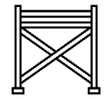
East Midlands Academy Trust
Design and Technology Curriculum - Overview

Why Teach Design and Technology?

Design and Technology involves learning about designed and manufactured products. It fosters an understanding of how things work and takes children on a journey to design and make functional products for specific purposes and users. It is an avenue through which children can develop their creativity and innovation through design – discovering the manmade world that they live in.

Design and Technology is a practical and valuable subject. It enables children and young people to actively contribute to the creativity, culture, wealth and well-being of themselves, their community and their nation. It teaches how to take risks and so become more resourceful, innovative, enterprising and capable.

Design and Technology – Substantive Big Ideas

KS1 Only	KS1 and KS2			KS2 only	
Mechanisms	Food	Textiles	Structures	Mechanical Systems	Electrical Systems
					

Design and Technology Principles

These elements should be in place to ensure that learning is genuinely design and technological in nature. Different projects will have a different profile, depending on the project being undertaken, each D&T principle will be emphasised to a greater or lesser degree.

User – Who the products are for

Purpose – What tasks the products will perform

Functionality – How the products will work

Design Decisions – The opportunity to make choices

Innovation – Being original with thinking

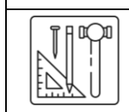
Authenticity – How believable/real the products are

Curriculum Overview

The following table provides an overview of the projects taught in each year and term. The key aspects of design and technology are covered including, textiles, food, construction materials, mechanical components and in key stage 2 electrical components.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Autumn	**Mechanisms** Sliders and Levers	**Food** Preparing Fruit and Vegetables	**Mechanical Systems** Levers and Linkages	**Structures** Shell Structures	**Mechanical Systems** Cams	**Textiles** Combining Different Fabric Shapes
Spring	**Structures** Freestanding Structures	**Textiles** Templates and Joining Techniques	**Mechanical Systems** Pneumatics	**Textiles** 2-D Shape to 3-D Product	**Structures** Frame Structures	**Electrical Systems** More Complex Switches and Circuits
Summer	**Mechanisms** Wheels and Axles		**Food** Healthy and Varied Diets	**Electrical Systems** Simple Circuits and Switches	**Food** Celebrating Culture and Seasonality	**Mechanical Systems** Pulleys or Gears

Disciplinary Knowledge

	**Designing**	Understanding contexts, users and purposes
		Generating, developing, modelling and communicating ideas
	**Making**	Planning
		Practical skills and techniques
	**Evaluating**	Own ideas and products
		Existing products
		Key events and individuals

Design and Technology Teaching Approaches

Following the D&T Association's 'Projects on a Page' we use the following approaches to teaching topics.

Investigative and Evaluative Activities (IEAs) where children learn from a range of existing products and find out about D&T in the wider world;

Focused Tasks (FTs) where they are taught specific technical knowledge, designing skills and making skills;

Design, Make and Evaluate Assignment (DMEA) where children create functional products with users and purposes in mind.

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Design & Technology Curriculum Map – EYFS

Expressive Arts and Design			
Being Imaginative and Expressive		**Creating with Materials**	
The development of children's artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe.			
	Autumn 1	Spring 1	Summer 1
Key Vocabulary			
Key Knowledge and Skills – Being Imaginative and Expressive	- Make use of props and materials to role play characters in narratives and stories - Sing a range of well-known nursery rhymes and songs - Model and encourage singing to self and making up simple songs - Model how to tap rhythms to accompany words, such as tapping the syllables of names, objects, animals and the lyrics of a song. - Watch and talk about dance and performance art, expressing their feelings and responses. - Play movement and listening games that use different sounds for different movements. Suggestions: march to the sound of the drum or creep to the sound of the maraca.	- Perform songs, rhymes, poems and stories with others - Play pitch-matching games, humming or singing short phrases for children to copy. - Sing call-and-response songs, so that children can echo phrases of songs you sing. - Tap out simple repeated rhythms - Play music with a pulse for children to move in time with and encourage them to respond to changes: they could jump when the music suddenly becomes louder, for example - Experience moving in time with music	- Invent, adapt and recount narrative and stories with peers and their teacher - Experience different kinds of music from across the globe, including traditional and folk music from Britain. - Encourage children to listen attentively to music. Discuss changes and patterns as a piece of music develops. - Encourage children to replicate choreographed dances, such as pop songs and traditional dances from around the world.
Creating with Materials	- Provide children with a range of materials for children to construct with. Encourage them to think about and discuss what they want to make. - Discuss problems and how they might be solved as they arise. Reflect with children on how they have achieved their aims. - Use various construction materials, e.g. joining pieces, staking vertically and horizontally, balancing, making enclosures and creating spaces - Use tools for a purpose - Talk to children about the differences between colours. Help them to explore and refine their colour mixing – for example: "How does blue become green?"	- Share creations, explaining the process they have used - Continue to explore colour and how colours can be changed - Develops an understanding of using lines to enclose a space, and begins to use drawing to represent actions and objects based on imagination, observation and experience - Encourage children to notice features in the natural world. Help them to define colours, shapes, texture and smells in their own words. Discuss children's responses to what they see.	- Safely uses and explores a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function - Develop colour-mixing techniques to be able to match the colours they see and want to represent, with step-by-step guidance when appropriate. - Introduce children to the work of artists from across times and cultures. Help them to notice where features of artists' work overlap with the childrens, for example in details, colour, movement or line.

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Design and Technology Curriculum Map – EYFS & KS1

EYFS	KS1	Year 1			Year 2		
		Autumn	Spring	Summer	Autumn	Spring	Summer
Early Learning Goal: Creating with Materials • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; • Share their creations, explaining the process they have used; • Make use of props and materials when role playing characters in narratives and stories. **Typical learning experiences include:** **Constructing**: Learning to construct with a purpose in mind, some children use scissors, glue, string and a hole punch to make a bag. Using woodwork materials to make a birdhouse or bug hotel. Junk modelling to make instruments. Construction blocks to make homes for Three Little Pigs. **Structure and joins:** Following a visit to their local high street, some children make a church tower out of small wooden bricks. Using a range of tapes and glue to join materials together. **Using a range of tools:** Through this, children will learn about planning and adapting initial ideas to make them better. For example, a child might choose to use scissors, a stapler, elastic bands and glue to join bits together to make a toy vehicle. But they might then modify their initial idea by using masking tape. **Cooking techniques:** Children learn basic cooking skills – mixing, quantities and amounts, spreading, chopping, pouring, weighing, following instructions, kitchen and tool safety, process of change, language. For example, children wanted to make a cake for a tea party – an ingredient list was made after finding a recipe, children in the class then worked together to make a cake. **Exploration**: Children will dismantle things and learn about how everyday objects work. For example, a child might dismantle a pepper grinder and discover how it is put together and the materials different parts are made of. **Discussion**: Children will be given opportunities to discuss reasons that make activities safe or unsafe, for example hygiene, electrical awareness, and appropriate use of senses when tasting different flavourings. They will also learn to record their experiences by, for example, drawing, pictures writing and making a video or model.	Aspect	**Mechanisms**	**Structures**	**Mechanisms**	**Food**	**Textiles**	
	Focus	**Sliders and Levers** *Making Toys*	**Freestanding Structures** *Building playground equipment*	**Wheels and Axles** *Making a vehicle*	**Preparing Fruit and Vegetables** *Food from around the world*	**Templates and Joining Techniques** *Creating a Character*	
	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)	• 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)	• 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)	• 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 and used different fabrics. (EYFS) • Cut and joined fabrics with simple techniques. (EYFS) • Thought about the user and purpose of products. (Yr1)	
	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.	• 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.	• Generate initial ideas and simple design criteria through talking and using own experiences. • Develop and communicate ideas through drawings and mock-ups.	• 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.	• 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	
	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.	• 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.	• 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.	• 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.	• 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	
	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 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.	• Explore and evaluate a range of products with wheels and axles. • Evaluate their ideas throughout and their products against original 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	• 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.	
	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.	• Know how to make freestanding structures stronger, stiffer and more stable. • Know and use technical vocabulary relevant to the project.	• Explore and use wheels, axles and axle holders. • Distinguish between fixed and freely moving axles. • 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 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.	

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Design and Technology Curriculum Map – Technical Knowledge

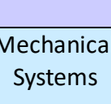
Technical Knowledge

Across Topics

- how to use learning from science to help design and make products that work
- how to use learning from mathematics to help design and make products that work
- that materials have both functional properties and aesthetic qualities
- that materials can be combined and mixed to create more useful characteristics
- Know and use technical and sensory vocabulary appropriately.

KS1 Only

Mechanisms



Year 1 Autumn	Year 1 Summer
Sliders and Levers	**Wheels and Axles**
• Explore and use sliders and levers. • Understand that different mechanisms produce different types of movement.	• Explore and use wheels, axles and axle holders. • Distinguish between fixed and freely moving axles.

KS1 and KS2

Food

Year 2 Autumn	Year 3 Summer	Year 5 Summer
Preparing Fruit and Vegetables	**Healthy and Varied Diets**	**Celebrating Culture and Seasonality**
• that all food comes from plants or animals • Understand where a range of fruit and vegetables come from e.g., farmed, grown elsewhere (e.g. home) or caught • 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. • how to use techniques such as cutting, peeling and grating	• that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world • that food ingredients can be fresh, pre-cooked and processed • how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking • that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The Eatwell plate • that to be active and healthy, food and drink are needed to provide energy for the body	• that seasons may affect the food available • how food is processed into ingredients that can be eaten or used in cooking • how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source • that recipes can be adapted to change the appearance, taste, texture and aroma • that a recipe can be adapted by adding or substituting one or more ingredients • that different food and drink contain different substances – nutrients, water and fibre – that are needed for health

Textiles

Year 2 Spring	Year 4 Spring	Year 6 Autumn
Templates and Joining Techniques	**2-D Shape to 3-D Product**	**Combining Different Fabric Shapes / Using CAD in Textiles**
• Understand that a 3-D textiles product can be assembled from two identical fabric 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 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.	• 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.

Structures

Year 1 Spring	Year 4 Autumn	Year 5 Spring
Freestanding Structures	**Shell Structures / Shell Structures using Computer-Aided Design (CAD)**	**Frame Structures**
• Know how to make freestanding structures stronger, stiffer and more stable.	• Develop and use knowledge of how to construct strong, stiff shell structures. • that a single fabric shape can be used to make a 3D textiles product • Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes.	• Understand how to strengthen, stiffen and reinforce 3-D frameworks. • Know and use technical vocabulary relevant to the project.

KS2 Only

Mechanical Systems

Year 3 Autumn	Year 3 Spring	Year 5 Autumn	Year 6 Summer
Levers and Linkages	**Pneumatics**	**Cams**	**Pulleys or Gears**
• Use and understand how lever and linkage mechanisms create movement. • Distinguish between fixed and loose pivots.	• Use and understand how pneumatic mechanisms create movement.	• 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.	• 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.

Electrical Systems

Year 4 Summer	Year 6 Spring
Simple Circuits and Switches	**More Complex Switches and Circuits**
• 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.	• Understand and use electrical circuits and components can be used to create functional products. • Apply their understanding of computing to program, monitor changes in the environment and control their products.

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Design & Technology Curriculum Map – Mechanisms & Mechanical Structures

	Mechanisms		Mechanical Systems			
	Year 1 - Autumn	**Year 1 - Summer**	**Year 3 - Autumn**	**Year 3 - Spring**	**Year 5 - Autumn**	**Year 6 - Summer**
Aspect	**Mechanisms**	**Mechanisms**	**Mechanical Systems**	**Mechanical Systems**	**Mechanical Systems**	**Mechanical Systems**
Focus	**Sliders and Levers** *Making Toys*	**Wheels and Axles** *Making a vehicle*	**Levers and Linkages** *Human Joints*	**Pneumatics** *Forces and movement*	**Cams** *Viking Longboat*	**Pulleys or Gears** *Vehicles*
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)	• 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 and Year 1 Autumn) • Developed some cutting, joining and finishing skills with card. (EYFS)	• 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)	• 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.	• 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 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)
Designing	• 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.	• Generate initial ideas and simple design criteria through talking and using own experiences. • Develop and communicate ideas through drawings and mock-ups.	• 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 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 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 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.
Making	• 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 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.	• 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 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.	• 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 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.
Evaluating	• 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 products with wheels and axles. • Evaluate their ideas throughout and their products against original 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 analyse books, videos and products with pneumatic mechanisms. • Evaluate their own products and ideas against criteria and user needs, as they design and make.	• 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.	• 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 sliders and levers. • Understand that different mechanisms produce different types of movement. • Know and use technical vocabulary relevant to the project.	• Explore and use wheels, axles and axle holders. • Distinguish between fixed and freely moving axles. • 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.	• Understand and use pneumatic mechanisms. • 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.	• 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.

Every child deserves to be the best they can be

East Midlands Academy Trust

Design & Technology Curriculum Map – Textiles and Food

	Textiles			Food		
	Year 2 - Autumn	Year 4 - Spring		Year 2 - Spring	Year 3 - Summer	Year 5 - Summer
Aspect	**Textiles**	**Textiles**	**Aspect**	**Food**	**Food**	**Food**
Focus	**Templates and Joining Techniques** *Creating a Character*	**2-D Shape to 3-D Product** *Reusable products*	**Focus**	**Preparing Fruit and Vegetables** *Food from around the world*	**Healthy and Varied Diets** *Lunch on the road*	**Celebrating Culture and Seasonality** *Savoury Food*
Prior Learning	• Explored and used different fabrics. (EYFS) • Cut and joined fabrics with simple techniques. (EYFS) • Thought about the user and purpose of products. (Yr1)	• 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)	**Prior Learning**	• 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)	• 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)	• 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)
Designing	• 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 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.	**Designing**	• 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 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.	• 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
Making	• 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	• 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.	**Making**	• 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.	• 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.	• 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
Evaluating	• 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 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.	**Evaluating**	• 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	• 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.	• 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.
Technical Knowledge	• 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.	• 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.	**Technical Knowledge**	• 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.	• Know how to use appropriate equipment and utensils to prepare and combine food. • Know about a range of fresh and processed ingredients appropriate for t heir product, and whether they are grown, reared or caught. • Know and use relevant technical and sensory vocabulary appropriately.	• 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.

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Design & Technology Curriculum Map – Electrical Systems and Structures

	Textiles			Structures		
	Year 4 - Summer	Year 6 - Spring		Year 1 - Spring	Year 4 - Autumn	Year 5 - Spring
Aspect	**Electrical Systems**	**Electrical Systems**	Aspect	**Structures**	**Structures**	**Structures**
Focus	**Simple Circuits and Switches** *Light*	**More Complex Switches and Circuits** *Security Alarms*	Focus	**Freestanding Structures** *Building playground equipment*	**Shell Structures / Shell Structures using Computer-Aided Design (CAD)** *Containers for equipment*	**Frame Structures** *Shelter Building*
Prior Learning	• 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)	• 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)	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 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 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. (Yr4 Autumn and Yr5 Autumn Science – Properties of and Changes to Materials)
Designing	• 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.	• 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.	**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.	• 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.	• 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.
Making	• 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	• 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	**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.	• 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	• 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.
Evaluating	• 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.	• 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.	**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.	• 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	• 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.
Technical Knowledge	• 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.	• 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.	**Technical Knowledge**	• Know how to make freestanding structures stronger, stiffer and more stable. • 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 how to strengthen, stiffen and reinforce 3-D frameworks. • Know and use technical vocabulary relevant to the project.

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East Midlands Academy Trust
Design and Technology Curriculum Map - Autumn

	Year 1	Year 2	Year3	Year 4	Year 5	Year 6
Aspect	**Mechanisms**	**Food**	**Mechanical Systems**	**Structures**	**Mechanical Systems**	**Textiles**
Focus	**Sliders and Levers** *Making Toys*	**Preparing Fruit and Vegetables** *Food from around the world*	**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)	• 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 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 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 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.	• 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, 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.	• 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 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 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 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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East Midlands Academy Trust
Design and Technology Curriculum Map - Spring

	Year 1	Year 2	Year3	Year 4	Year 5	Year 6
Aspect	**Structures**	**Textiles**	**Mechanical Systems**	**Textiles**	**Structures**	**Electrical Systems**
Focus	**Freestanding Structures** *Building playground equipment*	**Templates and Joining Techniques** *Creating a Character*	**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)	• Explored and used different fabrics. (EYFS) • Cut and joined fabrics with simple techniques. (EYFS) • Thought about the user and purpose of products. (Yr1)	• 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 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 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.	• 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 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.	• 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, 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 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 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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East Midlands Academy Trust
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.	**Opportunity to review Key Stage 1 units in a project in Summer 2.**	• 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.

East Midlands Academy Trust
Design and Technology Curriculum Map - Expectations

End of Phase Expectations		By the end of Y2 most children should:	By the end of Y4 most children should:	By the end of Y6 most children should:
Designing 	Understanding contexts, users and purposes	use simple design criteria; state what their products are, who and what they are for and how they will work.	gather information about user needs; develop their own design criteria; describe the user, purpose and design features of their products and explain how they will work.	carry out research; develop a simple design specification; describe the user, purpose and design features of their products and explain how they will work.
	Generating, developing, modelling and communicating ideas	generate ideas using their own experiences and existing products; use talk, drawing, templates, mock-ups and, where appropriate, computers.	generate realistic ideas based on user needs; use a range of drawing skills, discussion, prototypes, pattern pieces and computer-aided design.	generate innovative ideas drawing on research; use a range of drawing skills, discussion, prototypes, pattern pieces and computer-aided design.
Making 	Planning	plan by suggesting what to do next; select from a range of tools, equipment, materials and components.	order the main stages of making; select suitable tools, equipment, materials and components and explain their choices.	formulate lists of resources and step-by-step plans; select suitable tools, equipment, materials and components and explain their choices.
	Practical skills and techniques	follow procedures for safety and hygiene; measure, mark out, cut, shape, assemble, join, combine and finish a range of materials and components.	follow procedures for safety and hygiene; use a wider range of materials and components; measure, mark out, cut, shape, assemble, join, combine and finish with some accuracy.	follow procedures for safety and hygiene; use a wider range of materials and components; measure, mark out, cut, shape, assemble, join, combine and finish with accuracy.
Evaluating 	Own ideas and products	make simple judgements about their products and ideas against design criteria.	evaluate their ideas and products against their design criteria.	identify strengths and areas to develop in their ideas and products against their design specification; consider the views of others to make improvements.
	Existing products	explore who and what products are for, how they work and are used, what materials they are made from and what they like and dislike about them.	investigate how well products have been designed and made, whether they are fit for purpose and meet user needs; why materials have been chosen, the methods of construction used and how well they work.	investigate how well products have been designed and made, whether they are fit for purpose and meet user needs; why materials have been chosen, the methods of construction used, how well they work, and how innovative and sustainable they are.
	Key events and individuals		know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.	know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.
Technical Knowledge	Making products work	know about the simple working characteristics of materials and components, the movement of simple mechanisms, how freestanding structures can be made stronger, stiffer and more stable; use the correct technical vocabulary.	know that materials have functional and aesthetic qualities; that systems have an input, process and output; how to program a computer to control their products; how to make strong, stiff shell structures; use the correct technical vocabulary.	know that materials have functional and aesthetic qualities; that systems have an input, process and output; how to program a computer to control and monitor their products; how to reinforce and strengthen a framework; use the correct technical vocabulary.
Cooking and Nutrition 	Where food comes from	know that food comes from plants or animals and that it is farmed or caught.	know that food is grown, reared and caught in the UK, Europe and the wider world.	know that food is grown, reared and caught in the UK, Europe and the wider world; that seasons may affect the food available; how food is processed into ingredients.
	Food preparation, cooking and nutrition	know how to prepare simple dishes safely and hygienically without a heat source, name and sort foods into groups; know that everyone should eat at least five portions of fruit and vegetables a day.	know how to prepare a variety of dishes safely and hygienically; that a healthy diet is made from a variety and balance of different food and drink; that food and drink are needed to provide energy for the body.	know how to prepare and cook a variety of dishes safely and hygienically using, where appropriate, a heat source; that different food and drink contain nutrients, water and fibre that are needed for health.

East Midlands Academy Trust
Design and Technology Rocket Words

Key Recurring Vocabulary								
	design	make	evaluate	user	purpose	ideas	product	function
	design brief	innovative	authentic	planning	mock-up	features	constraints	quality
	investigating	ingredients	appealing	prototype	aesthetics	reduce	reuse	recycle
	consumer	organisation	perseverance	negotiation	motivation	leadership	persuasion	teamwork

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Autumn	**Mechanisms**	**Food**	**Mechanical Systems**	**Structures**	**Mechanical Systems**	**Textiles**
	Sliders and Levers	Preparing Fruit and Vegetables	Levers and Linkages	Shell Structures	Cams	Combining Different Fabric Shapes
	slider	fruit	mechanism	shell structure	cam	seam
	lever	vegetable	linkage	three-dimensional (3-d)	snail cam	seam allowance
	pivot	soft	pivot	net	off-centre cam	wadding
	slot	hard	system	prism	peg cam	appliqué
	bridge/guide	juicy	input	vertex	pear shaped cam	embroidery
	join	crunchy	process	edge	follower	needle
	pull	sweet	output	face	shaft	thread
	push	sour	movement	length	crank	fastenings
	up	flesh	linear	width	handle	clasp
	down	skin	rotary	breadth	housing	press stud
	straight	pip	oscillating	capacity	framework	toggle
	curve	peeling	reciprocating	tabs	rotating	stem stitch
	forwards	cutting	loose	adhesive	spacer	satin stitch
	backwards	squeezing	component	assemble	motion	chain stitch
Spring	**Structures**	**Textiles**	**Mechanical Systems**	**Textiles**	**Structures**	**Electrical Systems**
	Freestanding Structures	Templates and Joining Techniques	Pneumatics	2-D Shape to 3-D Product	Frame Structures	More Complex Switches and Circuits
	cut	textile	attaching	fastening	frame structure	parallel circuit
	fold	template	tubing	compartment	shelter	latching switch
	fix	joining	syringe	zip	compression	push-to-make switch
	structure	sewing	plunger	button	reinforce	push-to-break switch
	weak	pinning	pneumatic system	velcro	triangulation	reed switch
	strong	gluing	compression	back stitch	stability	tilt switch
	base	stapling	pressure	running stitch	stiffen	interface
	top	tools	inflate	blanket stitch	temporary	control box
	underneath	fabric	deflate	over sew stitch	permanent	sequence
	thinner	pieces	pump	seam	strut	sensor
	thicker	pattern	seal	woven	tension	alarm
	shape	mark out	air-tight	knitted	tie	flowchart
Summer	**Mechanisms**	decorate	**Food**	**Electrical Systems**	**Food**	**Mechanical Systems**
	Wheels and Axles	finish	Healthy and Varied Diets	Simple Circuits and Switches	Celebrating Culture and Seasonality	Pulleys or Gears
	vehicle	Summer Term Project KS1 Review	texture	series circuit	carbohydrate	pulley
	wheel		taste	fault	protein	drive belt
	axle		appearance	connection	vitamins	gear
	axle holder		preference	toggle switch	nutrients	mesh
	chassis		greasy	battery	gluten	gear up
	body		cook	bulb	dairy	gear down
	fixed		fresh	wire	allergy	spindle
	free		savoury	insulator	intolerance	driver
	moving		hygienic	conductor	seasonality	ratio
	mechanism		grown	crocodile clip	utensils	transmit
	tight		reared	program	fold	motor
	hole		caught	device	knead	rotation

Every child deserves to be the best they can be

East Midlands Academy Trust
Design & Technology Principles (1)

Overview of the Six Design and Technology Principles			
	What it means	**Why it matters**	**Example in practice**
User Who the products are for	Design and Technology should always consider the needs, wants and values of the end user. This principle encourages pupils to think beyond their own preferences and design for others.	• Encourages empathy and real-world thinking. • Helps pupils develop purposeful products. • Connects learning to the lives of others.	Designing a lunchbox for a child with allergies or creating a toy suitable for a younger sibling.
Purpose What tasks the products will perform	Projects must have a clear purpose, function or problem to solve. Design decisions are driven by intended outcomes.	• Promotes problem-solving and critical thinking. • Prevents 'craft for craft's sake'. • Makes learning relevant and meaningful.	Creating a chair that can hold a teddy bear's weight or designing packaging that protects a fragile item.
Functionality How the products will work	Products should work effectively (functional) and encourage pupils to think creatively or find new ways of solving a problem (innovative).	• Combines technical accuracy with creativity. • Encourages pupils to take risks and trial ideas. • Reflects the nature of design in the real world.	Designing a moving toy using mechanisms that not only works well but includes a unique feature or theme.
Design Decisions The opportunity to make choices	Pupils should be encouraged to explore, test, evaluate and improve their ideas continuously, not just produce one final outcome.	• Develops resilience, reflection, and problem-solving. • Mirrors real-life design processes used by engineers, architects, and designers. • Encourages Pupils to see that mistakes are a vital part of learning.	Pupils build simple structures and test their stability, then adjust and improve based on what they find.
Innovation Being original with thinking	Pupils are encouraged to think creatively, take risks, and develop original ideas. Innovation is about improving existing designs or inventing something new. Design decisions must balance user needs, the purpose of the product and innovative thinking. One element shouldn't dominate at the expense of others.	• Fosters curiosity and originality. • Encourages pupils to think like real designers and engineers. • Supports future-ready skills like problem-solving, creativity, and adaptability.	Pupils design a new type of pencil case that solves a common problem (e.g. zips breaking, things falling out), using original ideas or combining features in a novel way.
Authenticity How believable/real the products are	Projects should have real-life contexts, links to real users, and reflect how design and technology is used in the wider world.	• Helps pupils understand the role of D&T in everyday life and work. • Raises aspirations by showing how D&T is used in jobs and industries. • Makes learning more engaging and meaningful.	Designing a sustainable shopping bag as part of an eco-themed unit or exploring how engineers design bridges and applying that to a challenge.

Design and Technology Principles		
KS1	**Questions for the pupils before starting their project**	**Questions for pupils when evaluating their work**
User Who the products are for	• Who are you making your product for? • What do they need or like? • What will make it just right for them?	• Who did you make your product for? • What do you think they will like best? • Would you change anything for them?
Purpose What tasks the products will perform	• What is your product for? • What problem does it help with? • Why is it useful?	• What did your product do? • Did it help as you wanted? • Was anything missing that would make it better?
Functionality How the products will work	• How will it work? • What parts will help it do its job? • How will you check it works?	• Did everything work as planned? • What helped it to work well? • What could you do to make it better?
Design Decisions The opportunity to make choices	• What will you try first? • What might you change as you go? • How will you check your ideas?	• What did you change while you were making it? • What did you learn from fixing problems? • What would you do differently next time?
Innovation Being original with thinking	• What new ideas did you come up with for your product? • How will you try different ways to make your product? • Can you think of a special feature that makes your product unique?	• What new ideas did you come up with for your product? • How did you try different ways to make your product? • Can you think of a special feature that makes your product unique?
Authenticity How believable/real the products are	• Where might someone use this? • Who uses things like this in real life? • Why do they need it?	• Where could people use this? • How is it helpful in real life? • Why do you think someone might want it?

East Midlands Academy Trust
Design & Technology Principles (2)

Design and Technology Principles		
Lower KS2	**Questions for the pupils before starting their project**	**Questions for pupils when evaluating their work**
User Who the products are for	• Who will use this product? • What do they need it to do? • How will you make sure it suits them?	• Does the product meet the user's needs? • What do you think they would find most useful? • What might you improve for them?
Purpose What tasks the products will perform	• What problem is this product solving? • Why is this problem important? • How will this product help?	• Did it solve the problem effectively? • What features helped it to work well? • Was anything missing or unnecessary?
Functionality How the products will work	• What parts will your product need to work properly? • How will you make it move or work? • How will you test it?	• Did your product function as intended? • What did you test or adapt? • How could the design be more reliable?
Design Decisions The opportunity to make choices	• What materials will you choose for this product and why? • How will you decide on the shape and size of your product? • How will you check and improve my work?	• What changes did you make as you worked? • What did you learn from testing or problems? • What would you do differently next time?
Innovation Being original with thinking	• What's original or unique about your idea? • How could you improve something that already exists? • What will make it stand out?	• What makes your product different or inventive? • What ideas did you develop or change? • How could it be improved further?
Authenticity How believable/real the products are	• Where would this product be used in real life? • Who might use something like this? • Why is it useful?	• Would this product be useful in real life? • Where and when could someone use it? • What makes it realistic and helpful?

Design and Technology Principles		
Upper KS2	**Questions for the pupils before starting their project**	**Questions for pupils when evaluating their work**
User Who the products are for	• Who is the target user for your product, and what specific needs do they have? • How can you gather information about the user's preferences and requirements? • What features will you include to ensure your product meets the user's needs?	• Who is the target user for your product, and how well does your finished product meet their needs? • What feedback did you receive from users after they tried your product, and how could you use this feedback to improve it? • In what ways could your product be further refined to better meet the needs and preferences of the user?
Purpose What tasks the products will perform	• What is the primary purpose of your product, and why is it important? • How will your product improve the user's experience or solve a problem for them? • Are there any additional purposes or benefits your product could provide?	• What is the primary purpose of your product, and how effectively does it fulfil this purpose now that it is finished • Can you identify any secondary purposes or additional benefits of your product that emerged during its use • How does your product compare to existing solutions in terms of effectiveness and usability?
Functionality How the products will work	• How will your product work, and what are the key functions it needs to perform? • What challenges do you anticipate in making your product functional, and how will you address them? • How will you test your product to ensure it works as intended?	• How do the different components of your finished product work together to achieve its purpose • What challenges did you encounter in ensuring your product's functionality, and how did you address them during the making process? • How could you test and improve the functionality of your product to ensure it continues to meet user needs?
Design Decisions The opportunity to make choices	• What criteria will you use to evaluate different design options? • How will you balance aesthetics and functionality in your design choices? • What materials and construction methods will you use, and why?	• What criteria did you use to evaluate and choose your design options, and how did these decisions impact the final product? • How did you balance aesthetics, cost, and functionality in your design choices, and what trade-offs did you make? • Can you explain any compromises you made during the design process and how they affected the final product?
Innovation Being original with thinking	• What makes your design innovative or original? • How does it build on or improve existing products? • What creative risks are you willing to take in your design?	• What was innovative or original about your product? • How did your ideas evolve during the process? • What new features would you explore if you developed this further?
Authenticity How believable/real the products are	• Where and when do you think people will use your product, and how does this influence your design? • How will you ensure your product is relevant and valuable in everyday life?	• How does your finished product address real-world issues or challenges? • Can you provide examples of how similar products are used in everyday life, and how your product fits into this context? • How might your product need to be adapted for different contexts or environments to remain effective?

East Midlands Academy Trust
Design & Technology – Real World Examples (1)

Year 1 Design and Technology - Real World Examples

	✨ Real-Life Jobs	🏭 Real-World Case Study:	Designers
Autumn Sliders and Leavers	• **Mechanical Engineers** use sliders and levers when designing machines, tools, and everyday products that involve movement. • **Toy Designers** often create pop-up books, moving characters, and interactive toys that use simple mechanisms just like the ones children explore in class. • **Theme Park Ride Engineers** build rides with moving parts like pulleys, push mechanisms, and levers to make experiences fun and safe. • **Automotive Technicians** work with mechanical systems in cars – like gear levers, bonnets, and sliding windows – that rely on push, pull, and turn movements. • **Furniture Designers** use levers and sliders in items like drawers, extending tables, or fold-away beds, thinking carefully about how they move. • **Graphic and Product Designers** use simple mechanisms in things like packaging, promotional cards, and interactive displays that slide, pop or flip.	**Pop-Up Birthday Cards** **Company:** Hallmark **Product:** Pop-up and slider birthday cards Hallmark makes special birthday cards that come to life when you pull a tab or open a flap. These cards often include **sliders and levers** that help parts of the card move – like a dog wagging its tail or a rocket launching into space. Designers carefully plan how the moving parts will work and test different types of paper and folds. This is a brilliant example of how the mechanisms Year 1 children learn in class are used in real design jobs to make joyful, interactive products.	**Maho Ogawa** (Japan): A visual artist who uses sliders and paper mechanisms to bring her handmade storybooks and animations to life. **Robert Sabuda** (USA): Known for his intricate pop-up books, he shows how levers and sliders can create beautiful moving illustrations. **Samhita Arni** (India): Uses storytelling and traditional craft to create interactive visual books rooted in cultural heritage.
Spring Freestanding Structures	• **Architects** design buildings and structures that must stand up safely and look appealing. They think carefully about shape, strength, and stability. • **Civil Engineers** help build bridges, towers, and shelters — making sure they are strong and can stay upright even in bad weather. • **Construction Workers** use tools and materials to build houses, walls, fences and other free-standing structures from the ground up. • **Set Designers** create stage backgrounds and props in theatres or films that must stand up on their own but also be safe and movable. • **Playground Designers** design climbing frames, slides and playhouses that must be freestanding, safe and durable for children to use. • **Exhibition Stand Builders** design and assemble temporary structures for shows and events — these must stand independently and often be taken apart and reused.	**Wicksteed Playground Equipment** **Company:** Wicksteed Playgrounds **Product:** Climbing frames and freestanding play structures Wicksteed is one of the oldest and most trusted companies in the UK that designs and builds **playground equipment**. Their climbing frames, slides, swings and play towers are all **freestanding structures** – they must be safe, stable, and strong enough for lots of children to play on every day. Wicksteed's designers and engineers choose the right materials, test for balance and strength, and think about how children will climb, sit, swing or slide safely. When Year 1 pupils build a freestanding structure in class, they're using the same ideas that real engineers use when creating play spaces in parks and schools.	**Diébédo Francis Kéré** (Burkina Faso/Germany): An architect who uses natural, local materials to build strong, freestanding schools and community buildings. **Toyo Ito** (Japan): Designs innovative public buildings that use striking structural forms while staying strong and efficient. **Greta Magnusson-Grossman** (Sweden/USA): An industrial designer known for sleek modernist furniture with strong frame-based structures.
Summer Wheels and Axels	• **Vehicle Designers** (also known as automotive engineers) design cars, bikes, buses and other vehicles that use wheels and axles to move smoothly and safely. • **Toy Designers** create vehicles like toy cars, trains, and pull-along animals, all of which use basic wheel and axle mechanisms. • **Bicycle Mechanics** repair and maintain bikes, ensuring the wheels, axles, and gears all work properly together. • **Logistics Workers** use trolleys, pallet trucks and delivery carts that depend on wheels and axles for transporting goods. • **Theme Park Engineers** design rides like rollercoasters and carousels, where wheels and axles help parts rotate, roll, or glide. • **Mechanical Engineers** work on systems involving rotating parts, often using axles to transfer motion or support movement in machines.	**The Hot Wheels Car** **Company:** Mattel **Product:** Hot Wheels toy cars Hot Wheels cars are small, colourful toy vehicles that children love to race and collect. Each one is designed with working **wheels and axles**, allowing them to roll smoothly along tracks and floors. The axles (thin rods) hold the wheels in place while allowing them to spin freely. Designers at Hot Wheels use clever engineering to make sure the cars go fast, stay balanced, and look exciting. These toys are a brilliant example of how simple mechanisms – like wheels and axles – can be used to create fun, moving products.	**Margaret Wilcox** (USA): One of the first female mechanical engineers, she invented an early car heating system and worked with mechanical parts. **George Bamford** (UK): Customises luxury watches using intricate wheel and gear mechanisms. **Ruchi Sanghvi** (India/USA): While a software engineer, she shows how systems thinking and mechanism logic apply to both coding and physical design.

Year 2 Design and Technology - Real World Examples

	✨ Real-Life Jobs	Case Study	Designers
Autumn Fruit and Vegetables Preparing Fruit	• **Chefs** prepare fruit and vegetables every day in restaurants and cafes. They know how to chop safely, combine flavours, and present food beautifully. • **Nutritionists** help people make healthy food choices. They often work with schools and families to encourage eating more fruit and vegetables. • **Food Product Developers** create new healthy snacks, smoothies and ready meals. They test recipes and try different combinations of fruits and vegetables. • **School Cooks** prepare balanced meals and snacks for children, using fresh fruit and vegetables to make food tasty and nutritious. • **Supermarket Food Technicians** help check that fresh fruit and vegetables are clean, safe, and high quality before they're sold. • **Farmers and Growers** grow a variety of fruits and vegetables that are later washed, chopped and used in food production.	**Innocent Smoothies** **Company:** Innocent Drinks **Product:** Fruit smoothies and veg-packed juices Innocent makes smoothies and juices that you can find in almost every supermarket. Their drinks are made from **real fruits and vegetables**, which are washed, chopped, and blended without adding anything artificial. The people who work at Innocent have to choose the right ingredients, test different flavour combinations, and make sure every smoothie is both tasty and healthy. Just like children in Year 2, they use safe food preparation skills and think carefully about how food looks, tastes, and makes people feel. Innocent even shares recipe ideas and healthy eating tips with schools – showing how simple food prep at school is part of a much bigger food industry!	**Dominique Ansel:** A renowned pastry chef famous for his innovative desserts. He often uses fruits in his creations and shares techniques for enhancing their flavors and presentation. **Nadiya Hussain:** Great British Bake Off winner known for encouraging children to explore food, including vibrant fruit dishes. A role model for confidence and creativity in the kitchen. **Tunde Wey:** A chef who integrates African vegetables and ingredients into bold, meaningful dishes
Spring Joining Techniques	• **Costume Designers** make outfits for theatre, TV and film using sewing, stitching and other joining methods to work with fabrics. • **Textile Designers** create fabric-based products like cushions, bags or puppets by cutting, shaping and joining fabric creatively. • **Puppeteers and Puppet Makers** design and make hand puppets, glove puppets or character puppets for storytelling and performance. • **Toy Makers** design and sew soft toys and plush characters using a variety of textile joining methods. • **Upholsterers** work with fabric to cover furniture, using cutting, joining and decorating techniques. • **Fashion Designers** design clothes and accessories using joining techniques such as sewing, gluing, or sticking fabric pieces together.	**The Puppet Company – Soft Hand Puppets** **Company:** The Puppet Company (UK-based) **Product:** Hand and glove puppets The Puppet Company designs and makes a wide range of **soft puppets** used in schools, nurseries and homes around the world. These puppets are made from **fabric** and involve several **joining techniques** – such as sewing, gluing, and folding – to attach arms, eyes, mouths and features. Designers must choose the right fabric, draw simple templates, and think carefully about how the puppet will move and be used.	**Jim Henson**: The creator of the Muppets, Jim Henson's work can inspire students with the creativity and craftsmanship involved in puppet making. **Julie Taymor**: Known for her work on the Broadway production of "The Lion King," Julie Taymor uses puppetry and masks in innovative ways. Her work can show students the artistic possibilities of puppets. **Sarah Goldfinger**: A contemporary puppet maker who creates unique and imaginative puppets. Her work can provide modern examples of puppet design and construction.

East Midlands Academy Trust
Design & Technology – Real World Examples (2)

Year 3 Design and Technology - Real World Examples

	✨ Real-Life Jobs	Case Study	Designers
Autumn Levers and Linkages	• **Mechanical Engineers** design machines and tools that use levers and linkages to transfer motion, lift weight, or control movement. • **Automotive Engineers** use linkages in cars for steering, suspension systems, and windscreen wipers. • **Robotics Designers** build robots that use linkages and pivot joints to copy how arms, legs, or claws move. • **Medical Equipment Designers** use levers and joints in devices like crutches, mobility aids, or surgical tools. • **Stage and Prop Technicians** create moving props and stage sets that use levers and pulleys to create special effects. • **Industrial Product Designers** use lever and linkage systems to make tools (e.g. pliers, staplers, scissors) work more efficiently.	**Adjustable Desk Light** **Company:** Anglepoise® **Product:** Iconic adjustable desk lamps The **Anglepoise lamp**, originally designed by **George Carwardine** in the 1930s, is a brilliant real-world example of a product that uses **levers and linkages**. The lamp has arms and springs that move like an elbow joint, allowing the user to position it in many different ways without it falling or drooping. These parts work together using a system of **pivoting linkages and balanced levers**. Modern Anglepoise lamps are used in homes, offices, design studios and even art galleries. Designers at the company continue to improve the lamp while keeping the clever mechanical system that lets it move smoothly and hold its shape.	**Rube Goldberg**: Known for his complex and whimsical machines that perform simple tasks, Rube Goldberg's creations often include levers and linkages. His work can inspire creativity and problem-solving. **Leonardo da Vinci**: A Renaissance inventor and artist who designed numerous machines and devices using levers and linkages. His sketches and models can be fascinating examples for students. **Grant Imahara**: A former host of "MythBusters" and a robotics engineer, Grant Imahara worked on many projects involving mechanical systems. His work can show the fun and practical side of engineering.
Spring Pneumatics	• **Mechanical Engineers** design machines and tools that use compressed air to move or control parts – especially in factories and workshops. • **Vehicle Technicians** work with air-powered systems in buses, lorries, and trains, such as **air brakes** and suspension systems. • **Dentists and Dental Technicians** use pneumatic tools like polishers and drills powered by compressed air. • **Theme Park Ride Engineers** use pneumatics to control safety restraints and moving parts on rides. • **Robotics Designers** sometimes use pneumatic cylinders to power robotic arms or moving parts in production lines. • **Packaging Machine Operators** oversee machines that use air pressure to grip, lift or seal products in factories.	**Lego Pneumatics – Engineering Playsets** **Company:** LEGO® Technic **Product:** Pneumatic construction and control kits LEGO Technic has developed special kits that include **pneumatic cylinders, pumps, and valves**. These use real air pressure to make models move — for example, to lift a digger arm, tilt a truck bed, or operate a claw. Children and adults alike can build machines that simulate how air pressure is used in real-world tools. These sets show that **pneumatics aren't just for factories** – they're used in fun, creative and highly technical ways to build working models. LEGO's designers carefully plan how the air moves, how much pressure is needed, and how the system should respond — just like real engineers.	**George Westinghouse**: An inventor and engineer who developed the air brake system for trains, which is a significant application of pneumatics. His work can provide historical context and inspiration. **Ralph H. Mosher**: An engineer who worked on early robotics and pneumatic systems. His contributions can illustrate the development of pneumatics in robotics.
	• **Nutritionists** help people plan healthy meals, ensuring they eat a good balance of different food groups. They work in schools, hospitals, and sports organisations. • **Chefs** plan and prepare varied meals using fresh ingredients. Many create balanced menus that include fruit, vegetables, proteins and whole grains. • **Food Product Developers** design healthy ready meals, snacks and lunchbox products that are nutritious and appealing to children and families. • **School Cooks and Caterers** prepare balanced meals that follow national school food standards and encourage children to try new foods. • **Public Health Workers** run healthy eating campaigns and resources to help people understand what a balanced diet looks like. • **Supermarket Nutrition Advisors** help create packaging and recipes that promote healthy food choices to shoppers.	**Abel & Cole – Organic Recipe Boxes** **Company:** Abel & Cole **Product:** Healthy, seasonal meal kits and fresh produce boxes Abel & Cole is a UK-based food company that delivers **healthy, organic meal kits** directly to customers. Each box includes fresh ingredients and a recipe designed to promote a **balanced and varied diet**. The meals often contain a mix of **vegetables, wholegrains, and lean proteins**, and focus on **seasonal, sustainable food choices**. Recipe developers at Abel & Cole think carefully about nutrition, taste, and how easy it is for people to cook healthy meals at home. They test different ingredients and flavours to encourage people to eat more fruit and vegetables – just like children in Year 3 explore combining food groups in their school cooking.	**Jamie Oliver**: A well-known chef who advocates for healthy eating and has many recipes that promote balanced diets. His work can inspire students to think creatively about their packed lunches. **Alice Waters**: A chef and food activist who emphasizes the importance of fresh, locally sourced ingredients. Her approach to food can teach students about the value of using fresh produce in their lunches. **Michael Twitty**: Explores food history and African-American food culture with a focus on balance and nourishment. **Rosalind Rathouse**: Runs cookery classes teaching children to cook healthy, multicultural meals.

Year 4 Design and Technology - Real World Examples

	✨ Real-Life Jobs	Case Study	Designers
Autumn Shell Structures	• **Packaging Designers** create boxes and containers to protect products. They use nets and folds to form 3D shapes that are lightweight but strong. • **Product Designers** design items like phone cases, storage tins, and protective packaging that need to hold their shape and shield what's inside. • **Architects** use shell structures in roof domes, stadiums, and other curved buildings that need to enclose space without heavy frameworks. • **Graphic Designers** work on printed packaging and boxes, thinking about both the shape and the design that appears on the surface. • **Structural Engineers** help test and improve the strength of shell-like structures so they are safe and reliable. • **Toy Designers** use folded and formed card and plastic shells to create packaging that protects and presents the toy attractively.	**Apple iPhone Packaging** **Company:** Apple **Product:** iPhone and iPad packaging Apple's iconic packaging is a well-known example of a **shell structure** – a carefully designed **box with a snug-fitting lid** that protects the device inside. The outer shell is made from strong, recyclable board, and every part is designed to support and cushion the product. The designers use **precise nets** to cut the materials and fold them into the perfect shape, with no wasted space. Apple's packaging team thinks carefully about strength, shape, and user experience – just like children do when making their own shell structures in Year 4. They test how well the box protects the item, how easily it opens, and even how it feels to unbox the product. This case study helps pupils see that designing a strong, attractive shell structure isn't just about making a box – it's about combining **function, presentation, and protection**.	**Frei Otto** Frei Otto was a pioneer in lightweight structures and is known for his work with tensile and shell structures. The Munich Olympic Stadium features a revolutionary lightweight shell structure that covers the stadium. **Shigeru Ban Architects** Shigeru Ban is known for his innovative use of materials and shell structures, particularly in disaster relief architecture. The Cardboard Cathedral in Christchurch, New Zealand, uses a unique shell structure made from cardboard tubes.
Spring 2D to 3D Designs	• **Fashion Designers** turn flat patterns into clothing by cutting 2D fabric shapes and sewing them together to fit a 3D body. • **Bag and Luggage Designers** create products like backpacks or pencil cases by shaping flat fabric into useful 3D forms. • **Soft Toy Designers** design and make plush toys by cutting out fabric templates, sewing the parts together, and stuffing them into 3D shapes. • **Costume Makers** work in theatre or film, transforming 2D designs and sketches into wearable 3D garments using fabric joining techniques. • **Upholsterers** shape fabrics around furniture, turning flat pieces into fitted covers for chairs and sofas. • **Tent and Outdoor Gear Designers** design tents, sleeping bags and other fabric-based items that are created from joined 2D panel	**Trakke – Handmade Waxed Cotton Bags** **Company:** Trakke (Scotland) **Product:** Durable, handcrafted bags and accessories Trakke is a Glasgow-based company that makes **waxed canvas rucksacks and shoulder bags** by hand. Each bag starts as a set of **2D fabric pieces**, carefully cut from patterns (templates) and then stitched together to form a strong and weather-resistant 3D product. Designers at Trakke choose materials for their strength, feel, and waterproof qualities. They test different patterns to improve shape, comfort, and how much each bag can hold. Their sewing techniques ensure neat joins, strength at stress points, and high-quality finishes – just like pupils practise when turning fabric shapes into 3D items in Year 4. This case study shows how skills in **accurate cutting, shaping, joining, and finishing** are used in real textile design to produce functional and desirable everyday items.	**Anita Dongre (India):** Uses traditional textile methods to shape modern garments with a strong social message. **Little Goodall** Little Goodall creates whimsical and imaginative clothing and accessories for children. Their designs often feature playful elements like animal ears and tails.
Summer Simple Circuits and Switches	• **Electricians** install and repair circuits in homes, schools and businesses, making sure that lights, switches and sockets work safely. • **Electronic Engineers** design circuits for everyday devices like remote controls, radios, games consoles and mobile phones. • **Product Designers** create electrical products (like lamps, toys, and kitchen gadgets) that use switches to control movement, sound or light. • **Car Designers** design dashboard systems that rely on circuits and switches to control lights, signals and other features. • **Smart Home Technicians** work with voice-controlled lighting, doorbells and other gadgets that include hidden switches and sensors. • **Toy Designers** make toys that light up, make noise or move – all by using batteries, circuits and simple switching mechanisms.	**LittleBits – Modular Electronic Building Kits** **Company:** LittleBits (now part of Sphero) **Product:** Snap-together electronic circuits for inventors and students **LittleBits** is a company that creates electronic kits where children and adults can build working circuits by snapping together **magnetic components**. Each piece has a job: some are **power sources**, others are **lights, buzzers, or motors**, and some are **switches** to turn parts on and off. You don't need to use wires or soldering – the parts just click together, like building blocks for real-world electronics. Designers at LittleBits think carefully about how each module will work and how users can learn about **circuits and switches** through play. Their goal is to help young people become confident inventors and problem-solvers – the same goal that Year 4 pupils have when they make a working product that lights up or makes a sound using a switch.	**Limor Fried** (USA): Founder of Adafruit Industries, making DIY electronics accessible and inclusive. **Ann Makosinski** (Canada): Inventor of a flashlight powered by body heat, created as a school project. **Ayah Bdeir** (Lebanon): Founder of littleBits, which makes modular electronics for creative invention.

East Midlands Academy Trust
Design & Technology – Real World Examples (3)

Year 5 Design and Technology - Real World Examples

	✨ Real-Life Jobs	Case Study	Designers
Autumn Cams	**Mechanical Engineers** use cams in machines to convert rotary motion into up-and-down or side-to-side movement. **Automotive Engineers** design engines that include **camshafts**, which control the opening and closing of engine valves. **Toy Designers** use cam mechanisms in moving toys, automata, and novelty products to make parts rise, fall, or change direction. **Clockmakers and Watch Designers** use cams in traditional mechanical clocks and timepieces to control movement and rhythm. **Theatre and Set Designers** use cams and other mechanisms to create timed movement of props, sets, or puppets on stage. **Factory Machinery Technicians** use cams in assembly lines to control repetitive motion in tools like stamping presses or packaging arms.	**Automata by Cabaret Mechanical Theatre** **Company:** Cabaret Mechanical Theatre (UK) **Product:** Artist-designed automata (mechanical moving sculptures) Cabaret Mechanical Theatre is a group of artists and makers who design and build **automata** – moving mechanical sculptures powered by turning a handle. These creations use **cams**, **levers**, and **linkages** to make characters move in funny, surprising, or lifelike ways. Each automaton starts as a sketch and is then built using wooden cams and followers to create controlled motion – such as a figure nodding, jumping, or waving. Designers have to plan the shape of the cam, how the follower will move, and how the overall mechanism will work in sync. Children working on cams in Year 5 use the **same problem-solving skills** as these artists and engineers: exploring how to create movement, changing rotary motion into something more interesting, and thinking creatively about form and function.	**Santiago Calatrava** Santiago Calatrava is a renowned architect and engineer known for his innovative designs that often incorporate mechanical systems, including cams. **Boston Dynamics Robotics Engineers** Robotics engineers at Boston Dynamics design and build robots that use cams to control movements and functions.
Spring Frame Structures	**Architects** design buildings, bridges, towers, and sports stadiums that rely on strong frames to support their structure. **Structural Engineers** test and calculate how to make frames stronger, often using **triangulation** and bracing to resist loads and forces. **Civil Engineers** plan and manage the building of frame-based structures like railway bridges, scaffolding, and exhibition spaces. **Stage and Event Designers** use temporary frame structures to create sets, stages, lighting rigs and marquees that can be assembled and taken down. **Furniture Designers** make chairs, tables and shelving from metal, wood, or plastic frames that must be strong, stable, and attractive. **Scaffolders** build safe temporary frame structures to support workers and materials on construction sites.	**The London Eye – Giant Steel Frame Structure** **Structure:** The London Eye **Location:** South Bank, London **Designers/Engineers:** Marks Barfield Architects with a team of structural engineers The **London Eye** is one of the most recognisable examples of a **large-scale frame structure** in the UK. It is made from a network of **steel frames**, cables and supports that create the wheel's shape and hold it upright. The main frame is designed to resist enormous forces from wind and weight, using **triangulated supports** to keep everything stable. Just like Year 5 pupils who explore how to strengthen frames using struts and braces, the London Eye was carefully engineered to remain safe and secure while allowing it to rotate and carry people high into the sky. This case study shows how real designers and engineers use the same principles children learn in class – testing materials, reinforcing joints, and creating stable structures that stand up to pressure and movement.	**Shigeru Ban** (Japan): Builds emergency shelters and structures using paper tubes and frame-based design. **Yasmeen Lari** (Pakistan): Architect creating disaster-relief housing using sustainable frame systems. **Emily Pilloton-Lam** (USA): Leads Girls Garage, helping girls design and build real frame structures in their communities.
Summer Food – celebrating culture and	**Chefs** plan menus that celebrate ingredients and recipes from different cultures and use seasonal produce for flavour and sustainability. **Food Historians** research traditional recipes, cooking methods, and the cultural background of food across time and place. **Restaurant Owners** often create menus that reflect a cultural identity or theme, using authentic ingredients and presentation styles. **Nutritionists** advise on healthy eating that respects people's cultural preferences, while encouraging a variety of seasonal and balanced meals. **Farmers and Growers** provide local, seasonal produce to shops and restaurants, helping reduce food miles and support sustainability. **Food Education Specialists** work in schools and charities to teach children about where food comes from and how culture influences what we eat.	**Mowgli Street Food – Indian-Inspired Seasonal Dining** **Company:** Mowgli Street Food **Founder:** Nisha Katona (chef and food writer) **Mowgli** is a UK restaurant chain that serves dishes based on **traditional Indian home cooking**, designed to be fresh, bold, and full of flavour. The menu changes with the seasons and often features **local, seasonal ingredients** combined with **spices and techniques** from Indian cuisine. Nisha Katona created Mowgli to celebrate the food she grew up with, and to **honour cultural traditions** while making them accessible to new audiences. The chefs at Mowgli design meals that reflect regional Indian cooking, using **vegetables, pulses, and herbs** that are in season — a perfect match for Year 5's work on food, seasonality, and cultural celebration. This case study helps children see how learning to cook different dishes and understanding where ingredients come from connects them to the real world of food, culture, and sustainability.	**Preeti Mistry** (India/USA): Chef who blends Indian food with Californian seasonality and champions cultural pride. **Raymond Blanc** (France/UK): Focuses on sustainable, seasonal cooking and food education. **Samin Nosrat** (Iran/USA): Author of *Salt, Fat, Acid, Heat*, known for joyful cooking that connects culture and seasonality.

Year 6 Design and Technology - Real World Examples

	✨ Real-Life Jobs	Case Study	Designers
Autumn Combining different fabric	**Fashion Designers** cut and combine different shapes of fabric to create structured garments, often using darts, panels, pleats or seams. **Product Designers** make textile-based items like pencil cases, laptop sleeves, and phone holders by joining shaped pieces of fabric. **Costume Designers** use a variety of fabric shapes and textures to design eye-catching costumes that fit and function for actors and performers. **Technical Textile Engineers** design items like sportswear, medical garments, or safety vests by combining fabric shapes with specific functions. **Bag Designers** create rucksacks, purses and satchels using strong joins, linings and panels cut to specific shapes. **Sailmakers and Tent Designers** join triangular and curved pieces of fabric to create tension, structure and protection from weather.	**Finisterre – Sustainable Performance Outerwear** **Company:** Finisterre (Cornwall, UK) **Product:** Weatherproof jackets made from shaped and joined technical fabrics **Finisterre** is a UK company that designs and makes **sustainable outdoor clothing**, especially for cold and wet weather. Their jackets are made from **panels of performance fabrics** that are cut to shape and joined using strong stitching, taped seams and linings. Each jacket starts as a series of **2D fabric shapes**, precisely cut using digital templates, and then combined to form a shaped, fitted 3D garment. Designers at Finisterre choose different fabrics for their stretch, insulation or waterproof qualities and test them rigorously. The process of combining shapes into a working product is just like what Year 6 pupils do — but with added focus on sustainability, comfort and real-world performance. This case study shows how thoughtful fabric design connects with science, engineering and climate-conscious choices — all through combining shapes with purpose.	**Rei Kawakubo** (Japan): Avant-garde designer known for combining unexpected fabric forms and 3D fashion. **Anifa Mvuemba** (DR Congo/USA): Combines technology and fashion, designing complex garments from structured panels. **Lynne MacLachlan** (Scotland): Combines digital design with fabric shaping to create architectural jewellery and textiles.
Spring FMOre Complex Switches and	**Electronics Engineers** design systems inside phones, appliances, and vehicles using circuits with sensors, motors, and programmable switches. **Product Designers** create interactive items like alarms, toys, or lighting products that use different types of switches and components. **Security System Technicians** install alarm systems that use **pressure pads, tilt switches, and motion sensors** to detect movement. **Software and Hardware Developers** design **microcontroller-based** systems (like Raspberry Pi or Arduino kits) that control lights, motors or alarms. **Game Designers and Toy Engineers** create buzzers, light-up buttons, and interactive circuits in board games and electronic toys. **Automation Engineers** design control panels and systems for machines and factories using **input-output logic** (if/then switches and feedback).	**Kitronik – Electronic Kits for Designers and Inventors** **Company:** Kitronik (UK-based) **Product:** Electronic project kits including alarms, steady-hand games, and control systems **Kitronik** designs **educational electronics kits** that allow students and designers to build real electrical products. Many of their kits include **multiple switches, motors, buzzers, and lights**, and some can be connected to **microcontrollers** like the BBC micro:bit. Products like **burglar alarms**, **light-up signs**, and **steady-hand games** all include more complex circuits where switches control multiple components. Kitronik encourages young people to think like engineers: designing a system, building a working circuit, and evaluating how well it performs. This mirrors the process Year 6 pupils go through when building a product that relies on a carefully planned and functional electrical circuit. This case study shows that D&T projects using **more than one switch or output** are not just for school – they're the starting point for real careers in tech, design and innovation.	**Simone Giertz** (Sweden): Inventor known for her fun and often useless machines using complex switches and components. **Jasmine Lawrence** (USA): Robotics engineer passionate about youth innovation and tech accessibility. **Radia Perlman** (USA): Network engineer whose systems thinking supports understanding circuits and logic.
Summer Pulleys and Gears	**Mechanical Engineers** design systems like lifts, cranes, and conveyor belts using pulleys and gears to control movement and speed. **Bicycle Designers and Mechanics** work with gears and chains to help cyclists go faster or ride uphill with less effort. **Elevator Technicians** install and maintain lift systems that use counterweights, pulleys, and motor-driven gears. **Clockmakers and Watch Designers** create mechanical timepieces using complex gear trains to measure time accurately. **Theme Park Engineers** build rides that use pulley and gear systems to control height, speed, and rotation safely. **Industrial Machine Designers** develop systems that use gears and pulleys to lift, turn, rotate or press materials on factory floors.	**Schindler – Elevator and Escalator Systems** **Company:** Schindler Group (global) **Product:** Elevators and escalators for buildings and transport hubs **Schindler** designs and installs elevators and escalators around the world. Their lifts use **pulleys and counterweights** to move cabins safely up and down. In escalators, they use **rotating gear systems** to power the steps and handrails in sync, keeping them moving at the same speed. Engineers at Schindler calculate how much weight the lift can carry, how fast it should move, and how strong the gears and pulleys need to be. They also think carefully about energy use, safety, and comfort. This is a powerful real-world example of how the **simple pulley or gear system pupils explore in Year 6** connects directly to large-scale technology that millions of people use every day — all starting with the same design principles.	**Judith Resnik** (USA): NASA engineer and astronaut who worked on robotic arms and gear-based systems. **Maya Burhanpurkar** (Canada): Young inventor whose research included mechanical solutions for navigation. **Lisa Hawkes** (UK): Works in theatre engineering, designing pulley-based systems for stage effects.