# DT - Progression of Knowledge and Skills

## Early Years Foundation Stage (Early Learning Goals)

Creating and Materials ELG

Children at the expected level of development will:

- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function
- Share their creations, explaining the process they have used
- Make use of props and materials when role playing characters in narratives and stories.

Physical development ELG

Children at the expected level of development will:

- Hold a pencil effectively in preparation for fluent writing – using the tripod grip in almost all cases
- Use a range of small tools, including scissors, paint brushes and cutlery
- Begin to show accuracy and care when drawing.

## Key Stage 1

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

Technical knowledge

- build structures, exploring how they can be made stronger, stiffer and more stable
- explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

Cooking and Nutrition

- use the basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from.

**Key Stage 2**

Pupils should be taught to:

Design

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

Make

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

Evaluate

- investigate and analyse a range of existing products
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand how key events and individuals in design and technology have helped shape the world

Technical knowledge

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- apply their understanding of computing to program, monitor and control their products.

Cooking and Nutrition

- 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.

| Strand | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|---|---|---|---|---|
| **Design** | Talk about the product they want to make | **D1**<br>state what products they are designing and making<br><br>say whether their products are for themselves or other users<br><br>use simple design criteria to help develop their ideas<br><br>say how they will make their products suitable for their intended users | | **D1**<br>explain how particular parts of their products work<br><br>gather information about the needs and wants of particular individuals and groups | | **D1**<br>explain how particular parts of their products work<br><br>indicate the design features of their products that will appeal to intended users<br><br>carry out research, using surveys, interviews, questionnaires and web-based resources<br><br>develop a simple design specification to guide their thinking | |
| | | describe in *simple terms* what their products are for<br><br>*say* how their products will work | describe what their products are for *and record their ideas*<br><br>*describe* how their products will work | describe the purpose of their products *in simple terms*<br><br>indicate *some* design features of their products that will appeal to intended users<br><br>develop their own design criteria *as a class* and use these to inform their ideas | describe the purpose of their products<br><br>indicate *all* design features of their products that will appeal to intended users<br><br>develop their own design criteria and use these to inform their ideas | describe the purpose of their products *giving several reasons*<br><br>identify the needs, wants, ~~preferences and values~~ of particular individuals and groups | describe the purpose of their products *and justifying their reasons*<br><br>identify the ~~needs, wants,~~ preferences and values of particular individuals and groups |
| | | **D2**<br>generate ideas by drawing on their own experiences<br><br>use knowledge of existing products to help come up with ideas<br><br>model ideas by exploring materials, components and construction kits and by making templates and mock ups<br><br>use information and communication technology, where appropriate, to develop and communicate their ideas | | **D2**<br>share and clarify ideas through discussion<br><br>model their ideas using prototypes and pattern pieces<br><br>use annotated sketches, cross-sectional drawings ~~and exploded diagrams~~ to develop and communicate their ideas<br><br>use computer-aided design to develop and communicate their ideas *as a group*<br><br>generate realistic ideas, focusing on the needs of the user<br><br>model their ideas using recycled materials to make prototypes and pattern pieces using a single fabric shape. | | **D2**<br>share and clarify ideas through discussion<br><br>model their ideas using a construction kit to make a working prototype and pattern pieces where several pieces are combined to make the final project.<br><br>use ~~annotated sketches~~, cross-sectional drawings and exploded diagrams to develop and communicate their ideas<br><br>use computer-aided design to develop and communicate their ideas *individually or in pairs* | |
| | | develop and communicate ideas by talking and drawing *led by an adult* | develop and communicate ideas by talking and drawing | make design decisions that take account of the availability of resources *using the simple design criteria from KS1* | make design decisions that take account of the availability of resources *modelled by the teacher and generated as a class* | make design decisions, taking account of constraints such as ~~time~~, resources ~~and cost~~ *and putting them in order according to priority*<br><br>generate innovative ideas, drawing on research *as a group* | make design decisions, taking account of constraints such as time, resources and cost<br><br>generate innovative ideas, drawing on research |

| Strand | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| **Make** | Safely explore and use a variety of materials, tools and techniques to create a product. | **M1**<br>plan by suggesting what to do next<br><br>select from a range of materials and components according to their characteristics<br><br>select from a range of tools and equipment *at first being guided by the teacher and becoming more independent by year 2* | | **M1**<br>select tools and equipment suitable for the task *children should explain how their tools are suitable for the task*<br><br>explain their choice of tools ~~and equipment~~ in relation to the skills and techniques they will be using<br><br>select materials and components suitable for the task *from a selection provided by the adult*<br><br>explain their choice of ~~materials and components according to~~ functional properties ~~and aesthetic qualities~~<br><br>order the main stages of making | | **M1**<br>select tools and equipment suitable for the task *requested by the pupils during the design phase*<br><br>explain their choice of tools and equipment in relation to the skills and techniques they will be using<br><br>select materials and components suitable for the task *requested by the pupils during the design phase*<br><br>explain their choice of materials and components according to functional properties and aesthetic qualities | |
| | | | | | | formulate step-by-step plans as a guide to making *as a class* | formulate step-by-step plans as a guide to making |
| | | **M2**<br>follow procedures for safety and hygiene<br><br>use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components<br><br>use finishing techniques, including those from art and design | | **M2**<br>follow procedures for safety and hygiene<br><br>use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components | | **M2**<br>follow procedures for safety and hygiene<br><br>use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components<br><br>accurately apply a range of finishing techniques, including those from art and design | |
| | | measure, mark out, cut and shape materials and components *with support from an adult*<br><br>assemble, join and combine materials and components *with support from an adult* | measure, mark out, cut and shape materials and components<br><br>assemble, join and combine materials and components | measure, mark out, cut and shape materials and components with some accuracy *with support from an adult*<br><br>assemble, join and combine materials and components with some accuracy *with support from an adult*<br><br>apply a range of finishing techniques, including those from art and design, with some accuracy *using suggestions from an adult* | measure, mark out, cut and shape materials and components with some accuracy<br><br>assemble, join and combine materials and components with some accuracy<br><br>apply a range of finishing techniques, including those from art and design, with some accuracy | accurately measure, mark out, cut and shape materials and components *with limited support from an adult*<br><br>accurately assemble, join and combine materials and components *with limited support from an adult*<br><br>demonstrate resourcefulness when tackling practical problems *with limited support from an adult*<br><br>use techniques that involve a number of steps *with limited support from an adult* | accurately measure, mark out, cut and shape materials and components<br><br>demonstrate resourcefulness when tackling practical problems *by thinking critically and adapting their design j j*<br><br>use techniques that involve a number of steps *by formulating a step-by-step plan* |

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| **Evaluate** | Explain the process they have used to create their product. Give one idea of how it could be made better next time. | **E1**<br>Explore a range of products …<br>• what products are<br>• who products are for<br>• what products are for<br>• how products work<br>• how products are used<br>• where products might be used<br>• what materials products are made from<br>• what they like and dislike about products | | **E1**<br>Investigate and analyse…<br>• how well products have been designed<br>• how well products have been made<br>• how well products work<br>• who designed and made the products<br>• where products were designed and made<br>• when products were designed and made<br>• whether products can be recycled or reused | | **E1**<br>Investigate and analyse…<br>• how well products have been designed<br>• how well products have been made<br>• why materials have been chosen<br>• how well products work | |
| | | Record their thoughts about the products *as a class* | Record their thoughts about the products *as a small group* | why materials have been chosen<br>how well products meet user needs and wants | what methods of construction have been used<br>how well products achieve their purposes | what methods of construction have been used<br>how well products achieve their purposes<br>how well products meet user needs and wants | how much products cost to make<br>how innovative products are<br>how sustainable the materials in products are<br>what impact products have beyond their intended purpose |
| Example of intended users: | Themselves, their peers or a story character | Themselves, teddy bear, class doll, parents/carers, shoppers, character | | Teenagers considering appearance and finishing techniques<br>Grandparents – considering taste, texture, aroma and ingredients<br>Younger children – considering size, cost, size, shape, weight and strength | | People with special dietary needs, businesses, members of staff in school and consumers from a variety of cultures.<br>At this stage children should be able to say:<br>How the user will interact with the product e.g. using fasteners, compartments, switches or mechanical components<br>How the product is suited to the interests of the intended user e.g. takes into account of their hobbies and pasttimes | |
| | | **E2**<br>talk about their design ideas and what they have made<br><br>record how their products could be improved | | **E2**<br>identify the strengths and areas for development ~~in their ideas and~~ products<br><br>consider the views of others, including intended users, to improve their work *by using a questionnaire to carry out research*<br><br>refer to their design criteria as they design and make<br><br>use their design criteria to evaluate their completed products | | **E2**<br>identify the strengths and areas for development in their ideas and products<br><br>consider the views of others, including intended users, to improve their work *by interviewing potential users to edit their final product*<br><br>critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make<br><br>evaluate their ideas and products against their original design specification | |
| | | make simple judgements about their products and ideas against design criteria *with the support of an adult* | make simple judgements about their products and ideas against design criteria | | | | |
| | | | | **E3**<br>Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products | | **E3**<br>Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products | |
| | | | | Significant inventors, designers, engineers, chefs and manufacturers:<br>Fiona Fairhurst (swimwear designer); Stephen Sauvestre (Eiffel Tower); Thomas Farnolls Pritchard (Ironbridge); Thomas Edison (Lightbulb); Alexander Graham Bell (telephone); Antonio Meucci (telephone); Mary Anderson (windscreen wiper); Cath Kidston (designer); Charles and Ray Eames (chairs/furniture); Inigo Jones (Architect); Da Vinci (architect); Sir Norman Foster (architect); Alan Turing (computer scientist); Steve Jobs (computers) | | | |

| Technical Knowledge | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| **Cooking and Nutrition** | | | | | | | |
| **Cooking and Nutrition** | | **CN1**<br>use the basic principles of a healthy and varied diet to prepare dishes<br><br>Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of *The eatwell plate*. | | **CN1**<br>understand and apply the principles of a healthy and varied diet<br><br>that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The eatwell plate<br><br>that to be active and healthy, food and drink are needed to provide energy for the body | | | |
| | | Understand the terms:<br>Fruit and vegetables<br>Bread, rice, potatoes, pasta and other starchy foods<br>Milk and Dairy foods<br>Meat, fish, eggs, beans and other non-dairy sources of protein<br>Fat and sugar<br>Name and sort foods into 5 food groups. | Link previous labels to<br>Carbohydrates<br>Proteins<br>Fats<br><br>Understand what varied diet means.<br><br>Five portions of fruit and veg and recognise that there are other ways of gaining 1 of your 5 day | How to balance a healthy diet | How food provides energy for the body and how to actively burn food/ drink you have consumed | Adapt recipes to make a balanced diet | Foods contain different substances – nutrients, water, fibre and these are needed for health. |
| | | **CN2**<br>understand where food comes from.<br><br>Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. | | **CN2**<br>prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques<br><br>how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source<br><br>how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking<br><br>Know how to use appropriate equipment and utensils to prepare and combine food. | | | |
| | | Know that all food comes from animals/plants. | Understand that food can be farmed | **CN3**<br>understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.<br><br>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<br><br>Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught. | | | |
| | | | | What food is grown in Italy compared to the UK | What food is reared/caught? Compare UK to wider world | How does seasonality affect food? | Understand processed ingredients |

| Cooking and Nutrition: Food skills | | | | |
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| **Pull** | hull fruit, pick grapes from vine | | | |
| **Crush/Juice/ Press** | **crush** - soft fruit with a potato masher or fork, e.g. raspberries as a topping for yogurt or for a fruit drink | **Juice** - using a juicer to extract juice, e.g. orange | **Press** - using a garlic press | |
| **Peel** | by hand, e.g. satsuma, banana | with a swivel peeler with adult support | with a swivel peeler with supervision | with a swivel peel to create food ribbons to be used in a dish, e.g. courgette/carrot ribbons with supervision |
| **Spread** | | soft ingredients, e.g.hummus | ingredients evenly over another food | |
| **Shape/shape and mould** | foods by hand and with a rolling pin | with accuracy for a desired effect, e.g. basic bread roll (use a rolling pin) | to create visually appealing products e.g. mini cottage loaf or plait, wrap | |
| **Mix/stir** | to loosely combine ingredients<br><br>mash ingredients together using a fork | with increasing thoroughness to combine ingredients<br>- whisk foods using a fork<br>- rub in fat to flour<br>- knead dough | any ingredients thoroughly - whisk foods using a handwhisk | fold ingredients together carefully |
| **Spoon** | ingredients between containers | ingredients into different containers with increasing accuracy and minimal spillage | be able to use two spoons to transfer ingredients into different size/shape<br><br>containers with minimal spillage, e.g. liquid foods into baking cases (muffin mixture) | be able to gauge the quantities spooned to ensure an equal amount of ingredient in each container |
| **Measure** | using a spoon, e.g. dried herbs, dried fruit - count ingredients | using different size measuring spoons, e.g.liquids - refer to ingredients in simple fractions, e.g. half, quarter | using a measuring jug with support to obtain accuracy<br><br>using digital scales with support to obtain accuracy | using a measuring jug independently and accurately<br><br>using digital and analogue scales accurately and independently |
| **Cut out** | ingredients with a cutter e.g. dough for scones | ingredients neatly with a cutter<br><br>use a table knife to cut dough in equal portions, e.g. cheese straws | placing the cutter in positions to make good of the material available and avoid waste | |
| **Tear/Snip** | **Tear** - fresh herbs | **Snip** - fresh herbs, spring onions | **Snip** - with greater dexterity and control, e.g. to shred lettuce or cabbage leaves for salad | |
| **Grate** | | soft foods, e.g. cheese, cucumber | firmer foods, e.g. carrots, apples | using the zesting part of a grater, e.g. lemon, orange - use a nutmeg grater |
| **Sift** | | sift flour into a bowl with support of an adult | sift flour into a bowl independently | |
| **Thread** | | thread soft foods onto cocktail sticks, e.g. fruit kebab – strawberries, satsuma segments | medium resistance foods onto kebab sticks, e.g. mushrooms, courgettes | higher resistance foods onto kebab sticks, e.g. peppers, onions |
| **Cut** | soft foods with butter knife, e.g. banana, canned peach slices | low resistance foods with a table knife into equal size pieces/slices, e.g. canned pineapple slices, sticks of pepper, mushrooms<br><br>use a fork to secure foods | medium resistance foods with a vegetable knife, e.g. cucumber.<br><br>use a fork or the claw grip to secure foods<br><br>medium resistant or partly prepared foods using a bridge hold, e.g. cut half a tomato into a quarter, halve canned potatoes, halve large grapes | higher resistance food with a vegetable knife, using the claw grip, e.g. celery, carrots<br><br>higher resistant foods from whole using the bridge hold, e.g. halve an apple, raw potato |

| Cooking and nutrition: Recipe instructions progression | | | | |
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| **Follow** | instructions given one at a time by an adult | a simple recipe supported by an adult | a simple recipe with guidance from an adult | a simple recipe independently |
| **Carry out** | instructions with support | instructions with a little support | Instructions independently | modifications to recipes |
| **Cooking and nutrition: Equipment progression** | | | | |
| **Crushing/ squeezing** | Potato masher<br>Fork | Juicer | Garlic Press | |
| **Peeling** | Peel by hand | Swivel peeler with adult support | Swivel peeler with adult supervision | |
| **Shaping** | Rolling pin | | | |
| **Mixing** | Spoons | Whisk | Blender (adult supervision) | |
| **Measuring** | Spoons (table/tea) / cups | Measuring spoons – different sizes | Measuring jug<br>Digital scales | Analogue scales |
| **Cutting** | Butter knife / cutters | Table knife | Vegetable knife (adult supervision) | |
| **Snipping** | | Kitchen scissors (adult supervision) | | |
| **Grating** | | Grater (adult support) | Grater (adult support) | Grater (light adult supervision) |
| **Heating** | | | With adult support and under adult supervision<br>Toaster / hob | Under adult supervision<br><br>Kettle/ grill / oven |

| Technical Knowledge | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| **Structures** | | | | | | | |
| **Freestanding** | To make something freestanding by experimenting with a range of materials and techniques.<br><br>To understand that freestanding is to stand unaided.<br><br>To understand that structure is to build a product. | Know how to make freestanding structures stronger, stiffer and more stable.<br><br>***Skills taught:***<br>*Children to fold paper or card in different ways to make freestanding structures, using masking tape where necessary to make joins.* | | | | | |
| **Shell Structures** | | | | Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes.<br><br>Develop and use knowledge of how to construct strong, stiff shell structures.<br><br>***Skills taught:***<br>*Children to score, cut out and assemble using pre-drawn nets.*<br><br>*Children to use different ways of stiffening and strengthening e.g. folding and shaping, corrugating, ribbing, laminating.* | | |
| **Frame Structures** | | | | | | Understand how to strengthen, stiffen and reinforce 3 D frameworks.<br><br>***Skills taught:***<br>*Children to use a construction kit consisting of plastic strip and paper fasteners to build 2-D frameworks.*<br><br>*Reinforce square frameworks by using diagonals to add strength to a structure and give an understanding of triangulation.*<br><br>*Roll pieces of paper around dowel to strengthen and stiffen structures.*<br><br>*Use straws and pipe cleaners to make structures such as cubes, cuboids and pyramids to work out how frameworks can be strengthened.*<br><br>*Use card triangles to strengthen structures.* | |
| **Vocabulary** | Build<br>Join<br>Construct | structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved | | shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity | | frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent | |

| Technical Knowledge | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| **Mechanisms** | | | | | | | |
| **Sliders** | | Understand that different mechanisms produce different types of movement.<br><br>Explore and use sliders and levers.<br>***Skills taught:***<br>*Teacher to demonstrate simple levers and sliders to show the children how they work.*<br><br>*Children to tell the teacher how does the slider move? How does the lever move? Which part of the mechanism pivot?*<br><br>*Children to replicate teacher's modelled slider and lever.*<br><br>*Children to add pictures to their mechanisms.* | | | | | |
| **Vocabulary** | | slider, lever, pivot, slot, bridge/guide<br>card, masking tape, paper fastener, join<br>pull, push, up, down, straight, curve, forwards, backwards | | | | | |
| **Wheels and axles** | | Understand that different mechanisms produce different types of movement.<br><br>Distinguish between fixed and freely moving axles.<br><br>Explore and use wheels, axles and axle holders.<br><br>***Skills taught:***<br>*Using construction kits children to make a product that moves.*<br><br>*Teacher to demonstrate how wheels and axles may be assembled, either fixed axles or free axles.*<br><br>*Show different ways of making axle holders and stress the importance of making sure the axles run freely within the holders.*<br><br>*Children to mark out, hold, cut and join materials and components.* | | | | | |
| **Vocabulary** | | vehicle, wheel, axle, axle holder, chassis, body, cab<br>assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism | | | | | |

| Technical Knowledge | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| **Cams** | | | | | | Understand that mechanical ~~and electrical systems~~ have an input, process and an output.<br><br>Understand how cams can be used to produce different types of movement and change the direction of movement.<br><br>***Skills taught:***<br>*Children to use pre-cut cams made from MDF or wooden wheels to mount on a piece of board*<br><br>*Children to use a hand drill after teacher demonstration.*<br><br>*Wheels to be secured with G-clamp using a piece of scrap wood under the wheel to avoid drilling into the table.*<br><br>*Children to measure, mark, cut, shape and join accurately.*<br><br>*Children to use junior hacksaws, G-clamps, bench hooks, square section wood, card triangles, and hand drills to make mechanisms and construct wooden frames or card housings.* | |
| **Vocabulary** | | | | | | cam, snail cam, off-centre cam, peg cam, pear shaped cam follower, axle, shaft, crank, handle, housing, framework rotation, rotary motion, oscillating motion, reciprocating motion | |
| **Pulleys and gears** | | | | | | Understand that mechanical ~~and electrical systems~~ have an input, process and an output.<br><br>Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.<br><br>***Skills taught:***<br>*Children to use construction kits to investigate combinations of two different sized pulleys to learn about speed and direction.* | |
| **Vocabulary** | | | | | | pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor<br>circuit, switch, circuit diagram | |

| Technical Knowledge | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| **Levers and linkages** | | | | Understand and use lever and linkage mechanisms.<br><br>Distinguish between fixed and loose pivots.<br><br>***Skills taught:***<br>*Teacher to demonstrate a range of lever and linkage mechanisms.*<br><br>*Children to tell teacher which card strip is the lever? Which card strip is acting as the linkage? Which system is the input? Which is the output? Which are fixed pivots and which are the loose pivots?*<br><br>*Children to measure, mark out, cut, join and use finishing skills to replicate one of the teacher's models.* | | | |
| **Vocabulary** | | | | mechanism, lever, linkage, pivot, slot, bridge, guide system, input, process, output, linear, rotary, oscillating, reciprocating | | | |
| **Pneumatics** | | | | Understand and use pneumatic mechanisms<br><br>***Skills taught:***<br>*Teacher to demonstrate how to assemble the systems using syringes, tubing, balloons and plastic bottles. Introduce ways which pneumatics can operate levers.*<br><br>*Children to try out and draw one of the shown systems.*<br>*a) balloon connected to a washing-up liquid bottle*<br>*b) two syringes of the same size connected together*<br>*c) two syringes of different sizes connected together*<br>*NOTE- take care as syringes may come out with force* | | | |
| **Vocabulary** | | | | components, fixing, attaching, tubing, syringe, plunger, split pin, paper fastener<br>pneumatic system, input movement, process, output movement, control, compression, pressure, inflate, deflate, pump, seal, air-tight<br>linear, rotary, oscillating, reciprocating | | | |

| Technical Knowledge | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| **Textiles** | | | | | | | |
| **Needle preparation** | | Children to be taught to thread a needle using needle threaders. | | Children to be taught to thread a needle using finger and thumb method with some adult support. | | Children thread a needle independently. | |
| **Securing thread** | | Tie a knot with some adult support.<br><br>To tie a knot, wind thread around thumb, rub index finger and thumb together to twist thread, then push twisted thread down to create a knot. | | Tie a knot with chosen method and some adult support. | | Children do not use knot to hold needles in place or secure first stitch.<br><br>Secure thread to project by over stitching a couple of times. | |
| **Stitches** | Weaving in and out in preparation for running stitch | Sew using running stitch. | | Teach back stitch.<br><br>Children choose running stitch or back stitch as appropriate for outcome. | | Teach blanket stitch.<br><br>Children use a range of stitches in their outcome. | |
| **Thread choice** | | Contrasting thread to be used with confident sewers. Same colour thread if needed to hide sewing mistakes. | | Choice of thread – children choose whether to contrast or not. | | Children decide what thread to use based on aesthetics. | |
| **Mock ups/ templates/ pattern pieces** | | Paper mock-ups with a simple shape e.g. drawing around hand on a piece of paper for a puppet.<br><br>Pin template to fabric with the support of the adult. | | Pattern pieces use a single fabric shape to create a 3D product.<br><br>Paper mockup using more complex shapes.<br><br>Pin template to fabric with adult supervision. | | Pattern pieces use several fabric shapes which are combined to make the final product.<br><br>Design and make pattern pieces.<br><br>Pin template to fabric with light supervision. | |
| **Seam allowance** | | Add with support of the teacher | | Plan for seam allowance before cutting out the template | | Included in the pattern pieces | |
| **Vocabulary** | | names of existing products, joining and finishing techniques, tools, fabrics and components, template, pattern pieces, mark out, join, decorate, finish | | fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance | | 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, iron transfer paper | |

| Technical Knowledge | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|---|---|---|---|---|
| **Electrical systems** | | | | | | | |
| **Circuits and switches** | | | | Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers.<br><br>Apply their understanding of computing to program and control their products.<br><br>***Skills taught:***<br>*Children to be reminded how to make manually controlled, simple series circuits with batteries and different types of switches, bulbs and buzzers.*<br><br>*Children to tell the teacher which of the components are input (switches) and which are output (bulbs, buzzers).*<br><br>*Teacher to demonstrate how to find a fault in a simple circuit, correct it and children to practise.*<br><br>*Children to make a variety of switches by using simple classroom materials e.g. card, corrugated plastic, aluminum foil, paper fasteners and paper clips. Encourage children to 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. Ask the children to test their switches in a simple series circuit.*<br><br>*Teach children how to avoid making short circuits.* | | Understand and use electrical systems in their products.<br><br>Understand the use of computer control systems in products.<br><br>Apply their understanding of computing to program, monitor and control their products.<br><br>***Skills taught:***<br>*Teacher to demonstrate and enable children to practise methods for making secure electrical connections e.g. using automatic wire strippers, twist and tape electrical connections, screw connections and connecting blocks.*<br><br>*Drawing on science understanding, ask the children to explore a range of electrical systems that could be used to control their products, including a simple series circuit where a single output device is controlled, a series circuit where two output devices are controlled by one switch and, where appropriate, parallel circuits where two output devices are controlled independently by two separate switches.* | |
| **Vocabulary** | | | | series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip | | series circuit, parallel circuit, names of switches and components, input device, output device, system, monitor, control, program, flowchart | |

| Technical Knowledge | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|---|---|---|---|---|
| **Programming and control** | | | | Understand and use computing to program and control products containing electrical systems, such as series circuits incorporating switches, bulbs and buzzers.<br><br>***Skills taught:***<br>*Children to be reminded how to make manually controlled, simple series circuits with batteries and different types of switches, bulbs and buzzers.*<br><br>*Children to use a simple computer program with an interface box or standalone control box to physically control output devices e.g. bulbs and buzzers.* | | Understand and use electrical systems in their products.<br><br>Apply their understanding of computing to program, monitor and control their products.<br><br>***Skills taught:***<br>*Using a model circuit, demonstrate and enable children to practise using different input and output devices. Allow them to practise methods for making secure electrical connections e.g. using wire strippers, twist and tape connections, screw connections, crocodile clips and connecting blocks.*<br><br>*Drawing on related computing activities, ensure that children can write computer control programs that include inputs, outputs and decision-making.*<br><br>*Children to test out the programs using electrical components connected to interface boxes or standalone boxes.* | |
| **Vocabulary** | | | | series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, light emitting diode (LED), bulb, bulb holder, USB cable, wire, insulator, conductor, crocodile clip | | reed switch, toggle switch, push-to-make switch, push-to-break switch, light dependent resistor (LDR), tilt switch, light emitting diode (LED), bulb, bulb holder, battery, battery holder, USB cable, wire, insulator, conductor, crocodile clip | |