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DT

Progression Map

D & T Progression Map Year A

Structures

Skills

	EYFS		Key Stage 1
			By the end of Year 2, children will be taught to:
Junk Modelling	**Design:** • Making verbal plans and material choices. • Developing a junk model. **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. **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.	Make a Windmill	**Design:** • Learning the importance of a clear design criteria. • Including individual preferences and requirements in a design **Make:** • 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.

Knowledge

Junk Modelling	**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.	Make a Windmill	**Technical:** • To understand that the shape of materials can be changed to improve the strength and stiffness of structures. • 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. **Additional:** • To know that a client is the person I am designing for. • 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.

D & T Progression Map Year B
Structures

Skills

	EYFS		Key Stage 1 *By the end of Year 2, children will be taught to:*
Boats	**Design:** • Designing a junk model boat. • Using knowledge from exploration to inform design. **Make:** • Making a boat that floats and is waterproof, considering material choices. **Evaluate:** • Making predictions about, and evaluating different materials to see if they are waterproof. • Making predictions about, and evaluating existing boats to see which floats best. • Testing their design and reflecting on what could have been done differently. • Investigating the how the shapes and structure of a boat affect the way it moves.	Baby Bear' s Chair	**Design:** • Generating and communicating ideas using sketching and modelling. **Make:** • 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:** • Testing the strength of own structure. • Identifying the weakest part of a structure. • Evaluating the strength, stiffness and stability of own structure.

Knowledge

Boats	**Technical:** • To know that 'waterproof' materials are those which do not absorb water. **Additional:** • To know that some objects float and others sink. • To know the different parts of a boat.	Baby Bear' s Chair	**Technical:** • 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.

D & T Progression Map Year A

Structures

Skills

	Lower Key Stage 2 *By the end of Year 4, children will be taught to:*		Upper Key Stage 2 *By the end of Year 6, children will be taught to:*
Constructing a Pavilion	**Design:** • Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. • Building frame structures designed to support weight. **Make:** • 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 cladding. • Reinforcing corners to strengthen a structure. • Creating a design in accordance with a plan. • Learning to create different textural effects with materials. **Evaluate:** • Evaluating structures made by the class. • Describing what characteristics of a design and construction made it the most effective. • Considering effective and ineffective designs.	Bridges	**Design:** • Designing a stable structure that is able to support weight. • Creating a frame structure with a focus on triangulation. **Make:** • Making a range of different shaped beam bridges. • Using triangles to create truss bridges that span a given distance and support a load. • Building a wooden bridge structure. • Independently measuring and marking wood accurately. • Selecting appropriate tools and equipment for particular tasks. • Using the correct techniques to saws safely. • Identifying where a structure needs reinforcement and using card corners for support. • Explaining why selecting appropriating materials is an important part of the design process. • Understanding basic wood functional properties. **Evaluate:** • Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary. • Suggesting points for improvements for own bridges and those designed by others.

Knowledge

Constructing a Pavilion	**Technical:** • To understand what a frame structure is. • To know that a 'free-standing' structure is one which can stand on its own **Additional:** • To know that a pavilion is a decorative building or structure for leisure activities. • To know that cladding can be applied to structures for different effects. • To know that aesthetics are how a product looks. • To know that a product's function means its purpose. • To understand that the target audience means the person or group of people a product is designed for. • To know that architects consider light, shadow and patterns when designing.	Bridges	**Technical:** • To understand some different ways to reinforce structures. • To understand how triangles can be used to reinforce bridges. • To know that properties are words that describe the form and function of materials. • To understand why material selection is important based on properties. • To understand the material (functional and aesthetic) properties of wood. **Additional:** • To understand the difference between arch, beam, truss and suspension bridges. • To understand how to carry and use a saw safely.

D & T Progression Map Year A

Mechanisms/Mechanical Systems

Skills

	EYFS		Key Stage 1 *By the end of Year 2, children will be taught to:*
Junk Modelling	**Design:** • Making verbal plans and material choices. • Developing a junk model. **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. **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.	Making a Moving Storybook	**Design:** • Explaining how to adapt mechanisms, using bridges or guides to control the movement. • Designing a moving story book for a given audience. **Make:** • Following a design to create moving models that use levers and sliders. **Evaluate:** • 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.

Knowledge

Junk Modelling	**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.	Making a Moving Storybook	**Technical:** • To know that a mechanism is the parts of an object that move together. •To know that a slider mechanism moves an object from side to side. • To know that a slider mechanism has a slider, slots , guides and an object. • To know that bridges and guides are bits of card that purposefully restrict the movement of the slider. **Additional:** • To know that in Design and technology we call a plan a 'design'.

D & T Progression Map Year B

Mechanisms/Mechanical Systems

Skills

	EYFS		Key Stage 1 *By the end of Year 2, children will be taught to:*
Boats	**Design:** • Designing a junk model boat. • Using knowledge from exploration to inform design. **Make:** • Making a boat that floats and is waterproof, considering material choices. **Evaluate:** • Making predictions about, and evaluating different materials to see if they are waterproof. • Making predictions about, and evaluating existing boats to see which floats best. • Testing their design and reflecting on what could have been done differently. • Investigating the how the shapes and structure of a boat affect the way it moves.	Making a Moving Monster	**Design:** • Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria. **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. **Evaluate:** • Evaluating own designs against design criteria. • Using peer feedback to modify a final design.

Knowledge

Boats	**Technical:** • To know that 'waterproof' materials are those which do not absorb water. **Additional:** • To know that some objects float and others sink. • To know the different parts of a boat.	Making a Moving Monster	**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. **Additional:** • To know some real-life objects that contain mechanisms.

D & T Progression Map Year A

Mechanisms/Mechanical Systems

Skills

Lower Key Stage 2

By the end of Year 4, children will be taught to:

Making a slingshot car

Design:
- 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.

Make:
- Measuring, marking, cutting and assembling with increasing accuracy.
- Making a model based on a chosen design.

Evaluate:
- Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.

Upper Key Stage 2

By the end of Year 6, children will be taught to:

Automata toys

Design:
- Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement.
- Understanding how linkages change the direction of a force.
- Making things move at the same time.
- Understanding and drawing cross-sectional diagrams to show the inner-workings of my design.

Make:
- Measuring, marking and checking the accuracy of the jelutong and dowel pieces required.
- Measuring, marking and cutting components accurately using a ruler and scissors.
- Assembling components accurately to make a stable frame.
- Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles.
- Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set.

Evaluate:
- Evaluating the work of others and receiving feedback on own work.
- Applying points of improvement to their toys.
- Describing changes they would make/do if they were to do the project again.

Knowledge

Making a slingshot car

Technical:
- To know that air resistance is the level of drag on an object as it is forced through the air.
- To understand that the shape of a moving object will affect how it moves due to air resistance.

Additional:
- To know that aesthetics means how an object or product looks in design and technology.
- To know that a template is a stencil you can use to help you draw the same shape accurately.
- To know that a birds-eye view means a view from a high angle (as if a bird in flight).
- To know that graphics are images which are designed to explain or advertise something.
- To know that it is important to assess and evaluate design ideas and models against a list of design criteria.

Automata toys

Technical:
- To understand that the mechanism in an automata uses a system of cams, axles and followers.
- To understand that different shaped cams produce different outputs.

Additional:
- 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.
- To understand how to use a bench hook and saw safely.
- To know that a set square can be used to help mark 90° angles.

D & T Progression Map Year B

Electrical systems (KS2 only)

Skills

	Lower Key Stage 2 *By the end of Year 4, children will be taught to:*		Upper Key Stage 2 *By the end of Year 6, children will be taught to:*
Torches	**Design:** • Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. **Make:** • 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. **Evaluate:** • Evaluating electrical products. • Testing and evaluating the success of a final product.	Doodlers	**Design:** • 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. **Make:** • 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. **Evaluate:** • 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.

Knowledge

Torches	**Technical:** • To know that an electrical circuit must be complete for electricity to flow. • To know that a switch can be used to complete and break an electrical circuit. **Additional:** • To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. • To know facts from the history and invention of the electric light bulb(s) – by Sir Joseph Swan and Thomas Edison.	Doodlers	**Technical:** • To know that series circuits only have one direction for the electricity to flow. • To know when there is a break in a series circuit, all components turn off. • To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin. • To know a motorised product is one which uses a motor to function. **Additional:** • To know that product analysis is critiquing the strengths and weaknesses of a product. • To know that 'configuration' means how the parts of a product are arranged.

D & T Progression Map

Cooking and nutrition

Skills

Key Stage 1

By the end of Year 2, children will be taught to:

Fruit and Vegetables

Design:
- Designing smoothie carton packaging by-hand or on ICT software.

Make:
- 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

Evaluate:
- Tasting and evaluating different food combinations.
- Describing appearance, smell and taste.
- Suggesting information to be included on packaging.

A balanced diet

Design:
- Designing a healthy wrap based on a food combination which works well together

Make:
- Slicing food safely using the bridge or claw grip.
- Constructing a wrap that meets a design brief.

Evaluate:
- 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.

Knowledge

Fruit and Vegetables

- Understanding the difference between fruits and vegetables.
- To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber).
- To know that a blender is a machine which mixes ingredients together into a smooth liquid.
- To know that a fruit has seeds and a vegetable does not.
- To know that fruits grow on trees or vines.
- To know that vegetables can grow either above or below ground.
- To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).

A balanced diet

- To know that 'diet' means the food and drink that a person or animal usually eats.
- To understand what makes a balanced diet.
- To know where to find the nutritional information on packaging.
- To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar.
- To understand that I should eat a range of different foods from each food group, and roughly how much of each food group.
- To know that nutrients are substances in food that all living things need to make energy, grow and develop.
- To know that 'ingredients' means the items in a mixture or recipe.
- To know that I should only have a maximum of five teaspoons of sugar a day to stay healthy.
- To know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'.

D & T Progression Map Year A

Textiles

Skills

	EYFS		Key Stage 1 *By the end of Year 2, children will be taught to:*
Bookmarks	**Design:** • Discussing what a good design needs. • Designing a simple pattern with paper. • Designing a bookmark. • Choosing from available materials. **Make:** • Developing fine motor/cutting skills with scissors. • Exploring fine motor/threading and weaving (under, over technique) with a variety of materials. • Using a prepared needle and wool to practise threading. **Evaluate:** • Reflecting on a finished product and comparing to their design.	Puppets	**Design:** • Using a template to create a design for a puppet. **Make:** • Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing steps for construction. **Evaluate:** • Reflecting on a finished product, explaining likes and dislikes.

Knowledge

Bookmarks	• To know that a design is a way of planning our idea before we start. • To know that threading is putting one material through an object.	Puppets	• 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.

D & T Progression Map Year A

Textiles

Skills

	Lower Key Stage 2 *By the end of Year 4, children will be taught to:*		Upper Key Stage 2 *By the end of Year 6, children will be taught to:*
Cushions	**Design:** • Designing and making a template from an existing cushion and applying individual design criteria. **Make:** • 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. **Evaluate:** • Evaluating an end product and thinking of other ways in which to create similar items.	Soft Toy	**Design:** • Designing a stuffed toy, considering the main component shapes required and creating an appropriate template. • Considering the proportions of individual components. **Make:** • Creating a 3D stuffed toy from a 2D design. • Measuring, marking and cutting fabric accurately and independently . • Creating strong and secure blanket stitches when joining fabric. • Threading needles independently. • Using appliqué to attach pieces of fabric decoration. • Sewing blanket stitch to join fabric. • Applying blanket stitch so the spaces between the stitches are even and regular. **Evaluate:** • Testing and evaluating an end product and giving point for further improvements.

Knowledge

Cushions	•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.	Soft Toy	• To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric. • To understand that it is easier to finish simpler designs to a high standard. • To know that soft toys are often made by creating appendages separately and then attaching them to the main body. • To know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely.

D & T Progression Map Year A - *Digital world (KS2 only)*

Skills

Lower Key Stage 2
By the end of Year 4, children will be taught to:

Mindful Moments

Design:
- 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 by using computer-aided design (CAD), to produce a logo.
- Following a list of design requirements.

Make:
- Developing a prototype case for my mindful moment timer.
- Creating 3D structures using modelling materials.
- Programming a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press.

Evaluate:
- 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.
- Testing my program for bugs (errors in the code).
- Finding and fixing the bugs (debug) in my code.
- Gathering feedback from the user to make suggested improvements to a product.

Upper Key Stage 2
By the end of Year 6, children will be taught to:

Navigating the World

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

Mindful Moments

Technical:
- To understand what variables are in programming.
- To know some of the features of a Micro:bit.
- To know that an algorithm is a set of instructions to be followed by the computer.
- To know that it is important to check my code for errors (bugs).
- To know that a simulator can be used as a way of checking your code works before installing it onto an electronic device.

Additional:
- To understand the terms 'ergonomic' and 'aesthetic'.
- To know that a prototype is a 3D model made out of cheap materials, that allows us to test design ideas and make better decisions about size, shape and materials.
- To know that an exhibition is a way for companies to showcase products, meet potential new customers and gather feedback from users.

Navigating the World

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.