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|  | **Castle Academy****Design and Technology Curriculum Map - Autumn** |  |
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|  | 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)
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| 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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|  | 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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|  | 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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