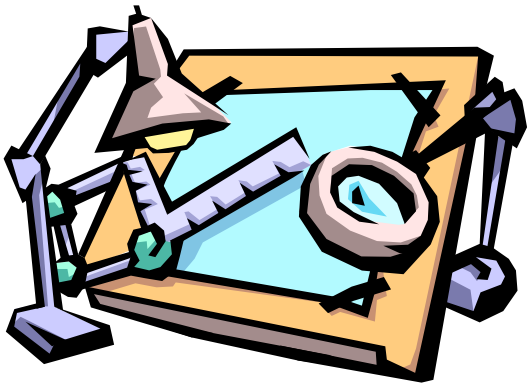
Design Technology

at

Welburn School



Curriculum

Scheme of Work

Progression

A Lewis 2023

Welburn Community Primary School DT Curriculum

Our intent for DT at Welburn Primary School is to develop children who:

- wonder and question how things work
- explore and investigate a variety of construction kits, materials, tools and products
- use a range of materials to express ideas
- work both independently and with others, listening to others' ideas and treating these with respect
- can be creative, flexible and show perseverance
- critically evaluate existing products, their own work and that of others
- develop designing skills, including generating and developing ideas, clarifying a task, creating design proposals, communicating ideas, planning and evaluating
- acquire and refine the practical skills associated with making, including working with materials and components, tools and processes, *eg planning, measuring and marking out, cutting and shaping, joining and combining, finishing, and evaluating*
- use and apply what they have learnt in maths, science, art, IT and literacy

To implement this we will:

- develop their designing and making skills
- develop knowledge and understanding
- develop their capability to create high quality products
- nurture creativity and innovation
- ensure lessons are inclusive for all children regardless of ability, gender or race
- explore values about and attitudes to the made world and how we live and work within it - ensuring we use a diverse range of examples
- develop an understanding of technological processes, products, and their manufacture, and their contribution to our society
- use the Welburn DT scheme of work to plan lessons which are based on the National Curriculum
- to teach about materials and components; mechanisms and control systems; structures; existing products; quality and health and safety

Welburn School DT Scheme of Work

EYFS

Fine motor skills

Use a range of small tools, including scissors and paint brushes.
Begin to show accuracy and care when drawing.

Creating with materials

Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form, and function.

DT Planning: Oak Class

National Curriculum: When designing and making, pupils should be taught to:

Design

- *design purposeful, functional, appealing products for themselves and other users based on design criteria*
- *generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology*

Make

- *select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]*
- *select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics*

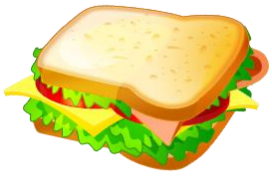
Evaluate

- *explore and evaluate a range of existing products*
- *evaluate their ideas and products against design criteria*

NOTE: All Oak Class units cover the Welburn 3D curriculum threads of problem solving, pattern and sequencing (instructions) and effect (does the product fulfil the success criteria?).

Unit 1.1 PUPPETS
Material: textiles (felt)
Suggested product: puppet
3D Curriculum:
Knowledge & understanding: working characteristics of fabric
Making skills: *Tools:* needle & thread, sharper scissors
Marking & Measuring: mark out cut lines, measure by comparison
Cutting & Shaping: Sharp scissors with support
Joining & Combining: Glue and stitching (running or overcast)
Finishing: surface decoration
Focussed Practical Tasks: investigating types of puppet, making a finger puppet, explore binca sewing with plastic needles
Previous learning: use of puppets in classroom
Health & safety: needles & sharp scissors to be supervised

Unit 1.3 SANDWICHES
National Curriculum:
 use the basic principles of a healthy and varied diet to prepare dishes
 understand where food comes from.
Material: food
Suggested product: sandwiches
Knowledge & understanding: hygiene and food safety
Making skills: *Tools:* knife, spoon, board
Marking & Measuring: measure by comparison
Cutting & Shaping: Table knives
Joining & Combining: Appropriate food such as margarine, sandwich fillings
Finishing: presentation of sandwich on a plate
Focussed Practical Tasks: investigate sandwich fillings, types of bread, process of sandwich making (instructions)
Previous learning: home experience of food
Health & safety: use of knives, wash hands, tables and equipment



Unit 1.4 CHRISTMAS DECORATION
Material: textiles (felt)
Suggested product: Christmas Decoration
Knowledge & understanding: working characteristics of fabric
Making skills: *Tools:* needle & thread, sharper scissors
Marking & Measuring: mark out cut lines, measure by comparison
Cutting & Shaping: Sharp scissors with support
Joining & Combining: Glue and stitching (running or overcast)
Finishing: surface decoration and hanging loop (with support)
Focussed Practical Tasks: investigating Christmas decorations (colour and shape), explore binca sewing with plastic needles
Previous learning: knowledge of Christmas from home
Health & safety: needles & sharp scissors to be supervised

Unit 1.5 WHEELED VEHICLES
National Curriculum: *explore and use mechanisms [for example, wheels and axles], in their products.*
Material: recyclable materials (junk!)
Suggested product: wheeled vehicle
Knowledge & understanding: structures – construction and box modelling
mechanisms – construction, wheels and axles, pushes & pulls
Making skills: *Tools:* glue, tape, hole punch, junior hacksaw with vice (for dowel), scissors,
Marking & Measuring: mark out cut lines, measure by comparison
Cutting & Shaping: scissors, hacksaw
Joining & Combining: Glue, tape, axle holders
Finishing: surface decoration (probably paint) (ICT opportunity)
Focussed Practical Tasks: investigate wheeled toys and construction kit wheels, make simple fixed wheel / free axle and fixed axle / free wheel models
Previous learning: free play with construction kits and junk modelling
Health & safety: hacksaws to be supervised, cutting into card boxes

Unit 1.6 FRUIT SALAD
National Curriculum:
 use the basic principles of a healthy and varied diet to prepare dishes
 understand where food comes from.
Material: food
Suggested product: fruit salad
Knowledge & understanding: hygiene and food safety
Making skills: *Tools:* knife, spoon, bowl, melon baller, board
Marking & Measuring: measure by comparison
Cutting & Shaping: Table knives, sharp knives with supervision
Joining & Combining: mixing
Finishing: presentation of fruit salad in bowl with topping choice
Focussed Practical Tasks: investigate fruit preferences, how to prepare fruit
Previous learning: home &school experience of fruit
Health & safety: use of knives, wash hands, tables and equipment

DT Planning: Beech Class

National Curriculum (KS2) 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.

NOTE: All Beech Class units cover the Welburn 3D curriculum threads of problem solving, pattern and sequencing (instructions) and effect (does the product fulfil the success criteria?).

Unit 2.1 BAGS

Material: textiles (woven fabric)
Suggested product: bags / purses (link to history / Victorians)
Knowledge & understanding: use of simple fastenings – drawstring, Velcro, popper, button
Making skills: *Tools:* needle & thread, sharper scissors, ruler
Marking & Measuring: measure with ruler, mark out cit lines with accuracy
Cutting & Shaping: Sharp scissors, use of paper pattern
Joining & Combining: stitching (running, backstitch and blanket)
Finishing: attention to material edges, possible embroidered initials, strap or carrying handle
Focussed Practical Tasks: investigating and practising types of stitch, investigating bags with different fastenings, paper prototypes (can be used for pattern)
Previous learning: basic running / overcast stitching
Health & safety: needles & sharp scissors

Unit 2.2 MOVING TOYS
National Curriculum: *understand and use mechanical systems in their products [for example, pulleys, levers and linkages]*
Material: sheet and block materials (stiff and flexible), mechanical components (cotton reels, construction kit KNex, pegs, tubing, syringes etc)
Suggested product: moving toy
Knowledge & understanding: levers & linkages, syringe and tube hydraulics, pulleys ie transferring power
Making skills: *Marking & Measuring:* measure with ruler, mark out with accuracy
Cutting & Shaping: scissors
Joining & Combining: card to wood & wood to card PVA, tape,
Finishing: higher quality finish
Focussed Practical Tasks: specific teaching on types of mechanisms- levers and pulleys.
Previous learning: junk modelling and construction kits, simple mechanisms – wheels, axles.
Health & safety: cutting stiff materials

Unit 2.3 SAVOURY BAKING
National Curriculum:
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.
Material: food
Suggested product: quiche/ pizza / bread (any food with a variety of types) (can be linked to science health)
Knowledge & understanding: cooked foods and varying ingredients for taste / texture / appearance / diet
Making skills: *NewTools: whisk, scales, measuring jugs, timers*
Marking & Measuring: measure weight / capacity
Cutting & Shaping: Table knives, cooking tin / cutter choice
Joining & Combining: Whisking, beating, folding, mixing
Finishing: icing / topping/ decoration to a design
Focussed Practical Tasks: Investigate similar existing products using senses. Learn specific cooking techniques and processes. Experiment with varying ingredients by quantity / flavour etc
Previous learning: designed and made non-cooked food in Class 1. Possible home experience of baking.
Health & safety: use of knives, wash hands, tables and equipment. Adult to use oven.

Unit 2.4 PICTURE FRAMES
Material: thicker card, foam board, wooden strip (square sections)
Suggested product: could link to Christmas, mothers' day, Easter etc
Relevant QCA unit: 3A packaging, 3D photo frames
Knowledge & understanding: Structures- simple frames and reinforcing for rigidity and strength.
Making skills: *NewTools:* hacksaws, card triangles
Marking & Measuring: measure with ruler / set square, mark out accurately
Cutting & Shaping: hacksaw, scissors
Joining & Combining: PVA, (tacks)
Finishing: focus on tidy joins
Focussed Practical Tasks: Investigate use of different materials to build 3D frames, compare strengths. Investigate reinforcing (card triangles, triangular support members).
Previous learning: Use of junk modelling
Health & safety: hacksaws and thin wood sections

DT PLANNING: SYCAMORE CLASS

National Curriculum (KS2) 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

NOTE: All Sycamore Class units cover the Welburn 3D curriculum threads of problem solving, pattern and sequencing (instructions) and effect (does the product fulfil the success criteria?).

Unit 3.1 MECHANISMS AND CONTROL

National Curriculum: *understand and use mechanical systems in their products [for example, gears, cams]*

 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.

Material: construction kits (lego technic) with electronic components

Suggested product: jitterbugs or fairgrounds

Knowledge & understanding: gears to change speed and direction, cams and eccentrics, control of models, input from switches and sensors

Making skills: *NewTools:* programmable switches, LEDs, reversible motors
Marking & Measuring: measure and mark out with accuracy
Cutting & Shaping: wire cutters, wire strippers
Joining & Combining: focus on secure and appropriate fixings
Finishing: components attached in a functional manner.

Focussed Practical Tasks: specific teaching on cams and eccentrics, gears and use of electronic sensors, control and switches.

Previous learning: power transference including lever and linkages, hydraulics and pulleys. Simple electric circuits in science.
Health & safety: electricity.

Unit 3.2 DESIGN A COSTUME
Material: textiles (design focus)
Suggested product: costume (Greek or Carnival)
Knowledge & understanding: using a variety of information to create a costume for a specific purpose (eg carnival), taking into account resource and time restrictions
Making skills: *NewTools:* choice of fabrics and fastenings
Marking & Measuring: measuring with tape measure and marking out accurately
Cutting & Shaping: Scissors, use of paper patterns
Joining & Combining: sewing stitches – running, backstitch & blanket stitch
Finishing: ensuring costume is practical and fit for purpose
Focussed Practical Tasks: Researching likes / dislikes, constraints, costings, testing ideas on focus group. Revise specific stitches, investigate costume design in chosen area(carnival, play etc)
Previous learning: sewing bags and use of fastenings in Class2
Health & safety: needles, is design safe for purpose.

Unit 3.3 SAVOURY DISH / MEAL
National Curriculum:
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.
Material: food
Suggested product: avoid baking but anything else you fancy!
Knowledge & understanding: cooked foods and varying ingredients for taste / texture / appearance / diet
Making skills: *NewTools: table top cookers*
Marking & Measuring: measure weight / capacity
Cutting & Shaping: Table knives, cooking tin / cutter choice
Joining & Combining: Whisking, beating, folding, mixing
Finishing: presentation on the plate
Focussed Practical Tasks: Investigate where products come from. Learn specific cooking techniques and processes. Experiment with varying ingredients by quantity / flavour etc
Previous learning: baked bread / pizza in Class 2.

Health & safety: use of knives, wash hands, tables and equipment. Use of table top cookers.

FINAL NOTE:
I recommend you plan your unit in the following format:

1. Investigative, disassembly and evaluative activities (IDEAs)
2. Focused practical tasks (FPTs)
3. Design and make activity (DMA)

This is a very successful teaching process. Please plan with this in mind!
Please also ensure your product has a purpose to fulfil – a ‘design criteria’. (This does not necessarily have to be the same for every child.)
This will help the children’s evaluations to be more objective. e.g. Does the product fulfil its design criteria or not?

Progression

Expectations

Broad issues of progression can be expressed as expectations for each key stage.

By the end of key stage 1, most children will be able to:

- use a range of materials to design and make simple products;
- select materials, tools and techniques and explain their choices;
- understand simple mechanisms and structures;
- measure, assemble, join and combine materials in a variety of ways using basic tools safely;
- investigate and evaluate simple products, commenting on the main features.

By the end of key stage 2, most children will be able to:

- use knowledge and understanding of a range of materials, components and techniques to design and make quality products;
- evaluate work as it develops and, if necessary, suggest alternatives;
- produce designs and plans which list the stages involved in making a product, and list tools and materials used;
- accurately measure, mark, cut, join and combine a variety of materials, working safely and recognising hazards to themselves and others;
- understand the use of electrical and mechanical systems and more complex structures;
- evaluate what is or is not working well in a product.

Features of progression

Progression in design and technology can be characterised by:

- an increase in knowledge, skills and understanding;
- moving from familiar to unfamiliar concepts;
- meeting needs which demand more complex or difficult solutions;
- an increase in a child's own understanding of their learning.

Progression in design and technology describes in more detail how progression can be characterised. This may be helpful to teachers in drawing up their own plans or modifying this scheme.

Progression in design and technology

At the early stages of developing capability, children should be able to:

- generate and develop ideas through talking about what their design has to do, handling materials and, where appropriate, drawing;
- increasingly take account of people's needs and wants;
- reflect more on their ideas;
- draw what they have made;
- recognise and begin to select suitable tools and materials;
- apply their previous knowledge and experience;
- suggest achievable ways forward and begin to suggest improvements to their own models.

As children make progress, they should:

- become more involved in finding out information useful to their designing and use their experience of products and applications as the stimulus for ideas;
- use 2D and 3D models to try out and develop ideas as they become more reflective about their designs;
- suggest an increasing number of achievable ways forward and develop simple plans which take into account the resources available;
- start combining and shaping materials to create products which meet their intentions;
- use tools safely and with increasing accuracy.

As children make further progress, they should:

- use a variety of information sources for their research, and set criteria for their designs, which increasingly take account of the views and preferences of the intended user;
- become more familiar with techniques, *eg brainstorming and product analysis to generate ideas,* and have a clearer sense of priorities in their design proposals;
- use a range of modelling techniques and be able to justify the decisions they make;
- plan and evaluate in a more considered manner, and show a greater awareness of constraints and the implications of their designs;
- draw upon a greater range of techniques and skills to create quality products for identified purposes;
- become increasingly competent at matching how they work to the materials and the task.