. • To know that there are various temporary methods of joining fabric by using staples. glue or pins. • To understand that different techniques for joining materials can be used for different purposes. • To understand that a template (or fabric pattern) is used to cut out the same shape multiple times. • To know that drawing a design idea is useful to see how an idea will look. | • To know that sewing is a method of joining fabric. • To know that different stitches can be used when sewing. • To understand the importance of tying a knot after sewing the final stitch. • To know that a thimble can be used to protect my fingers when sewing. | •To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. •To know that when two edges of fabric have been joined together it is called a seam. •To know that it is important to leave space on the fabric for the seam. •To understand that some products are turned inside out after sewing so the stitching is hidden. | • To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro. • To know that different fastening types are useful for different purposes. • To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions. |
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|  Design and Technology Digital world  |
|  |  | Year 5 /6 navigating the world  |  |  |
| Skills  | Design | • 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 combining one or more 3D objects, using CAD. |
|  | Make  | • 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. |
|  | Evaluate  | • 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 explaining 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 pitch |
| Knowledge  | Technical  | • To know that accelerometers can detect movement. • To understand that sensors can be useful in products as they mean the product can function without human input. |
|  | Additional | • To know that designers write design briefs and develop design criteria to enable them to fulfil a client’s request. • To know that ‘multifunctional’ means an object or product has more than one function. • To know that magnetometers are devices that measure the Earth’s magnetic field to determine which direction you are facing. |
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|  Design and Technology Cooking and nutrion  |
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| Skills  | Design |  |  |  |
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| Knowledge  | Technical  |  |  |  |
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|  Design and Technology Cooking and nutrion  |
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|  Design and Technology Cooking and nutrion  |
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| Skills  | Design |  |  |  |
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|  Design and Technology EYFS  |
| Junk Modelling  |  |  |  |  |
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