



# 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 a 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			
Reception			Use drawing to represent ideas  Physical Development (PD):  Fine Motor Skills      Develop their small motor skills so the range of tools competently, safely as Suggested tools: pencils for drawing paintbrushes, scissors, knives, forks	Fine Motor so a nat they can use a not confidently.  and writing, and spoons.  Fine Motor so use a cutlery  Expressive A  Creating wit  Safely usexperim	elopment (PD): Skills (ELG) Inge of small tools, including scissors, paintbrushes and Interest and Design: In Materials (ELG) Is a explore a variety of materials, tools & techniques, enting with colour, design, texture, form & function Their creations, explaining the process they have used	





Year 1	Wheels and	Axels

Assemble Design Evaluation Mechanism

Model Sliders Stencil

Target audience Template Test

# Fruit and Vegetables

Blender Carton Fruit

Healthy Ingredients

Peel
Peeler
Recipe
Slice

Smoothie Stencil Template Vegetable

# Making a moving

story book

Assemble Design Evaluation Mechanism

Model Sliders Stencil

Target audience Template

Test

Making a moving story book

# Design

-Designing a moving story book for a given audience

#### Make

- -Following a design to create moving models that use levers and sliders
- -Adapting mechanisms

# 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

# Technical Knowledge

- -Learning that levers and sliders are mechanisms and can make things move
- -Identifying whether a mechanism is a lever or slider and determining what movement the mechanism will make
- -Using the vocabulary: up, down, left, right, vertical and horizontal to describe movement
- -Identifying what mechanism makes a toy or vehicle roll forwards
- -Learning that for a wheel to move it must be attached to an axle

# 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

# Technical Knowledge

- -Understanding the difference between fruits and vegetables
- -Describing and grouping fruits by texture and taste

# Wheels and Axels

#### Design

- -Explaining how to adapt mechanisms, using bridges or guides to control the movement
- -Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to make
- -Creating clearly labelled drawings which illustrate movement

#### Make

- -Following a design to create moving models that use levers and sliders
- -Adapting mechanisms

# 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
- -Testing mechanisms, identifying what stops wheels from turning, knowing that a wheel needs an axle in order to move

#### Technical Knowledge

- -Learning that levers and sliders are mechanisms and can make things move  $\,$
- -Identifying whether a mechanism is a lever or slider and determining what movement the mechanism will make
- -Using the vocabulary: up, down, left, right, vertical and horizontal to describe movement
- -Identifying what mechanism makes a toy or vehicle roll forwards
- -Learning that for a wheel to move it must be attached to an axle





#### Fairground Wheel Year 2

Axle Decorate Evaluation Ferris wheel Mechanism Stable Strong Test Waterproof

# A Balanced Diet

Weak

Alternative Diet Balanced diet **Fvaluation** Expensive Healthy Ingredients Nutrients Packaging Refrigerator Sugar Substitute

# Moving Monster

Evaluation Input Lever Linear motion Linkage Mechanical Mechanism Motion Oscillating motion Output

# 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
- -Selecting materials according to their characteristics
- -Following a design brief

## Evaluate

- -Evaluating own designs against design criteria
- -Using peer feedback to modify a final design
- -Evaluating different designs
- -Testing and adapting a design

# Technical Knowledge

- -Learning that mechanisms are a collection of moving parts that work together in a machine
- -Learning that there is an input and output in a 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

# A Balanced Diet

# Design

-Designing a healthy wrap based on a food combination which work well toaether

### 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

# Technical Knowledge

- -Understanding what makes a balanced diet
- -Knowing where to find the nutritional information on packaging
- -Knowing the five food groups



# Fairground Wheel

# Design

- -Selecting a suitable linkage system to produce the desired motions
- -Designing a wheel Selecting appropriate materials based on their properties

- -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
- -Selecting materials according to their characteristics
- -Following a design brief

### Evaluate

- -Evaluating own designs against design criteria
- -Using peer feedback to modify a final design
- -Evaluating different designs
- -Testing and adapting a design

# Technical Knowledge

- -Learning that mechanisms are a collection of moving parts that work together in a machine
- -Learning that there is an input and output in a mechanism
- -Identifying mechanisms in everyday objects
- -Learning that a lever is something that turns on
- -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





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	Pivot				
	Reciprocating				
	motion				
	Rotary motion				
	Survey				
	July 107				
Year 3	Constructing a	<u>Pneumati</u>	c Toys	Eating Seasonally	Constructing a castle
	<u>castle</u>	<u>Design</u>		<u>Design</u>	Design
	2D shapes	1	g a toy which uses a	-Creating a healthy and nutritious	-Designing a castle with key features to appeal to
	3D shapes	pneumati		recipe for a savoury tart using	a specific person/purpose
	Castle	l ·	ng design criteria from a design	seasonal ingredients, considering the	-Drawing and labelling a castle design using 2D
	Design criteria	brief		taste, texture, smell and	shapes, labelling: -the 3D shapes that will create
	Evaluate		ing ideas using thumbnail	appearance of the dish	the features - materials need and colours
	Facade		and exploded diagrams	<u>Make</u>	-Designing and/or decorating a castle tower on
	Feature		that different types of	-Knowing how to prepare themselves	CAD software
	1 00.0.0		are used in design to explain	and a work space to	<u>Make</u>
	Flag	ideas clea	arly	cook safely in, learning the basic rules	-Constructing a range of 3D geometric shapes
	Net	<u>Make</u>		to avoid food contamination	using nets
	Recyclable	1	a pneumatic system to create a	-Following the instructions within a	-Creating special features for individual designs
	Scoring	desired n		recipe	-Making facades from a range of recycled
	Stable		secure housing for a pneumatic	Evaluate	materials
	Strong	system		-Establishing and using design criteria	Evaluate
	Structure		ringes and balloons to create	to help test and review dishes	-Evaluating own work and the work of others
	Tab		types of pneumatic systems to unctional and appealing	-Describing the benefits of seasonal fruits and vegetables	based on the aesthetic of the finished product
	Weak	make a ti pneumati		and the impact on the environment	and in comparison, to the original design
	Weak		g materials due to their	-Suggesting points for improvement	-Suggesting points for modification of the
		function	<del>-</del>	when making a seasonal tart	individual designs
	Eating Seasonally		netic characteristics	Technical Knowledge	<u>Technical Knowledge</u> -Identifying features of a castle
	Climate		iting materials to create	-Learning that climate affects food	-Identifying reatures of a castle -Identifying suitable materials to be selected and
	Dry climate		t effects by cutting, creasing,	growth	used for a castle, considering weight,
	Exported	folding, v		-Working with cooking equipment	compression, tension
	Imported	Evaluate	, saving	safely and hygienically	-Extending the knowledge of wide and flat based
	Mediterranean		e views of others to improve	-Learning that imported foods travel	objects are more stable
	climate	Designs		from far away and this can negatively	-Understanding the terminology of strut, tie,
	Nationality		and modifying the outcome,	impact the environment	span, beam
	Nutrients		ng improvements	-Learning that vegetables and fruit	-Understanding the difference between frame
	Polar climate		anding the purpose of	grow in certain seasons	and shell structure
	Recipe		-diagrams through the eyes of a	-Learning that each fruit and	
	Recipe		and their client	vegetable gives us nutritional	
		1			





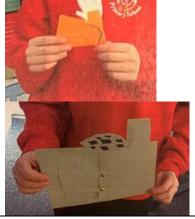
Seasonal food Seasons Temperate climate Tropical climate

# **Pneumatic Toys**

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

# Technical Knowledge

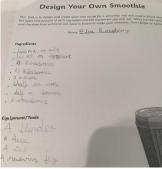
- -Understanding how pneumatic systems work
- -Learning that mechanisms are a system of parts that work together to create motion
- -Understanding that pneumatic systems can be used as part of a mechanism
- -Learning that pneumatic systems force air over a distance to create movement



# benefits

-Learning to use, store and clean a knife safely









# Year 4 Pavilions

sketch

Aesthetic
Cladding
Design criteria
Evaluation
Frame
Structure
Function
Inspiration
Pavilion

Reinforce Stable Structure Target audience Target customer Texture

# 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

# Adapting a Recipe

### Design

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

### Make

- -Following a baking recipe
- -Cooking safely, following basic hygiene rules
- -Adapting a recipe

### Evaluate

- -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 products

# **Pavilions**

# 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 for the cladding
- -Reinforcing corners to strengthen a structure
- -Creating a design in accordance with a plan
- -Learning to create different textural effects with materials





Theme		
Adapting	a	Recipe
Adapt		
Budget		

Cooling rack Creaming Equipment Evaluation Flavour Ingredients Method Net Packaging Prototype Quantity Recipe Rubbing Sievina Target audience Unit of measurement Utilities

and the accuracy of workmanship on performance.

# Technical Knowledge

- -To understand that all moving things have kinetic energy.
- -To understand that kinetic energy is the energy that something (object/person) has by being in motion.
- -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

# -Suggesting modifications Technical Knowledge

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

 Understanding the environmental impact on future product and cost of production

# 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

# Technical Knowledge

- -Learning what pavilions are and their purpose
- -Building on prior knowledge of net structures and broadening knowledge of frame structures
- -Learning that architects consider light, shadow and patterns when designing
- -Implementing frame and shell structure knowledge
- -Considering effective and ineffective designs

# Year 5 Making a Pop Up Book

Aesthetic
Computer-aided
design (CAD)
Caption
Explodeddiagram
Function
Input
Linkage
Mechanism
Motion
Output
Pivot
Prototype

Slider

# Isambard Kingdom Brunel



# Making a Pop Up Book 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.

# 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.

#### Evaluate

-Evaluating the work of others and receiving feedback on own work.

# What could be healthier?

# Design

- -Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients.
- -Writing an amended method for a recipe to incorporate the relevant changes to ingredients.
- -Designing appealing packaging to reflect a recipe.

#### Make

- -Cutting and preparing vegetables safely.
- -Using equipment safely, including knives, hot pans and hobs.
- -Knowing how to avoid cross-contamination.

# **Bridges**

# <u>Design</u>

- -Designing a stable structure that is able to support weight
- -Creating frame structure with focus on triangulation

# Make

- -Making a range of different shaped beam bridges
- -Using triangles to create truss bridges that span a given distance and supports 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





Structure Template

# What could be healthier?

Beef

Cross-

contamination

Diet

Fthical 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

-Suggesting points for improvement.

# Technical Knowledge

- -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 reinforce structures
- -Understanding how triangles can be used to reinforce bridges
- -Articulating the difference between beam, arch, truss and suspension bridges

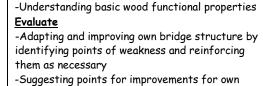
-Following a step by step method carefully to make a recipe.

# Evaluate

- -Identifying the nutritional differences between different products and recipes.
- -Identifying and describing healthy benefits of food groups

# Technical Knowledge

- -To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues.
- -To know that I can adapt a recipe to make it healthier by substituting ingredients.
- -To know that I can use a nutritional calculator to see how healthy a food option is.
- -To 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



is an important part of the design process

# Technical Knowledge

-Exploring how to create a strong beam Identifying arch and beam bridges and understanding the terms: compression and tension

bridges and those designed by others

-Identifying stronger and weaker structures -Finding different ways







# Year 6

Automata toys Accurate Assembly-diagram Automata Axle Bench hook Cam Clamp Component Cutting list Diagram Dowel Drill bits Exploded-diagram Finish Follower

# Linkage Come dine with

Frame

**Function** 

Hand drill

Jelutona

Accompaniment Collaboration Cookbook Crosscontamination Equipment Farm Flavour Illustration Imperative-verb

# Antonio Gaudi



# 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 crosssectional diagrams to show the innerworkings 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.

# Come dine with me

# Design

- -Writing a recipe, explaining the key steps, method and ingredients.
- -Including facts and drawings from research undertaken

# Make

- -Following a recipe, including using the correct quantities of each ingredient.
- -Adapting a recipe based on research.
- -Working to a given timescale.
- -Working safely and hygienically with independence.

# Evaluate

- -Evaluating a recipe, considering: taste, smell, texture and origin of the food group.
- -Taste testing and scoring final products.
- -Suggesting and writing up points of improvements when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process.
- -Evaluating health and safety in production to minimise cross contamination.

# Technical Knowledge

- -To know that 'flavour' is how a food or drink tastes.
- -To know that many countries have 'national dishes' which are recipes associated with that country.

# **Playarounds**

# Design

-Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs

# Make

- -Building a range of play apparatus structures drawing upon new and prior knowledge of structures
- -Measuring, marking and cutting wood to create a range of structures
- -Using a range of materials to reinforce and add decoration to structures

#### Evaluate

- -Improving a design plan based on peer evaluation
- -Testing and adapting a design to improve it as it is developed
- -Identifying what makes a successful structure

# Technical Language

- -Knowing that structures can be strengthened by manipulating materials and shapes
- -Identifying the shell structure in everyday life (cars, aeroplanes, tins, cans)
- -Understanding man-made and natural structures





			OND HAMA
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	-Applying points of improvement to their toysDescribing changes they would make/do if they were to do the project again.  Technical Knowledge -To understand that the mechanism in an automata uses a system of cams, axles and followersTo understand that different shaped cams produce different outputs.	food that has been put through multiple changes in a factoryTo understand that it is important to wash fruit and vegetables before	Tigate Ti