



Design & Technology (D.T.) - Curriculum Overview (Year A)

Year	Subject specific Vocabulary	'The Greats'	Autumn 2 Mechanisms/ Mechanical systems (KS1 & KS2)	Spring 2 Cooking and Nutrition	Summer 2 Mechanisms/ Mechanical systems (KS1) Structures (KS2)
Nursery			Personal, Social & Emotional Development (PSED): Managing Self • Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen, or one which is suggested to them Physical Development (PD): Gross Motor Skills • Choose the right resources to carry out their own plan. For example, choosing a spade to enlarge a small hole they dug with trowel Fine Motor Skills • Use one-handed tools and equipment, for example, making snips in paper with scissors Understanding the World: The Natural World • Explore how things work Expressive Arts and Design: Creating with Materials • Make imaginative & complex 'small worlds' with blocks & construction kits, such as a city with different buildings and a park • Explore different materials freely, in order to develop their ideas about how to use them and what to make • Develop their own ideas and then decide which materials to use to express them • Join different materials and explore different textures • Draw with increasing complexity and detail, such as representing a face with a circle and including details • Use drawing to represent ideas		ade to enlarge a small hole they dug with a ors a city with different buildings and a park te them and what to make
Reception			Physical Development (PD): Fine Motor Skills • Develop their small motor skills so that t range of tools competently, safely and con Suggested tools: pencils for drawing and w paintbrushes, scissors, knives, forks and s	fidently. range of tools riting, Suggested too	





Key stage 1

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

When designing and making, pupils should be taught to:

Design

- -design purposeful, functional, appealing products for themselves and other users based on design criteria
- -generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology

Make

- -select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
- -select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics Evaluate
- -explore and evaluate a range of existing products
- -evaluate their ideas and products against design criteria Technical knowledge
- -build structures, exploring how they can be made stronger, stiffer and more stable
- -explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

Key stage 2

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment]. When designing and making, pupils should be taught to:

<u>Design</u>

- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups





-generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

<u>Make</u>

- -select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- -select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

<u>Evaluate</u>

-investigate and analyse a range of exist

Wheels and Axels	Jamie Oliver
Assemble Design	
Evaluation	
Mechanism	
Model	
Sliders	
Stencil	
Target audience	
Template	
Test	
Fruit and	
<u>Vegetables</u>	
Blender	
Carton	
•	
Ingredients	
Peel	
Peeler	
Recipe	
Slice	
	Assemble Design Evaluation Mechanism Model Sliders Stencil Target audience Template Test Fruit and Vegetables Blender Carton Fruit Healthy Ingredients Peel Peeler Recipe

Smoothie

Stencil

Making a moving story book

Design (class design)

- -Learn the importance of a clear design criteria
- -Design a moving story book for a given audience

Make

- -Follow a design to create moving models that use levers and sliders
- -Adapt mechanisms

Evaluate

- -Test and evaluate a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed
- -Review the success of a product by testing it with its intended audience

Technical Knowledge

- -Learn that levers and sliders are mechanisms and can make things move
- -Identify whether a mechanism is a lever or slider and determining what movement the mechanism will make
- -Use the vocabulary: up, down, left, right, vertical and horizontal to describe movement

Fruit and Vegetables

Design

-Design smoothie carton packaging byhand or on ICT software

Make

- -Chop fruit and vegetables safely to make a smoothie
- -Identify if a food is a fruit or a vegetable
- -Learn where and how fruits and vegetables grow

Evaluate

- -Taste and evaluate different food combinations
- -Describe appearance, smell and taste
- -Suggest information to be included on packaging

Technical Knowledge

- -Understand the difference between fruits and vegetables
- -Describe and group fruits by texture and taste

Wheels and Axels

Design (group design)

- -Design a moving story book for a given audience -Design a vehicle that includes wheels, axles and
- axle holders, which will allow the wheels to move -Create clearly labelled drawings which illustrate movement

Make

- -Follow a design to create moving models that use levers and sliders
- -Adapt mechanisms

Evaluate

- -Test a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed
- -Review the success of a product by testing it with its intended audience
- -Test and evaluate mechanisms, identifying what stops wheels from turning,

- -Explain how to adapt mechanisms, using bridges or guides to control the movement $\,$
- -Know that a wheel needs an axle in order to move
- -Learn that levers and sliders are mechanisms and can make things move





	Template Vegetable Making a moving story book Assemble Design Evaluation Mechanism Model Sliders Stencil Target audience Template Test		-Identify what mechanism makes a toy or vehicle roll forwards -Learn that for a wheel to move it must be attached to an axle		-Identify whether a mechanism is a lever or slider and determining what movement the mechanism will make -Use the vocabulary: up, down, left, right, vertical and horizontal to describe movement -Identify what mechanism makes a toy or vehicle roll forwards -Learn that for a wheel to move it must be attached to an axle
Year 2	Fairground Wheel Axle Decorate Evaluation Ferris wheel Mechanism Stable Strong Test Waterproof Weak A Balanced Diet Alternative Diet Balanced diet Evaluation Expensive Healthy Ingredients Nutrients Packaging Refrigerator	George Ferris	Moving Monster Design -Understand and create a class design criteria for a moving monster -Design a moving monster for a specific audience in accordance with a design criteria Make -Make linkages using card for levers and split pins for pivots -Experiment with linkages adjusting the widths, lengths and thicknesses of card used -Cut and assemble components neatly -Select materials according to their characteristics -Follow a design brief Evaluate -Evaluate own designs against design criteria -Use peer feedback to modify a final design -Evaluate different designs -Test and adapt a design Technical Knowledge -Know the characteristics of materials	A Balanced Diet Design Design a healthy wrap based on a food combination which work well together Make Slice food safely using the bridge or claw grip Constructing a wrap that meets a design brief Evaluate Describe the taste, texture and smell of fruit and vegetables Taste testing food combinations and final products Describe the information that should be included on a label Evaluate which grip was most effective Technical Knowledge Understand what makes a balanced diet Know where to find the nutritional information on packaging Know the five food groups	Fairground Wheel Design (individual design) -Understand and create design criteria for a fairground wheel. -Design a wheel for a specific audience in accordance with design criteria. -Design a wheel selecting appropriate materials based on their properties -Generate and communicate ideas using sketching and modelling Make -Select a suitable linkage system to produce the desired motions -Make linkages using card for levers and split pins for pivots -Experiment with linkages adjusting the widths, lengths and thicknesses of card used -Cut and assemble components neatly -Select materials according to their characteristics -Follow a design brief Evaluate -Evaluate own designs against design criteria -Use peer feedback to modify a final design -Evaluate different designs -Test and adapt a design





Sugar Substitute

Moving Monster

Evaluation
Input
Lever
Linear motion
Linkage
Mechanical
Mechanism
Motion
Oscillating
motion
Output
Pivot
Reciprocating
motion
Rotary motion

Survey

-Learn that mechanisms are a collection of moving parts that work together in a machine

- -Learn that there is an input and output in a mechanism
- -Identify mechanisms in everyday objects
- -Learn that a lever is something that turns on a pivot
- -Learn that a linkage is a system of levers that are connected by pivots





- -Learn that mechanisms are a collection of moving parts that work together in a machine
- -Learning that there is an input and output in a $\mbox{\it mechanism}$
- -Identifying mechanisms in everyday objects
- -Learning that a lever is something that turns on a pivot
- -Learning that a linkage is a system of levers that are connected by pivots
- -Exploring wheel mechanisms
- -Learning how axels help wheels to move a vehicle





Year 3	Constructing of
	<u>castle</u>
	20 abanaa

2D shapes 3D shapes Castle

Design criteria Evaluate Facade Feature

Flag Net

Net Recyclable Scoring Stable Strona

Structure Tab Weak

Eating Seasonally

Climate
Dry climate
Exported
Imported
Mediterranean
climate
Nationality
Nutrients

Polar climate Recipe

Seasonal food Seasons Temperate

climate Tropical

Pneumatic Toys

William the Conqueror

Pneumatic Toys

Design

- -Develop design criteria from a design brief
- -Design a toy which uses a pneumatic system
- -Generate ideas using thumbnail sketches and exploded diagrams
- -Learn that different types of drawings are used in design to explain ideas clearly

Make

- -Create a pneumatic system to create a desired motion
- -Build secure housing for a pneumatic system
- -Use syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy
- -Select materials due to their functional and aesthetic characteristics
- -Manipulate materials to create different effects by cutting, creasing, folding, weaving

Evaluate

- -Use the views of others to improve Designs
- -Test and modify the outcome, suggesting improvements/points for modification.
- -Understand the purpose of explodeddiagrams through the eyes of a designer and their client

Technical Knowledge

- -Understand how pneumatic systems work
- -Learn that mechanisms are a system of parts that work together to create motion
- -Understand that pneumatic systems can be used as part of a mechanism

Eating Seasonally

<u>Design</u>

-Create a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish

Make

-Know how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination -Follow the instructions within a

-Follow the instructions within a recipe

Evaluate

- -Establish and use design criteria to help test and review dishes
- -Describe the benefits of seasonal fruits and vegetables
- and the impact on the environment
- -Suggest points for improvement when making a seasonal tart

Technical Knowledge

- -Learn that climate affects food growth
- -Work with cooking equipment safely and hygienically
- -Learning that imported foods travel from far away and this can negatively impact the environment
- -Learning that vegetables and fruit grow in certain seasons
- -Learn that each fruit and vegetable gives us nutritional benefits
- -Learn to use, store and clean a knife safely

Constructing a castle

Design

- -Design a castle with key features to appeal to a specific person/purpose
- -Draw and label a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials need and colours
- -Design a castle that fits the requirements of a given brief.

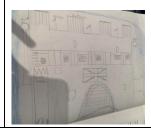
Make

- -Construct a range of 3D geometric shapes using nets
- -Create special features for individual designs
- -Make facades from a range of recycled materials

Evaluate

- -Evaluate own work and the work of others based on the aesthetic of the finished product and in comparison, to the original design
- -Suggest points for modification of the individual designs

- -Identify features of a castle
- -Identify suitable materials to be selected and used for a castle, considering weight, compression. tension
- -Extend the knowledge of wide and flat based objects being more stable
- -Understanding the terminology of strut, tie, span, beam
- -Understand the difference between frame and shell structure $% \left(1\right) =\left(1\right) \left(1\right)$

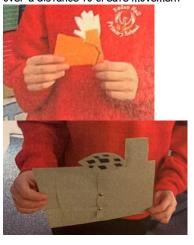


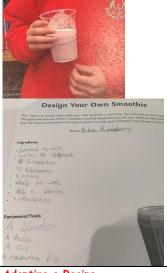




Explodeddiagram
Function
Input
Lever
Linkage
Mechanism
Motion
Net
Output
Pivot
Pneumatic
system
Thumbnail
sketch

-Learn that pneumatic systems force air over a distance to create movement







Year 4 Pavilions

Aesthetic
Cladding

Design criteria Evaluation

Evaluat

Frame

Structure

Function

Inspiration

Pavilion

Reinforce

Stable

Structure

Target audience

Target customer

Texture

Theme

Adapting a Recipe

Adapt Budget

Mary Berry

<u>Making a Slingshot Car</u>

Design

- -Develop design criteria from a design brief
- -Design a shape that reduces air resistance.
- -Draw a net to create a structure from.
- -Choose shapes that increase or decrease speed as a result of air resistance.
- -Personalise a design.

<u>Make</u>

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

<u>Evaluate</u>

- -Evaluate the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.
- -Consider effective and ineffective designs

Technical Knowledge

-Understand that all moving things have kinetic energy.

Adapting a Recipe

Design

-Design a biscuit within a given budget, drawing upon previous taste testing

Make

- -Follow a baking recipe
- -Cook safely, following basic hygiene rules
- -Adapt a recipe

Evaluate

- -Evaluate a recipe, considering: taste, smell, texture and appearance
- -Describe the impact of the budget on the selection of inaredients
- -Evaluate and compare a range of products
- -Suggesting modifications

Technical Knowledge

-Understand the impact of the cost and importance of budgeting while planning ingredients for biscuits

Pavilions

Design

- -Design a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect
- -Build frame structures designed to support weight

Make

- -Create a range of different shaped frame structures
- -Make a variety of free-standing frame structures of different shapes and sizes
- -Select appropriate materials to build a strong structure and for the cladding
- -Reinforce corners to strengthen a structure
- -Create a design in accordance with a plan
- -Learn to create different textural effects with materials

Evaluate

- -Evaluate structures made by the class
- -Describe what characteristics of a design and construction made it the most effective
- -Consider effective and ineffective designs

Technical Knowledge

-Learn what pavilions are and their purpose



What could be

healthier?

Beef



School School					School
	Cooling rack Creaming Equipment Evaluation Flavour Ingredients Method Net Packaging Prototype Quantity Recipe Rubbing Sieving Target audience Unit of measurement Utilities		-Understand that kinetic energy is the energy that something (object/person) has by being in motionKnow that air resistance is the level of drag on an object as it is forced through the airUnderstand that the shape of a moving object will affect how it moves due to air resistance	-Understand the environmental impact on future product and cost of production	-Build on prior knowledge of net structures and broadening knowledge of frame structures -Learn that architects consider light, shadow and patterns when designing -Implement frame and shell structure knowledge -Consider effective and ineffective designs
Year 5	Making a Pop Up Book Aesthetic Computer-aided design (CAD) Caption Exploded- diagram Function Input Linkage Mechanism Motion Output Pivot Prototype Slider Structure Template	David Hawcock	Making a Pop Up Book Design -Develop design criteria from a design brief -Design a pop-up book which uses a mixture of structures and mechanisms. -Name each mechanism, input and output accurately. -Storyboard ideas for a book. Make -Follow a design brief to make a pop-up book, neatly and with focus on accuracy. -Make mechanisms and/or structures using sliders, pivots and folds to produce movement. -Use layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result. Evaluate -Evaluate the work of others and receiving feedback on own work.	What could be healthier? Design -Adapt a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. -Write an amended method for a recipe to incorporate the relevant changes to ingredients. -Design appealing packaging to reflect a recipe. Make -Cut and prepare vegetables safely. -Use 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. Evaluate -Identify the nutritional differences	Bridges Design -Design a stable structure that is able to support weight -Create frame structure with focus on triangulation -Develop design criteria from a design brief. Make -Make a range of different shaped beam bridges -Use triangles to create truss bridges that span a given distance and supports a load

-Suggest points for

Technical Knowledge

improvement/modification.

between different products and

recipes.





Cross-contamination

Diet

Ethical issues

Farm

Healthy

Nutrients

Reared

Substitute

Vegan

Vegetarian

Welfare

Bridges

Abutment

Accurate

Arched bridge

Beam bridge

Coping saw

Evaluation

File

Mark out

Material

properties

Measure

Predict

Reinforce

Research

Sandpaper

Set square

Suspension bridge

Tenon saw

Test

Truss bridge

Wood

- -Know that mechanisms control movement.
- -Understand that mechanisms can be used to change one kind of motion into another.
- -Understand how to use sliders, pivots and folds to create paper-based mechanisms.
- to reinforce structures
- -Understand how triangles can be used to reinforce bridges
- -Articulate the difference between beam, arch, truss and suspension bridges

-Identify and describing healthy benefits of food groups

Technical Knowledge

- -Understand where meat comes from -Learn that beef is from cattle and how beef is reared and processed, including key welfare issues.
- -Know that I can adapt a recipe to make it healthier by substituting ingredients.
- -Know that I can use a nutritional calculator to see how healthy a food option is.
- -Understand that 'crosscontamination' means bacteria and germs have been passed onto readyto-eat foods and it happens when these foods mix with raw meat or unclean objects



- -Build a wooden bridge structure independently measuring and marking wood accurately
- -Select appropriate tools and equipment for particular tasks
- -Use the correct techniques to saws safely
- -Identify where a structure needs reinforcement and using card corners for support
- -Explain why selecting appropriating materials is an important part of the design process
- -Understand basic wood functional properties

Evaluate

- -Adapt and improve own bridge structure by identifying points of weakness and reinforcing them as necessary
- -Suggest points for improvements and modifications for own bridges and those designed by others

- -Explore how to create a strong beam identifying arch and beam bridges and understand the terms: compression and tension
- -Identify stronger and weaker structures
- -Find different ways to reinforce structures
- -Understand how triangles can be used to reinforce bridges
- -Articulate the difference between beam, arch, truss and suspension bridges





Imperative-verb



				After will near 2006. Genn 3. Winderstell 1. Winderstell 1	
Year 6	Automata toys	Matt Smith	Automata toys	Come dine with me	Playgrounds
	Accurate		<u>Design</u>	<u>Design</u>	<u>Design</u>
	Assembly-diagram		-Develop design criteria from a design	-Write a recipe, explaining the key	-Design a playground featuring a variety of
	Automata		brief	steps, method and ingredients.	different structures, giving careful
	Axle		-Experiment with a range of cams,	-Include facts and drawings from	consideration to how the structures will be
	Bench hook				used, considering effective and ineffective
	Cam		<u> </u>		designs
	'				-Develop design criteria from a design brief.
	•		, , , , , , , , , , , , , , , , , , , ,		<u>Make</u> -Build a range of play apparatus structures
	_				drawing upon new and prior knowledge of
	_				structures
				, ,,, ,	-Measure, marking and cutting wood to create a
				l •	range of structures
			' -	·	-Use a range of materials to reinforce and add
					decoration to structures
	Frame			_	<u>Evaluate</u>
	Function		,	-	-Improve a design plan based on peer evaluation
	Hand drill				-Test and adapt a design to improve it as it is
	Jelutong		accurately using a ruler and scissors.	improvements when scoring others'	developed
	Linkage		-Assemble components accurately to	dishes, and when evaluating their own	-Identify what makes a successful structure
	Come dine with		make a stable frame.	throughout the planning, preparation	Technical Knowledge
	<u>me</u>		-Understand that for the frame to	and cooking process.	-Know that structures can be strengthened by
	Accompaniment		function effectively the components	-Evaluate health and safety in	manipulating materials and shapes -Identify the shell structure in everyday life
	Collaboration		must be cut accurately and the joints of	1 *	(cars, aeroplanes, tins, cans)
	Cookbook		the frame secured at right angles.	contamination.	-Understand man-made and natural structures
	Cross-			Technical Knowledge	Siles. Stand man made and hard at 511 detail 65
	contamination				
			= -		
	l Flavour	I	i -bygingte the work of others and	i national alsnes which are recibes	
	Illustration		receiving feedback on own work.	associated with that country.	
		Bench hook Cam Clamp Component Cutting list Diagram Dowel Drill bits Exploded-diagram Finish Follower Frame Function Hand drill Jelutong Linkage Come dine with me Accompaniment Collaboration Cookbook Cross-	Bench hook Cam Clamp Component Cutting list Diagram Dowel Drill bits Exploded-diagram Finish Follower Frame Function Hand drill Jelutong Linkage Come dine with me Accompaniment Collaboration Cookbook Cross- contamination Equipment Farm	Bench hook Cam Clamp Component Cutting list Diagram Dowel Drill bits Exploded-diagram Finish Follower Frame Function Hand drill Jelutong Linkage Come dine with me Accompaniment Collaboration Cookbook Cross- Contamination Equipment Farm Bench hook Cam Clamp Creating a design for an automata toy based on a choice of cam to create a desired movementUnderstand how linkages change the direction of a forceMake things move at the same timeUnderstand and drawing cross-sectional diagrams to show the inner-workings of my design. Make -Measure, mark and check the accuracy of the jelutong and dowel pieces requiredMeasure, mark and cut components accurately using a ruler and scissorsAssemble components accurately to make a stable frameUnderstand that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right anglesSelect appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set. Evaluate	Bench hook Cam Clamp Clamp Component Component Cutting list Diagram Dowel Dowel Dorill bits Exploded-diagram Finish Follower Frame Function Hand drill Jelutong Linkage Come dine with me Accompaniment Combook Come Accompaniment Combook Come Accompaniment Combook Come Cookbook Cross- Cookbook Cross- Containination Equipment Equipment Exaluate Clamp Creating a design for an automata toy based on a choice of cam to create a desired movement. Adaes Cross- Component Come dine with Cookbook Cross- Contamination Equipment Evaluate Clamp Come dine with Come dine with Come dine with Cookbook Cross- Contamination Equipment Come dine with Come dine with Come dine with Come dine with Cookbook Cross- Contamination Equipment Come dine with Come dine with Come dine with Come dine with Cookbook Cross- Contamination Equipment Come dine with Come dine with Cookbook Cross- Contamination Equipment Come dine with Cookbook Cross- Contamination Equipment Come dine with Cookbook Cross- Contamination Equipment Cookbook Cross- Contamination Equipment Come dine with Cookbook Cross- Contamination Equipment Cookbook Cross-





7						70 ACHIES
	Ingredients Method Nationality Preparation Processed Reared Recipe Research Storyboard Target audience Top tips Playgrounds Adapt Apparatus Bench hook Cladding Coping saw Dowel Jelutong Landscape Modify Prototype Vice	-Apply points of improvement/modification to -Describe changes they woul if they were to do the project Technical Knowledge -Understand that the mecha automata uses a system of conditional followersUnderstand that different produce different outputs.	o their toys. d make/do ct again. nism in an ams, axles shaped cams d make/do multiple -Unders wash fr eating t insectic -Unders	hat 'processed food' means at has been put through changes in a factory. Itand that it is important to uit and vegetables before oremove any dirt and ides. Itand what happens to a food before it appears on the arket shelf (Farm to Fork).	Topics Control of the	