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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 |  |
| 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 |  |
| 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 |  |
| 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 start  To know that threading is putting one material through an object  To 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 3  Cooking 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 used  To know that some ingredients are grown  To name some common fruits / vegetables if used  To 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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