Cheetwood Community Primary School

Design and Technology Skills, Knowledge and Knowledge Categories

Term	EYFS Reception	Y1	Y2	Y3	Y4	Y5	Y6
Autumn	**Structures** Junk modelling	**Structures** Constructing a Windmill	**Textiles** Puppets/ Pouches	**Food-** Cooking and Nutrition Eating Seasonally	**Textiles** Cushions/Fastenings – 2D to 3D products	**Electrical Systems** Electric Greeting Cards - More Complex Switches and Circuits	**Food** -Cooking and Nutrition 'Come Dine with Me' Celebrating culture and seasonality

Spring	**Food-** Cooking and Nutrition Soup	**Mechanisms** Moving Story books: Sliders	**Food-** Cooking and Nutrition A Balanced Diet	**Mechanisms** Pneumatic Toys	**Electrical Systems** Torches Simple Circuits and Switches	**Structures** Bridges -Frame Structures	**Programming and control /Digital world** Navigating the world

Summer	**Textiles** Bookmarks	**Food-** Cooking and Nutrition Fruit and Vegetable Smoothie	**Mechanisms** Wheels and Axles.	**Structures** Constructing a Castle	**Mechanical systems/** Levers Slingshot Cars	**Food-** Cooking and Nutrition What Could Be Healthier? Celebrating culture and seasonality	**Textiles** Stuffed toys/ Waistcoats Combining different fabrics and shapes

Year group	Term	Scheme of Work/ Units	Skills (What do we want them to do by the end of the unit?)	Knowledge (what are the 3(EYFS), 4 – 5 (KS1), 5-6 (KS2) pieces of knowledge by the end of the unit?)	Knowledge Categories
Nursery	Autumn	Making porridge	I can mix and pour ingredients to combine them. I can use my senses to explore the look, taste and feel of ingredients.	I know the names of the ingredients used to make porridge. I know that when ingredients are heated they change. I know that some foods are healthy and some others unhealthy.	**Food** and Nutrition
	Spring	Construction - Junk Modelling (Building towers)	**Design** I can explore different materials freely and begin to develop my own ideas about how to use them and what to make. I can begin to make verbal plans. I can describe my junk model, and can say how I intend to put it together. **Make** I can begin to use selected materials to create simple constructions and models. I can handle tools and materials with increasing control to support model-making.	I know there are a range of different materials that can be used to make a model and that they are all different. I know how to make simple suggestions to fix my junk model.	**Structures**

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			I can safely use and explore a variety of materials, tools and techniques. I can join materials in a variety of ways (temporary and permanent). I can join different materials together. **Evaluate** I can give a verbal evaluation of my own and others' junk models with adult support.		
	Summer	Weaving and threading	**Design** I can begin to use simple weaving and threading techniques (e.g. making webs and threading beads **Make** I can use scissors correctly for cutting. I can explore threading and weaving (under, over technique) with a variety of materials.	To know that threading is putting one material through an object. I know how to evaluate my own work by talking about what I like and what I can do to improve my work.	**Textiles**
Reception	Autumn	Bookmarks-	**Design** I can discuss what a good design needs. I can design a simple pattern with paper I can design a bookmark. **Make**	I know what a stitch is. I know that a design is a way of planning our idea before we start.	**Textiles-** (weaving)

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			I can use a prepared needle to practise weaving and simple stitches. I can work neatly by sewing small, straight stitches. I can choose from a variety of available materials. I can use scissors correctly for cutting. **Evaluate** I can reflect on a finished product and compare it to my design.		
	Spring	Fruit kebab	**Design** I can design a fruit recipe. **Make** I can use a range of small tools, including cutlery. I can practise cutting with a knife. I can learn how to use a knife safely with adult support. **Evaluate** I can observe and help (where appropriate) with the use of tools to prepare ingredients. I can describe the finished product and evaluate the process.	I know the names of some fruits and vegetables and the differences between them. I know what the word healthy means and that some foods are healthier than others. I know and can use adjectives to describe how fruits and vegetables look, feel, smell and taste.	**Food** and Nutrition

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	Summer	Boats	**Design** I can design a junk model boat. I can use my knowledge from exploration to inform my design. I can make predictions about, and evaluate different materials to see if they are waterproof. I can make predictions about, and evaluate existing boats to see which floats best. **Make** I can make models with a purpose and with increasing skill (e.g. shaping, moulding or combining pieces) e.g, design and make a boat. I can explore a wide range of materials, making simple forms and apply simple decorative features where wanted. I can make imaginative structures, using tools with increasing control. I can combine pieces using different techniques and tools to represent a familiar object. I can make a boat that floats and is waterproof, considering material choices.	I know that 'waterproof' materials are those which do not absorb water I know that some objects float and others sink. I know the different parts of a boat.	**Structures**

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			Evaluate I can test my design and reflect on what could have been done differently. I can investigate how the shapes and structure of a boat affects the way it moves.		
1	**Autumn**	Constructing a Windmill	**Design** I can include individual preferences and requirements in a design. **Make** I can make stable structures from card, tape and glue. I can turn 2D nets into 3D structures. I can follow instructions to cut and assemble the supporting structure of a windmill. I can make functioning turbines and axles which are assembled into a main supporting structure. **Evaluate** I can evaluate a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't. I can suggest points for improvements.	**Technical Knowledge** I know the importance of a clear design criteria. I know what 2D nets are and how to turn them into 3D structures I know that the shape of materials can be changed to improve the strength and stiffness of structures. I know that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). I know that axles are used in structures and mechanisms to make parts turn in a circle. I know that a structure is something that has been made and put together. **Additional Knowledge** I know that a client is the person I am designing for.	**Structures**

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1				I know that design criteria is a list of points to ensure the product meets the clients needs and wants. I know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. I know that windmill turbines use wind to turn and make the machines inside work. I know that a windmill is a structure with sails that are moved by the wind. I know the three main parts of a windmill are the turbine, axle and structure**.**	
	Spring	Moving Story books: Sliders	**Design** I can create moving models that use sliders. I can design a moving storybook. **Make** I can construct a moving picture using sliders and levers. **Evaluate** I can review the success of my product by testing it (reading it to reception children). I can evaluate my product against the design criteria.	**Technical Knowledge** I know that a mechanism is the parts of an object that move together**.** I know that a slider mechanism moves an object from side to side**.** I know that a slider mechanism has a slider, slots , guides and an object. I know the importance of designing a product before making it. I know the importance of evaluating a product after making it. **Additional Knowledge**	**Mechanisms**

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1			I can consider what I have learnt from making my moving storybook.	I know how to use the words: up, down, left, right, vertical and horizontal to describe movement.	
	Summer	Fruit and Vegetable Smoothie	**Design** I can design smoothie carton packaging by-hand. **Make** I can chop fruit and vegetables safely to make a smoothie. I can juice fruits safely to make a smoothie. **Evaluate** I can taste and evaluate different food combinations. I can describe appearance, smell and taste. I can suggest information to be included on packaging. I can compare my own smoothie with someone else's.	**Technical Knowledge** I understand the difference between fruits and vegetables. I know that a fruit has seeds. I know that fruits grow on trees or vines. I know that vegetables can grow either above or below ground. I know that vegetables is any edible part of a plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber). I know that a blender is a machine which mixes ingredients together into a smooth liquid.	**Food-** Cooking and Nutrition

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3	Autumn	**Food-** Cooking and Nutrition Eating Seasonally	**Design** I can create a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish. **Make** I know how to prepare myself and a workspace to cook safely in, learning the basic rules to avoid food contamination. I can follow the instructions within a recipe. I know safety rules for using, storing and cleaning a knife safely. **Evaluate** I can establish and use design criteria to help test and review dishes. I can describe the benefits of seasonal fruits and vegetables and the impact on the environment.	**Technical Knowledge** I know that not all fruits and vegetables can be grown in the UK. I know that climate affects food growth. I know that vegetables and fruit grow in certain seasons. I know that cooking instructions are known as a 'recipe'. I know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre. I understand that vitamins, minerals and fibre are important for energy, growth and maintaining health.	**Food-** Cooking and Nutrition

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3			I can suggest points for improvement when making a seasonal tart.		
	Spring	**Mechanisms** Pneumatic Toys	**Design** I can design a toy which uses a pneumatic system. I can develop design criteria from a design brief. I can generate ideas using thumbnail sketches and exploded diagrams. I can learn that different types of drawings are used in design to explain ideas clearly. **Make** I can create a pneumatic system to create a desired motion. I can use syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy. I can build secure housing for a pneumatic system. I can select materials due to their functional and aesthetic characteristics. I can manipulate materials to create different effects by cutting, creasing, folding and weaving.	**Technical Knowledge** I understand how pneumatic systems work. I understand that pneumatic systems can be used as part of a mechanism. I know that pneumatic systems operate by drawing in, releasing and compressing air. **Additional Knowledge** I understand how sketches, drawings and diagrams can be used to communicate design ideas. I know that exploded-diagrams are used to show how different parts of a product fit together. I know that thumbnail sketches are small drawings to get ideas down on paper quickly	**Mechanisms**

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3			**Evaluate** I can use the views of others to improve designs. I can test and modify the outcome, suggesting improvements.		
	Summer	**Structures** Constructing a Castle	**Design** I can design a castle with key features to appeal to a specific person/purpose. I can draw and label a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours. I can design and/or decorate a castle tower. **Make** I can construct a range of 3D geometric shapes using nets . I can create special features for individual designs. I can make facades from a range of recycled materials **Evaluate** I can evaluate my own work and the work of others based on the aesthetic of the finished product and in comparison to the original design.	**Technical Knowledge** I understand that wide and flat based objects are more stable. I understand the importance of strength and stiffness in structures. **Additional Knowledge** I know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose. I know that a façade is the front of a structure. I understand that a castle needs to be strong and stable to withstand enemy attack. I know that a paper net is a flat 2D shape that can become a 3D shape once assembled. I know that a design specification is a list of success criteria for a product.	**Structures**

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3			I can suggest points for modification of the individual designs.		
4 **4**	Autumn	**Textiles** Cushions/Fastenings – 2D to 3D products	**Design** I can write design criteria for a product, articulating decisions made. I can design a personalised book sleeve**.** **Make** I can make and test a paper template with accuracy and in keeping with the design criteria. I can measure, mark and cut fabric using a paper template. I can incorporate fastening to a design. **Evaluate** I can decide how many of the criteria should be met for the product to be considered successful. I can suggest modifications for improvement. I can articulate the advantages and disadvantages of different fastening types	**Technical knowledge** I know that a fastening is something which holds two pieces of material together, for example a zipper, toggle, button, press stud and velcro. I know that different fastening types are useful for different purposes. I know that creating a mock up (prototype) of my design is useful for checking ideas and proportions. I know how to select a stitch style to join fabric, working neatly by sewing small, straight stitches. I know how to test and evaluate an end product against the original design criteria.	**Textiles**
		Electrical Systems	**Design** I can design a torch, giving consideration to the target audience	I know that an electrical circuit must be complete for electricity to flow.	**Electrical Systems**

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4	Spring	Torches Simple Circuits and Switches	and creating both design and success criteria focusing on features of individual design ideas. **Make** I can use appropriate equipment to cut and attach materials. I can assemble a torch according to the design and success criteria. **Evaluate** I can evaluate electrical products. I can test and evaluate the success of a final product.	I know that a switch can be used to complete and break an electrical circuit. I know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. I know how to make a torch with a working electrical circuit and switch I know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison.	
	Summer	**Mechanical systems/** Levers Slingshot Cars	**Design** I can design a shape that reduces air resistance. I can draw a net to create a structure from. I can choose shapes that increase or decrease speed as a result of air resistance. I can personalise a design. **Make** I can measure, mark, cut and assemble with increasing accuracy.	I know that air resistance is the level of drag on an object as it is forced through the air. I know that aesthetics means how an object or product looks in design and technology. I know that a template is a stencil you can use to help you draw the same shape accurately.	**Mechanical systems**

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			I can make a model based on a chosen design. **Evaluate** I can evaluate the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.	I know that graphics are images which are designed to explain or advertise something. I know that it is important to assess and evaluate design ideas and models against a list of design criteria.	
5	Autumn	**Electrical Systems** Electric Greeting Cards - More Complex Switches and Circuits	**Design** I can design a product for the relevant user. **Make** I can construct a product with consideration for the design criteria. I can create a functional series circuit using copper wire, an LED bulb and a battery. I can determine which parts of a product affect its function. **Evaluate** I can analyse whether changes in configuration positively or negatively affect an existing product.	I know that series circuits only have one direction for the electricity to flow. I know that when there is a break in a series circuit, all components turn off. I know that product analysis is critiquing the strengths and weaknesses of a product. I know that 'configuration' means how the parts of a product are arranged.	**Electrical Systems**
	Spring	**Structures-**	**Design**	I know different ways to reinforce structures.	**Structures-**

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		Bridges -Frame Structures	I can design and create a stable structure that is able to support weight and focus on triangulation. **Make** I can make a range of different shaped beam bridges, build a wooden bridge structure. I can select the appropriate tools and equipment for particular tasks, independently measure and mark wood accurately and use the correct techniques to saw safely. I can identify where a structure needs support, use triangles to create the support and explain why selecting appropriating materials is an important part of the design process. I understand the basic wood functional properties. **Evaluate** I can adapt and improve my own bridge structure by identifying points of weakness and reinforcing them as necessary.	I know how triangles can be used to reinforce bridges. I know that properties are words that describe the form and function of materials. I know why material selection is important based on properties. I know the material (functional and aesthetic) properties of wood.	

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			I can suggest points for improvements for my own bridges and those designed by others.		
	Summer	**Food-** Cooking and Nutrition What Could Be Healthier? Celebrating culture and seasonality	**Design** I can amend a traditional recipe and change the nutritional value by substituting ingredients. I can write the method up. **Make** I can follow a step by step method. I can use equipment safely. I can cut vegetables safely. I can avoid cross-contamination. **Evaluate** I can identify and describe healthy benefits of food groups. I can identify the nutritional differences between different products and recipes.	I know where meat comes from and how it is reared and processed, including key welfare issues. I know that I can adapt a recipe to make it healthier by substituting ingredients. I know that I can use a nutritional calculator to see how healthy a food option is. I know what 'cross-contamination' means and when it happens.	**Food-** Cooking and Nutrition
6	Autumn	**Food** -Cooking and Nutrition 'Come Dine with Me'	**Design** I can write a recipe, explaining the key steps, method and ingredients. I can include facts and drawings from research undertaken. **Make**	I know that 'flavour' is how a food or drink tastes. I know that many countries have 'national dishes' which are recipes associated with that country.	**Food** -Cooking and Nutrition

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		Celebrating culture and seasonality	Following a recipe, I can include using the correct quantities of each ingredient. I can adapt a recipe based on research. I can work on a given timescale. I can work safely and hygienically with independence. **Evaluate** I can evaluate a recipe, considering: taste, smell, texture and origin of the food group. I can taste-test and score final products. I can suggest and write up points of improvements in productions. I can evaluate health and safety in production to minimise cross-contamination.	I know that 'processed food' means food that has been put through multiple changes in a factory. I know that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides. I know what happens to a certain food before it appears on the supermarket shelf (farm to fork).	
	Spring	**Programming and control /Digital world** Navigating the world	**Design** I can write a design brief from information submitted by a client. I can develop design criteria to fulfil the client's request. I can develop a product idea through annotated sketches. **Make**I can place and manoeuvre 3D objects, using CAD.	I know that accelerometers can detect movement. I understand that sensors can be useful in products as they mean the product can function without human input. I know that designers write design briefs and develop design criteria to enable them to fulfil a client's request.	**Programming and control /Digital world**

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			I can change the properties of, or combine one or more 3D objects, using CAD. I can consider materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo). I can explain material choices and why they were chosen as part of a product concept. I can program an N,E, S,W cardinal compass. I can explain how my program fits the design criteria and how it would be useful as part of a navigation tool. I can develop an awareness of sustainable design. I can explain the key functions and features of my navigation tool to the client as part of a product concept pitch. I can demonstrate a functional program as part of a product concept.	I know that 'multifunctional' means an object or product has more than one function. I know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing.	
	Summer	**Textiles** Stuffed toys/ Waistcoats		I know different decorative stitches	**Textiles**

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		Combining different fabrics and shapes	**Design** I can design a waistcoat in accordance with a specification and design criteria to fit a specific theme. I can annotate designs. I can use a template when pinning panels onto fabric. **Make** I can mark and cut fabric accurately, in accordance with a design. I can sew a strong running stitch, making small, neat stitches and following the edge. I can tie strong knots. I can decorate a waistcoat – attaching objects using thread and adding a secure fastening. I can sew accurately with even regularity of stitches. **Evaluate** I can evaluate work continually as it is created.	I understand that it is important to design clothing with the client/target customer in mind. I know that using a template (or clothing pattern) helps to accurately mark out a design on fabric. I understand the importance of consistently sized stitches.	