

KOP science and non core subject progression document

Subject: DT

| Year group | Progression of skills | Progression in knowledge | Key vocab and essential experiences |
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| Pre school | <p>Anticipates repeated sounds, sights and actions, e.g. when an adult demonstrates an action toy several times.</p> <p>Shows interest in toys with buttons, flaps and simple mechanisms and beginning to learn to operate them.</p> | | Push, pull, button. |
| Nursery | <p>They safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p> <p>Seeks to acquire basic skills in turning on and operating some ICT equipment.</p> <p>Operates mechanical toys, e.g. turns the knob on a wind-up toy or pulls back on a friction car.</p> | <p>Children use what they have learnt about media and materials in original ways, thinking about uses and purposes.</p> <p>They represent their own ideas, thoughts and feelings through design and technology.</p> | Turn, wind, lift, push, pull |
| Reception | <p>Talks about why things happen and how things work.</p> <p>Knows how to operate simple equipment, e.g. turns on CD player and uses remote control.</p> <p>Shows an interest in technological toys with knobs or pulleys, or real objects such as cameras or mobile phones.</p> <p>Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images.</p> <p>Knows that information can be retrieved from computers.</p> <p>Children recognise that a range of technology is used in places such as homes and schools</p> <p>They select and use technology for particular purposes</p> | <p>Children use what they have learnt about media and materials in original ways, thinking about uses and purposes.</p> <p>They represent their own ideas, thoughts and feelings through design and technology.</p> | |

By the end of EYFS

Will be able to make things work by safely using and exploring a variety of materials, tools and techniques

Will be able to use toys with knobs or pulleys to explain the process they have used

Choose the resources they need for the chosen activities

Handle equipment and tools effectively

Know the importance for good health of a healthy diet

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| <p>Year 1</p> | <p>Understanding contexts, users and purposes - work confidently within a range of contexts, such as imaginary, story-based, home or school, - state what products they are designing and making - say whether their products are for themselves or other users.</p> <p>Generating, developing, modelling and communicating ideas - Identify a shared purpose for what is being designed and made - Generate ideas by drawing on their own experiences -Develop and communicate ideas by talking and drawing</p> <p>Planning Plan by suggesting what to do next</p> <p>Practical skills and techniques -Follow procedures for safety and hygiene, eg washing hands, hair tied back, safe cutting, knife safety -Use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components (levers and sliders) -Cut and shape materials, eg snails -Join with running stitch, being aware of needle safety</p> <p>Own ideas and products -Talk about their design ideas and what they are making -Make simple judgements about their products and ideas against design criteria</p> <p>Existing products -Explore what products are for -Explore who products are for</p> | <p>Pupils should know:</p> <ul style="list-style-type: none"> • that all food comes from plants or animals • that food has to be farmed, grown elsewhere (e.g. home) or caught • how to name and sort foods into the five groups in The Eatwell plate • that everyone should eat at least five portions of fruit and vegetables every day • how to prepare simple dishes safely and hygienically, without using a heat source • how to use techniques such as cutting soft fruit, peeling and grating <p>Progression in knowledge Know:</p> <ul style="list-style-type: none"> • about the movement of simple mechanisms such as levers, sliders • that a 3-D textiles product can be assembled from two identical fabric shapes • that food ingredients should be combined according to their sensory characteristics • the correct cutting grip eg 'bridge' • the correct technical vocabulary for the projects they are undertaking | <p>planning, investigating design, evaluate, make, user, purpose, ideas, product,</p> <p>Food and Nutrition fruit and vegetable names, names of equipment and utensils sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients,</p> <p>Textiles joining and finishing techniques, tools, fabrics and components, template, pattern pieces, mark out, join, decorate, finish</p> <p>Mechanisms slider, lever, pivot, slot, bridge/guide, card, masking tape, paper fastener, join, pull, push, up, down, straight, curve, forwards, backwards</p> |
| <p>Year 2</p> | <p>Understanding contexts, users and purposes -Describe what their products are for -Say how their products will work</p> | <p>Progression in knowledge -Say how they will make their products suitable for their intended users -Use simple design criteria to help develop their ideas</p> | <p>Investigating, planning, design, make, evaluate, user, purpose, ideas, design criteria,</p> |

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| <p>Generating, developing, modelling and communicating ideas</p> <ul style="list-style-type: none"> -Model ideas by exploring materials, components and by making templates and mock-ups -Generate ideas by drawing on their own and other people's experiences -Develop their design ideas through discussion, observation, drawing and modelling -Identify a purpose for what they intend to design and make -Identify simple design criteria <p>Make simple drawings and label parts</p> <p>Planning</p> <p>Plan by suggesting what to do next</p> <p>Practical skills and techniques</p> <ul style="list-style-type: none"> -measure , mark out, cut and shape materials and components -Assemble, join and combine materials and components using flange and L brace joints -Use finishing techniques including those from art and design -Use correct procedures for safety and hygiene <p>Own ideas and products</p> <p>Evaluate and suggest how their products could be improved</p> <p>Existing products</p> <ul style="list-style-type: none"> -How products work -How products are used -Where products might be used -What materials products are made from -What they like and dislike about products | <ul style="list-style-type: none"> -Select from a range of tools and equipment, explaining their choices -Select from a range of materials and components according into their characteristics <p>Know:</p> <ul style="list-style-type: none"> • the correct correct cutting grip and techniques, eg 'bridge' or 'claw' • the difference between hard and soft fruit and vegetables • about the movement of simple mechanisms such as wheels and axles • how freestanding structures can be made stronger, stiffer and more stable | <p>product, function</p> <p>Structures</p> <p>cut, fold, join, fix structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved, metal, wood, plastic</p> <p>Food and Nutrition</p> <p>fruit and vegetable names, names of equipment and utensils</p> <p>sensory vocabulary</p> <p>e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard</p> <p>flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients</p> <p>Mechanisms</p> <p>vehicle, wheel, axle, axle holder, chassis, body, cab</p> <p>assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism names of tools, equipment and materials used</p> |
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By the end of Key Stage 1

Will be able to communicate their ideas through talking, drawing,

Will have prepared a range of healthy snack, selecting from and using a range of tools and equipment

Will have sorted food using the Eatwell plate

Will have explored and evaluated a product against design criteria

Will have evaluated a product by considering whether the product does what it was designed to do, whether it has an attractive appearance, what changes were made during the making process and why the changes were made.

Will have explored/made models using mechanisms (sliders, levers, wheels and axles).

Will have used technical knowledge to build a structure exploring how they can be made stronger, stiffer and more stable, strengthened by glueing several layers of card together, using triangular shapes rather than squares,

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| <p>Year 3</p> | <p>Understanding contexts, users and purposes Pupils should:</p> <ul style="list-style-type: none"> • work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment • describe the purpose of their products • indicate the design features of their products that will appeal to intended users • explain how particular parts of their products work • gather information about the needs and wants of particular individuals and groups <p>Generating developing modelling and communicating ideas Pupils should:</p> <ul style="list-style-type: none"> • share and clarify ideas through discussion • model their ideas using prototypes and pattern pieces • use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas <p>Pupils should:</p> <ul style="list-style-type: none"> • make design decisions that take account of the availability of resources <p>Planning Pupils should:</p> <ul style="list-style-type: none"> • select tools and equipment suitable for the task • explain their choice of tools and equipment in relation to the skills and techniques they will be using • select materials and components suitable for the task (strong fabric for trousers) • explain their choice of materials and components according to functional properties and aesthetic qualities • order the main stages of making | <p>Making products work Pupils should know:</p> <ul style="list-style-type: none"> • that materials have both functional properties and aesthetic qualities • that mechanical and electrical systems have an input, process and output • the correct technical vocabulary for the projects they are undertaking • that food is grown such as wheat <p>Food preparation, cooking and nutrition Pupils should know:</p> <ul style="list-style-type: none"> • how to prepare and cook bread safely and hygienically including, where appropriate, the use of a heat source • how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, kneading and baking <p>Pupils should:know:</p> <ul style="list-style-type: none"> -that a single fabric shape can be used to make a 3D textiles product, eg turning the product inside out. <p>Pneumatics, Pupils should know:</p> <ul style="list-style-type: none"> -how mechanical systems such as pneumatic systems create movement -Pneumatic systems use energy that is stored in compressed air to do work, such as inflating a balloon to open a model monster's mouth. These effects can be achieved using syringes and plastic tubing. -Hydraulic mechanisms work in a similar way, but instead of air, the system is filled with a liquid, usually water. -It is important that the system is air or watertight. | <p>user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, function, planning, design criteria, annotated sketch, appealing</p> <p>Food and Nutrition name of products, names of equipment, utensils, techniques and ingredients texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury, hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet</p> <p>Mechanisms - Pneumatics Mechanism, lever, linkage, pivot, slot, bridge, guide system, input, process, output Linear, rotary, oscillating, reciprocating</p> <p>Textiles Fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance</p> |
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| | <p>Practical skills and techniques Pupils should:</p> <ul style="list-style-type: none"> • follow procedures for safety and hygiene • follow procedures for sewing safety • follow procedures for using a heat source for cooking • use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components <p>Pupils should:</p> <ul style="list-style-type: none"> • measure, mark out, cut and shape materials and components with some accuracy • assemble, join and combine materials and components with some accuracy, using a seam allowance <p>Own ideas and products Pupils should:</p> <ul style="list-style-type: none"> • identify the strengths and areas for development in their ideas and products • consider the views of others, including intended users, to improve their work • refer to their design criteria as they design and make • use their design criteria to evaluate their completed products <p>Existing products Pupils should investigate and analyse:</p> <ul style="list-style-type: none"> • how well products have been designed • how well products have been made • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants | | |
| Year 4 | Understanding contexts, | Pupils should know: | evaluating, design |

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| | <p>users and purposes</p> <ul style="list-style-type: none"> • develop their own design criteria and use these to inform their ideas <p>Generating developing modelling and communicating ideas</p> <ul style="list-style-type: none"> • generate realistic ideas, focusing on the needs of the user • use computer-aided design to develop and communicate their idea <p>Planning</p> <ul style="list-style-type: none"> • order the main stages of making <p>Practical skills and techniques</p> <ul style="list-style-type: none"> • apply a range of finishing techniques, including those from art and design, with some accuracy <p>Own ideas and products</p> <p>Pupils should:</p> <ul style="list-style-type: none"> • refer to their design criteria as they design and make • use their design criteria to evaluate their completed products <p>Existing products</p> <p>Pupils should investigate and analyse:</p> <ul style="list-style-type: none"> • who designed and made the products • where products were designed and made • when products were designed and made • whether products can be recycled or reused | <ul style="list-style-type: none"> • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • how simple electrical circuits and components can be used to create functional products • how to program a computer to control their products • how to make strong, stiff shell structures • that food ingredients can be fresh, pre-cooked and processed <p>Pupils should know:</p> <ul style="list-style-type: none"> • that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The eatwell plate • that to be active and healthy, food and drink are needed to provide energy for the body <p>Earthquake houses</p> <ul style="list-style-type: none"> • how to make strong, stiff shell structures <p>Victorian Broth</p> <p>In early KS2 pupils should know:</p> <ul style="list-style-type: none"> • that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The eatwell plate • that to be active and healthy, food and drink are needed to provide energy for the body • that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world • how to use a range of techniques such as peeling, chopping, slicing, grating, mixing and cooking <p>Robots</p> <ul style="list-style-type: none"> • how simple electrical circuits and components can be used to create functional products • how to program a computer to control their products | <p>brief design criteria, innovative, prototype, user, purpose, function, prototype, design criteria, innovative, appealing, design brief, planning, annotated sketch, sensory evaluations</p> <p>Food and Nutrition</p> <p>name of products, names of equipment, utensils, techniques and ingredients texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury, hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet</p> <p>Structures</p> <p>Shell structure, three-dimensional (3D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity, marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating, font, lettering, text, graphics, decision</p> <p>Electrical</p> <p>Series circuit, fault, connection, toggle, switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor,</p> |
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| | | | crocodile clip, control, program, system, input device, output device. |
| <p>By the end of lower KS2</p> <p>Will be able to make products by gathering information about the needs and wants of particular individuals and groups, taking into account the availability of resources</p> <p>Will be able to develop their own design criteria and use these to design a robot, ordering the main stages of making</p> <p>Will have made a robot, identifying the strengths and areas for development in their ideas and products, referring to their design criteria and using this to evaluate their finished product.</p> <p>Will be able to prepare food, make Viking bread and make trousers by developing their own design criteria and using these to inform their ideas. Will have made trousers by assembling with some accuracy and applying a range of finishing techniques.</p> <p>Will have made a structure to withstand an earthquake analysing why materials have been chosen and what methods of construction have been used and considering who designed and made these products, when they were designed and made and whether products can be recycled or reused.</p> <p>Will have made Victorian broth by following procedures for safety and hygiene and using a wide range of food ingredients,</p> <p>Will have used pneumatics to understand and use lever and linkage mechanisms. Distinguish between fixed and loose pivots.</p> | | | |
| Year 5 | <p>Understanding contexts, users and purposes</p> <ul style="list-style-type: none"> • identify the needs, wants, preferences and values of particular individuals and groups • develop a simple design specification to guide their thinking <p>Planning</p> <p>In late KS2 pupils should also:</p> <ul style="list-style-type: none"> • produce appropriate lists of tools, equipment and materials that they need <p>Practical skills and techniques</p> <p>In late KS2 pupils should:</p> <ul style="list-style-type: none"> • accurately measure, mark out, cut and shape materials and components • accurately apply a range of finishing techniques, including those from art and design <p>Own ideas and products</p> <p>In late KS2 pupils should:</p> <ul style="list-style-type: none"> • critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make • use computer-aided design to develop and communicate | <p>Across KS2 pupils should know:</p> <ul style="list-style-type: none"> • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products <p>Pupils should know:</p> <ul style="list-style-type: none"> -how mechanical systems such as levers and linkages create movement <p>In late KS2 pupils should know:</p> <ul style="list-style-type: none"> • that seasons may affect the food available • how food is processed into ingredients that can be eaten or used in cooking <p>Food preparation, cooking and nutrition</p> <p>Tudor Biscuits</p> <p>pupils should know:</p> <ul style="list-style-type: none"> • that seasons may affect the food available • how food is processed into ingredients that can be eaten or used in cooking • how to use a range of techniques such as mixing, kneading and baking <p>Food preparation, cooking and nutrition</p> <p>In late KS2 pupils should know:</p> <ul style="list-style-type: none"> • that recipes can be adapted to change the appearance, taste, texture and aroma • that different food and drink contain different substances – nutrients, water | <p>Design decisions, functionality, authentic, user, purpose, design specification, design brief, innovate, research, evaluate, design criteria, annotate, evaluate, mock-up, prototype</p> <p>Food and Nutrition.</p> <p>ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble</p> <p>Mechanisms</p> <p>Pulley, drive belt,</p> |

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| | <p>their idea</p> <p>Existing products In late KS2 pupils should also investigate and analyse:</p> <ul style="list-style-type: none"> • how much products cost to make • how innovative products are | <p>and fibre – that are needed for health</p> <p>A balanced diet gives your body all the nutrients it needs to function correctly. This means eating a wide variety of foods in the correct proportions.</p> <p>Seasonality is the time of year when the harvest or flavour of a type of food is at its best. Buying seasonal food is beneficial for many reasons: the food tastes better; it is fresher because it hasn't been transported thousands of miles; the nutritional value is higher; the carbon footprint is lower, due to reduced transport; it supports local growers and is usually cheaper.</p> <p>Pupils should know</p> <ul style="list-style-type: none"> -the significance of a designer or inventor can be measured in various ways. • know how Jamie Oliver's work may benefit society in health, | <p>gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor, circuit, switch, circuit diagram, annotated drawings, exploded diagrams, mechanical system, electrical system, input, process, output</p> <p>Textiles Seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces, name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings</p> |
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| <p>Year 6</p> | <p>Understanding contexts, users and purposes</p> <p>Pupils should:</p> <ul style="list-style-type: none"> • carry out research, using surveys, interviews, questionnaires and web-based resources <p>Generating developing modelling and communicating ideas</p> <p>Pupils should:</p> <ul style="list-style-type: none"> • generate innovative ideas, drawing on research • make design decisions, taking account of constraints such as time, resources and cost <p>Planning</p> <ul style="list-style-type: none"> • formulate step-by-step plans as a guide to making <p>Practical skills and techniques</p> <ul style="list-style-type: none"> • accurately assemble, join and combine materials and components • use techniques that involve a number of steps • demonstrate resourcefulness when tackling practical problems <p>Own ideas and products</p> <ul style="list-style-type: none"> • evaluate their ideas and products against their original design specification <p>Existing products</p> <ul style="list-style-type: none"> • how sustainable the materials in products are • what impact products have beyond their intended purpose | <p>Pupils should know:</p> <ul style="list-style-type: none"> • how to use learning from science to help design and make products that work <p>Anderson shelter</p> <p>Equipment and devices can be controlled by pressing buttons on a control panel, such as on a washing machine or microwave.</p> <p>Electrical circuits can be controlled by a simple on/off switch, or by a variable resistor that can adjust the size of the current in the circuit. Real-life examples are a dimmer switch for lights or volume control on a stereo</p> <p>Pupils should know:</p> <ul style="list-style-type: none"> • about designer who has developed ground-breaking products • Know about engineer William Patterson who developed ground breaking product - Andersen Shelter <p>Caribbean curry</p> <p>In late KS2 pupils should know:</p> <ul style="list-style-type: none"> • that recipes can be adapted to change the appearance, taste, texture and aroma • that different food and drink contain different substances – nutrients, water and fibre – that are needed for health <p>Sweet dishes are usually desserts, such as cakes, fruit pies and trifles. Savoury dishes usually have a salty or spicy flavour rather than a sweet one</p> <p>-A balanced diet gives your body all the nutrients it needs to function correctly. This means eating a wide variety of foods in the correct proportions</p> <p>-that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world</p> <ul style="list-style-type: none"> • how to use a range of techniques such as peeling, chopping, slicing, grating, mixing and cooking -that food ingredients can be fresh, pre-cooked and processed -Where food comes from | <p>Function, innovative, design specification, design brief, user, purpose, prototype, annotated sketch, purpose, user, innovation, research, functional, mock-up, prototype</p> <p>Food and Nutrition</p> <p>ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble</p> <p>Structures</p> <p>frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent</p> <p>Electrical</p> <p>Reed switch, toggle switch, push-to-make switch, push-to-break switch, light dependent resistor (LDR), bulb, bulb holder, battery, battery holder, USB cable, wire, insulator, conductor, crocodile clip, control, program, system, input device, output device, series circuit, parallel circuit</p> |
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By the end of upper KS2

Will be able to make Tudor biscuits by assembling and cooking ingredients, measuring accurately and creating ingredients

Will be able to sew an Egyptian tunic by measuring, marking out, cutting and shaping materials and components with some accuracy, referring to their design criteria and using this to evaluate their finished product.

Will be able to use various methods to support an Anderson shelter including cross braces, diagonal struts..

Will be able to add strength by using multiple layers. For example, corrugated cardboard can be placed with corrugations running alternately vertically and horizontally.

Will be able to recognise how people's lives have been improved in countless ways due to new inventions and designs. For example, the Anderson shelter was designed in 1938 by William Paterson and Oscar Carl Kerrison and was an outdoor air-raid shelter used in over half a million homes during the Second World War. It saved the lives of many people caught in bombing raids.

Will be able to design a flood proof house using criteria that should cover the intended use of the product targeted and final appearance. Ideas should be communicated in a range of ways, including through discussion, annotated sketches, cross sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. Will know how much products cost to make, how innovative products are, how sustainable the materials in products are and what impact products have beyond their intended purpose.

Will be able to produce healthy recipes for independence knowing that eating a balanced diet is a positive lifestyle choice that should be sustained over time. Food that is high in fat, salt or sugar can still be eaten occasionally as part of a balanced diet

Will be able to consider using organic produce that is food that has been grown without the use of man-made fertilisers, pesticides, growth regulators or animal feed additives. Organic farmers use crop rotation, animal and plant manures, hand weeding and biological pest control.

Will know the significance of a designer or inventor can be measured in various ways. Will know how Jamie Oliver's work may benefit society in health,