Design Technology

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Introduction

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 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

DT at Micklem

KS1

Through a variety of creative and practical activities, pupils at Micklem will be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. Pupils will work in a range of relevant contexts ie; home, school,gardens,playgrounds and the wider environment.

When designing and making, pupils will be taught:

- To design purposeful, functional, appealing products for themselves and other users based on design criteria
- To generate, develop, model and communicate their ideas through talking drawing, templates, mock-ups and , where appropriate, information and communication technology
- To select from and use a range of tools and equipment to perform practical tasks ie; cutting, shaping, joining and finishing
- To select from and use and wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics
- To explore and evaluate a range of existing products
- To evaluate their ideas and products against design criteria
- To build structures, exploring how they can be made stronger, stiffer and more stable
- To explore and use mechanisms (leavers,slides,wheels and axles) in their products

DT at Micklem

KS2

Through a variety of creative and practical activities, pupils at Micklem will be taught and continue to develop the knowledge, understanding and skills needed to engage in an iterative process of designing and making. Pupils will work in a range of relevant contexts ie; home, school,gardens,playgrounds and the wider environment.

When designing and making, pupils will be taught:

- To 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
- To generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design
- To select from and use a wider range of tools and equipment to perform practical tasks (for example: cutting, shaping, joining and finishing) accurately
- To select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic properties
- To investigate and analyse a range of existing products
- To evaluate ideas and products against their own design criteria and consider the views of others to improve their work
- To understand how key events and individuals in design and technology have helped shape the world
- To apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- To understand and use mechanical systems in their products (gears, pulleys, cams, levers and linkages)
- To understand and use electrical systems in the products (series circuits incorporating switches, bulbs, buzzers and motors)
- To apply understanding of computing to program, monitor and control their products.

Curriculum Content and Sequence

DT at Micklem-KS1 NC objectives	Autumn Term	Spring Term	Summer Term
Year 1	**Moving Pictures** 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. 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 explore and evaluate a range of existing products evaluate their ideas and products against design criteria explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products	**Eat more Fruits and Vegetables** design purposeful, functional, appealing products for themselves and other users based on design criteria enerate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. 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 their ideas and products against design criteria use the basic principles of a healthy and varied diet to prepare dishes understand where food comes from	**Homes** 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. 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 explore and evaluate a range of existing products evaluate their ideas and products against design criteria build structures, exploring how they can be made stronger, stiffer and more stable

DT at Micklem-KS1 NC objectives	Autumn Term	Spring Term	Summer Term
Year 2	**Vehicles** 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. 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 explore and evaluate a range of existing products evaluate their ideas and products against design criteria explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products	**The Great Bread Bake Off** Understand how key events and individuals in design and technology have helped shape the world Investigate and analyse a range of existing products 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 and annotated sketches Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques Select from and use a wider range of equipment to perform practical tasks accurately. Evaluate their ideas and products against their own Design Criteria.	**Puppets** 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. 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 explore and evaluate a range of existing products evaluate their ideas and products against design criteria

DT at Micklem-Lower KS2 NC objectives	Autumn Term	Spring Term	Summer Term
Year 3	**Moving Monsters** 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 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 their ideas and products against their own design criteria and consider the views of others to improve their work understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]	**Perfect Pizzas** 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 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 explore and evaluate a range of existing products evaluate their ideas and products against design criteria use the basic principles of a healthy and varied diet to prepare dishes understand where food comes from	**Mini Greenhouses** 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 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 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 apply their understanding of how to strengthen, stiffen and reinforce more complex structures

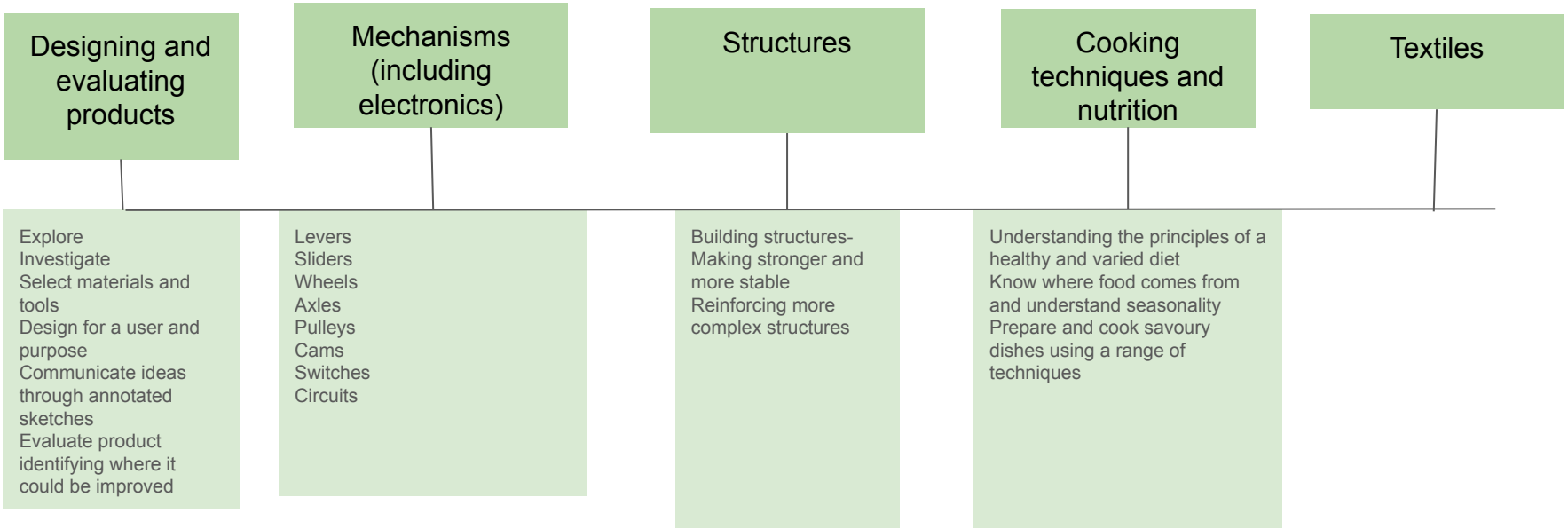
DT at Micklem-Lower KS2 NC objectives	Autumn Term	Spring Term	Summer Term
Year 4	**Pencil Cases** use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups select from and use a wider 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 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	**Edible Garden** Understand seasonality and know where and how a variety of ingredients are grown Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques Select from and use a wider range of tools and equipment to perform practical tasks accurately	**Battery Operated Lights** Understand how key events and individuals in design and technology have helped shape the world Understand and use electrical systems in their products (for example, series circuits, incorporating switches, and bulbs) 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 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 their ideas and products against design criteria and consider the views of others to improve their work

DT at Micklem-Upper KS2 NC objectives	Autumn Term	Spring Term	Summer Term
Year 5	**Programming Adventures** apply their understanding of computing to program, monitor and control their products by generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams prototypes, pattern pieces and computer-aided 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 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	**Burger Bonanza** 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 select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately evaluate their ideas and products against their own design criteria and consider the views of others to improve their work 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	**Funky Furnishings** 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 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 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

DT at Micklem-Upper KS2 NC objectives	Autumn Term	Spring Term	Summer Term
Year 6	**Fairground Mechanisms** 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 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 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	**Super Seasonal Food** 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 generate, develop, model and communicate ideas through discussion and annotated sketches	**Bird Houses** 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 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 their ideas and products against their own design criteria and consider the views of others to improve their work

Knowledge and Skills Progression

Components of Design and Technology



Curriculum knowledge and skills progression

	Designing and evaluating products	Mechanisms (including electronics)	Structures	Cooking techniques and nutrition	Textiles
Year 1	I can, with support, explore and evaluate existing products through discussions, comparisons and written evaluations **With support, I can design for a purpose, thinking about who may use the product.** I can, with support, talk about my design and what I am making With support, I can draw and label a diagram using basic design criteria. I can suggest ways to improve my own work	I can, with some support, explore and create products using mechanisms, such as levers and sliders I can, with support, begin to select from a range of hand tools and equipment **I can select from a range of materials, textiles and components according to their characteristics** I can, with some support, cut and shape materials with some accuracy I can use a range of materials and components I can, with support, assemble, join and combine materials I understand how moving components work and, with some support, can use them in my design and product	**I can, with some support, build simple structures, exploring how they can be made stronger, stiffer and more stable** I can select from a range of materials according to their characteristics I can use a range of materials I can assemble and join materials I can, with support, measure and mark out	**I can, with some support, use hand tools and kitchen equipment safely and appropriately and learn to follow hygiene procedures** I can, with support, cut, peel and grate ingredients, including measuring and weighing ingredients using measuring cups I can, with support, combine food ingredients	

Curriculum knowledge and skills progression

	Designing and evaluating products	Mechanisms (including electronics)	Structures	Cooking techniques and nutrition	Textiles
Year 2	I can explore and evaluate existing products through discussions, comparisons and written evaluations I can design for a purpose, thinking about who may use the product. **I can talk about my design and what I am making** I can draw and label a diagram using basic design criteria. I can suggest ways to improve my own work	I can explore and create products using mechanisms, such as levers, sliders and wheels **I can use a range of materials and components** I can select from a range of materials and components according to their characteristics I can cut and shape materials with some accuracy I can begin to select from a range of hand tools and equipment I can assemble, join and combine materials I understand how moving components work and can use them in my design and product		I can use hand tools and kitchen equipment safely and appropriately and learn to follow hygiene procedures **I can cut, peel and grate ingredients, including measuring and weighing ingredients using measuring cups** I can combine food ingredients	With support, I can create a template, thinking about the size and shape that will work for my product. **With support, I can demonstrate how to cut, shape and join fabric to make a simple product** With support, I can manipulate fabrics in simple ways to create the desired effect I can use running stitch (and backstitch) to join material. I can begin to use simple finishing techniques to improve the appearance of my product, such as adding simple decorations.

Curriculum knowledge and skills progression

	Designing and evaluating products	Mechanisms (including electronics)	Structures	Cooking techniques and nutrition	Textiles
Year 3	I can, with some support, use my knowledge of a broad range of existing products to help generate my ideas I can, with some support, design innovative and appealing products that have a clear purpose and are aimed at a specific user I am beginning to use annotated sketches and cross-sectional drawings to develop and communicate my ideas I can explain my choice of materials and components including function and aesthetics I can, with some support, develop and follow simple design criteria I can evaluate my product against my original design criteria	I can, with growing confidence, carefully select from a range of tools and equipment, explaining my choices I can, with some support, select from a range of materials and components according to their functional properties and aesthetic qualities I can use a range of tools and equipment safely, appropriately and accurately I can use a wider range of materials and components I can, with some support, cut, shape and score materials with some degree of accuracy I can, with some support, assemble, join and combine material and components with some degree of accuracy I can use some mechanical systems in my products	I can apply my understanding of how to strengthen, stiffen and reinforce more complex structures in order to create more useful characteristics of products I can, with growing confidence, carefully select from a range of tools and equipment, explaining my choices I can, with some support, select from a range of materials and components according to their functional properties and aesthetic qualities I can, with growing independence, measure and mark out to the nearest cm and millimetre I can use a range of tools and equipment safely, appropriately and accurately	I can, with some support, measure and weigh ingredients to the nearest gram and millilitre I can, with some support, prepare ingredients using appropriate cooking utensils I can, with some support, use a range of techniques such as mashing, whisking, crushing, grating, cutting, kneading and baking I can prepare and cook safely and hygienically I can use a range of tools and equipment safely, appropriately and accurately and follow hygiene procedures	

Curriculum knowledge and skills progression

	Designing and evaluating products	Mechanisms (including electronics)	Structures	Cooking techniques and nutrition	Textiles
Year 4	I can use my knowledge of a broad range of existing products to help generate my ideas I can design innovative and appealing products that have a clear purpose and are aimed at a specific user I can, with increasing confidence, use annotated sketches and cross-sectional drawings to develop and communicate my ideas I can explain my choice of materials and components including function and aesthetics I can develop and follow simple design criteria I can evaluate my product against my original design criteria	I can, with growing confidence, carefully select from a range of tools and equipment, explaining my choices I can select from a range of materials and components according to their functional properties and aesthetic qualities I can use a range of tools and equipment safely, appropriately and accurately I can use a wider range of materials and components I can cut, shape and score materials with some degree of accuracy I can assemble, join and combine material and components with some degree of accuracy I can make and represent simple electrical circuits, such as a series and parallel, and components to create functional products;		I can measure and weigh ingredients to the nearest gram and millilitre I can prepare ingredients using appropriate cooking utensils I can use a range of techniques such as mashing, whisking, crushing, grating, cutting, kneading and baking I can prepare and cook safely and hygienically I can use a range of tools and equipment safely, appropriately and accurately and follow hygiene procedures	I can demonstrate how to measure, cut, shape and join fabric with some accuracy to make a simple product I can with growing independence, measure and mark out to the nearest cm and millimetre I can join material with some degree of accuracy I can join textiles with an appropriate sewing technique I can, with some support, select and use different and appropriate finishing techniques to improve the appearance of a product such as hemming, tie-dye, fabric paints

Curriculum knowledge and skills progression

	Designing and evaluating products	Mechanisms (including electronics)	Structures	Cooking techniques and nutrition	Textiles
Year 5	I can use research to inform and develop detailed design criteria to inform the design of innovative, functional and appealing products that are fit for purpose and aimed at a target market I can design products that have a clear purpose and indicate the design features of their products that will appeal to the intended user I can use more detailed annotated sketches and cross-sectional drawings to develop and communicate my ideas I can generate a range of design ideas and clearly communicate final designs I can develop and follow more complex design criteria I can evaluate my ideas and products against the original design criteria, making changes as needed	I understand and can demonstrate that mechanical and electrical systems have an input, process and output I can apply my understanding of computing to program, monitor and control a product.		I can measure accurately and calculate ratios of ingredients to scale up or down from a recipe I can independently follow a recipe I can demonstrate how to use a range of cooking techniques, such as griddling, grilling, frying and boiling I can prepare and cook safely and hygienically I can use a range of tools and equipment safely, appropriately and accurately and follow hygiene procedures I can alter methods, cooking times and/or temperatures where appropriate	I can independently take exact measurements and mark out, to within 1 millimetre I can join material with precision and accuracy I can join textiles using a greater variety of stitches, such as backstitch, whip stitch, blanket stitch I can demonstrate how to measure, make a seam allowance, tape, pin, cut, shape and join fabric with precision to make a more complex product I can refine the finish using techniques to improve the appearance of my product, such as a more precise scissor cut after roughly cutting out a shape

Curriculum knowledge and skills progression

	Designing and evaluating products	Mechanisms (including electronics)	Structures	Cooking techniques and nutrition	Textiles
Year 6	I can use research to inform and develop detailed design criteria to inform the design of innovative, functional and appealing products that are fit for purpose and aimed at a target market I can design products that have a clear purpose and indicate the design features of their products that will appeal to the intended user I can use more detailed annotated sketches and cross-sectional drawings to develop and communicate my ideas I can generate a range of design ideas and clearly communicate final designs I can develop and follow more complex design criteria I can evaluate my ideas and products against the original design criteria, making changes as needed	I can select from a wide range of tools and equipment, explaining my choices I can use a range of tools and equipment confidently, safely and appropriately I can cut a range of materials with precision and accuracy I can shape and score materials with precision and accuracy I can assemble, join and combine materials and components with accuracy I understand and can demonstrate that mechanical and electrical systems have an input, process and output I can explain how mechanical systems, such as cams, create movement and use mechanical systems in my products	I can apply my understanding of how to strengthen, stiffen and reinforce more complex structures in order to create more useful characteristics of products I can select from a wide range of tools and equipment, explaining my choices I can use a range of tools and equipment confidently, safely and appropriately I can cut a range of materials with precision and accuracy I can shape and score materials with precision and accuracy I can assemble, join and combine materials and components with accuracy	I can measure accurately and calculate ratios of ingredients to scale up or down from a recipe I can independently follow a recipe I can demonstrate how to use a range of cooking techniques, such as griddling, grilling, frying and boiling I can prepare and cook safely and hygienically I can use a range of tools and equipment safely, appropriately and accurately and follow hygiene procedures I can alter methods, cooking times and/or temperatures where appropriate	