

**Can you create....
An Anglo-Saxon well to teach other children about how they work?**

Term: Autumn 2

Aspect of Design and Technology: Mechanical Systems

Designing	Making	Evaluating	Technical knowledge and understanding
<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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 are accurately assembled and well finished. Work within the constraints of time, resources and cost. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.

Key Vocabulary

Knowledge Overview

ANCHOR WORDS	GOLDILOCKS WORDS	STEP ON WORDS	By the end of this unit, the pupils should know:
<p>Mechanism – a device used to create movement in a product.</p> <p>Guide – a piece of material used to guide the movement of another.</p>	<p>Cam – a mechanism that changes one sort of movement to another.</p> <p>Follower – the device that follow the movement of a cam: a lever or a slider.</p> <p>Spacer – a piece of material used to create extra space to allow moving parts to move freely.</p>	<p>Oscillating motion – moving to and fro around a pivot point, as in a lever.</p> <p>Reciprocating motion – backwards and forwards movement in a straight line, as in slider.</p> <p>Rotary motion – movement that goes round.</p>	<ul style="list-style-type: none"> Cams can be an off-centre or specially-shaped wheel. The distance between the cam and the pivot point of the lever will affect the amount of movement with more movement close to the pivot. There are 4 different types of cams: an egg cam; an off-centre cam; a peg cam and a snail cam. When drilling wood, it should always be secured using a G-clamp. Accurate measuring is essential when making and using cams.

“Bridging Back” (previous years/cross-curricular content)

Y3 – “A moving volcano leaflet to explain to KS1 how a volcano works”

- When you input a movement to a linkage system, the levers move to output a movement.

“Bridging Forward” (future years/cross curricular content)

KS3

- Understand how more advanced mechanical systems used in their products enable changes in movement and force.

**Can you create....
An automatic nightlight for employees in the workhouse?**

Term: Spring 2

Aspect of Design and Technology: Electrical Systems

Designing	Making	Evaluating	Technical knowledge and understanding
<ul style="list-style-type: none"> Develop a design specification for a functional product that responds automatically to changes in the environment. Generate, develop and communicate ideas through discussion, annotated sketches and pictorial representations of electrical circuits or circuit diagrams 	<ul style="list-style-type: none"> 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 their electrical product to respond to changes in the environment. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Understand and use electrical systems in their products. Understand the use of computer control systems in products. Apply their understanding of computing to program, monitor and control their products. Know and use technical vocabulary relevant to the project.

Key Vocabulary

Knowledge Overview

ANCHOR WORDS	GOLDBLOCKS WORDS	STEP ON WORDS	By the end of this unit, the pupils should know:
<p>Circuit – a path through which electricity passes.</p> <p>Conductor – a material which allows an electrical current to pass through it.</p> <p>Insulator – a material which does not easily allow an electrical current to pass through it.</p>	<p>Output devices – components that produce an outcome, e.g. – bulbs and buzzers.</p> <p>Input devices – components that are used to control an electrical circuit, e.g. – switches.</p> <p>Program – a sequence of instructions that can be used to control electrical components.</p> <p>Sensor – A device that detects and responds to</p>	<p>Micro controller – a device that can be programmed to control how an electrical product operates.</p> <p>Light-emitting diode (LED) – an output device that glows when electricity is passed through it.</p>	<ul style="list-style-type: none"> Light-dependent resistors (LDRs) can be used as a monitoring or input device which controls an LED as the output device. Different methods can be used to make secure electrical connections, e.g. – wire strippers, screw connections, crocodile clips and connecting blocks. Design ideas can be communicated through annotated sketches. Drawings should indicate the design decisions made, including the location of the electrical components and how they work as a system with an input, process and output. LEDs can produce a variety of light outputs, e.g. – steady light or flashing light. LED lights are more sustainable as they use less energy.

Y5 Design and Technology

	certain changes in the environment.		
“Bridging Back” (previous years/cross-curricular content) Y4 – “A light up Iron Man to help children in Year 4 understand electrical circuits” <ul style="list-style-type: none">• Circuits must be complete to allow energy to flow.• Switches can be made using items that can be found in the home, e.g. – tin foil, paper clips and card.		“Bridging Forward” (future years/cross curricular content) Y6 – “An alarm to protect an important Islamic artefact” <ul style="list-style-type: none">• Micro-switch, latching switch, push-to-make switch, push-to-break switch, reed switch, tilt switch are all different types of switches that are used in different ways.• Thomas Eddison was a famous inventor who invented the lightbulb.	

Y5 Design and Technology

Can you create.... An insulated bag to help us transport frozen food home?

Term: Summer 1

Aspect of Design and Technology: Textiles

Designing	Making	Evaluating	Technical knowledge and understanding
<ul style="list-style-type: none"> Generate innovative ideas through research including surveys, interviews and questionnaires. Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes including using computer-aided design. Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification. 	<ul style="list-style-type: none"> 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, including CAD, to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost. 	<ul style="list-style-type: none"> Investigate and analyse textile products linked to their final product. Compare the final product to the original design specification. Test products with 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. 	<ul style="list-style-type: none"> 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.

Key Vocabulary

Knowledge Overview

ANCHOR WORDS	GOLDBLOCKS WORDS	STEP ON WORDS	By the end of this unit, the pupils should know:
<p>CAD – Computer aided design.</p> <p>Pattern/template – a shape drawn to exact shape and size and used to assist cutting out.</p> <p>Working drawing – detailed drawing, contains all information needed to make the product.</p>	<p>Specification – this describes what a product has to do.</p> <p>Tacking – large running stitches to hold pieces of fabric together temporarily.</p> <p>Mock-up – quick 3D modelling, using easy to work materials, useful for checking proportions and scale.</p>	<p>Seam allowance – extra fabric allowed for joining, usually 15mm.</p> <p>CAM – computer-aided manufacture.</p> <p>Sustainable – not harmful to the environment or using up natural resources.</p>	<p>By the end of this unit, the pupils should know:</p> <ul style="list-style-type: none"> That there are environmental issues related to the wastage of materials and this is the reason that mock ups are used before final designs are completed. (link to Geography – “fast fashion”) Computer aided design software can be used to generate, modify, scale, save and print pattern pieces. How to join textiles together by sewing and making seams. That all products have a specification which tells the designer what function the product needs. A 3D textile product can be made using a combination of accurately made pattern pieces, fabric shapes and different fabrics.

“Bridging Back” (previous years/cross-curricular content)

“Bridging Forward” (future years/cross curricular content)

Y3 – “A beach bag for visitors to remind them of their holiday”

KS3

- Back stitches; backwards running stitch; over sew stitch; blanket stitch and running stitch are all different types of stitches.

- Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions

Y5 Design and Technology

- Different fabrics are all constructed in different ways giving them different properties - this also makes them more suited to different purposes.