Design and Technology

The Inspire Multi Academy Trust (South West)

SUBJECT ON A PAGE

Design Technology

AT THE INSPIRE MULTI ACADEMY TRUST WE BELIEVE DESIGN AND TECHNOLOGY ENABLES CHILDREN TO TAKE RISKS, BECOMING CREATIVE, RESOURCEFUL, INNOVATIVE, ENTERPRISING & SUCCESSFUL CITIZENS WITHIN AN INCREASINGLY TECHNOLOGICAL WORLD

Pupils develop the creative, imaginative technical & practical expertise to perform everyday tasks confidently that solve real and relevant problems within a variety of contexts.

Develop in children an understanding of how environmental issues and societal factors (e.g. cost effectiveness) impact design.

Children will acquire the technical know-how and practical skills to translate these ideas into workable solutions to construct high-quality products,

Expose children to a range of inventors, designers and inventions so they can use critical thinking skills to reflect on, evaluate and revise products according to purpose and user.

To enable children to make purposeful links across the curriculum in subjects such as Maths, Science & Computing to strengthen and transfer knowledge & skills.

Our high quality design and technology education makes an essential contribution to the culture, wealth and well-being of the nation.

STRONG FOUNDATIONS

In the Early Years, DT lays a solid foundation for KS1. In nursery and reception, children should have opportunities to work with mechanisms, structures, food and textiles. Using a variety of tool is incorporated in everyday learning and helps strengthen their fine motor skills. The environment provides children with opportunities to problem solve, take risks and build resilience. Alongside this, we recognise the Early Years practitioners fundamental role of promoting the use of specific language through purposeful conversation and questioning.

PROGRESSION OF KNOWLEDGE

From the EYFS through to KS2, there is clear progression. The curriculum enables children to build on previous knowledge therefore progressing their skills set and applying this in different contexts. In the Early Years children begin to design and explore materials and tools. In Key Stage 1, children continue to create their designs but begin to have an awareness of possibilities and limitations and learn to evaluate these. In Key Stage 2, children design products which allows them to develop at a greater depth, therefore preparing them to be innovative problem solvers of the future.

VOCABULARY

Within each unit, subject specific vocabulary is explicitly taught and children then apply this into their learning. Deliberate repetition of this language ensures that key knowledge is retained. This entitlement allows children to talk confidently about the designs and products they make as well as critique others.

PERSONAL DEVELOPMENT

We aim for our children to leave Key Stage 2 with the knowledge and skills to become inventors, designers and engineers of the future. We feel it is vital to nurture creativity and innovation through design, and by exploring the designed and made world in which we live and work. We achieve this by giving them purposeful contexts and showing them how their learning impacts the world around them.

MECHANISMS

STRUCTURES

TEXTILES

COOKING & NUTRITION

ELECTRICAL SYSTEMS

The Inspire Multi Academy Trust
Design and Technology Progression

Term 1

Early Years: In Term 1, the children begin to express their ideas and share creations as well as explaining the processes. They learn different techniques for joining materials such as how to use adhesive tapes and different sorts of glue. Their designs and creations will link to what they would like to be when they grow up.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Skill: Structures Focus: Free Standing Structures Links: 3 little pigs Product: Create a home fit for purpose **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. **Making** Plan by suggesting what to do next. Select and use tools, skills and techniques, explaining their choices. Select new and reclaimed materials to build their structures. **Evaluating** Explore a range of existing freestanding structures in	Skill: Mechanisms Focus: Wheels & Axels Link: Geography Product: Moving vehicle (plane) **Designing** Generate initial ideas and simple design criteria through talking and using own experiences. Develop and communicate ideas through drawings and mock-ups. **Making** 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. **Evaluating**	**Skill: Textiles** **Focus: Sewing** **Product: Pencil Case** **Designing** Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification. Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology. **Making** Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. **Evaluating**	Skills: Programming/Structures Focus: TinkerCAD programming Link: 3D shapes - maths Product: Redesign classroom furniture **Designing** Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and the functional and aesthetic purposes of the product. Develop ideas through the analysis of existing shell structures and use computer-aided design to model and communicate ideas. **Making** Plan the order of the main stages of making. Select and use appropriate tools and software to measure, mark out and assemble with some accuracy. Use computer-generated finishing techniques suitable	Skill: Cooking and Nutrition Focus: Culture Link: Mediterranean Product: Making a Mezze **Designing** 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** 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	

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. **Technical knowledge and understanding** Know how to make freestanding structures stronger, stiffer and more stable. Know and use technical vocabulary relevant to the project. Explore what a home is and how they can differ in appearance.	Explore and evaluate a range of products with wheels and axles. Evaluate their ideas throughout and their products against original criteria. **Technical knowledge and understanding** Explore and use wheels, axles and axle holders. Distinguish between fixed and freely moving axles. Know and use technical vocabulary relevant to the project.	Investigate and analyse textile products linked to their final product. Compare the final product to the original design specification.	for the product they are creating. **Evaluating** Investigate and evaluate a range of 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. **Technical knowledge and understanding** Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. Develop and use knowledge of how to construct strong, stiff shell structures.	combine appropriate ingredients. Make, decorate and present the food product appropriately for the intended user and purpose. **Evaluating** 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 and understanding** 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.	

Term 2

Early Years: In Term 2, children will discuss fruit and vegetables and express their likes and dislikes. They will explore the need for hygiene and how to keep themselves healthy. Within this they will discuss why it is important to exercise and to eat good food. Children will also build confidence when sharing their thoughts and ideas with their peers. Children will begin to design and create using materials and then use these as props when role playing.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

Term 3

Early Years: In Term 3, children will continue to develop their understanding of a healthy lifestyle through selecting healthy snacks and practising their own hygiene. During their unit 'Past and Present', children will know some similarities between the past and now as well as drawing on their own experiences. They will know how people travelled in the past and how they travel now. When creating materials, children will be provided with a range of materials and tools and use them with care and precision.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Skill: Mechanisms Focus: Sliders and Levers Link: English – We're Going on a Lion Hunt Product: Moving storyboard **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. **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. **Evaluating** Explore a range of existing books and everyday products	Skill: Textiles Focus: Templates & Joining Link: Geography – Desert vs Dartmoor Product: Creating a puppet of a desert animal **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. **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. **Evaluating** Explore and evaluate a range of existing textile products	Skill: Structures Focus: Shell Structures Link: History – The Railways (Term 2) Product: How to make a bridge stronger **Designing** 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. **Making** 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.	Skill: Electrical Systems Focus: Simple circuits and switches Link: Electricity – Science Term 3 Product: Making a Torch **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. **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	Skill: Mechanical systems Focus: Pulleys & Gears Link: Science – Space (Term 2) Product: Mars Lunar Rover **Designing** 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** 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	Skill: Programming Focus: Framed Structures & Computer Aided Design (CAD) Link: Plymouth & The Blitz (Term 2) Product: 3D Anderson Shelter **Designing** 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** 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

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. **Technical knowledge and understanding** Explore and use sliders and levers. Understand that different mechanisms produce different types of movement. Know and use technical vocabulary relevant to the project.	relevant to the project being undertaken. Evaluate their ideas throughout and their final products against original design criteria. **Technical knowledge and understanding** 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.	Use finishing techniques suitable for the product they are creating. **Evaluating** 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. **Technical knowledge and understanding** 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.	properties and aesthetic qualities. **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. **Technical knowledge and understanding** Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers.	constraints of time, resources and cost. **Evaluating** 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 and understanding** 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.	construction materials to make frameworks. Create their prototypes on TinkerCAD. **Evaluating** 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 and understanding** Understand how to strengthen, stiffen and reinforce 3-D frameworks. **Skill: Electrical Systems** **Focus: More complex switches** **Link: Science** **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. **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. **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. **Technical knowledge and understanding** Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers.
Term 4					
Early Years: In Term 4, children will be making props by manipulating materials in different ways as well as overcoming obstacles they might face. While using a wide range of materials, they will construct using them and discuss what they would like to make and how problems can be solved as they arise. Junk modelling and recyclable materials are examples of materials which will be made available. They will use these to design products for a purpose and follow simple instructions in the process.					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Term 5					

Early Years: In Term 5, children will be provided with a range of materials and tools and use them with care and precision. They will begin to think about the perspective of others and their opinions. They will know some similarities and differences between things in the past and now linked to people and their culture.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Skill: Cooking and Nutrition **Focus: Preparing Fruit & Vegetables** **Link: SMSC (Term 4)** **English: Lighthouse Keeper's Lunch** **Product: Healthy Salad/Kebab** **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. **Making** Use simple utensils and equipment. Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product. **Evaluating** Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences.	**Skill: Cooking and Nutrition** **Focus: Preparing Fruit & Vegetables** **Link: Geography – farming/Africa** **CaterEd link** **Product: Smoothies** **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. **Making** Use simple utensils and equipment. Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product. **Evaluating** Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences. Evaluate ideas and finished products against design	**Skill: Cooking and Nutrition** **Focus: Healthy & Varied Diet** **Link: Science & SMSC – The importance of nutrition.** **Product: Primary School Packed Lunch** **Designing** 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. **Making** 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,	**Skill: Cooking & Nutrition** **Focus: Celebrating Culture** **Links: Religious Education - Easter** **Product: Hot Cross Bun** **Designing** 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** 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	**Skill: Textiles** **Focus: Combing Different Fabric Shapes** **Link: Roman Britain** **Product: Tunic** **Designing** Generate innovative ideas by carrying out research including surveys, interviews and questionnaires. Develop, model and communicate ideas through talking, drawing, templates, mock-ups. Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification. **Making** 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. **Evaluating**	

Evaluate ideas and finished products against design criteria, including intended user and purpose. **Technical knowledge and understanding** Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of The Eatwell Guide. Know and use technical and sensory vocabulary relevant to the project.	criteria, including intended user and purpose. **Technical knowledge and understanding** Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of The Eatwell Guide. Know and use technical and sensory vocabulary relevant to the project.	thinking about sensory characteristics. **Evaluating** Evaluate the ongoing work and the final product with reference to the design criteria and the views of others. **Technical knowledge and understanding** 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.	appropriately for the intended user and purpose. **Evaluating** Carry out sensory evaluations of a range of relevant products and ingredients. Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements. **Technical knowledge and understanding** 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.	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 and understanding** 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.	

Term 6

Early Years: In Term 6, children with demonstrate strength, control and co-ordination in all fine and gross movements. They will have opportunity to explore and play with a wide range of media and materials as well as tools. This will encourage them to use care and precision as well as notice features such as textures and shapes.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					Skill: Cooking and Nutrition **Focus: Celebrating Culture & Seasonality** **Link: Young Enterprise** **Product: Great British Menu** **Designing** 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** 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** 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 and understanding 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.