# Design & Technology Long term plan

**All of these elements must be appropriately embedded into each DT unit (age appropriate)- Design Brief**

**Technical knowledge** (Research)

(KS1) build structures, exploring how they can be made stronger, stiffer and more stable/ explore and use mechanisms, e.g. levers, sliders, wheels and axles

(KS2) strengthen, stiffen and reinforce more complex structures/ mechanical systems, e.g. gears, pulleys, cams, levers and linkages/ electrical systems, e.g. series circuits incorporating switches, bulbs, buzzers and motors/ computing to program, monitor and control their products

**Design**

(KS1) design purposeful, functional, appealing products/ generate, develop, model and communicate their ideas

(KS2) research and develop design criteria to inform the design of innovative, functional, appealing products/ generate, develop, model and communicate their ideas, e.g. cross-sectional and exploded diagrams

(Plan)

**Make** – Use a range of tools for cutting, shaping, joining and finishing.

(KS1) select from and use a wide range of materials and components according to their characteristics

(KS2) select from and use a wider range of materials and components according to their functional properties and aesthetic qualities

**Evaluate**

(KS1) explore and evaluate a range of existing products and their ideas and products against design criteria

(KS2) 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

| DT | AU1 | AU2 | SP1 | SP2 | SU1 | SU2 |
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| **Nursery** | **Name of unit:** All about me | **Name of unit:** Stories | **Name of unit:** Transport<br><br>**Vocabulary: scissors, hold, grip, snips**<br><br>**Key Knowledge:**<br>***Can hold the scissors correctly**<br>***Can keep their thumb on the top**<br>***Can make small snips**<br><br>**Vocabulary: make it, materials, resources, ideas**<br>**Key Knowledge**<br>**Can say what they are going to make** | **Name of unit:** Amazing animals<br><br>**Vocabulary: scissors, hold, grip, snips**<br><br>**Key Knowledge:**<br>***Can hold the scissors correctly**<br>***Can keep their thumb on the top**<br>***Can make small snips** | **Name of unit:** Seaside<br><br>**Vocabulary: materials, hard, soft, bumpy, shiny, rough, same, different**<br><br>**Key Knowledge:**<br>***Knows that some materials feel different, and some feel the same**<br>***Can use some key words to describe the materials** | **Name of unit:** Minibeasts<br><br>**Vocabulary: small world, build, city, buildings, park**<br><br>**Key Knowledge:**<br>***Can use equipment to build familiar places e.g. parks, homes, etc…** |

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| | | | *Can point to or name the materials they will need<br>*Can say how they will use the materials<br>*Can complete their planned idea<br><br>Vocabulary: materials, join, fix, stick<br><br>Key Knowledge<br>*Knows that 2 materials can be joined together<br>*Knows that glue, Sellotape, split pins etc…can be used to join materials together<br>*Knows that the 2 materials have to be joined securely | | | |
| **Reception** | **Name of unit:** colours<br><br>Vocabulary:<br>Scissors, snip, cut, grip join, materials,<br><br>Key Knowledge:<br>*Knows how to hold scissors correctly<br>*Can make snips with scissors<br>*Explores joining materials together (glue, masking tape, Sellotape, split pins, string) | **Name of unit:** Superheroes<br><br>Vocabulary:<br>Scissors, snip, cut, grip join, materials,<br><br>Key Knowledge:<br>*Knows how to hold scissors correctly<br>*Can make snips with scissors<br>*Explores joining materials together (glue, masking tape, Sellotape, split pins, string)<br><br>Vocabulary:<br>Attach, snip, stick, join | **Name of unit:** Under the Sea<br><br>Vocabulary:<br>Scissors, cut, grip, control outline, join, materials<br><br>Key Knowledge:<br>*Consistently holds scissors correctly<br>*Can cut around a simple outline with good control<br>*Join materials together successfully (glue, masking tape, Sellotape, split pins, string) | **Name of unit:** Dinosaurs<br><br>Vocabulary:<br>Scissors, equipment, purpose, safely, store, carrying<br><br>Key Knowledge:<br>*Can hold scissors and other equipment correctly<br>*Can use scissors and other equipment for the right purpose<br>*Can store scissors and other equipment safely<br>*Can move around the classroom safely carrying | | |

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| | | **Key Knowledge:**<br>***How to join materials together**<br>***How to adapt cardboard boxes to form superhero vehicles** | | **scissors and other equipment** | | |
| **Year 1** | **Name of unit:** Ourselves – Food – vegetable subs<br><br>Patsy is adding new items to the school dinner menu. She wants to make **tasty and healthy vegetable subs** that children will enjoy eating at lunch. Patsy isn't sure which vegetables children like best. She needs your help to create a delicious vegetable sub!<br>You will explore different fruits and vegetables, learn how to prepare them safely using various techniques, and **design and make your own vegetable sub**. You will then **taste and evaluate your creation** to help Patsy decide what to put on the menu.<br><br>**Vocabulary:**<br>Fruit, Vegetables, Nutrients, utensils, cut, peel, slice, grate, sweet, sour, spicy, texture - soft or hard, mushy or | | | | | **Name of unit:** Transport-<br>  <br><br>**Design Brief:**<br><br>Ian at the Great Central Railway has contacted the school. They are putting on an exhibition about trains and need a new model to display. He would like the Year 1 children to plan, design, make and evaluate a new model train. You will need to work in pairs to create a train which must have; at least two carriages, wheels and windows.<br><br>**Vocabulary:**<br>Design, Evaluate<br>Construct<br>Joining<br><br>**Key Knowledge:**<br>*Know how they want to construct their product |

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| | crunchy, or smooth or lumpy<br><br>**Key Knowledge:**<br>*To know how to use a range of utensils to cut, peel, slice and grate safely<br>*To know the correct vocabulary to describe the flavour and texture of foods<br>*Why they need to wash their hands and make sure that surfaces are clean<br>*To know how to follow a simple recipe<br>*How to weigh ingredients using measuring cups<br>*To know which foods make healthier choices<br>*Know where food comes from such as animals or plants<br>*Know that food has to be farmed, grown or caught<br><br>**Name of unit:** Food –<br><br>Making porridge (English-Goldilocks)<br><br>Revisiting and applying-additional skill of decorating, grating, slicing using chocolate sprinkles, fruits.<br><br>**Vocabulary:**<br>carbohydrates, fruits and vegetables, protein, dairy, fats | | | | | *Know the appropriate resources and tools for their building projects<br>*Know how to make simple plans before making objects, e.g. drawings, arranging pieces of construction before building<br>*Know how to add decorative design for a product<br>*Know how to choose suitable materials for their project<br>*Know how to improve their product |

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| | **Key Knowledge:**<br>*Know how to make food look appealing | | | | | |
| **Year 2** | | | | **Name of unit:** Great Fire of London – Fire Engine project<br><br>**Design brief:**<br>King Charles has sent an order to the people to create a Fire engine to put out the fire!<br>Your fire engine must have a strong structure and it must have moving wheels. Research, design, plan, make and evaluate your product.<br><br>**Vocabulary:**<br>mechanism, chassis, axle, dowel, freestanding structure, frame structure, shell structure<br><br>**Key Knowledge:**<br>*To know about different types of mechanisms and use one in their product<br>*Know how to make part of their product move<br>*To know how to make structures that are stronger, stiffer and more stable.<br>*To know why they have chosen to make specific parts move | | **Name of unit:** Seaside – Glove puppets<br><br>**Design Brief:**<br>You will be putting on a puppet show to the year 1 children about caring for the environment. Your puppet must fit your hand inside, have an applique decoration and be made from suitable materials. Research, design, plan, make and evaluate your product.<br><br>**Vocabulary:**<br>**Glove puppet - a glove puppet fits over the hand, and the fingers operate its head and arms,**<br>**applique - a cut out decoration fastened to a larger piece of material**<br>**seam, sew, template, mock-up, weaving,**<br>**texture- rough, smooth, coarse, fine, soft, stiff, opaque, sheer**<br><br>**Key Knowledge:**<br>*Know how to cut materials using scissors |

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| | | | | *To know how to develop their own ideas, using a brief as a starting point<br>*Know how to properly join materials together as part of a moving product | | *Know how to describe the materials using different keywords<br>*To know the process of weaving using paper.<br>To know how to confidently thread a needle.<br>*Know how to cut out a simple template shape from felt.<br>*Know how to decorate with beads, sequins, braids and ribbons. |
| **Year 3** | | | | | **Name of unit:** Romans – Roman Clothing Project<br><br>**Design Brief:**<br>Spartacus (Doll) the gladiator needs a new outfit to visit Emperor Claudius. You need to design him a decorative tunic to impress the emperor. It must include a range of different fabrics, joined together, and must include stitched applique decorations. You must also create a thread belt. Research, design, plan, make and evaluate your product.<br><br>**Vocabulary:**<br>running stitch, oversewing, back stitch, blanket stitch<br><br>**Key Knowledge:** | **Name of unit:** Volcanoes – making a Volcanic cupcake Project<br><br>**Design Brief:**<br>You need to design eggless, nut-free cupcakes inspired by a volcano to sell at a cake sale raising money for 'the disaster charity foundation'. It must have volcanic flavours and textures as well as appearance. Research, design, plan, make and evaluate your product.<br><br>**Vocabulary:**<br>Mashing, whisking, crushing, grating, cutting, kneading, baking, texture – flavoursome, tangy, appetising<br><br>**Key Knowledge:** |

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| | | | | | *Know how to use simple patterns as a template, to cut different fabrics.<br>*How to confidently thread a needle using a smaller eye<br>*How to join fabrics and applique decorations using running stitch, over sewing, backstitch, and blanket stitch<br><br>*Know how to use weaving with threads to knot, plait and twist. | *Know how to use a range of techniques such as mashing, whisking, crushing, grating, cutting, kneading and baking<br>*How to prepare ingredients using appropriate cooking utensils<br>*How to measure and weigh ingredients to the nearest gram<br><br>Science link - explain that a healthy diet is made up of a variety and balance of different food and drink, as represented in the Eatwell Guide and be able to apply these principles when planning and cooking dishes<br>Science link - understand that to be active and healthy, nutritious food and drink are needed to provide energy for the body |
| **Year 4** | | **Name of unit:** Raging Rivers Project- River boats<br>**Design Brief:**<br>Mr Aldred is going on a fishing trip this weekend and needs a boat! The boat must be able to float in the river and be waterproof to ensure Mr Aldred doesn't get wet! There must be a moving element to your boat using gears, pulleys or leavers. Research, design, | | | **Name of unit:** Vikings – Viking stew<br><br>**Design Brief:**<br>Ulf, the Viking, is preparing for a feast to celebrate the winternights festival. He needs your help to create a delicious stew, skause or porridge using traditional Viking ingredients that will fill the bellies of his 4 family members. Research, | **Name of unit:** Lighthouses (Science linked mini unit) Application of skills<br><br>**Vocabulary:** circuit, input, process, output<br><br>**Key Knowledge:**<br>*Know how to use electrical components<br>*Know that electrical systems have an input, process and output |

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| | | plan, make and evaluate your product.<br><br>**Vocabulary:**<br>Appropriate, functional properties-<br>-absorbent, waterproof, buoyant, lightweight, dense, durable<br>aesthetic qualities<br>-smooth, polished, grainy, flexible<br><br>**Key Knowledge:**<br>*To know how to choose appropriate tools<br>*Know how to select appropriate materials for their functional properties and their aesthetic qualities<br>*Know how to measure, mark, cut, shape and score objects accurately<br>*Know how to use cams, gears, and pulleys to create movement<br>*Know how to select an appropriate joining method | | | design, plan, make and evaluate your product.<br><br>**Vocabulary:** Forage, boil, reduce, sauté, simmer, stock, broth, aromatics-garlic, onions, leeks, carrots, celery<br>chop- bridge technique, claw technique<br>Skause- a traditional Viking meat or fish broth<br><br>**Key Knowledge:**<br>*To know how to prepare a range of ingredients using correct utensils<br>*Know how to weigh and measure ingredients to the nearest gram<br>*To know which ingredients are grown locally in the UK<br>*To know how to prepare and cook savoury dishes, safely and hygienically<br>*To know how to use a heat source and how to control the temperature<br>*To know how to follow a recipe, more independently | Science link - use the science through stories to link the lighthouse keeper's son to electricity. As part of this Science topic, design, plan, make and evaluate a model lighthouse to demonstrate the ability to use electrical components as part of a project. |
| **Year 5** | | **Name of unit:** Egyptians- Irrigation System<br><br>**Design Brief:**<br>An Egyptian farmer needs a new irrigation system to get water from the river Nile onto his crops. Research, design, plan, | | | | **Name of unit:** Tudors- Tudor Coin purse<br><br>**Design Brief:**<br>King Henry VIII wants to give a gift of a decorative coin purse to his wife. It must be able to hold lots of coins safely and must |

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| | | refine, make and evaluate a mechanism -based irrigation system with a solid base. Your design must include a specific permanent join.<br><br>**Vocabulary:**<br><br>**Rotary motion:** movement that goes round<br>**Oscillating motion**: moving to and fro around a pivot point, as in a lever<br>**Reciprocating motion:** backwards and forwards movement in a straight line, on a slider<br>**Cam**:<br>**Follower:** the device that follows the movement of the cam – a lever or a slider<br>**Lever**: a piece of rigid material that moves to and fro around a pivot point creating oscillating motion.<br><br>**Key Knowledge:**<br>*To know how to make modifications throughout a project<br>*Know how to select an appropriate permanent joining method<br>*To know how to make high quality, finished products<br>*Know how to create a cross-sectional diagram | | | | be decorated lavishly with reference to the Tudor rose. Research, design, plan, create and evaluate your product.<br><br>**Vocabulary: oversewing, backstitch, pattern layout, seam, seam allowance, aesthetics**<br><br>**Key Knowledge:**<br>*Know how to use a pattern layout to cut a range of fabrics<br>*To know which needle to use for different threads<br>*Know how to use different stitches to join fabrics<br>*Know how to decorate using applique, beads and sequins |

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| | | *Know how to use a range of tools and equipment<br><br>Key Changes- 'A-frame' stipulation removed, children to be given a choice of structures to work with. | | | | |
| **Year 6** | **Name of unit:** Science linked electricity project – for young children<br><br>  <br>**Design Brief:**<br>Steady Hand Game (Electrical Systems)<br><br>You need to research, design, plan, make and refine a themed steady hand game to use with EYFS children. The base will need to be secure with neat edges. Create an operational electrical circuit with a buzzer/light that completes the circuit when the handle makes contact with the wire.<br><br>**Vocabulary:**<br>Buzzer, copper wire, circuit, net, electricity, stable, tabs, assemble<br><br>**Key Knowledge:**<br>*Know how key events and individuals in design | **Name of unit:** WW1<br><br>**Design Brief:**<br>You need to research, design, plan, make, refine and evaluate a themed meal (rationing) within a set budget, e.g. £3.00. Your meal must be inspired by the foods available during that time period.<br><br>**Vocabulary:**<br>Seasonality, grown, reared, caught, processed, substances, seasonality, adapt, timings, temperatures cooking -grilling, griddling, frying, boiling<br><br>**Key Knowledge:**<br>*Know how to measure ingredients to the nearest gram and millimetre<br>*To know how seasonality effects food availability<br>*Know where and how a variety of ingredients are grown, reared, caught, or processed | | | | |

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| | and technology have helped shape the world<br>*How to use market research to develop a design specification for a functional product<br>*Know how to show ideas through annotated sketches of electrical circuits or circuit diagrams<br>* How to evaluate and improve their ideas and products against design criteria and considering the views of others<br>*Know how to use electrical systems in their products | *Know how wheat is processed into flour, and that other foods are also processed into ingredients<br>*To know how to prepare and cook a variety of predominantly savoury dishes<br>*To know how to safely use a heat source for grilling, griddling, frying and boiling<br>*To know what substances in food, make a healthy diet<br>*To know how to balance substances in food when planning and preparing meals<br>*Know how to adapt a recipe by using ratios or scaling up<br>*Know how to adapt a recipe by altering cooking time and temperatures<br>*Know how to adapt and refine recipes by substituting one or more ingredient. | | | | |
| **SEND – Adaptive Teaching** | ➢ Adjust the level of challenge<br>➢ Targeted support from a TA<br>➢ Clarify/simplify a task or provide numbered steps with visual representations **eg-have step by step pictures on how to complete the activity. As well as teacher modelling of the activity.**<br>➢ Provide worked (completed) and partially completed examples.<br>➢ Highlight essential content<br>➢ Re-explain a concept or explain it in a different way<br>➢ Give additional (or revisit) examples<br>➢ Use peer tutoring/collaborative learning (everyone must participate – give them roles)<br>➢ Provide additional scaffolds ***always provide lots of visual images***<br>➢ Set clear targets/expectations | | | | | |

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| | ➢ Provide prompts/sentence stems- **for their evaluations children will be provided with a word bank/ list of statements to support them to talk/write about their work. These will include what they like about their outcome as well as ways in which they could improve it.**<br>➢ Improve accessibility (e.g. proximity to speaker, visibility of whiteboard, read a text to the pupil)<br>➢ Consider pace - (extra time for responses to questions, contributing to class discussions and to complete activities)<br>➢ Provide vocabulary with visual images- **have slides on the computer with key vocabulary so children can refer to these when completing their work.**<br>➢ check understanding and reinforcing as needed through repetition, rephrasing, explaining and demonstration<br>➢ Have alternative ways to record learning, e.g. **evaluations can be completed using multiple choice questions or verbally answer questions for the teacher to scribe; the use of recording devices**<br>➢ Pre-teach vocabulary, key content etc.<br>➢ ***Provide one to one support where possible and do small demonstrations during each stage of the topic.***<br>➢ ***Break the task up into smaller sections*** |
| **Strategies to stretch and challenge** | ➢ **Identify and account for prior knowledge** – a child who has extensive prior knowledge could be asked to present some of the knowledge they have to the class; explain something they understand easily to a child who doesn't 'get it' so quickly<br>➢ **Build on interests to extend** – **allow children to research using laptops/ magazines to do their market research for the product they are about to make; set tasks/question to investigate during home learning time**<br>➢ **Depth of content** - consider what you can add to create depth, e.g. digging into an area more deeply, going laterally with a concept, or asking pupils to use more complex terminology to describe abstract ideas<br>➢ **Use questioning techniques to boost thinking –throughout the task ask children open ended questions which will get them to think deeper into the reasons why certain materials have been chosen. For Example, when cooking you could ask what else could make your dish sweet without adding sugar?**<br>➢ **Consider learner roles** – ensure they are appropriately challenged through the role they are given so they can make an effective contribution; argue in favour of a viewpoint that is different to their own, e.g. argue the opposite position to that which they actually hold, during a class debate<br>➢ **Mastery** - more intensive teaching, tutoring, peer-assisted learning, small group discussions **where children are given the opportunity to lead the activity**<br>➢ **Differentiated success criteria/choice of task** – offer a choice of tasks with a different level of challenge**, e.g. give children additional criteria to the original design brief, e.g. Y4 making soup – children have to consider ingredients for somebody who has a specific dietary requirement such as celiac; Y5 Shadufs – children might be given a set volume of water to transport etc.**<br>➢ **Feedback** – framing feedback so pupils must take responsibility for improving their own learning |