

Penistone St John's Design and Technology assessment tool

	EYFS	KS1	LKS2	UKS2
	Disciplinary knowledge			
Design	<ul style="list-style-type: none"> -Select appropriate resources -Use gestures, talking and arrangements of materials and components to show design -Use contexts set by the teacher and myself -Use language of designing and making (join, build, shape, longer, shorter, heavier etc.) - can design using paint (CAD) 	<ul style="list-style-type: none"> -have own ideas and plan what to do next -explain what I want to do and describe how I may do it -explain purpose of product, how it will work and how it will be suitable for the user -describe design using pictures, words, templates and mock-ups -design products for myself and others following design criteria -choose best tools and materials, and explain choices -research similar existing products -use knowledge of existing products to produce ideas -design explaining basic chronology of steps 	<ul style="list-style-type: none"> -begin to research others' needs -use research for design ideas -describe purpose of product -show design meets a range of requirements and is fit for purpose -begin to create own design criteria -follow a given design criteria -have at least one idea about how to create product and suggest improvements for design. --create a plan which shows order, equipment and tools produce a plan and explain it to others -say how realistic plan is. -describe design using an accurately annotated sketches and words -make a prototype -begin to use exploded diagrams to show design -begin to design using a cross-sectional diagram -make and explain design decisions considering availability of resources -explain how product will work -begin to use computers to show design. -design explaining chronology of steps 	<ul style="list-style-type: none"> -carry our research such as surveys, interviews and questionnaires to identify needs, wants, preferences and values of individuals the product is intended for and include in design ideas -draw on market research to inform design -use research of user's individual needs, wants, requirements for design and ensure product is fit for purpose -identify features of design that will appeal to the intended user -create own design criteria and specification -explain how product meets design criteria -come up with innovative design ideas -follow and refine a logical plan and explain it to others. -use annotated sketches and exploded diagrams including measurements -make design decisions, considering, resources, time and cost -clearly explain how parts of design will work, and how they are fit for purpose -independently model and refine design ideas by making prototypes and using pattern pieces -design explaining detailed chronology of steps
	Substantive knowledge			
Design	<ul style="list-style-type: none"> -know what tools are used for and how to use them -know language of designing and making (join, build, shape, longer, shorter, heavier etc.) 	<ul style="list-style-type: none"> -know the purpose of a product, how it will work and how it will be suitable for the user -know what design criteria is -know which tools will help them to make their product -know some similar existing products -know that you perform some tasks before others 	<ul style="list-style-type: none"> -know why a product is being made – intended purpose -know that the design criteria needs to be followed in order to produce a functional, appealing product -understand how realistic plan may be, considering tools and equipment -know what a prototype is -know what a cross-sectional diagram is -know what an exploded diagram is -know how to use computer software to design -understand chronology and the importance of it when making 	<ul style="list-style-type: none"> -understand the reasons and benefits for performing market research -know what makes their product fit for purpose -know how to create annotated sketches and exploded diagrams including measurements -know how to measure in specified units -know the barriers to making a product such as resources, time and cost -understand that when a product is completed, they are still able to independently model and refine design ideas by making prototypes and using pattern pieces -understand detailed chronology of steps for making a product.

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Disciplinary knowledge				
Make	<ul style="list-style-type: none"> -Construct with a purpose, using a variety of resources -Use simple tools and techniques -Build / construct with a wide range of objects -Select tools & techniques to shape, assemble and join -Replicate structures with materials / components -Discuss how to make an activity safe and hygienic -Record experiences by drawing, writing, voice recording -Understand different media can be combined for a purpose 	<ul style="list-style-type: none"> -explain what I am making and why it fits the purpose -make suggestions as to what I need to do next. -select tools/equipment to cut, shape, join, finish and explain choices -join materials/components together in different ways -measure, mark out, cut and shape materials and components, with support. -describe which tools I'm using and why -choose suitable materials and explain choices depending on characteristics. -use finishing techniques to make product look good -work safely and hygienically 	<ul style="list-style-type: none"> -select suitable tools and equipment, explain choices in relation to required techniques and use accurately -select appropriate materials, fit for purpose; explain choices -work through plan in order. -measure, mark out, cut and shape materials/components with some accuracy -assemble, join and combine materials and components with some accuracy -apply a range of finishing techniques with some accuracy 	<ul style="list-style-type: none"> -use selected tools and equipment precisely -produce suitable lists of tools, equipment, materials needed, considering constraints -select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics -create, follow, and adapt detailed step-by-step plans -explain how product will appeal to audience; make changes to improve quality -accurately measure, mark out, cut and shape materials/components -accurately assemble, join and combine materials/components -accurately apply a range of finishing techniques -use techniques that involve a number of steps -be resourceful with practical problems
Substantive knowledge				
Make	<ul style="list-style-type: none"> -knows how to use simple tools and their intended purpose -knows some ways to shape, assemble and join -knows how to make an activity safe and hygienic -knows different media can be combined for a purpose 	<ul style="list-style-type: none"> - knows products need to be made in chronological order -knows which tools/equipment are used to cut, shape, join, finish and explain choices -knows some ways to join materials/components together - can follow a pattern piece by drawing around the object -knows which tools are begin using and why -knows characteristics of materials being used -knows some ways to work safely and hygienically 	<ul style="list-style-type: none"> - knows which tools and equipment would be best for their intended purpose. -knows a plan is needed to be worked through in order -realise if product is going to be good quality -know how to measure with some accuracy - know how to join with accuracy - knows a range of finishing techniques 	<ul style="list-style-type: none"> -knows that measuring must be accurate -knows the constraints of making their products -know how product will appeal to audience - knows that materials and components can be assembled and joined -knows a wide range of finishing techniques -knows how to manage practical problems

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Disciplinary knowledge				
evaluate	<ul style="list-style-type: none"> -Adapt work if necessary -Dismantle, examine, talk about existing objects/structures -Consider and manage some risks -Practise some appropriate safety measures independently -Talk about how things work -Look at and talk about similarities and differences between existing objects / materials / tools -Show an interest in technological toys -Describe textures 	<ul style="list-style-type: none"> -describe what went well, thinking about design criteria -talk about existing products considering: use, materials, how they work, audience, where they might be used; express personal opinion -evaluate how good existing products are -talk about what I would do differently if I were to do it again, and why -evaluate some inventors/designers/ engineers/chefs/ manufacturers of ground-breaking products 	<ul style="list-style-type: none"> -refer to design criteria while designing and making -use criteria to evaluate product -begin to explain how I could improve original design -evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose -discuss by whom, when and where products were designed -evaluate some inventors/designers/ engineers/chefs /manufacturers of ground-breaking products 	<ul style="list-style-type: none"> -evaluate quality of design while designing and making; is it fit for purpose? -keep checking design is best it can be. -evaluate ideas and finished product against specification, stating if it's fit for purpose and aesthetically pleasing. -test and evaluate final product; explain what would improve it and the effect different resources may have had -explain thorough evaluations of existing products considering: how well they've been made, materials, whether they work, how they've been made, fit for purpose -evaluate how much products cost to make and how innovative they are -research and discuss how sustainable materials are -evaluate and discuss some key inventors/designers/ engineers/ chefs/manufacturers of ground-breaking products
Substantive knowledge				
Evaluate	<ul style="list-style-type: none"> -knows that work can be adapted if needed - knows that products can be dismantled to analyse their parts -knows that some activities bring risks -knows some appropriate safety measures -knows how things work -knows some similarities and differences between existing objects / materials / tools -knows materials can have different textures 	<ul style="list-style-type: none"> - knows that in order to improve a product, they must think about how well it went when making -know about some inventors/designers/ engineers/chefs/ manufacturers of ground-breaking products 	<ul style="list-style-type: none"> -knows that design criteria can be useful when evaluating a product -know by whom, when and where existing products were designed -knows about existing products considering: use, materials, how they work, audience, where they might be used -know about some inventors/designers/ engineers/chefs /manufacturers of ground-breaking products -know whether products can be recycled or reused 	<ul style="list-style-type: none"> -know what would make a product fit for purpose -know what would make a product aesthetically pleasing. -know thorough evaluations of existing products: how well they've been made, materials, whether they work, how they've been made, fit for purpose -know how much products cost to make and how innovative they are -understand how sustainable materials are -know the impact of products beyond their intended purpose -know and discuss some key inventors/designers/ engineers/ chefs/manufacturers of ground-breaking products

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Disciplinary knowledge				
Textiles	<ul style="list-style-type: none"> -Practise sewing with blunt needle - practising in and out motion -investigate different materials when making products, choosing appropriate ones with support -choose materials according to aesthetic properties in their makes and crafts - develop knowledge of sewing equipment and practise skills using a Binca - can practise running stitch 	<ul style="list-style-type: none"> -measure textiles -join textiles together to make a product, and explain how I did it -carefully cut textiles to produce accurate pieces -explain choices of textile -make 3D textile structure from two identical fabric shapes. -thread a needle safely -cut fabric with scissors safely -create a pattern piece - make a knot with the thread to finish the stitch neatly -perform new stitches 		<ul style="list-style-type: none"> -think about user's wants/needs and aesthetics when choosing textiles -make product attractive and strong -explain how to join things in a different way -create a product that is fit for purpose -create a clean finish on products -make a prototype -create a pattern piece or template -use a range of sewing techniques and stitches -think about how product might be sold -make 3D textiles project from a combination of fabric shapes. -add applique to products -add embellishments to products for visual appeal -use scissors, needles and other tools safely and accurately -perform of a range of ways to join things
Substantive knowledge				
Textiles	<ul style="list-style-type: none"> -knows that needles can be used to pierce materials -knows what an eye of a needle is -knows thread must be used to sew -knows that some materials are harder to sew with than others -knows that some materials will be more aesthetic than others - know the tools used to sew 	<ul style="list-style-type: none"> -knows how to use a ruler -knows some ways to join textiles together -knows how to safely use scissors -knows some textiles are better for sewing with than others -knows that a 3D textile structure can be made from two identical fabric shapes. -knows how to thread a needle through the eye safely -knows what a pattern piece is - knows that a knot can be used for finishing -knows how to perform 2 new stitches 		<ul style="list-style-type: none"> -knows it is beneficial to consider user's wants/needs and aesthetics when choosing textiles -knows ways to make product attractive -knows ways to make products strong -knows how to join things in a different way -knows how to create a clean finish on products -knows what a prototype is -knows a range of sewing techniques and stitches -knows that a single 3D textiles project can be made from a combination of fabric shapes. -knows what applique is and some methods of adding it to their products -knows that embellishments add visual appeal - knows how to use scissors, needles and other tools safely and accurately -knows of a range of ways to join things
Vocabulary				
Textiles	felt, scissors, button, zip, attach, clothes, thread	Sew, needle, thread, fabric, bauble, stitch, appealing, creativity, design		<p>Synthetic, manufacture, garments, pattern pieces, hem, seams, applique, functionality, designer, innovative, scrutinise,</p> <p>visual appeal, design criteria, zig-zag stitch, finishing, function, aesthetic, embellish, embroidery</p>

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Disciplinary knowledge				
Moving mechanisms	<ul style="list-style-type: none"> -Experiment with loose parts -Begin to use moving equipment and toys such as plug-n-play electronics and BeeBots (programming) -Investigate books that have moving parts and toys that move -develop own product with a moving part by using a split pin. Practise operating equipment such as stopping and starting. 	<ul style="list-style-type: none"> -begin to use levers or slides -make a slide, lever and pivot mechanism 	<ul style="list-style-type: none"> -refine product after testing -grow in confidence about trying new / different ideas -use wheels and axles to create movement -select appropriate tools / techniques -alter product after checking, to make it better -explain alterations to product after checking it. -use pneumatics to create movement -test out prototypes for their moving parts 	
Substantive knowledge				
Moving mechanisms	<ul style="list-style-type: none"> -knows items can have loose parts -knows equipment can be plugged in to make it work -knows that books can have moving parts and toys can move -knows what the function of a split pin is 	<ul style="list-style-type: none"> - understand the mechanisms of levers, pivots or slides and how they work 	<ul style="list-style-type: none"> -knows a product can be adapted after testing -know that wheels and axles can be used to create movement -understand the functionality of tools / techniques -know that air can be used to create movement 	
Vocabulary				
Moving mechanisms	forwards, backwards, sideways, up, down, push pin	Join, movement, mechanism, pivot, lever, slider, wheel	Inflate, pneumatic systems, compressed, pressure, effective, mechanism, purpose, evaluate Motion, rotary, assemble, attach, fling, catapult, mechanism, users, critique	

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Disciplinary knowledge				
Structures	<ul style="list-style-type: none"> -Make a range of products such as puppets, poppies and boats using a range of materials. -make a product stand up (stable) -Begin to develop cutting, sticking and joining skills. - can smooth edges of soft materials for finishing -Explore building area – train tracks, Duplo, wooden blocks, raw materials, Lego -Experiment with different tools in creative area and outdoors. 	<ul style="list-style-type: none"> -begin to measure and join materials, with some support -describe differences in materials -suggest ways to make material/product stronger -select materials according to functional properties -create a base for a structure 	<ul style="list-style-type: none"> -use appropriate materials -work accurately to make cuts and holes -join materials using various resources -begin to make strong structures -begin to reinforce structures -continue working on product even if original didn't work -reinforce and strengthen a 3D frame 	<ul style="list-style-type: none"> -select materials carefully, considering intended use of the product, the aesthetics, functionality and appearance. -measure accurately enough to ensure precision -become confident with more risky tools and equipment -can work safely with risky machinery -ensure product is strong and fit for purpose
Substantive knowledge				
Structures	<ul style="list-style-type: none"> -knows that they can produce their makes using a wide range of materials -knows how to make a product stand up (stable) -knows some cutting, sticking and joining techniques. - knows how to smooth edges of soft materials for finishing -knows what some creative tools are used for 	<ul style="list-style-type: none"> -knows how to use a ruler to measure -knows how to join materials -knows some differences in materials -knows ways to make material/product stronger -knows what a base is -knows that a base helps to make a structure stable 	<ul style="list-style-type: none"> -knows which materials are appropriate for intended purpose -knows how to accurately to make cuts and holes with selected tools and equipment -knows materials can be joined using various resources -begin to understand how to make strong structures -begin to understand some ways to reinforce structures -knows some ways to reinforce and strengthen a 3D frame 	<ul style="list-style-type: none"> -knows how to select materials carefully, considering intended use of the product, the aesthetics, functionality and appearance. -knows how to use appropriate measuring units accurately enough to ensure precision -knows how to be safe with more risky tools and equipment -knows how to work safely with risky machinery
Vocabulary				
Structures	<p>Sellotape, glue stick masking tape, paper clip, plasticine, ruler, straws join, cut, stand, push, first, next, smooth, edges</p>	<p>Stable, stiff, raised, flexible, weak, strong, base, architect</p>	<p>Stable, joining, reinforce, 3d shape names, net, 3d, structure, framework, strengthen, inventor</p>	<p>design brief, customer, purpose, cutting, shaping, joining, finishing techniques, complex structure, butt joint, brackets, supports, dowel, lock, hinge, measuring, accuracy, finesse</p> <p>design brief, customer, purpose, cutting, shaping, joining, finishing techniques, LED, battery source, electrical circuit, complex structure, butt joint, measuring, accuracy, finesse</p>

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Disciplinary knowledge				
Electrical systems	<p>Begin to play with electronic toys such as Plug-n-play electronics and BeeBots (programming) Practise operating equipment such as stopping and starting. Can switch and operate a light</p> <p>Computing curriculum: TBC</p>		<ul style="list-style-type: none"> -use simple circuit in product -use number of components in circuit -incorporate switch into product -construct a working circuit with one or more bulbs -working safely around electrical components -design using CAD 	<ul style="list-style-type: none"> -use different types of circuit in product -think of ways in which adding a circuit would improve product
Substantive knowledge				
Electrical systems	<p>Knows how to operate electronic toys such as Plug-n-play electronics and BeeBots (programming) Knows that when a button is pressed, a light may appear Knows that something can be controlled with buttons, such as stop start.</p>		<ul style="list-style-type: none"> -know what a circuit is -know the components that make a circuit -understands the need to work safely around electrical products -knows that designing can be performed on computers -knows how to operate computers 	<ul style="list-style-type: none"> -know different types of circuits -knows ways in which adding a circuit would improve product
Vocabulary				
Electrical systems	<p>Connect, button, light, torch, bulb, sound</p>		<p>Illuminated, electrical circuit, components, resistor, incandescent, electrical terminal, insulated, CAD, engineer, inventor, design brief</p>	<p>9v battery, electrical circuit, connectors, exposed wires,</p>