Stockton on the Forest Primary School

Progression ladder: **Design Technology – Strong Structures, Mechanisms, Electricity/Computing** Children can…

	Design and Develop (FPT= Focus Practical Task)	Making	Product and Evaluation
Reception	Wants to make	**Make models** in areas of provision **Uses various construction materials** **Uses and handles simple tools** **Joins construction pieces together to build and balance**	Be excited about what they have made **Understands that equipment and tools have to be used safely.** **Realises tools can be used for a purpose** Share their creations, explaining the process they have used
Year 1	Generate ideas from their own experience Talk about their ideas and say what will be done Describe what they want to do using pictures and words Make a simple list of what they will need Know the features of some familiar products FPT – levers/pivots & sliders in card FPT - wheels and axles Know how some moving objects work	**Join two materials together** **Use scissors to cut, sometimes with help** **Make simple models, not necessarily with a purpose** **Use simple construction kits – e.g. Lego** **Know about basic safety** Make models and pictures with moving parts (including wheels and axles, levers & pivots and sliders)	Use simple terms to talk about their own and others' work Describe differences in common materials and their properties Talk about how moving objects work
Year 2	Generate ideas, and plan what to do next, using their experience of materials and components. Use their knowledge of some working characteristics of materials when designing Use plans to show how to put their ideas into practice Say how the product will be useful to the user Draw pictures with labels, with some text **FPT- how to build a strong wall (foundations/ brick pattern, thickness)** FPT – levers and pivots in models – e.g. catapult FPT – levers and linkages to create movement Show understanding of how some moving objects work	**Start to use folding, joining, rolling to make something stronger** **Use a simple template for cutting out** **Use simple finishing techniques** **Start to think how to strengthen models in own ways** **Select tools and techniques appropriate to the job** **Follow basic safety rules** **Understand and use the term component** Make models with moving parts (eg wheels and axles, levers & pivots/ linkages and sliders)	Talk about how moving objects work Describe how a commercial product works Use like and dislike when evaluating or describing Explain why some products are useful Use digital photography to present design or finished work Recognise what they have done well and talk about what could be improved Seek out the views and judgements of others Predict how changes will improve the finished product
Year 3	Use others to help generate their ideas **Use what they know about the properties of materials** **Plan their work to include a range of joins** Ensure that plans are realistic and appropriate for the aim Show the order of working in plans Use models, pictures and words in designs Make increasing use of ICT to plan ideas Recognise that designs must meet a range of needs Say why something will be useful **FPT – building stronger 3D shapes (using triangles)** **FPT- Make holes using a punch and drill** FPT -investigate pneumatics / hydraulics / hinges and & incorporate into designs Apply what they know about mechanisms to create movement when planning and designing Investigate a range of products to see how they work	**Measure carefully and cut out using centimetres** **Choose tools and equipment which are appropriate for the job** **Prepare for work by assembling components together before joining** **Use scoring and folding for precision** **Make holes using a punch and drill** **Work out how to make models stronger, then alter and adapt materials accordingly** **Combine a number of components together in different ways** **Begin to re-enforce 3D structures to make a strong, stiff structure** Apply knowledge of pneumatics/ hydraulics & hinges in making **Make the finished product neat and tidy**	Be clear about their ideas when asked Can alter and adapt original plans following discussion and evaluation Recognise what has gone well, but suggest further improvements for the finished article Suggest which elements they would do better in the future Identify where evaluation has led to improvements
Year 4	Collect and use information to generate ideas Consider the way the product will be used Understand designs must meet a range of criteria and constraints Take users' views into account FPT -investigate cams & incorporate into designs **FPT – investigate strengthening joins and corners** **Understand how some properties can be used – e.g. waterproof** Think ahead about the order of their work FPT – simple circuits Add electricity to create motion or make light Produce step by step plans Make ongoing sketches and annotations	**Measure accurately enough to ensure precision** **Increasingly model their ideas before making** **Combine materials for strength and to improve how the product looks** **Use permanent and temporary fastenings to join** **Join with a greater range of techniques – e.g. staples** **Strengthen joins and corners in a variety of ways** Understand how wheels, axles, turning mechanisms, hinges and levers all work together Apply knowledge of cams in building designs Create simple electrical circuits and incorporate into a model	Talk about what they like and dislike, giving reasons Develop their designs through their own reflection and the evaluation of others Carry out tests before making improvements Explain how mechanisms used work in their designs

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Year 5	FPT: winches, belts, pulleys Make more complex designs to include belts and pulleys, and a combination of other mechanisms Plan the order of work by thinking ahead Use sketches to show other ways of doing things – and then make choices Plan using cross-sectional and exploded diagrams and computer aided design Meet an identified need / brief Use various sources of information and draw on them in design FPTs: Little Bits FPT: circuits with switches and multiple components Apply their understanding of computing and electrical circuits to program, monitor and control their products	**Carry out tests to see if their design works** Make improvements from design suggestions Work in a safe way **Measure and cut precisely to millimetres** **Make stable and strong joins to stand the test of time** **Ensure products are strong and fit for purpose** Build winches, belts and pulleys into designs Be confident to try new / different ideas Create electrical circuits and incorporate into a model.	Identify what is working well and what might be improved – and make choices from several alternatives Refine the quality of the finished product, including making annotations on the design Clarify ideas through drawing and modelling Increasingly use testing to improve models and finished products Explain how mechanisms used work in their designs
Year 6	**Select materials carefully, considering intended use, aesthetics and functionality** Be aware of commercial aspects and incorporate these into their designs FPT - gears Design incorporating knowledge of mechanisms so far Draw scaled diagrams with increasing use of ratio Calculate the amount of materials needed use this to estimate cost and keep cost constraints in mind FPTs: Control / link computing sessions Plan how to use electrical circuits (incorporating switches, bulbs, buzzers and motors) to improve a product Apply their understanding of computing to design and control their products using technology (eg Little Bits)	**Measure and cut out in precise detail, and make sure that finished products are carefully finished** **Apply their knowledge in making strong, reinforced structures that last the test of time** Use cams, pulleys or gears to create movement Make and test separate elements (e.g. electrical circuits) of a model before combining into the finished article Understand how an article might be mass produced Produce a simple instruction manual or handbook for their product Apply their understanding of computing to program, monitor and control their products	Research products using the internet Test and evaluate commercial products, understanding how this information supports their own designs Evaluate a range of different sources of information such as advertising and handbooks Explain how products meet design criteria