

Design and Technology – Y5 KAPOW

<u>Honesty</u> Learning to communicate with confidence Asking for help when necessary Giving criticism kindly	<u>Love</u> Offering to help Giving praise to self and others	<u>Forgiveness</u> Being able to accept kind criticism Learn to be patient when sharing	<u>Respect</u> Appreciating the efforts of others Looking after equipment, materials, the classroom environment and each other's work	<u>Cultural Capital Opportunities</u> Investigating products in the school environment, the locality and at home Learning about the impact of nutrition on health Learn about significant designers who have shaped the locality, the UK and the world Learning where food comes from Learning to use unfamiliar equipment and materials
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<u>A Love Of Language</u> <u>Reading:</u> -reading technical and other key vocabulary -reading instructions -reading age appropriate information about designers and products -reading peers' writing <u>Listening:</u> -listening to instructions -listening to video clips -listening to partners and team members <u>Speaking:</u> -communicating with partners and team members -asking questions -using technical and other key vocabulary -describing and explaining ideas, decisions and opinions <u>Writing:</u> -labelling drawings -writing technical and other key vocabulary -writing instructions -writing product evaluations	<u>Aspirations</u> Identify the ways a product will meet the design criteria Identify the positive effect the product will have on the intended user Self-evaluate their use of equipment and skills and set their own targets for improvement Aspire to become a designer, inventor, mechanical engineer, architect, chef Aspire to use own creativity and practical skills to improve people's ways of life	<u>Bringing Learning To Life</u> Evaluating a variety of existing products Visits to the locality to investigate products Practical use of a range of techniques and materials Making products that function and are appealing	<u>Emotional Well-Being</u> Learning to be supportive and cooperative Being proud of what they have accomplished	<u>Resilience</u> Being willing to take risks Persevering with new techniques and equipment Know that practise brings improvement	<u>Valuing Our Diversity</u> Learning about foods from around the world Finding out about and valuing people's preferences	<u>Respect and Responsibility</u> Listening to safety instructions and using equipment with care Looking after equipment, materials, the classroom / local environment and each other's work Giving praise (to self as well as others) Giving criticism kindly Accept kind criticism Asking for help when necessary Offer to help Learn to be patient when sharing
	What will they learn?		In what order?			End points
Key Concepts and Key Skills		Autumn	Spring	Summer		

<p>Structures: Bridges:</p> <p>Design</p> <ul style="list-style-type: none"> • Designing a stable structure that is able to support weight. • Creating a frame structure with a focus on triangulation. <p>Make</p> <ul style="list-style-type: none"> • Making a range of different shaped beam bridges. • Using triangles to create truss bridges that span a given distance and support a load. • Building a wooden bridge structure. • Independently measuring and marking wood accurately. • Selecting appropriate tools and equipment for particular tasks. • Using the correct techniques to saws safely. • Identifying where a structure needs reinforcement and using card corners for support. • Explaining why selecting appropriating materials is an important part of the design process. • Understanding basic wood functional properties. <p>Evaluate:</p> <ul style="list-style-type: none"> • Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary. • Suggesting points for improvements for own bridges and those designed by others. <p>Technical Knowledge</p> <ul style="list-style-type: none"> • To understand some different ways to reinforce structures. • To understand how triangles can be used to reinforce bridges. • To know that properties are words that describe the form and function of materials. • To understand why material selection is important based on properties. • To understand the material (functional and aesthetic) properties of wood <p>Gears and Pulleys:</p> <p>Design:</p> <p>Noticing wider-reaching problems or needs in the community.</p> <ul style="list-style-type: none"> • Identifying a wide range of needs and potential barriers through market research. • Writing more complex problem statements that consider multiple factors and constraints. 	<p>Mechanical systems</p> <p>Gears and pulleys :</p> <p>Making and designing gear and pulley systems and exploring their uses.</p> <p>Investigate the history, mechanics, and uses of gears and pulleys. Construct a gear and pulley system and design an eco-bike that utilises energy from an exercise bike for practical work.</p> <p>Digital World</p> <p>Monitoring Devices</p> <p>Program a Micro: bit animal monitoring device that will alert the owner when the temperature is not optimal. Develop 3D CAD skills by learning how to navigate the Tinkercad interface and essential tools.</p>	<p>Cooking and Nutrition</p> <p>Developing a recipe (6 lessons)</p> <p>Research and modify a traditional bolognese sauce recipe to improve the nutritional value. Cook improved version and create packaging that fits design criteria. Learn about where beef comes from.</p> <p>Structures:</p> <p>Bridges (4 lessons) After learning about various types of bridges and exploring how the strength of structures can be affected by the shapes used, create their own bridge and test its durability - using woodworking tools and techniques.</p>	<p>Textiles:</p> <p>Stuffed toys (4 lessons) Create a stuffed toy by applying skills learnt in previous units. Introduce blanket stitch.</p> <p>Electrical Systems</p> <p>Doodlers (4 lessons) Explore series circuits further and introduce motors. Explore how the design cycle can be approached at a different starting point, by investigating an existing product, which uses a motor, to encourage pupils to problem-solve and work out how the product has been constructed, ready to develop their own.</p>	<p>Autumn</p> <p>Gears and pulleys</p> <ul style="list-style-type: none"> • Describe how gears and pulleys work and their purpose in society. • Design and make a gear and pulley system. • Write questions for market research, provide feedback and research market competitors. • Evaluate a product against a set of design criteria, provide useful feedback and incorporate changes. • Draw and annotate an eco-gadget bike design. <p>Monitoring Devices:</p> <ul style="list-style-type: none"> • Write a program that monitors the ambient temperature and alerts someone when the temperature moves from a specified range. • Research a chosen animal’s key information to develop a list of design criteria for an animal monitoring device. • Identify errors (bugs) in the code and ways to fix (debug) them. • Build a variety of brick models to invent Micro:bit case, housing and stand ideas, evaluating the success of their favourite model. • Explain key pros and cons of
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<ul style="list-style-type: none"> ● Creating more complex design criteria that require considering detailed user needs, environmental impact, materials and cost. ● Coming up with a broader range of ideas and deeper innovation, requiring pupils to think critically about their ideas' practicality and originality. ● Beginning to use more complex annotated sketches, such as cross-sectional and exploded diagrams and pattern pieces in design. ● Using a series of prototypes to refine and improve their designs. <p>Make</p> <ul style="list-style-type: none"> ● Consistently apply safety instructions. ● Select appropriate scissors to handle delicate cutting tasks and challenging materials. ● Cutting patterns and drawings accurately. ● In supervised groups, using hot glue guns safely. ● Recognising that hot glue is useful for joining materials that need a strong bond that sets quickly. ● Choosing PVA glue over hot glue for its safety when joining materials in less intensive projects. <p>Evaluate:</p> <ul style="list-style-type: none"> ● Reflecting on the usability, aesthetics, innovation and sustainability of products and discussing how design choices impact these aspects. ● Assessing their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost. ● Considering alternative materials, tools or techniques that could enhance the product. ● Providing feedback that is helpful, specific, and encouraging. ● Incorporating feedback from peers or users improve their product further, explaining the changes they made and the impact they had. <p>Technical Knowledge</p> <p>That mechanical systems that use gears in everyday objects (eg bicycle, clock).</p> <ul style="list-style-type: none"> ● That gears and pulleys allow us to transfer movement and force from one part of a mechanical system to another. ● That gears allow us to increase the output of a mechanism. <p>Pop-up Books</p> <p>Design</p> <ul style="list-style-type: none"> ● Designing a pop-up book which uses a mixture of structures and mechanisms. ● Naming each mechanism, input and output accurately. 				<p>virtual modelling vs physical modelling.</p> <hr/> <p>Spring</p> <p>Developing a recipe</p> <ul style="list-style-type: none"> ● Describe the process of beef production. ● Research a traditional recipe and make changes to it. ● Add nutritional value to a recipe by selecting ingredients. ● Prepare and cook a version of bolognese sauce. <p>Bridges:</p> <ul style="list-style-type: none"> ● Recognise that supporting shapes can help increase the strength of a bridge, allowing it to hold more weight. ● Identify beam, arch and truss bridges and describe their differences. ● Use triangles to create simple truss bridges that support a load (weight). ● Smooth down any rough cut edges with sandpaper.
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<ul style="list-style-type: none"> • Storyboarding ideas for a book. <p>Make</p> <ul style="list-style-type: none"> • Following a design brief to make a pop up book, neatly and with focus on accuracy. • Making mechanisms and/or structures using sliders, pivots and folds to produce movement. • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result <p>Evaluate</p> <ul style="list-style-type: none"> • Evaluating the work of others and receiving feedback on own work. • Suggesting points for improvement. <p>Technical Knowledge</p> <ul style="list-style-type: none"> • To know that mechanisms control movement. • To understand that mechanisms can be used to change one kind of motion into another. • To understand how to use sliders, pivots and folds to create paper-based mechanisms. <p>Doodlers:</p> <p>Design:</p> <ul style="list-style-type: none"> • Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product. • Developing design criteria based on findings from investigating existing products. • Developing design criteria that clarifies the target user <p>Make:</p> <ul style="list-style-type: none"> • Altering a product's form and function by tinkering with its configuration. • Making a functional series circuit, incorporating a motor. • Constructing a product with consideration for the design criteria. • Breaking down the construction process into steps so that others can make the product <p>Evaluate:</p> <ul style="list-style-type: none"> • Carry out a product analysis to look at the purpose of a product along with its 				<ul style="list-style-type: none"> • Complete a bridge, with varying ranges of accuracy and finish, supported by the teacher. • Identify some areas for improvement, reinforcing their bridges as necessary. <p><u>Summer:</u></p> <p><u>Stuffed toys</u></p> <ul style="list-style-type: none"> • Design a stuffed toy, considering the main component shapes of their toy. • Create an appropriate template for their stuffed toy. • Neatly cut out the fabric and join pieces together using a blanket stitch. • Use appliqué or decorative stitching to decorate the front of their stuffed toy. • Identify what worked well and areas for improvement. <p>Doodlers:</p> <ul style="list-style-type: none"> • Identify simple circuit components (battery, bulb and switch) and explain that a series circuit is assembled in a loop to allow the electricity to flow along one path.
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- strengths and weaknesses.
- Determining which parts of a product affect its function and which parts affect its form.
 - Analysing whether changes in configuration positively or negatively affect an existing product.
 - Peer evaluating a set of instructions to build a product

Technical Knowledge:

- To know that series circuits only have one direction for the electricity to flow.
- To know when there is a break in a series circuit, all components turn off.
- To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.
- To know a motorised product is one which uses a motor to function

Cooking and Nutrition: Developing a recipe

Design:

- Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients.
- Writing an amended method for a recipe to incorporate the relevant changes to ingredients.
- Designing appealing packaging to reflect a recipe.
- Researching existing recipes to inform ingredient choices

Make

- Cutting and preparing vegetables safely.
- Using equipment safely, including knives, hot pans and hobs
- Knowing how to avoid cross-contamination.
- Following a step by step method carefully to make a recipe.

Evaluate

- Identifying the nutritional differences between different products and recipes.
- Identifying and describing healthy benefits of food groups

Technical knowledge:

- To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed.
- To know that recipes can be adapted to suit nutritional needs and dietary requirements.
- To know that I can use a nutritional calculator to see how healthy a food option is.

- Remove and replace different parts of a Doodler, as part of a team.
- Explain, in an investigation report, each of the changes they made and the effect this had on the Doodler's ability to draw scribbles (function) and appearance (form).
- Explain simply why their Doodler has a certain configuration based on the findings of their investigation (e.g. I used four pens because the Doodler would fall over with two).
- Create a functional Doodler that creates scribbles on paper with or without a switch.
- Write instructions to build a functional circuit, explaining how to identify if it is functional or not.

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| <ul style="list-style-type: none">• To understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.• To know that coloured chopping boards can prevent cross-contamination.• To know that nutritional information is found on food packaging.• To know that food packaging serves many purposes. | | | | |
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