

Gosfield Primary School Design and Technology Curriculum

Intent: Design Technology prepares children to deal with tomorrow's rapidly changing world. It encourages children to become independent, creative problem solvers and thinkers as individuals and as part of a team - making positive changes to their quality of life. It enables them to identify needs and opportunities and to respond to them by developing a range of ideas and by making products and systems. Through the study of Design and technology, they combine practical skills with an understanding of aesthetic, social and environmental issues, as well as functions and industrial practices. This allows them to reflect on and evaluate present and past design and technology, its uses and its impacts. Design and Technology helps all children to become astute and informed future consumers and potential innovators. We intend to provide children with a variety of experiences including mechanisms, food, structures and textiles.

Our skills ladder provides opportunity for all children to build on previous skills each year. Our specific knowledge objectives allow children to explore materials and areas of the technology curriculum, again building on previous experiences.

Implementation: Assessment of children's learning in Design Technology is an ongoing monitoring of children's understanding, knowledge and skills by the class teacher throughout lessons. This assessment is then used to inform differentiation, support and challenge required by the children. Class teachers conduct summative assessment across each year group to inform the subject leader of progress or skills and knowledge still to be embedded. Design Technology is also monitored by the subject leader throughout the year in the form of book monitoring, lesson observations and pupil interviews to discuss their learning and understanding and establish the impact of the teaching taking place.

Impact: Our lessons are taught in specific units based on a 3 year cycle in key stages 1 and 2, with just one cycle in Year 6. Although the topics are different each year, skills are built upon every year based on the previous year's experiences. Our technology lessons are taught practically using a variety of different tools and resources. Lessons are recorded in different ways including written work in the pupil's Technology books, photographs of practical learning and whole class floor books as talking prompts. Through our cooking units, children will be taught about healthy lifestyles and keeping safe in the kitchen; both life skills that we want to ensure our children take with them into adulthood.

Ks1 Cycle A	<p>Mechanisms – Sliders and levers Food – Preparing fruit and vegetables</p>
Ks1 Cycle B	<p>Mechanisms – Wheels and axels Structures – Freestanding structures</p>
Ks1 Cycle C	<p>Textiles – Templates and joining techniques Food – Healthy and varied diet</p>
Ks2 Cycle A	<p>Mechanical systems – Levers and linkages Food – Cooking sweet food Structures – Frame structures</p>
Ks2 Cycle B	<p>Mechanical systems – Pulleys and gears Textiles – 2D shape to 3D product Structures – Shell structures</p>
Ks2 Cycle C	<p>Mechanical systems – Pneumatics Food – Cooking savoury food Electrical systems – Simple circuits and switches</p>
Y6	<p>Electrical systems – Monitoring and control Mechanical systems – Cams Textiles – Combining different fabric shapes</p>

DT Progression of knowledge and skills Key Stage 1 CYCLE A

KS1.

- ✓ Use language of designing and making, join, build, shape (R). Explain what they want to do, starting to use correct vocabulary for the unit of work (Y1/2).
- ✓ Select appropriate resources (R). Select appropriate resources and begin to express why (Y1/2).
- ✓ Use contexts set by teacher (R). Use pictures and words to plan (Y1. Have own ideas and plan what to do next (Y2).
- ✓ Research and evaluate similar existing products with support (R/1), independently (Y2).
- ✓ Listen and responded to how to keep safe and hygienic when cooking (R). Discuss how to make an activity safe and hygienic (Y1/2).
- ✓ To know how to be safe when cooking with support (R). To start to know what dangers to look for when cooking (Y1/2).
- ✓ To talk about what they are making/designing/evaluating (R). To talk about what they are making/designing/evaluating (Y1/2).
- ✓ Record experiences by drawing (R). Record experiences by drawing and recording (Y1/2).
- ✓ Select from and use a wide range of materials and components including, materials/textiles/ingredients according to their characteristics.
- ✓ Talk about adapting their work (R). Talk about and adapt their work when needed (Y1/2).
- ✓ Talk about what went well with their product (R). Describe what went well, thinking about design criteria (Y1/2).

Knowledge objectives.

Mechanisms – Sliders and Levers

- Explore and use sliders and levers.
- Understand that different mechanisms produce different types of movement.
- Know what lever, pivot and slider mean

Food – Preparing Fruit and Vegetables

- Create a cold vegetable/fruit product e.g. a fruit salad.
- 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.
- Know basic food hygiene practices when handling food including the importance of following instructions to control risk.
- Know how to use to use simple utensils to wash grate, dice, peel, slice and squeeze, and know the different effects achieved by different processes.
- Use the bridge hold and claw grip

DT Progression of knowledge and skills Key Stage 1 CYCLE B

KS1.

- ✓ Use language of designing and making, join, build, shape (R). Explain what they want to do, starting to use correct vocabulary for the unit of work (Y1/2).
- ✓ Select appropriate resources (R). Select appropriate resources and begin to express why (Y1/2).
- ✓ Use contexts set by teacher (R). Use pictures and words to plan (Y1. Have own ideas and plan what to do next (Y2).
- ✓ Research and evaluate similar existing products with support (R/1), independently (Y2).
- ✓ Listen and responded to how to keep safe and hygienic when cooking (R). Discuss how to make an activity safe and hygienic (Y1/2).
- ✓ To know how to be safe when cooking with support (R). To start to know what dangers to look for when cooking (Y1/2).
- ✓ To talk about what they are making/designing/evaluating (R). To talk about what they are making/designing/evaluating (Y1/2).
- ✓ Record experiences by drawing (R). Record experiences by drawing and recording (Y1/2).
- ✓ Select from and use a wide range of materials and components including, materials/textiles/ingredients according to their characteristics.
- ✓ Talk about adapting their work (R). Talk about and adapt their work when needed (Y1/2).
- ✓ Talk about what went well with their product (R). Describe what went well, thinking about design criteria (Y1/2).

Knowledge objectives.

Mechanisms – Wheels and Axels

- Explore and use wheels, axles and axle holders.
- Distinguish between fixed and freely moving axles.
- Know how wheels and axles may be assembled as either fixed axles or free axles.
- Show different ways of making axle holders and stress the importance of making sure the axles run freely within the holders.

Structures – Freestanding Structures

- Create a freestanding structure for a purpose.
- Understand that different materials vary in strength.
- Know that structure, materials and shape all affect strength and stability.
- Know how to make freestanding structures stronger, stiffer and more stable.
- Know how to make strong joins.

DT Progression of knowledge and skills Key Stage 1 CYCLE C

KS1.

- ✓ Use language of designing and making, join, build, shape (R). Explain what they want to do, starting to use correct vocabulary for the unit of work (Y1/2).
- ✓ Select appropriate resources (R). Select appropriate resources and begin to express why (Y1/2).
- ✓ Use contexts set by teacher (R). Use pictures and words to plan (Y1. Have own ideas and plan what to do next (Y2).
- ✓ Research and evaluate similar existing products with support (R/1), independently (Y2).
- ✓ Listen and responded to how to keep safe and hygienic when cooking (R). Discuss how to make an activity safe and hygienic (Y1/2).
- ✓ To know how to be safe when cooking with support (R). To start to know what dangers to look for when cooking (Y1/2).
- ✓ To talk about what they are making/designing/evaluating (R). To talk about what they are making/designing/evaluating (Y1/2).
- ✓ Record experiences by drawing (R). Record experiences by drawing and recording (Y1/2).
- ✓ Select from and use a wide range of materials and components including, materials/textiles/ingredients according to their characteristics.
- ✓ Talk about adapting their work (R). Talk about and adapt their work when needed (Y1/2).
- ✓ Talk about what went well with their product (R). Describe what went well, thinking about design criteria (Y1/2).

Knowledge objectives.

Textiles – Templates and Joining Techniques

- Create a simple textile product created by joining two identical pieces of fabric together.
- Understand how simple 3-D textile products are made, using a template to create two identical shapes.
- Mark out, tape or pin the fabric to the templates or paper patterns and cut out the relevant fabric pieces for the product.
- Understand how to join fabrics using different techniques (e.g. running stitch, glue, over stitch, lacing, stapling) and the advantages and disadvantages of each.
- Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.

Food – Healthy and Varied Diet

- Create a cold lunchbox product e.g. a wrap.
- Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught.
- Know basic food hygiene practices when handling food including the importance of following instructions to control risk.
- Know how to use to use simple utensils to wash grate, peel, dice, slice and squeeze, and know the different effects achieved by different processes.

DT Progression of knowledge and skills Key Stage 2 CYCLE A

KS2.

- ✓ Use research for design ideas (Y3/4). Draw on market research to inform design (Y5).
- ✓ Show design meets a range of requirements (Y3) and is fit for purpose (Y4/5).
- ✓ Begin to create own design (Y3/4). Begin to consider needs/wants of individuals/groups when creating a design (Y5).
- ✓ Produce a plan and show it to others with support (Y3/4). Produce a logical, realistic plan and explain it to others (Y5).
- ✓ Draw and label a sketch/plan with given vocabulary (Y3/4), using appropriate vocabulary (Y5).
- ✓ Make simple design decisions (Y3/4). Make design decisions considering time and resources (Y5).
- ✓ Make a prototype (Y3/4). Refine product ideas by making a prototype (Y5).
- ✓ Begin to use computers to show designs.
- ✓ Select suitable equipment and explain choices (Y3/4) and use accurately (Y5).
- ✓ Select appropriate materials fit for purpose and explain choices (Y3/4) and consider functionality (Y5).
- ✓ To work through a plan in order with support (Y3/4) independently (Y5).
- ✓ Begin to measure, mark out and cut with support (Y3/4) with accuracy (Y5).
- ✓ Begin to assemble, join and combine materials with support (Y3/4) with accuracy (Y5).
- ✓ Begin to apply a range of finishing techniques (Y3/4) with accuracy (Y5).
- ✓ Look at design criteria while designing and making (Y3/4) evaluate quality of design while making (Y5).
- ✓ Say what I would change to make it better (Y3/4) test and evaluate final product (Y5)
- ✓ Start to evaluate product from start to finish (Y3/4) suggest improvements for design (Y5).

Knowledge objectives.

Mechanical systems – Levers and linkages

- Understand and use lever and linkage mechanisms.
- Distinguish between fixed and loose pivots.
- Distinguish between the lever, the linkage, the input, the process and the output.
- Understand the types of movement that can be created using levers and linkages

Food – Cooking sweet food

- Create a cooked sweet product e.g. a cake.
- Understand the need for a balanced diet .
- Know how to use utensils and equipment including heat sources to prepare and cook food.
- Know to measure out, cut, shape and combine (e.g. knead, beat, rub and mix) ingredients.
- Use the appropriate utensils and equipment safely and hygienically.
- Know which ingredients could be changed or added in a basic recipe and which must stay the same.
- Consider the texture, shape, size, taste and appearance of products and relate these to purpose and the consumer

Structures – Frame structures

- Create a frame structure for a purpose.
- Recognise frame structures in the world around them.
- Understand how to strengthen, stiffen and reinforce 3-D frameworks..
- Understand and use triangulation to add strength to a structure.
- Develop skills and techniques to accurately join framework materials together

DT Progression of knowledge and skills Key Stage 2 CYCLE B

KS2.

Knowledge objectives.

- ✓ Use research for design ideas (Y3/4). Draw on market research to inform design (Y5).
- ✓ Show design meets a range of requirements (Y3) and is fit for purpose (Y4/5).
- ✓ Begin to create own design (Y3/4). Begin to consider needs/wants of individuals/groups when creating a design (Y5).
- ✓ Produce a plan and show it to others with support (Y3/4). Produce a logical, realistic plan and explain it to others (Y5).
- ✓ Draw and label a sketch/plan with given vocabulary (Y3/4), using appropriate vocabulary (Y5).
- ✓ Make simple design decisions (Y3/4). Make design decisions considering time and resources (Y5).
- ✓ Make a prototype (Y3/4). Refine product ideas by making a prototype (Y5).
- ✓ Begin to use computers to show designs.
- ✓ Select suitable equipment and explain choices (Y3/4) and use accurately (Y5).
- ✓ Select appropriate materials fit for purpose and explain choices (Y3/4) and consider functionality (Y5).
- ✓ To work through a plan in order with support (Y3/4) independently (Y5).
- ✓ Begin to measure, mark out and cut with support (Y3/4) with accuracy (Y5).
- ✓ Begin to assemble, join and combine materials with support (Y3/4) with accuracy (Y5).
- ✓ Begin to apply a range of finishing techniques (Y3/4) with accuracy (Y5).
- ✓ Look at design criteria while designing and making (Y3/4) evaluate quality of design while making (Y5).
- ✓ Say what I would change to make it better (Y3/4) test and evaluate final product (Y5)
- ✓ Start to evaluate product from start to finish (Y3/4) suggest improvements for design (Y5).

Mechanical systems – Pulleys and gears

- Understand and use pulleys and gears.
- Distinguish between the input, process and output.
- Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.
- Investigate combinations of two different sized pulleys to learn about direction and speed of rotation.
- Explore combinations of two different size gears meshed together.
- Investigate the direction and speed of rotation focusing on how the size of the driver gear affects the speed of the follower gear

Textiles – 2D shape to 3D product

- Create a 3D textile product by joining differently shaped pieces of fabric.
- Create a paper pattern from an existing product.
- Choose which fabric is appropriate.
- Know how to pin a pattern on to fabric ensuring limited wastage, how to leave a seam allowance and how to cut out.
- Understand how to securely join pieces of fabric together..
- Know how to strengthen, stiffen and reinforce existing fabrics.

Structures – Shell structures

- Understand and use a strong, stiff shell structure in an attractive product.
- Know how shell structures are created.
- Create nets and use tabs.
- Know how to assemble, stiffen and strengthen shell structures.
- Understand the importance of aesthetics in shell structures

DT Progression of knowledge and skills Key Stage 2 CYCLE C

KS2

Knowledge objectives.

- ✓ Use research for design ideas (Y3/4). Draw on market research to inform design (Y5).
- ✓ Show design meets a range of requirements (Y3) and is fit for purpose (Y4/5).
- ✓ Begin to create own design (Y3/4). Begin to consider needs/wants of individuals/groups when creating a design (Y5).
- ✓ Produce a plan and show it to others with support (Y3/4). Produce a logical, realistic plan and explain it to others (Y5).
- ✓ Draw and label a sketch/plan with given vocabulary (Y3/4), using appropriate vocabulary (Y5).
- ✓ Make simple design decisions (Y3/4). Make design decisions considering time and resources (Y5).
- ✓ Make a prototype (Y3/4). Refine product ideas by making a prototype (Y5).
- ✓ Begin to use computers to show designs.
- ✓ Select suitable equipment and explain choices (Y3/4) and use accurately (Y5).
- ✓ Select appropriate materials fit for purpose and explain choices (Y3/4) and consider functionality (Y5).
- ✓ To work through a plan in order with support (Y3/4) independently (Y5).
- ✓ Begin to measure, mark out and cut with support (Y3/4) with accuracy (Y5).
- ✓ Begin to assemble, join and combine materials with support (Y3/4) with accuracy (Y5).
- ✓ Begin to apply a range of finishing techniques (Y3/4) with accuracy (Y5).
- ✓ Look at design criteria while designing and making (Y3/4) evaluate quality of design while making (Y5).
- ✓ Say what I would change to make it better (Y3/4) test and evaluate final product (Y5)
- ✓ Start to evaluate product from start to finish (Y3/4) suggest improvements for design (Y5).

Mechanical systems – Pneumatics

- Understand and use pneumatic mechanisms.
- Understand that air can be used to lift heavy objects.
- Distinguish between the input, process and output.
- Know how pneumatic systems can be used to operate levers.
- Know the differing effects of different pneumatic systems

Food – Cooking savoury food

- Create a cooked savoury food product e.g. a pizza.
- 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 to measure out, cut, shape and combine (e.g. knead, beat, rub and mix) ingredients.
- Use the appropriate utensils and equipment safely and hygienically.
- Know which ingredients could be changed or added in a basic recipe and which must stay the same.
- Consider the texture, shape, size, taste and appearance of products and relate these to purpose and the consumer.

Electrical systems – Simple circuits and switches

- Understand and use a simple electrical system in a product (such as series circuits incorporating switches, bulbs and buzzers).
- Understand how circuits are used in simple products.
- Know the difference between input and output devices.
- Demonstrate how to find a fault in a simple circuit and correct it.
- Make a variety of switches by using simple classroom materials e.g. card, corrugated plastic, aluminium foil, paper fasteners and paper clips.
- Make switches that operate in different ways e.g. when you press them, when you turn them, when you push them from side to side

DT Progression of knowledge and skills YEAR 6

Y6.	Knowledge objectives.
<ul style="list-style-type: none"> ✓ Draw on market research and individual needs and wants to inform design ✓ Identify features of design that will appeal to the intended user. ✓ Create own design criteria and specification. ✓ Come up with innovative design ideas and follow and refine a logical plan. ✓ Use annotated sketches, cross-sectional planning and exploded diagrams. ✓ Make design decisions, considering, resources and cost. ✓ Clearly explain how parts of design will work, and how they are fit for purpose. ✓ Independently model and refine design ideas by making prototypes and using pattern pieces. ✓ Use computer-aided designs ✓ Use selected tools and equipment precisely. ✓ Produce suitable lists of tools, equipment, materials needed, considering constraints. ✓ Create, follow, and adapt detailed step-by-step plans. ✓ Explain how product will appeal to audience; make changes to improve quality. ✓ Accurately measure, mark out, cut and shape materials/components. ✓ Accurately assemble, join and combine materials/components. ✓ Accurately apply a range of finishing techniques. ✓ Use techniques that involve a number of steps. ✓ evaluate quality of design while designing and making; is it fit for purpose? ✓ Test and evaluate final product; explain what would improve it and the effect different resources may have had. ✓ Do thorough evaluations of existing products considering: how well they've been made, materials, whether they work, how they've been made, fit for purpose. 	<p><u>Electrical systems – Monitoring and control</u></p> <ul style="list-style-type: none"> ○ Create a product that uses electrical or computer control. ○ Know about products (such as nightlights, garden lights, alarm systems, security lighting, electronic moneyboxes) that respond to changes in the environment using a computer control program. Know how computer control systems enable these to work. ○ Know how sensors (such as light dependent resistors (LDRs)) and a range of switches (such as push-to-make, push-to-break, toggle, micro and reed switches) work. ○ Use different input and output devices. ○ Make secure electrical connections e.g. using wire strippers, twist and tape connections, screw connections, crocodile clips and connecting blocks. ○ Write and modify computer control programs that include inputs, outputs and decision making. Test out the programs using electrical components connected to microcontrollers, interface boxes or standalone boxes <p><u>Mechanical systems – Cams</u></p> <ul style="list-style-type: none"> ○ Understand and use cams in a product. ○ Understand how cams can be used to produce different types of movement and change the direction of movement. ○ Distinguish between the input, process and output. ○ Know the differences between rotary, oscillating and reciprocating movement. ○ Know about the relationship between a cam and a follower. ○ Know how to make an off-centre cam and position it accurately in a housing <p><u>Textiles – Combining different fabric shapes</u></p> <ul style="list-style-type: none"> ○ Create a 3D textile product from a combination of accurately made pattern pieces, fabric shapes and different fabrics. ○ Use new stitches to join and improve the appearance and consistency of stitches. ○ Sew textiles by joining right side together and making seams. ○ Choose when and how to strengthen, stiffen and reinforce fabrics. ○ Know how to sew and shape curved edges by snipping seams, how to tack or attach wadding or stiffening, and how to start and finish off a row of stitches. ○ Make 2-D paper patterns using grid or tracing paper and create a 3-D mock-up of a product.