

Design and Technology Medium Term Planning

Year 6



Key Concept Overview

Key Concepts	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design design	 -I am beginning to design products using pictures and words based on a design criteria. -I use pictures, words and models to convey what I want to design. 	-l use simple drawings and labels to record my ideas. -l design products that have a clear purpose based on my own design criteria.	-I can research similar products to develop my own design ideas. -I am able to develop a design through discussion and annotated sketches to add detail to my design.	 -I generate and develop ideas using exploding diagrams and prototypes. -I use different ways to creatively record and present my designs to show they are fit for purpose. 	-I can generate and develop ideas using pattern pieces and computer aided design.	 -I generate and develop ideas using a variety of design techniques. -I justify my plans in a convincing way. -I use research and develop design criteria to design innovative functional and appealing products aimed at a specific group.
Make	 -I can choose appropriate resources and tools to make a product. -I can use a range of materials to make a product, including construction materials, textiles and ingredients. 	 I can select from and use a range of tools and equipment to per- form practical tasks 9for example, cutting, shaping, joining and finishing.) I use a range of materials to make a product, including con- struction materials, textiles and ingredients and explain why the 	 -I can choose a material for both its suitability and its appearance and explain why it has been selected. -I can think ahead about the order of my work, select tools needed for a given task and give reasons for my choices. 	 -I can choose and use appropriate tools from a wider range to perform practical tasks. -I can choose suitable materials from a wider range and explain its suitabil- ity. 	 -I use a range of appropriate tools competently. -I can join and combine a range of materials competently. 	 -I select and use specialist tools and equipment to perform practical tasks accurately. -I can select from and use a wider range of materials and components according to their functional qualities and aesthetic qualities.
Evaluate	-l am beginning to explore and evaluate a range of existing prod- ucts by evaluating the product against the purpose -l can evaluate my designs and products by saying how well they do the job they were designed for.	 -I can explore and evaluate a range of existing products by looking at function and materials. -I can evaluate my ideas and products against set design crite- ria. 	 -I can investigate and analyse an existing product by identifying whether it is fit for purpose and how easy it is to use. -I can prove that my design meets some set criteria and evaluate how well it works. 	 -I can explain why certain materials were used to make existing products. -I can evaluate and suggest improve- ments for my design. 	 -I can evaluate appearance and function against original criteria. -I am able to justify decisions made during the design process. 	 -I can critically evaluate the quality of the design, manufacture and fitness for purpose by comparing existing prod- ucts -I can evaluate my ideas and products against my own design criteria and consider the views of others to improve my work.
Technical Knowledge	- I can explore and use simple mechanisms in my products.	 -I can build structures, exploring how they can be made stronger, stiffer and more stable. 	-l can apply my understanding of how to strengthen, stiffen and reinforce more complex struc- tures.	-I am able to understand and use mechanical systems in my products.	-l can understand and use electrical systems in my products.	-I am able to control and model using an ICT control programme.
Cooking and nutrition	I can tell you where my food comes from.	I can use a range of ingredients to prepare a healthy dish.	diet. -I can use a range of ingredients to ingredients were chosen and the ef	rom an understanding of a balanced prepare a healthy dish, explain why the fects on the body. h as peeling, chopping, slicing, grating,	 -I can explore a range of cooking techniqu -I can measure out ingredients accurately recipe. -I understand seasonality and know when grown, reared, caught and processed. 	and use ratios to scale up or down a

	DT Whole School Overview											
	Autu	ımn	Sp	ring	Summer							
Year 1	Textiles puppets	Food & Nutrition Fruit and Vegetables.			Structures windmills	Mechanisms Wheels and axels						
Year 2	Mechanisms Fairground wheels	Structures Victorian houses		xtiles pouches	Mechanisms Moving monster	Food and nutrition Healthy wraps						
Year 3	Mechanica Pneuma			d nutrition ly– vegetable tart	Textiles Cushions	Structures Constructing a castle						
Year 4	Electrical systems torches	Textiles Book sleeve	Structures pavilions	Mechanical systems Slingshot chariot	Food and Adapting a rec *enterprise o	cipe– biscuits						
Year 5	Food and nutrition What could be healthier?	Electrical systems Electronic Christmas cards	Digital world Monitoring device		Structures Bridges	Mechanical systems Making a pop-up book.						
Year 6	Structures playground	Mechanical systems Automata toys	_	ıl world g the world	Food Come dine with me	Electrical systems Steady hand game						

Prior Learning	Autumn Year 6 Structures: playground Structure: playgrounds - Kapow Primary Structure: Playgrounds - Kapow Primary rior Learning Do I know how to strengthen strictures? Do I know the shapes that make structures strong? Do I know how to use woodwork tools accurately and safely? Do I know how to measure accurately? Do I know how to use a template? Do I know what a prototype is?										
Vocabulary End Point	ral materials, p	olan view, p	layground, prototype, reinforce, sketch, stro	valuation, feedback, idea, jelutong, landscape, mark out, me ng, structure, tenon saw, texture, user, vice, weak y will have then designed, made and evaluated their own pla							
Key Concept	Second order concept	Lesson Sequence	Learning Objectives	Suggested teaching sequence	Resources						
Design	Significance Written and oral expression Similarities and difference	Lesson 1	 OO: I generate and develop ideas using a variety of design techniques. I use research and develop design criteria to design innovative functional and appealing products aimed at a specific group. LO: I can design a playground with a variety of structures. 	Lesson 1: <u>KS2, Y6, DT, Lesson 1: Plan For a New PlaygroundKapow</u> <u>Primary</u> Children to research and design a new playground.	Presentation: Playground design (see Attention grabber), Plain paper, Pencils, Rubbers, Sharp- eners, A3 card Printed resources						
Make	Responsibility Cause and con- sequence	Lesson 2	OO: To be able to I select and use specialist tools and equipment to perform practical tasks accurate- ly. LO: I can build a playground model.	Lesson 2: <u>KS2, Y6, DT, Lesson 2: Building Playground StructuresKapow</u> <u>Primary</u> Children to build the structures for their playground apparatus as de- signed in the previous lesson.	Pencils, Rubbers, Rulers, 10 cm x10 cm or 5 cm x 5 cm softwood, dowel, lolly sticks or toothpicks, Tenon saws and bench hooks or coping saws and vices, card, scissors, glue guns, straws, pipe						
	Responsibility Cause and con- sequence	lesson 3	OO: To be able to select and use specialist tools and equipment to perform practical tasks accurate- ly. LO: I can build a playground model.	Lesson 3: <u>KS2, Y6, DT, Lesson 3: Cladding and Perfecting StructuresKapow Primary</u> Children to complete the remaining structures for their playground apparatus, developing and testing them as they work and adding the cladding. Children should consider improving and reinforcing their structures if necessary.	cleaners, foil, egg boxes, cardboard tubes and other modelling materi- als.						

Key Concept	Second order concept	Lesson sequence	Learning Objectives	Suggested teaching sequence	Resources
Evaluate (E)	Written and oral expression. Cause and conse- quence Similarities and difference.	(Omit les- son 4) Lesson 5	OO -I can evaluate my ideas and products against my own design criteria and consider the views of others to improve my work. LO: I can evaluate my playground model.	Children to evaluate their models against their design criteria.	Evaluation to go in DT books.
End of unit assessn	nent quiz: <u>Assess</u> i	ment Resourc	es and Quiz D&T KS2: Structures	: Playgrounds (kapowprimary.com)	

	Autumn										
	Year 6										
	Mechanical systems: Automata toys										
			<u>Mechanical systems: Automata toys -</u>	Kapow Primary							
Prior Learning			alist tools accurately and safely? Do I know how v ? Can I design a product to fit the design brief?	vheel and axle mechanical systems work	? Can I measure and cut wood						
Vocabulary			n, automata, axle, bench hook, cam, clamp, compo and drill, jelutong, linkage, mark out, measure, me								
End Point	By the end of th	e unit, child	ren will have designed, made and evaluated an au	utomata toy using wooden components.							
Key Concept	Second order concept	Lesson Sequence	Learning Objectives	Suggested teaching sequence	Resources						
Evaluate Make	Written and oral expression Responsibility Cause and conse- quence Significance	Lesson 1	 OO- To be able to critically evaluate the quality of the design, manufacture and fitness for purpose by comparing existing products. LO: I can evaluate existing automata mechanical systems. OO: I select and use specialist tools and equipment to perform practical tasks accurately. LO: I can use prepare wood for assembly by measuring, marking and cutting each piece accurately. 	Lesson 1: <u>KS2, Y5, DT, Lesson 1: Making an</u> <u>automata frame - Kapow Primary</u> The children will learn about automata me- chanical systems. They are presented with a problem and a design brief to produce a me- chanical shop display window. They should work together to prepare (mark, cut, saw) the materials required for a functional automata frame. Children should also evaluate the effectiveness of existing products through discussion.	Hand drills and drill bits, the cutting tools which go into the drill to make different sized holes of 3mm and 4mm, Tenon saws and bench hooks, scissors, set or engineers squares, rul- ers, pencils, masking tape and plastic wallets, sandpaper. Materials – required per pair of pupils: 1cm x 1cm jelutong(1.8m) 3cm dowel, wood in the shape of a cylinder. Dow- el rod (54cm), 1x thin card (A4), 1x thick card (A4,) printed resources from Kapow.						
Design Make	Responsibility Written and oral expression	Lesson 2	 OO: To use research and develop design criteria to design innovative functional and appealing products aimed at a specific group. LO: I can design an automata toy for a window display. OO: I can select from and use a wider range of materials and components according to their functional qualities and aesthetic qualities. Lo: I can make an automata frame. 	Lesson 2: <u>KS2, Y5, DT, Lesson 2: Assembling a</u> <u>Wood Frame - Kapow Primary</u> Children will design their product. They will learn about exploded-diagrams and apply this knowledge to help them assemble the automata frame components.	Presentation: Exploded-diagrams, ex- ample finished product (pre-made by teacher, each pair's: components, sup- ports and worksheets from Lesson 1, glue gun and/or PVA glue, blue tack, printed resources.						

Key Concept	Second order concept	Lesson sequence	Learning Objectives	Suggested teaching sequence	Resources
Design	Significance Written and oral expression Cause and conse- quence similarities sand difference.	Lesson 3	OO: I use research and develop design criteria to design innova- tive functional and appealing products aimed at a specific group. LO: I can research cam profiles and make prototypes.	Lesson 3: <u>KS2, Y5, DT, Lesson 3: Experimenting With Cam Profiles -</u> <u>Kapow Primary</u> Children explore the relationship between cam profiles and follow- er movement, to inform a design decision. Take photographs for evidence.	Your finished teacher exam- ple automata, cam profiles in slides 4- 6, each pair's: automata frames and worksheets from Lesson 2, corrugated card, thick and thin card, pencils and erasers, blue tack, PVA and/or glue gun, colouring and deco- rating resources. Printed resources.
Make Evaluate	Written and oral expression	Lesson 4	 OO: I can select from and use a wider range of materials and components according to their functional qualities and aesthetic qualities. Lo: I can make afunctional automata toy. OO-I can evaluate my ideas and products against my own design criteria and consider the views of others to improve my work. LO: I can evaluate my automata toy. 	Lesson 4: <u>KS2, Y6, DT, Lesson 4: Finishing Touches- Kapow Primary</u> Children apply the housing design to the automata frame and eval- uate the final product, comparing it with the design brief and crite- ria.	As above. Printed resources.
End of unit assessn	nent quiz: <u>Assess</u> r	nent Resourc	ces and Quiz D&T KS2: Mechanisr	<u>ms: Automata toys (kapowprimary.com)</u>	

Prior Learning	Spring Year 6 Digital world: navigating the world KS2 Year 6: D&T: Digital World: Navigating the World - Kapow Primary Prior Learning Do I know how to use Computer Aided Design? Do I know how to code? Do I know compass directions? Do I know how to debug?									
Vocabulary	feature, finite, fu	nction, functio	onal, GPS tracker, if statement, infinite	ss, client, compass, concept, convince, corrod, duplicate, environmentalle, investment, lightweight, loop, manufacture, materials (wood, metal, plaam, recyclable, smart, sustainable, sustainable design, unsustainable desi	astic etc.), mouldable,					
End point			· •	al (or physical) micro: bit. The will design, and create a navigation t o design and make a housing unit for the device then pitch their ideas.	ool then evaluate					
Key Concept	Second order concept	Lesson Sequence	Learning Objectives	Suggested teaching sequence	Resources					
Design	Significance Written and oral expression	Lesson 1	OO: To be able to use research and develop design criteria to design inno- vative functional and appealing prod- ucts aimed at a specific group and to justify my plans in a convincing way. LO: I can write a design brief and crite- ria based on a client request.	Lesson 1: <u>D&T Y6 Digital world</u> : <u>Navigating the World - Kapow Primary</u> Children receive a design brief from a client, across the globe, to develop a navigation tool for their customers. They develop an informed design brief and criteria based on information extracted and analysed from the client's letter. Pupils suggestions for key functions that the navigation tool will need based on customer habits.	Printed resources. Computer or lapton to use programme: <u>Mi- crosoft MakeCode for</u> <u>micro:bit (microbit.org)</u>					
Make Technical knowledge	Responsibility Cause and conse- quence	Lesson 2	 OO: To select and use specialist tools and equipment to perform practical tasks accurately. OO: To be able to control and model using an ICT control programme. LO: I can write a program to include multiple functions as part of a navigation device 	 Lesson 2: <u>D&T Y6 Digital world: Programming a Navigation Tool - Kapow Primary</u> Cross-curricular link: Computing N.B. A physical Micro:bit is not needed, the online simulator can be used instead. Children program a navigation tool, combining multiple functions learnt across the Digital world units and new functions such as a cardinal compass, to produce a multifunctional device for trekkers. Test, error check and debug the program using a simulator. 	Computers. Micro:bit (if available) Printed resources					

Key Concept	Second order concept	Lesson se- quence	Learning Objectives	Suggested teaching sequence	Resources		
Design	Significance	Lesson 3 (to be spread over 2- 3 lessons)	OO:-I generate and develop ideas using a variety of design techniques. LO: I can design a micro:bit housing unit using sustaina- ble materials.	Lesson 3- <u>D&T Y6 Digital world: Product concept - Kapow Pri-</u> mary As part of this project, children will design a housing unit for the micro:bit using sustainable materials.	Presentation and printed resources.		
Make	Responsibility Cause and conse- quence		OO: I can select from and use a wider range of materi- als and components according to their functional quali- ties and aesthetic qualities. LO: I can make a micro:bit housing unit.	Lesson 3- <u>D&T Y6 Digital world: Product concept - Kapow Pri-</u> mary As part of this project, children will make a housing unit for the micro:bit using sustainable materials.			
Evaluate	Written and oral expression Similarity and difference		OO: I can evaluate my ideas and products against my own design criteria and consider the views of others to improve my work. LO: I can evaluate my product.	Lesson 3- <u>D&T Y6 Digital world: Product concept - Kapow Pri-</u> mary As part of this project, children will evaluate a housing unit for the micro:bit using sustainable materials.			
Design Evaluate Technical knowledge	Responsibility Written and oral expression Cause and conse- quence	Lesson 4	 OO:-I generate and develop ideas using a variety of design techniques. OO: I can evaluate my ideas and products against my own design criteria and consider the views of others to improve my work. OO: I am able to control and model using an ICT control programme. LO: I can develop 3D CAD skills to produce a virtual model. 	D&T Year 6 Digital world: 3D CAD modelling - Kapow Primary Cross curricular: Computing Learning about the applications of 3D modelling and printing in industry such as film and animation. Developing existing essential 3D CAD skills to combine 3D objects to form a com- plete product in CAD 3D modelling software.	Computers for CAD <u>Tinkercad </u> <u>Create 3D digital</u> <u>designs with</u> <u>online CAD Tink-</u> <u>ercad</u> Printed activities		
To present and pitch their	Enterprise / presentation opportunity: Lesson 5 D&T Y6 Digital world: Product Pitch! - Kapow Primary To present and pitch their products to an audience. This may be carried out as a celebratory event or an assembly to give the children the opportunity to communicate their ideas and designs and use tech- nical knowledge and presentation skills.						
nd of unit assessment quiz: Assessment Resources and Quiz D&T KS2: Navigating the world (kapowprimary.com)							

Prior Learning Vocabulary	how to use pliers and other specialist tools safely? Do I know how to measure accurately? Do I know how to draw electrical circuits in my designs?										
End point	By the end of th a 3D Structure.	ne unit, Child	-	valuated their own 'steady hand' game using wire and an electrica							
Key Concept	Second order concept	Lesson Sequence	Learning Objectives	Suggested teaching sequence	Resources						
Design	Responsibility Significance	(Omit les- son 1.) Lesson 2	OO: To be able to use research and devel- op design criteria to design innovative functional and appealing products aimed at a specific group. LO: I can design a steady hand game with an electrical system.	Lesson 2: <u>KS2, Y6, DT, Lesson 2: Design a Steady Hand Game- Kapow Primary</u> Cross curricular link: Science Children identify the components of a 'steady hand game', design their own game and create perspective drawings of their design.	Presentation Printed resources						
Make	Image: A series of the serie										
		Lesson 4	OO: -I select and use specialist tools and equipment to perform practical tasks ac- curately. LO: I can assemble electronics and com- plete their electronic game.	Lesson 4: <u>KS2, Y6, DT, Lesson 4: Electronics and Assembly - Kapow Primary</u> Children to make and test their circuits and incorporate them into the bases of their games. Take photographs for evidence.	Electrical circuit equipment, pliers, tinned copper wire (50cm per child), wire cutters.						

Key Concept	Second order concept	Lesson sequence	Learning Objectives	Suggested teaching sequence	Resources
Evaluate	Written and oral expression Similarity and difference	Lesson 5	OO: To be able to evaluate my ideas and products against my own design criteria and consider the views of others to improve my work. LO: I can evaluate my electrical game.	Children give feedback to their peers (two stars and a wish format.) Then to evaluate their 'steady hand' game, considering the views of their peers.	Evaluation in DT books.
End of unit assessn	nent quiz: <u>Assess</u> r	ment Resourc	ces and Quiz D&T KS2: Electrical:	Steady hand game (kapowprimary.com)	

	Summer										
	Year 6										
	Cooking and nutrition: Come dine with me.										
	Food: Come dine with me - Kapow Primary										
Prior Learning	Do I know how t	o safely prep	pare food? Do I know how to store and handle food co	orrectly? Do I know a variety of healthy ingredients?							
Vocabulary				t • Farm • Flavour • Illustration • Imperative-verb • I Storyboard • Target audience • Top tips , unit of mea	-						
End point			nildren will know how to safely prepare a healthy 3 co npiled a class cookbook.	ourse meal. They will understand how their food is gro	wn, reared						
Key Concept	Second order concept	Lesson sequence	Learning Objectives	Suggested teaching sequence	Resources						
Cooking and Nutrition	Responsibility Significance Written and oral expressionLesson 1OO: To be able to use a range of cooking techniques to pro- duce a healthy balanced dish. LO: I can research and design a three course meal.Lesson 1: KS2, Y6, DT, Lesson: Designing Three Course Meal - Kapow Primary Cross curricular link: Science In pairs, children research a recipe for the course they will make: a pepper starter or salmon main course or pineapple dessert.Computers or iPads for re- search.										
	The next three lessons will be carried out as a rotation , with children completing each of the following three activities for the remainder of the topic: Preparing one of the courses. Creating a storyboard that explains how the main ingredient in their course is grown/reared, farmed/caught and processed. Writing up a family or favourite recipe that will be added to a class cookbook.										

Key Concept	Second order	Lesson	Learning Objectives	Suggested teaching sequence	Resources
	concept	sequence			
Cooking and Nutrition	Responsibility Written and oral expression	Lesson 2	 Group 1 OO: To be able to use a range of cooking techniques to produce a healthy balanced dish. Ito be able to measure out ingredients accurately and use ratios to scale up or down a recipe. To understand the importance of correct storage and handling of ingredients. LO: I can prepare a healthy starter. Group 2 OO: To understand seasonality and know when and how a variety of ingredients are grown, reared, caught and processed. LO: I know how food is reared, caught and processed. 	Lesson 2: <u>KS2, Y6, DT, Lesson: Starters,</u> <u>Cookbooks, Farm to Fork - Kapow Primary</u> Those pairs of children making the pepper starters prepare and make the recipes they researched in Lesson 1. Children to research how salmon are reared, caught and processed.	Ingredients Food preparation tools and cooking equipment if neces- sary . Computers, devices or books for research.
			 Group 3 OO: To be able to use a range of cooking techniques to produce a healthy balanced dish. To be able to measure out ingredients accurately and use ratios to scale up or down a recipe. LO: I can make a recipe page for the class cookbook. 	Children to make a recipe page for a class cookbook.	
		Lesson 3	Group 2 OO: To be bale to use a range of cooking techniques to produce a healthy bal- anced dish. To be able to measure out ingredients accurately and use ratios to scale up or down a recipe. To understand the importance of correct storage and handling of ingredients. LO: I can prepare a healthy main course.	Lesson 3: <u>KS2, Y6, DT, Lesson: Salmon Main</u> <u>Meal, Farm Research - Kapow Primary</u> Those children making the salmon main course prepare and make the recipes they researched in Lesson 1.	Ingredients Food preparation tools and cooking equipment if neces- sary . Computers , devices
			Group 3 OO: To understand seasonality and know when and how a variety of ingredients are grown, reared, caught and processed. LO: I know how food is reared, caught and processed.	Children to trace the journey food makes across the world to reach our supermar- kets.	or books for research.
			Group 1 OO: To be able to use a range of cooking techniques to produce a healthy bal- anced dish. To be able to measure out ingredients accurately and use ratios to scale up or down a recipe. LO: I can make a recipe page for the class cookbook.	Children to make a recipe page for a class cookbook.	

Key Concept	Second order	Lesson sequence	Learning Objectives	Suggested teaching sequence	Resources
Cooking and Nutrition	Responsi- bility	Lesson 4	 Group 3 OO: To be able to use a range of cooking techniques to produce a healthy balanced dish. To be able to measure out ingredients accurately and use ratios to scale up or down a recipe. To understand the importance of correct storage and handling of ingredients. LO: I can prepare a healthy dessert. Group 1 OO: To understand seasonality and know when and how a variety of ingredients are grown, reared, caught and processed. LO: I know how food is grown. 	Lesson 4: KS2, Y6, DT, Lesson: Pineapple Dessert, Farm Research - Kapow Primary Those children making the pineapple desserts, pre- pare and make the recipes they researched in Lesson 1. Children to research how peppers are grown.	Ingredients Food preparation too and cooking equipme if necessary . Computers, devices o books for research.
			Group 2 OO: To be able to use a range of cooking techniques to produce a healthy balanced dish. To be able to measure out ingredients accurately and use ratios to scale up or down a recipe. LO: I can make a recipe page for the class cookbook.	Children to make a recipe page for a class cookbook.	