

Key Stage 1	Year 1		Year 2	
	<i>Practical skills, techniques and technical knowledge</i>	<i>Context</i>	<i>Practical skills, techniques and technical knowledge</i>	<i>Context</i>
Tools and Joining	Cut accurately and safely with scissors Join appropriately using tape and basic glue (stick)	Throughout the term CH can be shown how and make various different sliders and levers using the theme of Dinosaurs and the Stone Age. Also fits nicely with English units - such as traditional tales and other units linking characters to settings.	Cut wood/dowel using a bench hook and hack saw Join appropriately with glue or tape and in different situations (e.g frame, axle, chassis)	Aut2 (Wheels and Wings) Design, Make, Evaluate: To design and make a.... - vehicle of the future - vehicle for a character (from a text the children are familiar with)
Mechanisms	Create levers and sliders	Design, Make, Evaluate: To design and make a movable Christmas card for someone who is special to you	Create and use wheels and axles	To design and make a moving toy. (After looking at toys with wheels and wings - could be made for a specific person therefore would need to research what that person likes or pick an age range - i.e child in reception and go and ask what programmes /characters they like)
Structures	Fold, tear, roll and cut paper and card Create simple hinges and pop ups		Improve structures by making them stronger, stiffer and more stable	
Vocabulary	slider, lever, pivot, slot, bridge/guide, card, masking tape, paper fastener, join, pull, push, up, down, straight, curve, forwards, backwards, design, make, evaluate, user, purpose, ideas, design criteria, product, function		vehicle, wheel, axle, axle holder, chassis, body, cab, assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism, names of tools, equipment and materials used, design, make, evaluate, purpose, user, criteria, functional	
Questions to support with planning and assessment	Developing, planning and communicating ideas: <ul style="list-style-type: none">• Can they think of some ideas of their own?• Can they explain what they want to do?• Can they use pictures and words to plan? Working with tools, equipment, materials and components to make quality products: <ul style="list-style-type: none">• Can they explain what they are making?• Can they explain which tools are they using?		Developing, planning and communicating ideas: <ul style="list-style-type: none">• Can they think of ideas and plan what to do next?• Can they choose the best tools and materials? Can they give a reason why these are best?• Can they describe their design by using pictures, diagrams, models and words? Working with tools, equipment, materials and components to make quality products:	

	<p>Evaluating processes and products:</p> <ul style="list-style-type: none">• Can they describe how something works?• Can they talk about their own work and things that other people have done? <p>Mechanisms:</p> <ul style="list-style-type: none">• Can they operate sliders and levers?• Do they know that different mechanisms create different types of movement?• Can they join materials together as part of a moving product?• Can they add some kind of design to their product?	<ul style="list-style-type: none">• Can they join things (materials/ components) together in different ways? <p>Evaluating processes and products:</p> <ul style="list-style-type: none">• Can they explain what went well with their work?• If they did it again, can they explain what they would improve? <p>Mechanisms:</p> <ul style="list-style-type: none">• Do they know the difference between fixed and free moving axels?• Do they know simple methods to fix wheels and axels to a product?• Can they make a product which moves?• Can they describe the materials using different words?• Can they say why they have chosen moving parts?
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Lower Key Stage 2	Year 3		Year 4	
	<i>Practical skills, techniques and technical knowledge</i>	<i>Context</i>	<i>Practical skills, techniques and technical knowledge</i>	<i>Context</i>
Tools and Joining	Measure and mark with reasonable accuracy. Cut using scissor to a marked line. Join appropriately using different glues (stick, PVA) and tape	This is a stand-alone unit. <i>Possible ideas:</i> <ul style="list-style-type: none">- <i>Banish broken biscuits! Design and make packaging for shortbread biscuits.</i>- <i>Design and make a gift box (for Christmas) for a specific person.</i>- <i>Make a Christmas bauble and design and make the box for it.</i> Design, Make, Evaluate: <i>To design a box for _____</i>	Measure and mark accurately. Cut using scissors and wire cutters to a marked line. Join appropriately using different glues (stick, PVA) and tape	Linked Science unit -Sound. Children will need to understand how a simple circuit works and what happens when there is a break in a circuit. They will need to understand how switches work and how they create open and closed circuits. Design, Make, Evaluate: <i>To design and make a game that uses an electrical buzzer</i> Can look at existing games for inspiration - Steady hand game, Operation, Press the buzzer to answer a question etc....Children could design their toy for a specific person and what they like in mind.
Mechanisms	N/A		Create an open circuit that sounds a buzzer when it becomes a closed circuit	
Structures	Create a shell or frame structure using diagonal struts to strengthen. Cut slots in card Prototype and build shell structures making improvements		Create a shell structure using 3D shapes as the base or to hide the electrical circuit with buzzer.	
Vocabulary	three-dimensional (3-D) 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, evaluating, design brief design criteria, innovative, prototype		circuit, fault, connection, battery, battery holder, switch light, buzzer, wire, insulator, conductor, crocodile clips, input device, output device, design, make, evaluate, user, purpose function, decision, design specification, design brief, product, evaluating	
Questions to support with planning and assessment	Developing, planning and communicating ideas: <ul style="list-style-type: none">• Can they show that their design meets a range of requirements?• Can they put together a step-by-step plan which shows the order and also what equipment and tools they need?• Can they describe their design using an accurately labelled sketch and words?• How realistic is their plan?		Developing, planning and communicating ideas: <ul style="list-style-type: none">• Can they come up with at least one idea about how to create their product?• Do they take account of the ideas of others when designing?• Can they produce a plan and explain it to others?• Can they suggest some improvements and say what was good and not so good about their original design?	

	<p>Working with tools, equipment, materials and components to make quality products:</p> <ul style="list-style-type: none"> • Can they use equipment and tools accurately? <p>Evaluating processes and products:</p> <ul style="list-style-type: none"> • Can they explain what they changed which made their design even better? <p>Shell Structures:</p> <ul style="list-style-type: none"> • Do they use the most appropriate materials? • Can they use more sophisticated methods for stiffening/ strengthening structures? • Do they know what a net is? • Do they know the names of more complex 3D shapes? • Can they work accurately to make cuts and holes? • Can they measure, mark out, cut and join materials in different ways? • Can they test a material's strength? 	<p>Working with tools, equipment, materials and components to make quality products:</p> <ul style="list-style-type: none"> • Can they tell if their finished product is going to be good quality? • Are they aware of the need to produce something that will be liked by others? • Can they show a good level of expertise when using a range of tools and equipment? • Do they work at their product even though their original idea might not have worked? <p>Evaluating processes and products:</p> <ul style="list-style-type: none"> • Have they thought of how they will check if their design is successful? • Can they begin to explain how they can improve their original design? • Can they evaluate their product, thinking of both appearance and the way it works? • Do they take time to consider how they could have made their idea better? <p>Electrical and mechanical:</p> <ul style="list-style-type: none"> • Do they select the most appropriate tools and techniques to use for a given task? • Do they know what an electrical circuit is and know a range of electrical components and their functions? such as a bulb, buzzer and switch. • Can they use a simple circuit? • How have they altered their product after checking it?
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Upper Key Stage 2	Year 5		Year 6	
	Practical skills, techniques and technical knowledge	Context	Practical skills, techniques and technical knowledge	Context
Tools and Joining	Cut accurately with scissors and saws safely to a marked line.	Linked to Tudors: Design and make a Tudor House - children could be given a person they have learnt about in their history topic for it to be for i.e Lady Jane Grey, Mary Queen of Scots Design and make a bridge to cross the River Thames. Could link to the Coronation of a monarch from that period - Henry VIII, Elizabeth I...Maybe it needs to be able to hold a certain weight? Design, Make, Evaluate: To design and make a _____ for _____.	Cut using a craft knife and cutting mat using a safety ruler.	Automata toy that uses different shaped cams, being rotated to create an up and down motion - gears can also be included Could be a toy brought home from the front by a returning dad, brother, uncle etc.... Could be a toy made to celebrate VE Day Design, Make, Evaluate: To design and make a moving toy for a child in the 1940's.
	Use a glue gun with close supervision (1:1) Join appropriately using different glues (stick, PVA) and tape		Join materials using the most appropriate method for the materials and/or purpose	
Mechanisms	N/A		Use cams or gears in their product	
Structures	Create a framed structure using diagonal struts to strengthen		Build a framework structure using a range of materials (e.g wood, car, corrugated plastic) that supports a mechanism	
Vocabulary	frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent, design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional		frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent, fixed, free, moving, mechanism, cams - egg shaped, round, eccentric etc....names of tools, equipment and materials used, design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional	
Questions to support with planning and assessment	Developing, planning and communicating ideas: <ul style="list-style-type: none">• Can they come up with a range of ideas after they have collected information?• Do they take a user's view or design criteria into account when designing?• Can they produce a detailed step-by-step plan?		Developing, planning and communicating ideas: <ul style="list-style-type: none">• Can they use a range of information to inform their design?• Can they work within constraints?• Can they follow and refine their plan if necessary?• Can they justify their plan to someone else?• Do they consider culture and society in their designs?	

- Can they suggest some alternative plans and say what the good points and drawbacks are about each?

Working with tools, equipment, materials and components to make quality products:

- Can they explain why their finished product is going to be of good quality?
- Can they explain how their product will appeal to the audience?
- Can they use a range of tools and equipment expertly?
- Do they persevere through different stages of the making process?

Evaluating processes and products:

- Do they keep checking that their design is the best it can be?
- Do they check whether anything could be improved?
- Can they evaluate appearance and function against the original criteria?

Frame Structure:

- Do they know how to stiffen strengthen and reinforce a range of 3-D frameworks?
- Do they know which materials are best suited to stiffen and reinforce by selecting them due to their properties?
- Are their measurements accurate enough to ensure that everything is precise?
- Do they know which shapes are the strongest and will support the most weight in a structure?
- Can they use skills in using different tools and equipment safely and accurately? E.G. junior hacksaw, G-clamps, bench hooks, hand drills

Working with tools, equipment, materials and components to make quality products:

- Can they use tools and materials precisely?
- Do they change the way they are working if needed? (i.e something goes wrong or doesn't work whilst they are doing it)

Evaluating processes and products:

- How well do they test and evaluate their final product?
 - Is it fit for purpose?
- What would improve it?
- Would different resources have improved their product?
- Would they need more or different information to make it even better?
- Does their product meet all design criteria?
- Did they consider the use of the product when selecting materials?

Mechanisms:

- Can they make a product which moves?
- Can they join materials together ensuring that they are still able to move?
- Can they explain why they chose a particular movement referring to the shape of the cam?

Frame Structure:

- Can they select appropriate tools, materials, components and techniques and justify their choices?
- Do they know how to stiffen strengthen and reinforce a range of 3-D frameworks?
- Can they hide joints so as to improve the look of their product?
- Are their measurements accurate enough to ensure that everything is precise?
- Can they use skills in using different tools and equipment safely and accurately? E.G. junior hacksaw, G-clamps, bench hooks, hand drills