St Columb Minor Academy – DT Substantive knowledge progression EYFS/KS1/KS2

composites	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design **Key vocab:**	**Components (eg specific learning intention)** Understanding contexts, users, and purposes Generating, developing, modelling, and communicating ideas						
	Explore the sensory qualities of materials Begin to use the language of designing and making, e.g. join, build and shape. Use pictures and words to convey what they want to make.	State what products they are designing and making which have a clear purpose and an intended user. Begin to understand the needs of users other than themselves. Generate and talk about ideas by handling materials and components – handling, investigating and disassembling.	State what products they are designing and making which have a clear purpose and an intended user. Begin to understand the needs of users other than themselves. Generate and talk about ideas by handling materials and components – handling, investigating and disassembling.	Explain clearly what products they are designing and making which have a clear purpose and an intended user. Undertake research to gather information about the needs and wants of individuals and groups using surveys, questionnaires, etc Generate ideas by collecting and using	Explain clearly what products they are designing and making which have a clear purpose and an intended user. Undertake research to gather information about the needs and wants of individuals and groups using surveys, questionnaires, etc Generate ideas by collecting and using	Explain clearly and justify what products they are designing and making which have a clear purpose and an intended user. Undertake research to inform the design process, using surveys, interviews, questionnaires and web-based resources. Use knowledge of inventors, designers,	Explain clearly and justify what products they are designing and making which have a clear purpose and an intended user. Undertake research to inform the design process, using surveys, interviews, questionnaires and web-based resources. Use knowledge of inventors, designers,

		Learn to use and respond to simple design criteria to help develop their ideas Generate ideas by drawing on their own experiences. Use knowledge of existing products to help come up with ideas. Model ideas by exploring materials, components and construction kits and by making templates and mock-ups.	Learn to use and respond to simple design criteria to help develop their ideas. Generate ideas by drawing on their own experiences. Use knowledge of existing products to help come up with ideas. Model ideas by exploring materials, components and construction kits and by making templates and mock-ups.	information from a number of sources, including ICT based sources to generate design ideas. Disassemble and investigate existing everyday products to see how they fit their user and purpose. Work from a given design specification to guide their thinking. Learn what a prototype is and use pre-made examples of prototypes and patterns. Generate labelled and annotated	information from a number of sources, including ICT based sources to generate design ideas. Disassemble and investigate existing everyday products to see how they fit their user and purpose. Work from a given design specification to guide their thinking. Learn what a prototype is and use pre-made examples of prototypes and patterns. Generate labelled and annotated	engineers, chefs and manufacturer who have developed ground-breaking products to design their own innovative designs. Generate ideas by collecting and using information, from a number of sources, including ICT based sources. Review mechanical products to see how they function and meet user's needs. Develop their own simple design	engineers, chefs and manufacturer who have developed ground-breaking products to design their own innovative designs. Generate ideas by collecting and using information, from a number of sources, including ICT based sources. Review mechanical products to see how they function and meet user's needs. Develop their own simple design

		Use information and communication technology, where appropriate, to develop and communicate their ideas. To begin to use software to represent 2D designs. To use pictures and words to convey what they want to make. To think of interesting ways to decorate food that I have made.	Use information and communication technology, where appropriate, to develop and communicate their ideas. To begin to use software to represent 2D designs. To use pictures and words to convey what they want to make. Think of interesting ways to decorate food that I have made thinking of what would be best for the person eating it.	sketches of their ideas, using computer-aided design where appropriate. Learn an increasing range of correct technical vocabulary to use to enable them to explain.	sketches of their ideas, using computer-aided design where appropriate. Learn an increasing range of correct technical vocabulary to use to enable them to explain.	specification to guide their thinking. Create and use a prototype/pattern to scale. Create cross-sectional drawings, exploded diagrams and CAD software to represent designs. Identify the properties and qualities of materials they might use such as cardboard, wood, plastic.	specification to guide their thinking. Create and use a prototype/pattern to scale. Create cross-sectional drawings, exploded diagrams and CAD software to represent designs. Identify the properties and qualities of materials they might use such as cardboard, wood, plastic.

Make Key vocab:	Components (eg specific learning intention) KS1: Mechanisms, structures, food and textiles KS2: Mechanical systems, electrical systems, structures, food and textiles Planning Practical skills and techniques						
	To learn to construct with a purpose in mind. To learn how to use a range of small tools, e.g. scissors, hole punch, stapler, woodworking tools, rolling pins, pastry cutters. To have basic hygiene awareness. To safely use and explore a variety of materials, tools and techniques.	Learn how to keep themselves and other safe when using tools and materials such as holding scissors away from self and clothes, etc. Learn simple characteristics and properties of materials they will use in order to make informed choices. Demonstrate a range of cutting and shaping techniques; tearing/cutting/folding, rolling and curling.	Learn how to keep themselves and other safe when using tools and materials such as holding scissors away from self and clothes, etc. Learn simple characteristics and properties of materials they will use in order to make informed choices. Demonstrate a range of cutting and shaping techniques; tearing/cutting/folding, rolling and curling.	To use learning from maths and science to help design and make products that work. To know that materials have both functional properties and aesthetic qualities. To know the correct technical vocabulary for the projects they are undertaking. Learn essential procedures for safety and hygiene when handling	To use learning from maths and science to help design and make products that work. To know that materials have both functional properties and aesthetic qualities. To know the correct technical vocabulary for the projects they are undertaking. Learn essential procedures for safety and hygiene when handling	To use learning from maths and science to help design and make products that work. To know that materials have both functional properties and aesthetic qualities. To know the correct technical vocabulary for the projects they are undertaking. Learn essential procedures for safety and hygiene when handling	To use learning from maths and science to help design and make products that work. To know that materials have both functional properties and aesthetic qualities. To know the correct technical vocabulary for the projects they are undertaking. Learn essential procedures for safety and hygiene when handling

		Measure, mark out, cut and shape materials and components. Shape paper and card by cutting with scissors. Mark out materials to be cut using a template. Assemble, join and combine materials and components with adhesives and tapes. Saw wood with a gents saw/backsaw. Use wood glue. Use a drill or hole punch.	Measure, mark out, cut and shape materials and components. Shape paper and card by cutting with scissors. Mark out materials to be cut using a template. Assemble, join and combine materials and components with adhesives and tapes, or creating hinges. Saw wood with a gents saw/backsaw. Use wood glue. Use a drill or hole punch.	materials and tools safely. Measure, mark out, cut and shape a range of materials and components with some accuracy. e.g. using saws and sand paper using cms to measure. Use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components.	materials and tools safely. Measure, mark out, cut and shape a range of materials and components with some accuracy. e.g. using saws and sand paper using cms to measure. Use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components.	materials and tools safely. Measure, mark, cut out and shape a range of materials and components. e.g. using saws and sand paper using cm & mm to measure. To understand that materials can be combined and mixed to create more useful characteristic. To use a range of tools in order to be able to choose appropriately from them. Use modelling wire, pliers, wire cutters etc.	materials and tools safely. Measure, mark, cut out and shape a range of materials and components. e.g. using saws and sand paper using cm & mm to measure. To understand that materials can be combined and mixed to create more useful characteristic. To use a range of tools in order to be able to choose appropriately from them. Use modelling wire, pliers, wire cutters etc.

		Learn simple finishing techniques. **Mechanisms** Use and explore different levers and slides in my work. Use a range of materials and components, including construction materials and kits and mechanical components. Use wheels and axles (pushed through) Use construction kits. Make moving joints using	Learn simple finishing techniques, including those from art and design. **Mechanisms** Use and explore different mechanisms; levers and slides in my work. Use a range of materials and components, including construction materials and kits and mechanical components. Use wheels and axles (pushed through) Use construction kits.	Use tools independently with increasing accuracy, control and awareness of conservation e.g. bench hooks and mitre blocks, electric components (such as bulbs and buzzers), wire strippers, staplers, cardboard triangles etc. Learn to use a range of tools with accuracy including scissors, … what tools should we include for lks2 and uks2?	Use tools independently with increasing accuracy, control and awareness of conservation e.g. bench hooks and mitre blocks, electric components (such as bulbs and buzzers), wire strippers, staplers, cardboard triangles etc. Learn to use a range of tools with accuracy including scissors, … what tools should we include for lks2 and uks2?	Use techniques that involve a number of steps. Use a glue gun with close supervision. Use a hand drill to drill tight and loose fit holes. Use finishing techniques to strengthen and improve the appearance of their product. Ensure products have a high-quality finish using appropriate resources (such as sanding wood).	Use techniques that involve a number of steps. Use a glue gun with close supervision. Use a hand drill to drill tight and loose fit holes. Use finishing techniques to strengthen and improve the appearance of their product. Ensure products have a high-quality finish using appropriate resources (such as sanding wood).

		paper fasteners, wood, axels etc Identify how toys can be made to move (push, pull) Use programmable toys (e.g. Roamer) Create pop-ups and sliders **Structures** Investigate strengthening	Make moving joints using paper fasteners, wood, axels etc Identify how toys can be made to move (push, pull) Use programmable toys (e.g. Roamer) Create pop-ups and sliders Use a range of materials to create models with wheels and axels e.g. tubes, dowel and cotton reels. Use simple pop-ups. **Structures** Build freestanding structures,	Learn how finishing techniques can improve the appearance of their product. **Mechanical Systems** Cut slots. Use cutting and shaping techniques that include cuts within the perimeter of the material (slots or cut outs). To know how mechanical systems such as levers and linkages or pneumatic systems create movement.	Learn how finishing techniques can improve the appearance of their product. **Mechanical systems** Cut slots and internal shapes. Use cutting and shaping techniques that include cuts within the perimeter of the material (slots or cut outs). To know how mechanical systems such as levers and linkages or pneumatic systems create movement.	**Mechanical systems** Use simple mechanisms, e.g. pulleys, cams, cogs. Begin to use hydraulics. Design ICT controlled mechanisms- use computer to control programs and equipment. FLOWOL. Know that mechanical systems have an input, process and output. Know how mechanical systems such as cams or pulleys or gears create movement.	**Mechanical systems** Use simple mechanisms, e.g. pulleys, cams, cogs. Begin to use hydraulics. Design ICT controlled mechanisms- use computer to control programs and equipment. FLOWOL. Know that mechanical systems have an input, process and output. Know how mechanical systems such as cams or pulleys or gears create movement.

		sheet materials. Build structures, exploring how they can be made stronger, stiffer and more stable. Make box models, card and wood constructions.	exploring how they can be made stronger, stiffer and more stable. Make box models, card and wood constructions. Use materials to practise drilling, screwing, nailing and gluing to strengthen products.	Use mechanisms in their products, e.g. syringes for pneumatics, levers, gears, pulleys. Use levers and pulleys to create moving parts using split pins, card and string. **Structures** To know how to make strong, stiff shell structures. Use construction kits to test for strength. Investigate how structures can	Use mechanisms in their products, e.g. syringes for pneumatics, levers, gears, pulleys. Use levers and pulleys to create moving parts using split pins, card and string. To use and explore complex pop-ups. **Structures** To know how to make strong, stiff shell structures. Use construction kits to test for strength.	**Structures** Construct regular free standing 3D frames – bridges. Use techniques for reinforcing and strengthening structures. Use construction kits and building instructions to identify how structures are stabilised and strengthened. Know how to reinforce and strengthen a 3D framework. **Electrical Systems** Attach motors for electrical control.	Use a cam to make an up and down mechanism. **Structures** Construct regular free standing 3D frames – bridges. Use techniques for reinforcing and strengthening structures. Use construction kits and building instructions to identify how structures are stabilised and strengthened. Know how to reinforce and strengthen a 3D framework. **Electrical Systems**

				fail when loaded, and stabilise structures to withstand greater loads. Understand different structures types, shell/frame. Strengthen frames using diagonal struts. **Electrical Systems** Explore batteries and bulbs. Use simple switches to achieve a functional result. To know how simple electrical circuits and components can be used to	Investigate how structures can fail when loaded, and stabilise structures to withstand greater loads. Understand different structures types, shell/frame. Investigate how to make structures more stable e.g. by widening the base. **Electrical Systems** Explore batteries and bulbs. Use simple switches to achieve a functional result.	Switch motors on/off Control electrical circuits with ICT (e.g. use computer to operate switch) Know how to program a computer to monitor changes in the environment and control their products. Know how more complex electrical circuits and components can be used to create functional products. Know that electrical systems have an input,	Attach motors for electrical control. Switch motors on/off Control electrical circuits with ICT (e.g. use computer to operate switch) Know how to program a computer to monitor changes in the environment and control their products. Know how more complex electrical circuits and components can be used to create functional products.

				create functional products. To know how to program a computer to control products. Give a series of commands (Roamer).	To know how simple electrical circuits and components can be used to create functional products. To know how to program a computer to control products. Give a series of commands (Roamer). Create series and parallel circuits.	process and output. Control a model using an ICT control model.	Know that electrical systems have an input, process and output. Create circuits that employ a number of components (such as LEDs, resistors and transistors).
Analysing and Evaluating **Key vocab:**	Components (eg specific learning intention)						
	Own ideas and products Learn about planning and adapting initial ideas to make them better.	**Own ideas and products** Use design criteria to guide production process.	**Own ideas and products** Use design criteria to guide production process.	**Own ideas and products** Refer to their design criteria as they design and make.	**Own ideas and products** Refer to their design criteria as they design and make.	**Own ideas and products** Refer to their design criteria as they design and make.	**Own ideas and products** Refer to their design criteria as they design and make.

	Begin to talk about changes made during the making process, e.g. making a decision to use a different joining method.	Develop vocabulary related to the products they are making. **Existing Products** Explore and ask questions of products such as: - what products are - who products are for - what products are for - how products work - how products are used -where products might be used -what materials products are made from -what they like and dislike about products	Develop technical vocabulary related to the products they are making. **Existing Products** Explore and ask questions of products such as: - what products are - who products are for - what products are for - how products work - how products are used -where products might be used -what materials products are made from	Modify plans as they work and use their design criteria to evaluate their completed products. **Existing products** Investigate and analyse: - how well products have been designed - how well products have been made - why materials have been chosen - what methods of construction have been used - how well products work - how well products achieve their purposes - how well products meet	Modify plans as they work and use their design criteria to evaluate their completed products. **Existing products** Investigate and analyse: - how well products have been designed - how well products have been made - why materials have been chosen - what methods of construction have been used - how well products work - how well products achieve their purposes - how well products meet	Modify plans as they work and use their design criteria to evaluate their completed products. **Existing products** Investigate and analyse: - how well products have been designed - how well products have been made - why materials have been chosen - what methods of construction have been used - how well products work - how well products achieve their purposes - how well products meet	Modify plans as they work and use their design criteria to evaluate their completed products. **Existing products** Investigate and analyse: - how well products have been designed - how well products have been made - why materials have been chosen - what methods of construction have been used - how well products work - how well products achieve their purposes - how well products meet

		Make a protype.	-what they like and dislike about products Make more than one prototype and learn which works best.	user needs and wants **Key events and individuals** Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.	user needs and wants **Key events and individuals** Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.	user needs and wants **Key events and individuals** Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.	user needs and wants **Key events and individuals** Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.
Textiles **Key vocab:**	Components (eg specific learning intention)						
	Learn to thread using pre-punctured fabric and card	Introduce learning to thread a needle (large binca type). Learn to tie simple reef knots.	Introduce learning to thread a needle (large binca type). Learn to tie simple reef knots. Learn to use running stitch to join two	Weave with a variety of materials. Sew using a range of basic stitches e.g: running stitch, back stitch and over stitch.	Weave with a variety of materials. Sew using a range of basic stitches e.g: running stitch, back stitch and over stitch.	Use different ways to join materials, e.g. glue, pins, press studs, Velcro, various stitches, buttons. Learn to make own simple pattern pieces.	Use different ways to join materials, e.g. glue, pins, press studs, Velcro, various stitches, buttons. Learn to make own simple pattern pieces.

		Learn to use running stitch to join two pieces of fabric.	pieces of fabric.	Learn to thread a needle (large binca type). Learn to tie simple knots. Use patterns and templates. Pinning and cutting with increasing accuracy. Learn about the properties of a small range of fabrics.	Learn to thread a needle (large binca type). Learn to tie simple knots. Use patterns and templates. Pinning and cutting with increasing accuracy. Learn about the properties of a small range of fabrics.	Able to join fabrics using a range of stitches with increasing independence including blanket stitch.	Able to join fabrics using a range of stitches with increasing independence including blanket stitch.
Cooking and Nutrition **Key vocab:**	Components (eg specific learning intention)						
	Know that all food comes from plants or animals. Know the importance of a healthy diet. Know that everyone should eat at least five	Know that all food comes from plants or animals. Know that food has to be farmed, grown elsewhere (e.g. home) or caught.	Know that all food comes from plants or animals. Know that food has to be farmed, grown elsewhere (e.g. home) or caught.	Understand seasonality and know how a variety of ingredients are grown, reared, caught and processed.	Understand seasonality and know how a variety of ingredients are grown, reared, caught and processed.	Understand seasonality and know how a variety of ingredients are grown, reared, caught and processed.	Understand seasonality and know how a variety of ingredients are grown, reared, caught and processed.

	portions of a variety of fruit and vegetables every day. To manage own basic hygiene. To use cutlery safely.	Know that everyone should eat at least five portions of a variety of fruit and vegetables every day. To name and sort foods into the five groups in The Eatwell Guide. Understand the importance of food safety and hygiene; washing hands. To prepare simple dishes safely and hygienically, without using a heat source. To use cutlery safely.	Know that everyone should eat at least five portions of a variety of fruit and vegetables every day. To name and sort foods into the five groups in The Eatwell Guide. Understand the importance of food safety and hygiene; washing hands. To prepare simple dishes safely and hygienically, without using a heat source. To use cutlery safely and accurately.	Understand that food ingredients can be fresh, pre-cooked and processed. To understand that a healthy diet is made up from a variety and balance of different food and drink, as depicted in the Eatwell Guide. To know the 5 areas of the Eatwell Guide. To know that to be active and healthy, food and drink are needed to provide energy for the body.	Understand that food ingredients can be fresh, pre-cooked and processed. To understand that a healthy diet is made up from a variety and balance of different food and drink, as depicted in the Eatwell Guide. To know the 5 areas of the Eatwell Guide. To know that to be active and healthy, food and drink are needed to provide energy for the body.	Understand how food is processed into ingredients that can be eaten and used in cooking. To understand the importance of a healthy and varied diet and know the 5 areas of the Eatwell Guide. To know that food and drink contain different substances – nutrients, water and fibre – that are needed for health.	Understand how food is processed into ingredients that can be eaten and used in cooking. To understand the importance of a healthy and varied diet and know the 5 areas of the Eatwell Guide. To know that food and drink contain different substances – nutrients, water and fibre – that are needed for health.

		To use a bridge technique to cut food safely. To cut, peel and grate safely and accurately. Spread soft butter with a knife. Think of interesting ways to decorate food that I have made thinking of what would be best for the person eating it.	To use a bridge technique to cut food safely. To cut, peel and grate ingredients safely. Spread soft butter with a knife. To use measuring cups, spoons, and scales to measure out ingredients in grams. To use a jug to measure liquids in ml.	To understanding basic hygiene and know how bacteria develops. To peel and grate soft foods e.g. courgette, cheese To use measuring cups, spoons, and scales to measure out ingredients in grams. Use a jug to measure liquids in ml. To mix ingredients to form a bread dough To knead and shape dough.	To develop a deeper understanding of basic hygiene and how bacteria develops. To peel and grate soft foods e.g. courgette, cheese To use measuring cups, spoons, and scales to measure out ingredients in grams. Use a jug to measure liquids in ml. To crack an egg & beat an egg. To cut fat (butter) into flour and rub fat into flour.	To develop a deeper understanding of basic hygiene and how bacteria develops. To peel and grate soft and harder foods e.g. apple, carrot, parmesan To measure ingredients accurately using different equipment. To use simple combination of 'Bridge' and 'Claw' e.g. onion Use a hand mixer or blender	To develop a deeper understanding of basic hygiene and how bacteria develops. To measure ingredients to the nearest gram/ml and calculate ratios of ingredients to scale up or down a recipe. To use simple combination of 'Bridge' and 'Claw' e.g. onion To combine ingredients appropriately (beating, rubbing). To crack an egg & separating

			Think of interesting ways to decorate food that I have made thinking of what would be best for the person eating it.			Assemble or cook ingredients, controlling the temperature of the oven or hob with adult supervision e.g. to sweat a soup	Assemble or cook ingredients, controlling the temperature of the oven or hob with adult supervision e.g. to sweat a soup To roll pastry. Use a hand mixer or blender