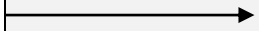
Maulden Lower School Design & Technology Curriculum Map

Knowledge, skills and understanding - progression across the school

1.Key Knowledge

TECHNICAL KNOWLEDGE - Mechanisms					
EYFS	Year 1	Year 2	Year 3	Year 4	Y5 Alameda Middle School
Wheels and axles • objects on wheels can be moved by pulling or pushing • how a wheel fits on to an axle **Wider knowledge** • know a product that has wheels	*Sliders and levers* • how to operate sliders and levers •that different mechanisms create different types of movement • the name of simple tools and their purpose •some simple fixing techniques and when to use them (e.g., masking tape to secure a lollipop stick slider) • what a pivot is • technical vocabulary relevant to the project (see vocabulary) **Wider knowledge** •To know where sliders and levers are used in real life context	*Wheels and axles* • what wheels, axles and axle holders are • the difference between fixed and free moving axles • simple methods to fix wheels and axles to a product • the names of some simple tools and their purpose • technical vocabulary relevant to the project (see vocabulary) **Wider knowledge** • simple commercial products that use wheels and axles to move • the difference between pulling and pushing forces • which materials are best used for particular components (e.g., rubber covered wheels might provide more grip than plastic wheels)	*Levers and linkages* • the difference between a fixed and loose pivot • how to use lever and linkage mechanisms • the difference between inputs and outputs • how to increase accuracy when measuring, marking out and cutting (e.g., measure in mm rather than cm) • technical vocabulary relevant to the project (see vocabulary) **Wider knowledge** • what a design brief is • where levers and linkages are used in commercial products or industry • why levers are used to lift loads		

TECHNICAL KNOWLEDGE - Structures					
EYFS	Year 1	Year 2	Year 3	Year 4	Y5 Alameda Middle School
Freestanding Structures Know: • how to make a freestanding structure from simple blocks/boxes • how to make a structure taller • how to make a structure more stable **Wider knowledge** • one example of a strong structure • one example of a strong/weak material	*Freestanding Structures* Know: • how to make freestanding structures stronger, stiffer and more stable • how to join some simple materials • a simple order of making a structure • some simple finishing techniques to complete their structure • the names of simple 2D shapes • technical vocabulary relevant to the project (see vocabulary) **Wider knowledge** • examples of strong/stiff structures (e.g,. climbing frame, tower) • what materials are useful for strengthening or stiffening structures and why this is • simple facts about an important structural engineer (e.g., Isambard Kingdom Brunel)	*Freestanding Structures* (not taught but used in mechanisms) Know: • how to make freestanding structures stronger, stiffer and more stable • how to join some simple materials • a simple order of making a structure • some simple finishing techniques to complete their structure • the names of simple 2D shapes • technical vocabulary relevant to the project (see vocabulary) **Wider knowledge** • examples of strong/stiff structures (e.g,. climbing frame, tower) • what materials are useful for strengthening or stiffening structures and why this is simple facts about an important structural engineer (e.g., Isambard Kingdom Brunel)	*Frame Structures* Know: • more sophisticated methods for stiffening/strengthening structures • names of some 2D shapes • which tools are appropriate for cutting materials • To know technical vocabulary relevant to the project (see vocabulary) **Wider knowledge** • why engineers use certain structures for certain purposes • how engineers solve design problems e.g., how Homan Walsh used a kite to help build the Niagara Falls Bridge	*Shell Structures* Know: • more sophisticated methods for stiffening/strengthening structures • what a net is • names of more complex 3D shapes • which tools are appropriate for cutting and scoring materials • how to use CAD to develop a product • how to increase accuracy when measuring, marking out and cutting (e.g., measure in mm rather than cm) • technical vocabulary relevant to the project (see vocabulary) **Wider knowledge** • why certain structures are used for certain purposes • key invention – tetrapak	taught in Y6 

TECHNICAL KNOWLEDGE – Electrical Systems					
EYFS	Year 1	Year 2	Year 3	Year 4	Y5 Alameda Middle School
Not required to cover in EYFS / KS 1 •how to control and program a product using computing (e.g, bee-bots) (taught in computing)			Know: •how to control and program a product using computing	*Simple Circuits* Know: •what an electrical circuit is •a range of simple electrical components and their functions (e.g., bulb, bulb holder, buzzer and switch) •how to control and program a product using computing (e.g, bee-bots) •how to construct a simple series circuit •how to make a range of simple secure connections (twisting wires together, wrapping ends, taping over, connecting block) •technical vocabulary relevant to the project (see vocabulary) **Wider knowledge** •some simple conductors and insulators •simple facts about more than one inventor and the impact of their work e.g., Thomas Edison, Humphry Davy	

TECHNICAL KNOWLEDGE – Textiles					
EYFS	Year 1	Year 2	Year 3	Year 4	Y5 Alameda Middle School
Know: •how to join two pieces of material using one joining technique (e.g. gluing)	→	*Templates & Joining Techniques* Know: •why designers use templates •when to use certain fabrics based on their suitability to the product •how to use simple stitch techniques •which finishing technique to use depending upon the required effect •how to follow relevant health and safety protocols •technical vocabulary relevant to the project (see vocabulary) **Wider knowledge** name of at least one designer of fabric products •where simple fabrics come from/are made of •what a design evaluation is	→	*2d shape to 3d product* Know •why designers might need to strengthen, stiffen and reinforce existing fabrics •how to securely join two pieces of fabric together using a range of stitches •what seam allowances are •how/when to use decorative stitches to finish a product •what constitutes a renewable/sustainable material/fabric •how to follow relevant health and safety protocols •technical vocabulary relevant to the project (see vocabulary) **Wider knowledge** •what accuracy means and how it can be improved •what an annotated sketch is •why designers use patterns and prototypes •a range of designers who use fabrics in their work	Information from Alameda Curriculum Map An introduction to design and make skills. •hand sewing methods •how to design & initial designs, •design development, final designs, annotation, •shading and rendering, •assembly of practical

TECHNICAL KNOWLEDGE – Cooking and Nutrition					
EYFS	Year 1	Year 2	Year 3	Year 4	Y5 Alameda Middle School
Know • how to mix ingredients • how to follow simple health and safety procedures **Wider Knowledge** • where some food come from	Know: • how to use simple cutting tools to prepare soft fruit and vegetables • how to follow simple health and safety procedures • how to peel, chop, slice and grate foods. • technical vocabulary relevant to the project (see vocabulary) **Wider knowledge** • where a range of fruit and vegetables come from. • the principles of a varied diet.	Know: • how to prepare simple dishes safely and hygienically, without using a heat source • how to use techniques such as cutting, peeling and grating with greater confidence and independence • technical vocabulary relevant to the project (see vocabulary) **Wider knowledge** • how to name and sort foods into the five groups in The Eatwell Plate • everyone should eat at least five portions of fruit and vegetables every day	Know: • how to chop a wider range of foods using different techniques e.g., claw grip, bridge grip. • how to use sensory information to evaluate a variety of ingredients • how to combine foods using different utensils • relevant health and safety procedures when handling and preparing foods • technical vocabulary relevant to the project (see vocabulary) **Wider knowledge** • about a range of fresh and processed foods for their product • whether foods are grown, reared or caught • about one key chef and their contribution to healthy eating e.g., Jamie Oliver – healthy schools	Know • how to chop a wider range of foods using different techniques • how to measure ingredients using simple measures • how to use sensory information to evaluate a variety of ingredients • how to combine foods using different utensils • relevant health and safety procedures when handling and preparing foods • technical vocabulary relevant to the project (see vocabulary) **Wider knowledge** • about a range of fresh and processed foods for their product • whether foods are grown, reared or caught • about fair trade foods	Information from Alameda Curriculum Map Focusing on hygiene, cross contamination and following basic recipes. • food room • health and safety rules • importance of hygiene. • adapting recipes and justification. • measurements • preparation requirements

2. Key Skills

DESIGN Developing, Planning and Communicating Ideas.					
EYFS Key Skills	**Year 1 Key Skills**	**Year 2 Key Skills**	**Year 3 Key Skills**	**Year 4 Key Skills**	**Y5 Alameda Middle**
• Begin to use the language of designing (i.e. design, plan, draw) • Learn how to plan and adapt initial ideas to make them better • Verbally explain some features of their design	• Draw on their own experience to help generate ideas • Suggest ideas and explain what they are going to do • Identify a target group for what they intend to design and make • Model their ideas in card and paper • Develop their design ideas applying findings from their earlier research	• Generate ideas by drawing on their own and other people's experiences • Develop their design ideas through discussion, observation, drawing and modelling • Identify a purpose for what they intend to design and make • Identify simple design criteria • Make simple drawings and label parts	• Generate realistic ideas for an item, considering its purpose and the user/s • Identify a purpose and establish criteria for a successful product. • Plan the order of their work before starting • Explore, develop and communicate design proposals by modelling ideas • Make drawings with labels when designing	• Generate realistic ideas, considering the purposes for which they are designing • Make labelled drawings from different views showing specific features • Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making, if the first attempts fail • Evaluate products and identify criteria that can be used for their own designs	assumed... • Generate ideas through brainstorming and identify a purpose for their product • Draw up a specification for their design • Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making if the first attempts fail • Use results of investigations, information sources, including ICT when developing design ideas

MAKE - Working with tools, equipment, materials, and components to make quality products (inc food)					
EYFS Key Skills	**Year 1 Key Skills**	**Year 2 Key Skills**	**Year 3 Key Skills**	**Year 4 Key Skills**	**Year 5 Key Skills**
• Construct their product with a simple purpose in mind • Use simple tools to shape, assemble and join materials together • Use construction kits • Mix ingredients using simple utensils • Follow basic food safety and hygiene procedures	• Make their design using appropriate techniques • With help measure, mark out, cut and shape a range of materials • Use tools e.g., scissors and a hole punch safely • Assemble, join and combine materials and components together using a variety of temporary methods e.g. glues or masking tape • Select and use appropriate fruit and vegetables, processes and tools • Use basic food handling, hygienic practices and personal hygiene • Use simple finishing techniques to improve the appearance of their product	• Begin to select tools and materials; use vocab' to name and describe them • Measure, cut and score with some accuracy • Use hand tools safely and appropriately • Assemble, join and combine materials in order to make a product • Cut, shape and join fabric to make a simple product. • Use basic sewing techniques • Follow safe procedures for food safety and hygiene • Choose and use appropriate finishing techniques • Use construction kits	• Select tools and techniques for making their product • Think about their ideas as they make progress and be willing change things if this helps them improve their work • Measure, mark out, cut, score and assemble components with more accuracy • Make simple frame structures • Work safely and accurately with a range of simple tools • Demonstrate hygienic food preparation and storage • Use finishing techniques strengthen and improve the appearance of their product using a range of equipment including ICT	• Select appropriate tools and techniques for making their product • Measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques • Use simple graphical communication techniques • Join and combine materials and components accurately in temporary and permanent ways • Measure, tape or pin, cut and join fabric with some accuracy • Sew using a range of different stitches	• Select appropriate materials, tools and techniques • Measure and mark out accurately • Use skills in using different tools and equipment safely and accurately • Weigh and measure accurately (time, dry ingredients, liquids) • Apply the rules for basic food hygiene and other safe practices e.g. hazards relating to the use of ovens • Cut and join with accuracy to ensure a good-quality finish to the product • Pin, sew and stitch materials together create a product
EVALUATE - Evaluating Processes and Products					
• Verbally explain what they like/dislike about their product • Suggest one thing that they might change when creating a similar product	• Evaluate their product by asking questions about what they have made and how they have gone about it • Evaluate their product by discussing how well it works in relation to the purpose • Evaluate their products as they are developed, identifying strengths and possible changes they might make	• Evaluate against their design criteria • Evaluate their products as they are developed, identifying strengths and possible changes they might make • Talk about their ideas, saying what they like and dislike about them	• Evaluate their product against original design criteria e.g. how well it meets its intended purpose • Disassemble and evaluate familiar products • Learn about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.	• Evaluate their work both during and at the end of the assignment • Evaluate their products carrying out appropriate tests • Learn about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.	• Evaluate a product against the original design specification • Evaluate it personally and seek evaluation from others

3. Key Vocabulary

EYFS	Year 1	Year 2	Year 3	Year 4	Y5 Alameda Middle School
VOCABULARY – Design & Evaluating Processes and Products					
tools, ideas, make, plan, user	design, designer, make, materials, tools, brief, product, evaluate, problem-solving, user, ideas, purpose, design criteria, improve	design, designer, make, materials, tools, brief, product, evaluate, problem-solving, user, ideas, purpose, design criteria, function, label, technology, features, quality, suitable, improve	design, designer, make, materials, tools, design brief, product, evaluate, problem-solving, intended user, purpose, function, design criteria, function, label, technology, features, quality, suitable, improve, prototype, appealing, innovative	design, designer, make, materials, tools, design brief, product, evaluate, problem-solving, intended user, purpose, function, design criteria, function, label, technology, features, quality, suitable, improve, prototype, test, appealing, innovative, annotate(d), cross-section, aesthetics	*not available – suggested vocabulary:* design development, initial design, final design, materials, tools, design brief, product, evaluate, problem-solving, intended user, purpose, function, design criteria, function, label, technology, features, quality, suitable, improve, prototype, test, appealing, innovative, annotate, cross-section, aesthetics, shading, rendering
VOCABULARY - Mechanisms					
Wheels & Axles: Car, wheel, pull, push	**Sliders & Levers:** cut, join, moving picture, mechanism, lever, slider, pivot, slot, bridge/guide names of materials used e.g. card, masking tape, paper fastener, join	**Wheels & Axles:** vehicle, wheel, axle, axle-holder, chassis, body, cab assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism names of tools, equipment and materials used	**Sliders & Levers:** mechanism, lever, linkage, pivot, slot, bridge, guide, system, input, process, output, perpendicular linear, rotary, reciprocating names of materials used		

EYFS	Year 1	Year 2	Year 3	Year 4	Y5 Alameda Middle School
VOCABULARY - Textiles					
fabric, sew, needle, thread, join	→	**Templates & Joining:** names of existing products, tools, fabrics and components mock-up, template, pattern pieces, mark out, join, fabric, fray, sew, stich, running stitch, decorate, finish	→	**2d Shape to 3d Product** fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance, pattern pieces	*not available – suggested vocabulary:* assembly, fabric, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance, pattern pieces, name of products, names of equipment, tools and techniques
VOCABULARY – Cooking and Nutrition					
Cut, chop, taste, fruit, vegetable, stir mix, healthy	**Preparing Fruit & Vegetables:** Fruit, soft, juicy, crunchy, sticky, smooth, sharp, crisp, sour, hard, flesh, skin, seed pip, core, slicing, peeling, cutting, squeezing, healthy, choosing, ingredients, planning, tasting, arranging, ingredients chopping board, hygiene, chef, prepare	**Preparing Fruit & Vegetables:** Fruit, vegetables, soft, juicy, crunchy, sticky, smooth, sharp, crisp, sour hard, flesh, skin, seed pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, tasting, arranging	**Healthy & Varied Diet:** Texture, taste, appearance, preference, greasy, moist, fresh, savoury, hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested, healthy/varied diet, protein, fat, carbohydrate name of products, names of equipment, utensils, techniques and ingredients	**Healthy & Varied Diet:** Texture, taste, appearance, preference, yeast, dough, wholemeal, gluten, yeast, kneed, unleavened, moist, fresh, savoury, hygienic, edible, healthy/varied diet name of products, names of equipment, utensils, techniques and ingredients	*not available – suggested vocabulary:* adapt, justification, health and safety, hygiene, preparation name of products, names of equipment, utensils, techniques and ingredients

4.Yearly Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	Following children's interests and learning may include . . .					
	Building freestanding structures Joining models made out of recycled materials		Exploring mechanisms Recipes Healthy food		Designing, creating and constructing Evaluating	
Year 1	Design, make and evaluate: Puppets Make: select from and use a range of tools and equipment to perform practical tasks [e.g. cutting, shaping, joining and finishing]		Design, make & evaluate: Wacky Windmills Technical Knowledge: build structures, exploring how they can be made stronger, stiffer and more stable		Teddy Bears Picnic Design, make and evaluate a fruit Kebab and Teddy bear biscuits Cooking and Nutrition: use the basic principles of a healthy and varied diet to prepare dishes and understand where food comes from Sliders and levers	
Year 2	Design, make and evaluate: Fabric faces Technical knowledge: Selecting and joining textiles		Design, make and evaluate: Vehicles, wheels and axels Technical knowledge: what wheels, axles and holders are. Simple methods to fix wheels and axles to a product, the names of some simple tools and their purpose, the difference between fixed and free moving axles.		Design, make & evaluate: Sensational salads Technical knowledge: washing, chopping, slicing, preparing & mixing foods Cooking & nutrition: Understanding where food comes from and principles of a healthy diet to prepare dishes	
Year 3	Levers and Linkages Creating moveable objects discussing the force and movement (link to science) Posters		Food Technology Healthy cooking - pizzas		Design, make and evaluate: Plants topic Frame Structures Mini Greenhouses	
Year 4	Design, Make and evaluate Christmas Stocking		Food technology - bread Cooking and Nutrition: a range of fresh and processed foods for their product		Design, make and evaluate: Morse Code Machine	

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 5 at Alameda Middle School	Product Design Travel Game Puzzle – An introduction to the workshop, various hand tools and skills when using acrylic	Summary of tasks Design lessons are an introduction to initial designs, development and the production of final designs. New materials are introduced and properties discussed. The importance of accuracy will be discussed including time spent on annotation and how to label designs	Textiles Hand Puppet - An introduction to design and make skills. Hand sewing methods leading to production of a hand puppet	Summary of tasks A mix of practical and design lessons in Year 6. Lessons include; how to design, initial designs, design development, final designs, annotation, shading and rendering, hand sewing demos, initial sewing practical, assembly of practical	Cooking and Nutrition Focusing on hygiene, cross contamination and following basic recipes.	Summary of tasks Introduction to food room, health and safety rules and importance of hygiene. A focus is on improving independence and teamwork with a series of short tasks linked to adapting recipes and justification. Lessons will cover measurements, adapting recipes, health and safety, food hygiene and preparation requirements