



Design and Technology

Year 3



Unit	Mechanisms  Pneumatics (Moving Toy)	Textiles  Different stitch types (Purse or Wallet)	Mechanisms  Electrical systems (Alarming vehicle)
National curriculum Purpose of Study & Aims	Purpose of study Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation. Aims The national curriculum for design and technology aims to ensure that all pupils: • develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world • build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users • critique, evaluate and test their ideas and products and the work of others • understand and apply the principles of nutrition and learn how to cook.		
National Curriculum: Key Stage 2	Key stage 2: Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment]. When designing and making, pupils should be taught to:		

Design

- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.

Make

- select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities.

Evaluate

- investigate and analyse a range of existing products
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand how key events and individuals in design and technology have helped shape the world Technical knowledge
- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- apply their understanding of computing to program, monitor and control their products.

Cooking and Nutrition

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life. Pupils should be taught to:

- understand and apply the principles of a healthy and varied diet
- prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques
- understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

Title of Unit (Enquiry Question)	How can we create a moving 'creature in a box' toy for young children?	How can we design and make a useful holder, purse or wallet that meets the needs of a friend or relative?	How can we design and make an electrical alarm system that keeps a car or lorry safe?
Theme	Mechanisms\ Pneumatics	Textiles 2D shape to 3D product	Electrical systems
Knowledge	Lesson 1 - I know that materials can be joined in different ways to allow movement. Lesson 2 – I know that designs must meet the needs of the user and purpose.	Lesson 1 - I know what features make a textile product strong, durable and fit for purpose. Lesson 2 - I know how to design a product for a specific user and purpose.	Lesson 1 - I know how designers use research to help them create better products. Lesson 2 - I know how to use sketches, diagrams and prototypes to communicate my ideas clearly.

	Lesson 3 - I know that pneumatic mechanisms use air pressure to create movement. Lesson 4 - I know that finishing techniques improve the appearance of my product. Lesson 5 - I know how to compare my design to real products and examples.	Lesson 3 – I know which tools I will need and how to use them safely. Lesson 4 – I know which stitches and tools will help me make a strong, neat product. Lesson 5 – I know how to check if my product meets the design criteria.	Lesson 3 - I know how simple electrical systems work, including switches, motors or lights. Lesson 4 - I know how to assemble mechanisms or electrical systems so that they work reliably. Lesson 5 - I know how to evaluate a product based on user needs and design criteria.
Skills	Lesson 1 - I can examine products closely, identifying key features and how they work. Lesson 2 – I can use research to help develop design ideas. Lesson 3 - I can build and test simple pneumatic systems. Lesson 4 - I can assemble the pneumatic mechanism in my design. Lesson 5 - I can evaluate my product against simple design criteria and describe what improvements I might make based on testing.	Lesson 1 – I can describe how different parts (fastenings, seams, fabric type) affect how well a product works. Lesson 2 – I can make design decisions based on what the product needs to do. Lesson 3 – I can choose fabrics and fastenings that match my design criteria. Lesson 4 – I can cut, stitch and join fabric accurately using the correct tools. Lesson 5 – I can evaluate what works well and what I would improve.	Lesson 1 - I can investigate and compare existing products to find what works well and what could be improved. Lesson 2 - I can create annotated sketches and diagrams to show my ideas. Lesson 3 – I can design and test simple mechanical or electrical systems for my product. Lesson 4 – I can build and test the mechanical or electrical systems in my product. Lesson 5 - I can describe what I changed during making and why.
Vocabulary	Components pneumatic, tubing, syringe, compression, pressure, pump, inflate, deflate, system	Running stitch, blanket stitch, templates, applique, embroidery, fabric, seam, strength, flexibility	circuit, alarm, sensor, switch, series circuit, design brief, prototype, design specification, connection, control

Career Links	Industrial/Product Designer 	Materials Technologist 	Automotive Design Technician 
Focus Designer	Ole Kirk Christiansen  Toy designer	Orla Kiely  Textile and fashion designer	Bertha Benz  She played a decisive part in the development of the automobile.
Resources	Examples of products and books, photos and videos showing pneumatic systems. Washing-up liquid bottles, 5mm plastic tubing, sterile syringes, T-connectors, balloons, card, plastic sheet, PVA glue, masking tape, parcel tape, sticky pads, pipe cleaners, elastic bands, syringe clips, scissors, snips, card drills, cutting mats, hole punches, finishing media and materials.	Examples of textile products linked to the chosen product to be made. A selection of fabrics and fastenings, scissors, needles, thread, tape, fabric glue, pins, measuring tape, paints, threads, appliqué pieces, paints for printing, thin paint brushes.	Switches, push-to-break switches, reed switches and magnets, tilt switches, micro switches, batteries, battery holders, wires, buzzers, light bulbs, bulb holders, LEDs, crocodile clips, paper fasteners, paper clips, card, dowel, paper sticks, crumble microcontroller, motors, battery box, connectors, inputs and outputs, scissors, junior hacksaws, glass paper, G-clamps, bench hooks, hand drill, snips, wire strippers, PVA glue, sticky pads, masking tape, double-sided tape, card triangles, square-section wood, corrugated plastic, coloured papers, foil, fabric, pens, paint

Assessment



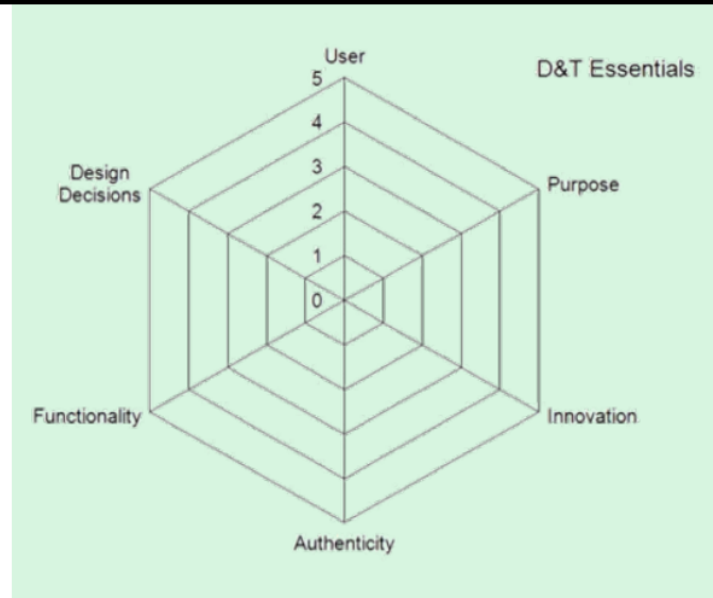
Lower Key Stage 2 - End of Unit Assessment



My Design Criteria

- User:
- Purpose:
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-
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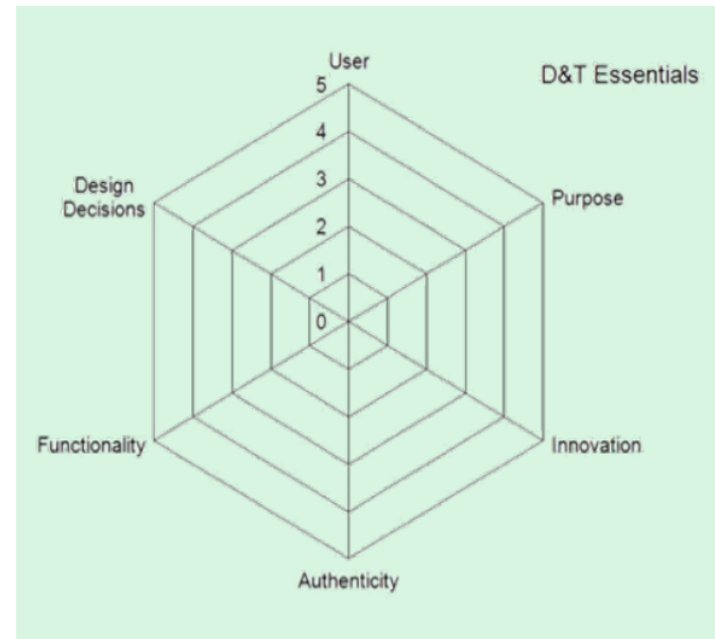
Peer Review of My Design and Final Product



Peer Review: Is the Design Criteria Met?

Yes ☐ No ☐ Partly ☐

Self Evaluation of My design and Final Product



Self Evaluation: Is the Design Criteria Met?

Yes ☐ No ☐ Partly ☐