St. Peter's
CE Primary Academy

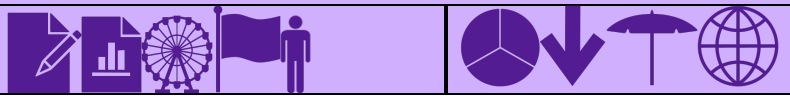
Design and Technology
Progression of skills and technical knowledge

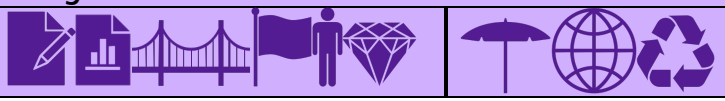
D&T concepts

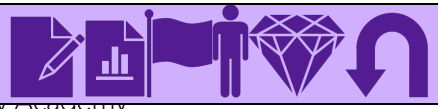
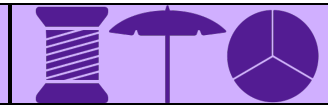
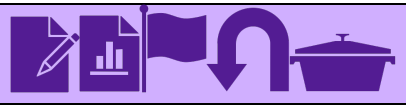
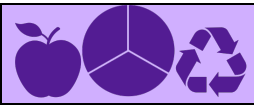
Design:	Evaluate:	Product:	Function
Mechanism:	Structure:	Nutrition:	Innovation	Aesthetic:

D&T Big Ideas

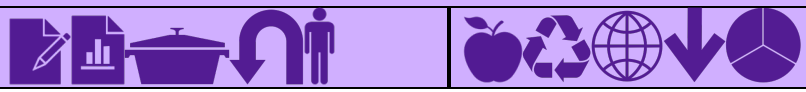
Marketing	Modern Life	Sustainability	Textiles
Healthy Eating	Leisure	Community	

Year 1/ 2	Year A	Year B
Enquiry question	**Can we recreate Old Sarum castle?**	**How does the London Eye spin round?**
Concepts/ Big ideas		
Design	• Learn the importance of a clear design criteria • Generate and communicate ideas using sketching and modelling • Research different types of structures, found in the surrounding world Research the features of castles around the world	• Create a class design criteria for a new London Eye • Design a moving wheel that includes wheels, axles and axle holders, which will allow the wheels to move • Create clearly labelled drawings which illustrate movement • Select appropriate materials based on their properties
Make	• Make stable structures from card, tape and glue according to design criteria • Make a strong and stable structure for a model castle	• Make a prototype wheel and axle out of card • Cut and assemble components neatly • Select materials according to their characteristics • Follow a design brief
Evaluate	• Identify the weakest part of a structure • Compare the stability of different shapes • Suggest points for self- and peer-improvements • Evaluate a castle model according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't	• Test a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed • Test mechanisms, identifying what stops wheels from turning, knowing that a wheel needs an axle in order to move • Evaluate own designs against design criteria • Use peer feedback to modify a final design
Technical Knowledge	• Identify the purpose of castle features e.g. thick outer walls, towers, drawbridges, crenelations, and arrow loops • Understand how to turn 2D nets into 3D structures • Understanding that cylinders are a strong type of structure that are often used for towers • Know that triangulation makes a structure more stable • Develop awareness of different structures for different purposes **Vocabulary: strength, stiffness, stability, net, triangulation, crenelation, arrow loop,**	• Know that mechanisms are a collection of moving parts that work together in a machine • Know that there is an input and output in a mechanism • Identify mechanisms in everyday objects • Know that for a wheel to move it must be attached to an axle **Vocabulary: up, down, left, right, vertical, horizontal, wheel, axle**

Enquiry question	**Can seaside snacks be healthy?**	**Is it possible to make a strong and sturdy chair for baby bear?**
Concepts/ Big ideas		
Design	• Design picnic box packaging by-hand or on ICT software • Design a healthy wrap based on a food combination which work well together	• Include individual preferences and requirements in a design • Generate and communicating ideas using sketching and modelling • Learn about different types of structures, found in the natural world and in everyday objects
Make	• Slice food safely using the bridge or claw grip • Construct a wrap that meets a design brief	• Make stable structures from wood • Create joints and structures from wood • Make a structure according to design criteria
Evaluate	• Taste and evaluate different food combinations • 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	• Explore the features of structures • Compare the stability of different shapes • Test the strength of own structures • Identify the weakest part of a structure • Evaluate a chair according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't • Suggest points for improvements
Technical Knowledge	• Understand the difference between fruits and vegetables • Learn where and how fruits and vegetables grow • Describe and group fruits by texture and taste • Know what food groups make a balanced diet • Know where to find the nutritional information on packaging • Use the bridge and claw method to cut and prepare fruit **Vocabulary: food groups, healthy, diet, bridge/claw grip, nutrition, balanced**	• Identify natural and man-made structures • Know that shapes and structures with wide, flat bases or legs are the most stable • Develop awareness of different structures for different purposes • Know that materials can be manipulated to improve strength and stiffness **Vocabulary: structure, stability, joints, stiffness, strength, natural/ man-made, purpose**
Enquiry question	**Can we use finger puppets to re-enact fairy tales?**	**What ingredients make a delicious and nutritious smoothie?**

Concepts/ Big ideas				
Design	• Use a template to create a design for a puppet • Design a puppet using existing models		• Design picnic box packaging by-hand or on ICT software • Design a healthy snack based on a food combination which work well together	
Make	• Select and cutting fabrics for sewing • Cut fabric neatly with scissors • Use joining methods to decorate a puppet • Sequence steps for construction • Decorate a puppet using fabric glue or running stitch		• Slice food safely using the bridge or claw grip • Construct a snack that meets a design brief	
Evaluate	• Evaluate different joining techniques • Reflect on a finished product, explaining likes and dislikes • Troubleshoot scenarios posed by teacher • Evaluate the quality of the stitching on others' work		• 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	• Learn different ways in which to join fabrics together: pinning, stapling, gluing • Thread a needle • Sew a running stitch, with evenly spaced, neat, even stitches to join fabric • Neatly pin and cut fabric using a template **Vocabulary: template, join, construct, running stitch, pin, staple, threading**		• Understand the difference between fruits and vegetables • Learn where and how fruits and vegetables grow • Describe and group fruits by texture and taste • Know what food groups make a balanced diet • Know where to find the nutritional information on packaging • Use the bridge and claw method to cut and prepare fruit **Vocabulary: food groups, healthy, diet, bridge/claw grip, nutrition, balanced**	

Year 3/4	Year A	Year B
Enquiry question	**Do moving toys always need batteries?**	**What kind of cushions do people want in their homes?**
Concepts/ Big ideas		
Design	• Design a toy which uses a pneumatic system • Develop design criteria from a design brief • Generate ideas using thumbnail sketches and exploded diagrams • Learn that different types of drawings are used in design to explain ideas clearly	• Write design criteria for a product, articulating decisions made • Design and making a pattern piece (paper template) from an existing cushion and applying individual design criteria
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	• Follow design criteria to create a cushion • Select and cutting fabrics with ease using fabric scissors • Measure, marking and cutting fabric using a paper template • Sew cross stitch to join fabric • Decorate fabric using appliqué • Complete design ideas with stuffing and sewing the edges
Evaluate	• Use the views of others to improve designs • Test and modifying the outcome, suggesting improvements • Understand the purpose of exploded diagrams through the eyes of a designer and their client • *Explore the range of Lego pneumatics*	• Evaluate an end product and thinking of other ways in which to create similar items • Decide how many of the criteria should be met for the product to be considered successful • Suggest modifications for improvement • *Understand how the electronic sewing machine has shaped the field of textiles*
Technical Knowledge	• 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 • Learn that pneumatic systems force air over a distance to create movement	• Thread needles with greater independence • Tie knots with greater independence • Sew cross stitch and appliqué • Understand the need to count the thread on a piece of even-weave fabric in each direction to create uniform size and appearance

	Vocabulary: pneumatic, exploded diagram, motion, housing, syringe, aesthetic, modify, mechanism, force	• Understand that fabrics can be layered for affect **Vocabulary: pattern piece, fabric, cross stitch, join, applique, modify, textiles, threading, evenweave**
Enquiry question	**Should St Peter's Place have a public pavilion?**	**Do we need to source food from around the world?**
Concepts/ Big ideas		
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	• Create a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish • Design a tart within a given budget, drawing upon previous taste testing
Make	• Create a range of prototypes using different shaped frame structures • 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	• Know how to prepare themselves and a workspace to cook safely in, learning the basic rules to avoid food contamination • Follow the instructions within a recipe • Adapt a recipe
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 • Describe what characteristics of a design and construction made it the most effective • Consider effective and ineffective designs • *Analyse how the 18th century pavilion was designed to fit its purpose*	• Establish and using design criteria to help test and review dishes • Describe the benefits of seasonal fruits and vegetables and the impact on the environment • Evaluate a recipe, considering taste, smell, texture and appearance • Describe the impact of the budget on the selection of ingredients • Suggest modifications • *Explore the food miles of a range of supermarket produce*
Technical Knowledge	• Learn what pavilions are and their purpose • Build on prior knowledge of net structures to use frame and shell structures • Learn that architects consider light, shadow and patterns when designing	• Learn that climate affects food growth • Know how to use cooking equipment, including knives, safely and hygienically • Learn that imported foods travel from far away and this can negatively impact the environment • Learn that vegetables and fruit grow in certain seasons

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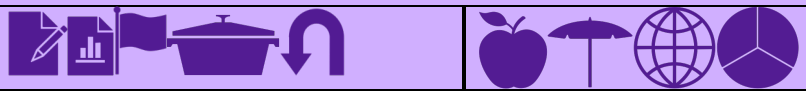
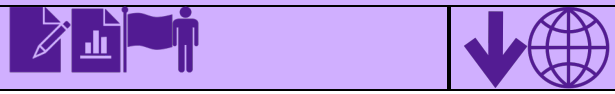
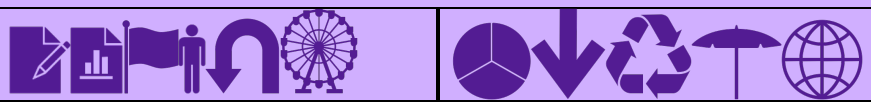
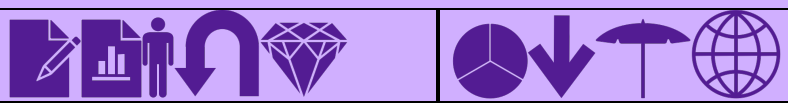
	Vocabulary: aesthetically pleasing, prototype, frame, cladding, reinforce, textural, modification, net structures	• Understand the impact of the cost and importance of budgeting while planning ingredients for tart **Vocabulary: nutrition, seasonal, budget, food contamination, environment, climate**
Enquiry question	**What meals could have been served at a Roman Thermopolium?**	**What design criteria does a pocket torch need?**
Concepts/ Big ideas		
Design	• Create a healthy and nutritious recipe for a Roman Thermopolium using seasonal ingredients, considering the taste, texture, smell and appearance of the dish	• Design a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas
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 recipe	• Make a torch with a working electrical circuit and switch • Use appropriate equipment to cut and attach materials • Assemble a torch according to the design and success criteria
Evaluate	• Establish and using design criteria to help test and review dishes • Evaluate a recipe, considering: taste, smell, texture and appearance • Evaluate and compare a range of products • Describe the benefits of seasonal fruits and vegetables and the impact on the environment • Suggest points for improvement when making a seasonal dish • Suggest modifications • *Research Roman thermopolia and explore how they paved the way for modern restaurants*	• Learn to give constructive criticism on own work and the work of others • Evaluate electrical products • Test and evaluate the success of a final product and taking inspiration from the work of peers • *Learn how Thomas Edison's invention of the light bulb has shaped our world today*
Technical Knowledge	• Work with cooking equipment, including knives, safely and hygienically • Learn that vegetables and fruit grow in certain climates and seasons • Learn that each fruit and vegetable gives us nutritional benefits **Vocabulary: thermopolium, seasonal, review, environment, climate, hygiene, nutrition**	• Learn what electrical conductors and insulators are • Understand that a battery contains stored electricity and can be used to power products • Identify the features of an electrical items including a torch **Vocabulary: target audience, electrical circuit, switch, assemble, constructive criticism, conductor, insulator, battery**

Year 5/6	Year A	Year B
Enquiry question	**Are wooden toys still popular?**	**How do bridges stay standing?**
Concepts/ Big ideas		
Design	•Experiment with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement • Understand how linkages change the direction of a force • Make things move at the same time • Understand and draw cross-sectional diagrams to show the inner-workings of the automata	• Design a stable structure that is able to support weight • Create frame structure with focus on triangulation
Make	• Measure, mark and check the accuracy of the jelutong and dowel pieces required • Measure, mark and cut components accurately using a ruler and scissors • Assemble components accurately to make a stable frame • Understand that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles • Select appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set	• Make a range of prototypes using different shaped beam bridges • Use triangles to create truss bridges that span a given distance and supports a load • Build a wooden bridge structure independently measuring and marking wood accurately • Select appropriate tools and equipment for particular tasks • Use the correct techniques to saw safely • Identify where a structure needs reinforcement and using card corners for support
Evaluate	• Evaluate the work of others and receiving feedback on own work • Apply points of improvements • Describe changes they would make/do if they were to do the project again • *Explore how Mary Anderson, inventor of the windscreen wiper, used mechanisms to solve real world problems*	• Adapt and improving own bridge structure by identifying points of weakness and reinforcing them as necessary • Suggest points for improvements for own bridges and those designed by others • Improve a design plan based on peer evaluation • Identify what makes a successful structure • *Analyse the designs of Thomas Farnolls Pritchard – designer of the Iron Bridge.*

Technical Knowledge	• Use a bench hook to saw safely and effectively • Explore cams, learning that different shaped cams produce different follower movements • Explore types of motions and direction of a motion **Vocabulary: cams, automata, linkages, force, cross-sectional diagrams, jelutong, dowel, components, bench hook, motion**	• Identify arch and beam bridges and understanding 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 **Vocabulary: triangulation, prototype, beam, truss, reinforcement, function**
Enquiry question	**Can buzzers be used to make entertaining games?**	**Can we design a machine that is controlled by a computer?**
Concepts/ Big ideas		
Design	• Design a steady hand game – identifying and naming the components required • Draw a design from three different perspectives • Generate ideas through sketching and discussion • Model ideas through prototypes • Understand the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'	• Research (books, internet) for uses of a pulley system, e.g. elevators, flag poles, well, window blinds, cranes • Develop design criteria based on research • Generate multiple construction ideas using annotated sketches and lego bricks • Innovate a construction method to design a new product
Make	• Construct a stable base for a game • Accurately cut, fold and assemble a net • Decorate the base of the game to a high-quality finish • Make and test a circuit • Incorporating a circuit into a base	• Follow a step-by step construction method to learn how a pulley system can be programmed using Lego WeDo • Build an innovated design incorporating a pulley system
Evaluate	• Evaluate the work of others and receiving feedback on own work • Apply points of improvements • Describe changes they would make/do if they were to do the project again	• Evaluate work continually as it is created • Test and evaluate an end product and give point for further improvements • Evaluate the work of others and receiving feedback on own work • Apply points of improvements

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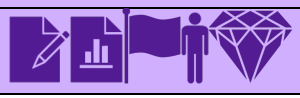
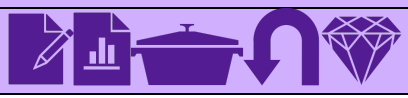
Technical Knowledge	• Learn that batteries contain acid, which can be dangerous if they leak • Identify and name the circuit components in a steady hand game **Vocabulary: components, perspective, prototype, 'fit for purpose', 'form over function', circuit, battery, acid**	• Explain key functions in my program (audible alert, visuals) • Explain how my product would help to solve real world problems **Vocabulary: pulley, mechanical power, annotated sketch, innovate, programme**
Enquiry question	**What kind of costumes would Mayan nobles have worn?**	**Can we survive on a vegan diet?**
Concepts/ Big ideas	 	 
Design	• Design a stuffed toy considering the main component shapes required and creating an appropriate pattern piece (paper template) • Consider the proportions of individual components • Annotate designs	• 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 • Include facts and drawings from research undertaken
Make	• Create a 3D stuffed toy from a 2D design • Measure, mark and cut fabric accurately and independently • Create strong and secure blanket stitches when joining fabric • Use applique to attach pieces of fabric decoration	• Cut and prepare vegetables safely • Use equipment safely, including knives, hot pans and hobs • Know how to avoid cross-contamination • Follow a recipe, including using the correct quantities of each ingredient • Adapt a recipe based on research • Work to a given timescale • Work safely and hygienically with independence
Evaluate	• Evaluate work continually as it is created • Test and evaluate an end product and give point for further improvements	• Identify the nutritional differences between different products and recipes • Identify and describe healthy benefits of food groups

	• *Research Margarete Steiff and the development of the Steiff bear*	• Evaluate a recipe, considering: taste, smell, texture and origin of the food group • Taste testing and scoring final products • Suggest and write up points of improvements in productions • Evaluate health and safety in production to minimise cross contamination • *Explore how Yotam Ottolenghi's cookbook, Plenty, has influenced food trends in the UK*
Technical Knowledge	• Learn to sew blanket stitch to join fabric • Apply blanket stitch so the space between the stitches are even and regular • Thread needles independently **Vocabulary: pattern piece, annotate, components, blanket stitch, applique, threading**	• Understand where food comes from, describing the process of 'Farm to Fork' for a given ingredient • Understand what constitutes a balanced diet • Compare two adapted recipes using a nutritional calculator and then identifying the healthier option • Adapt a recipe to use plant based ingredients instead of meat or dairy. • Record the relevant ingredients and equipment needed for a recipe • Understand the combinations of food that will complement one another **Vocabulary: traditional, nutritional, substitute, amend, method, cross-contamination, quantity, hygiene, 'farm to fork', balanced diet, complement**