Hardingstone Academy
Design and Technology Curriculum Map - Autumn

	Year 1	Year 2	Year3	Year 4	Year 5	Year 6
Aspect	**Mechanisms**	**Textiles**	**Mechanical Systems**	**Structures**	**Mechanical Systems**	**Textiles**
Focus	**Sliders and Levers** *Making Toys*	**Templates and Joining Techniques** *Creating a Character*	**Levers and Linkages** *Human Joints*	**Shell Structures / Shell Structures using Computer-Aided Design (CAD)** *Containers for equipment*	**Cams** *Viking Longboat*	**Combining Different Fabric Shapes / Using CAD in Textiles** *Tool / Equipment Belt*
Prior Learning	• Early experiences of working with paper and card to make simple flaps and hinges. (EYFS) • Experience of simple cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape. (EYFS)	• Explored and used different fabrics. (EYFS) • Cut and joined fabrics with simple techniques. (EYFS) • Thought about the user and purpose of products. (Yr1)	• Explored and used mechanisms such as flaps, sliders and levers. (Yr1 Autumn) • Gained experience of basic cutting, joining and finishing techniques with paper and card. (Yr2 Autumn /Yr1 Summer)	• Experience of using different joining, cutting and finishing techniques with paper and card. (Yr3 Autumn) • A basic understanding of 2-D and 3-D shapes in mathematics and the physical properties and everyday uses of materials in science. (Yr3/4 Maths and Science)	• Experience of axles, axle holders and wheels that are fixed or free moving. (Yr1 Summer) • Basic understanding of different types of movement. (Yr3/4 DT) • Experience of cutting and joining techniques with a range of materials including card, plastic and wood. (Yr3 Autumn/Spring) • An understanding of how to strengthen and stiffen structures. (Yr4 Autumn)	• Experience of basic stitching, joining textiles and finishing techniques. (Yr4 Spring) • Experience of making and using simple pattern pieces. (Yr4 Spring)
Design	• Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through drawings and mock-ups with card and paper.	• Design a functional and appealing product for a chosen user and purpose based on simple design criteria. • Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology	• Generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user. • Use annotated sketches and prototypes to develop, model and communicate ideas.	• Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product. • Develop ideas through the analysis of existing products and use annotated sketches and prototypes to model and communicate ideas.	• Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide their thinking. • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.	• Generate innovative ideas by carrying out research including surveys, interviews and questionnaires. • Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes and, where appropriate, computer aided design (CAD). • Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification.
Make	• Plan by suggesting what to do next. • Select and use tools, explaining their choices, to cut, shape and join paper and card. • Use simple finishing techniques suitable for the product they are creating.	• Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing. • Select from and use textiles according to their characteristics	• Order the main stages of making. • Select from and use appropriate tools with some accuracy to cut, shape and join paper and card. • Select from and use finishing techniques suitable for the product they are creating.	• Order the main stages of making. • Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy. • Explain their choice of materials according to functional properties and aesthetic qualities. • Use finishing techniques suitable for the product they are creating	• Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. • Work within the constraints of time, resources and cost.	• Produce detailed lists of equipment and fabrics relevant to their tasks. • Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. • Work within the constraints of time, resources and cost
Evaluate	• Explore a range of existing books and everyday products that use simple sliders and levers. • Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.	• Explore and evaluate a range of existing textile products relevant to the project being undertaken. • Evaluate their ideas throughout and their final products against original design criteria.	• Investigate and analyse books and, where available, other products with lever and linkage mechanisms. • Evaluate their own products and ideas against criteria and user needs, as they design and make.	• Investigate and evaluate a range of existing shell structures including the materials, components and techniques that have been used. • Test and evaluate their own products against design criteria and the intended user and purpose	• Compare the final product to the original design specification. • Test products with the intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. • Investigate famous manufacturing and engineering companies relevant to the project.	• Investigate and analyse textile products linked to their final product. • Compare the final product to the original design specification. • Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work.
Technical Knowledge	• Explore and use sliders and levers. • Understand that different mechanisms produce different types of movement. • Know and use technical vocabulary relevant to the project.	• Understand how simple 3-D textile products are made, using a template to create two identical shapes. • Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling. • Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons. • Know and use technical vocabulary relevant to the project.	• Understand and use lever and linkage mechanisms. • Distinguish between fixed and loose pivots. • Know and use technical vocabulary relevant to the project.	• Develop and use knowledge of how to construct strong, stiff shell structures. • Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. • Know and use technical vocabulary relevant to the project.	• Understand that mechanical systems have an input, process and an output. • Understand how cams can be used to produce different types of movement and change the direction of movement. • Know and use technical vocabulary relevant to the project.	• A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics. • Fabrics can be strengthened, stiffened and reinforced where appropriate.

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Hardingstone Academy
Design and Technology Curriculum Map - Spring

	Year 1	Year 2	Year3	Year 4	Year 5	Year 6
Aspect	**Structures**	**Food**	**Mechanical Systems**	**Textiles**	**Structures**	**Electrical Systems**
Focus	**Freestanding Structures** *Building playground equipment*	**Preparing Fruit and Vegetables** *Food from around the world*	**Pneumatics** *Forces and movement*	**2-D Shape to 3-D Product** *Reusable products*	**Frame Structures** *Shelter Building*	**More Complex Switches and Circuits** *Security Alarms*
Prior Learning	• Experience of using construction kits to build walls, towers and frameworks. (EYFS) • Experience of using of basic tools e.g. scissors or hole punches with construction materials e.g. plastic, card. (EYFS) • Experience of different methods of joining card and paper. (EYFS)	• Experience of common fruit and vegetables, undertaking sensory activities i.e. appearance taste and smell. (EYFS) • Experience of cutting soft fruit and vegetables using appropriate utensils. (EYFS)	• Explored simple mechanisms, such as sliders and levers, and simple structures. • Learnt how materials can be joined to allow movement. (Yr1 Autumn) • Joined and combined materials using simple tools and techniques.	• Have joined fabric in simple ways by gluing and stitching. (Yr2 Autumn) • Have used simple patterns and templates for marking out. (Yr2 Autumn) • Have evaluated a range of textile products (Yr2 Autumn)	• Experience of using measuring, marking out, cutting, joining, shaping and finishing techniques with construction materials. (Yr4 Autumn/Year 3 Autumn) • Basic understanding of what structures are and how they can be made stronger, stiffer and more stable.	• Understanding of the essential characteristics of a series circuit and experience of creating a battery powered, functional, electrical product. (Yr4 Summer) • Initial experience of using computer control software and an interface box or a standalone box, e.g. writing and modifying a program to make a light flash on and off. (Yr4 Summer)
Designing	• Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through talking, mock-ups and drawings.	• Design appealing products for a particular user based on simple design criteria. • Generate initial ideas and design criteria through investigating a variety of fruit and vegetables. • Communicate these ideas through talk and drawings.	• Generate realistic and appropriate ideas and their own design criteria through discussion, focusing on the needs of the user. • Use annotated sketches and prototypes to develop, model and communicate ideas.	• Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s. • Produce annotated sketches, prototypes, final product sketches and pattern pieces.	• Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost. • Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches.	• Use research to develop a design specification for a functional product that responds automatically to changes in the environment. Take account of constraints including time, resources and cost. • Generate and develop innovative ideas and share and clarify these through discussion. • Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams.
Making	• Plan by suggesting what to do next. • Select and use tools, skills and techniques, explaining their choices. • Select new and reclaimed materials and construction kits to build their structures. • Use simple finishing techniques suitable for the structure they are creating.	• Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely. • Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product.	• Order the main stages of making. • Select from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons. • Select from and use finishing techniques suitable for the product they are creating.	• Plan the main stages of making. • Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing. • Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.	• Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. • Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. • Use finishing and decorative techniques suitable for the product they are designing and making.	• Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. • Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product. • Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment
Evaluating	• Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings. • Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.	• Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences. • Evaluate ideas and finished products against design criteria, including intended user and purpose	• Investigate and analyse books, videos and products with pneumatic mechanisms. • Evaluate their own products and ideas against criteria and user needs, as they design and make.	• Investigate a range of 3-D textile products relevant to the project. • Test their product against the original design criteria and with the intended user. • Take into account others' views. • Understand how a key event/individual has influenced the development of the chosen product and/or fabric.	• Investigate and evaluate a range of existing frame structures. • Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. • Research key events and individuals relevant to frame structures.	• Continually evaluate and modify the working features of the product to match the initial design specification. • Test the system to demonstrate its effectiveness for the intended user and purpose. • Investigate famous inventors who developed ground-breaking electrical systems and components.
Technical Knowledge	• Know how to make freestanding structures stronger, stiffer and more stable. • Know and use technical vocabulary relevant to the project.	• Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. • Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of The Eatwell plate. • Know and use technical and sensory vocabulary relevant to the project.	• Understand and use pneumatic mechanisms. • Know and use technical vocabulary relevant to the project.	• Know how to strengthen, stiffen and reinforce existing fabrics. • Understand how to securely join two pieces of fabric together. • Understand the need for patterns and seam allowances. • Know and use technical vocabulary relevant to the project.	• Understand how to strengthen, stiffen and reinforce 3-D frameworks. • Know and use technical vocabulary relevant to the project.	• Understand and use electrical systems in their products. • Apply their understanding of computing to program, monitor and control their products. • Know and use technical vocabulary relevant to the project.

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Hardingstone Academy
Design and Technology Curriculum Map - Summer

	Year 1	Year 2	Year3	Year 4	Year 5	Year 6
Aspect	**Mechanisms**		**Food**	**Electrical Systems**	**Food**	**Mechanical Systems**
Focus	**Wheels and Axles** *Making a vehicle*		**Healthy and Varied Diets** *Lunch on the road*	**Simple Circuits and Switches** *Light*	**Celebrating Culture and Seasonality** *Savoury Food*	**Pulleys or Gears** *Vehicles*
Prior Learning	• Assembled vehicles with moving wheels using construction kits. (EYFS) • Explored moving vehicles through play. (EYFS) • Gained some experience of designing, making and evaluating products for a specified user and purpose. (EYFS) • Developed some cutting, joining and finishing skills with card. (EYFS)		• Know some ways to prepare ingredients safely and hygienically. (Yr2 Spring) • Have some basic knowledge and understanding about healthy eating and The Eatwell plate. (Yr2 Spring) • Have used some equipment and utensils and prepared and combined ingredients to make a product. (Yr2 Spring)	• Constructed a simple series electrical circuit in science, using bulbs, switches and buzzers. (Yr4 Science) • Cut and joined a variety of construction materials, such as wood, card, plastic, reclaimed materials and glue. (Yr2/3 DT)	• Have knowledge and understanding about food hygiene, nutrition, healthy eating and a varied diet. (Y3 Summer) • Be able to use appropriate equipment and utensils, and apply a range of techniques for measuring out, preparing and combining ingredients. (Yr3 Summer)	• Experience of axles, axle holders and wheels that are fixed or free moving. (Yr5 Autumn) • Basic understanding of electrical circuits, simple switches and components. (Yr6 Spring) • Experience of cutting and joining techniques with a range of materials including card, plastic and wood. (Yr5 Autumn/Spring) • An understanding of how to strengthen and stiffen structures. (Yr5 Spring)
Design	• Generate initial ideas and simple design criteria through talking and using own experiences. • Develop and communicate ideas through drawings and mock-ups.		• Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose. • Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas.	• Gather information about needs and wants and develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups. • Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams.	• Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification. • Explore a range of initial ideas and make design decisions to develop a final product linked to user and purpose. • Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas	• Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide their thinking. • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.
Make	• Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing. • Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.		• Plan the main stages of a recipe, listing ingredients, utensils and equipment. • Select and use appropriate utensils and equipment to prepare and combine ingredients. • Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics.	• Order the main stages of making. • Select from and use tools and equipment to cut, shape, join and finish with some accuracy. • Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities	• Write a step-by-step recipe, including a list of ingredients, equipment and utensils • Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients. • Make, decorate and present the food product appropriately for the intended user and purpose	• Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost.
Evaluate	• Explore and evaluate a range of products with wheels and axles. • Evaluate their ideas throughout and their products against original criteria.		• Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs. • Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.	• Investigate and analyse a range of existing battery-powered products. • Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.	• Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/charts such as star diagrams. • Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements. • Understand how key chefs have influenced eating habits to promote varied and healthy diets.	• Compare the final product to the original design specification. • Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. • Investigate famous manufacturing and engineering companies relevant to the project.
Technical Knowledge	• Explore and use wheels, axles and axle holders. • Distinguish between fixed and freely moving axles. • Know and use technical vocabulary relevant to the project.		• Know how to use appropriate equipment and utensils to prepare and combine food. • Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught. • Know and use relevant technical and sensory vocabulary appropriately.	• Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers. • Apply their understanding of computing to program and control their products. • Know and use technical vocabulary relevant to the project.	• Know how to use utensils and equipment including heat sources to prepare and cook food. • Understand about seasonality in relation to food products and the source of different food products. • Know and use relevant technical and sensory vocabulary.	• Understand that mechanical and electrical systems have an input, process and an output. • Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement. • Know and use technical vocabulary relevant to the project.

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