

# Uplands Manor Primary School – DT progression grid



## Structures

		EYFS	
National Curriculum		Junk Modelling	Boats
Skills	Design	<ul style="list-style-type: none"> <li>• <i>Making verbal plans and material choices.</i></li> <li>• <i>Developing a junk model.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Designing a junk model boat.</i></li> <li>• <i>Using knowledge from exploration to inform design.</i></li> </ul>
	Make	<ul style="list-style-type: none"> <li>• <i>Improving fine motor/scissor skills with a variety of materials.</i></li> <li>• <i>Joining materials in a variety of ways (temporary and permanent).</i></li> <li>• <i>Joining different materials together.</i></li> <li>• <i>Describing their junk model, and how they intend to put it together.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Making a boat that floats and is waterproof, considering material choices.</i></li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• <i>Giving a verbal evaluation of their own and others' junk models with adult support.</i></li> <li>• <i>Checking to see if their model matches their plan.</i></li> <li>• <i>Considering what they would do differently if they were to do it again.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Making predictions about, and evaluating different materials to see if they are waterproof.</i></li> <li>• <i>Making predictions about, and evaluating existing boats to see which floats best.</i></li> <li>• <i>Testing their design and reflecting on what could have been done differently.</i></li> </ul>

		<ul style="list-style-type: none"> <li>• Describing their favourite and least favourite part of their model.</li> </ul>	<ul style="list-style-type: none"> <li>• Investigating the how the shapes and structure of a boat affect the way it moves.</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>• To know there are a range to different materials that can be used to make a model and that they are all slightly different.</li> <li>• Making simple suggestions to fix their junk model.</li> </ul>	<ul style="list-style-type: none"> <li>• To know that 'waterproof' materials are those which do not absorb water.</li> </ul>

National Curriculum		Year 1	Year 2
		Constructing a windmill	Baby Bear's chair
Skills	Design	<ul style="list-style-type: none"> <li>• Learning the importance of a clear design criteria.</li> <li>• Including individual preferences and requirements in a design.</li> </ul>	<ul style="list-style-type: none"> <li>• Generating and communicating ideas using sketching and modelling.</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Making stable structures from card, tape and glue.</li> <li>• Learning how to turn 2D nets into 3D structures.</li> <li>• Following instructions to cut and assemble the supporting structure of a windmill.</li> <li>• Making functioning turbines and axles which are assembled into a main supporting structure.</li> </ul>	<ul style="list-style-type: none"> <li>• Making a structure according to design criteria.</li> <li>• Creating joints and structures from paper/card and tape.</li> <li>• Building a strong and stiff structure by folding paper.</li> </ul>
	Evaluate		<ul style="list-style-type: none"> <li>• Testing the strength of own structure.</li> <li>• Identifying the weakest part of a structure.</li> </ul>

			<ul style="list-style-type: none"> <li>• <i>Evaluating the strength, stiffness and stability of own structure.</i></li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>• <i>To understand that the shape of materials can be changed to improve the strength and stiffness of structures.</i></li> <li>• <i>To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses).</i></li> <li>• <i>To understand that axles are used in structures and mechanisms to make parts turn in a circle.</i></li> <li>• <i>To begin to understand that different structures are used for different purposes.</i></li> <li>• <i>To know that a structure is something that has been made and put together.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>To know that materials can be manipulated to improve strength and stiffness.</i></li> <li>• <i>To know that a structure is something which has been formed or made from parts.</i></li> <li>• <i>To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.</i></li> <li>• <i>To know that a 'strong' structure is one which does not break easily.</i></li> <li>• <i>To know that a 'stiff' structure or material is one which does not bend easily.</i></li> </ul>

National Curriculum		Year 3	Year 5
		Constructing a castle	Bridges
Skills	Design	<ul style="list-style-type: none"> <li>• <i>Designing a stable structure that is able to support weight.</i></li> <li>• <i>Creating a frame structure with a focus on triangulation.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect.</i></li> <li>• <i>Building frame structures designed to support weight.</i></li> </ul>
	Make	<ul style="list-style-type: none"> <li>• <i>Making a range of different shaped beam bridges.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Creating a range of different shaped frame structures.</i></li> </ul>

		<ul style="list-style-type: none"> <li>• <i>Using triangles to create truss bridges that span a given distance and support a load.</i></li> <li>• <i>Building a wooden bridge structure.</i></li> <li>• <i>Independently measuring and marking wood accurately.</i></li> <li>• <i>Selecting appropriate tools and equipment for particular tasks.</i></li> <li>• <i>Using the correct techniques to saws safely.</i></li> <li>• <i>Identifying where a structure needs reinforcement and using card corners for support.</i></li> <li>• <i>Explaining why selecting appropriating materials is an important part of the design process.</i></li> <li>• <i>Understanding basic wood functional properties.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Making a variety of free-standing frame structures of different shapes and sizes.</i></li> <li>• <i>Selecting appropriate materials to build a strong structure and cladding.</i></li> <li>• <i>Reinforcing corners to strengthen a structure.</i></li> <li>• <i>Creating a design in accordance with a plan.</i></li> <li>• <i>Learning to create different textural effects with materials.</i></li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• <i>Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary.</i></li> <li>• <i>Suggesting points for improvements for own bridges and those designed by others.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Evaluating structures made by the class.</i></li> <li>• <i>Describing what characteristics of a design and construction made it the most effective.</i></li> <li>• <i>Considering effective and ineffective designs.</i></li> </ul>

Knowledge	Technical	<ul style="list-style-type: none"> <li>• To understand some different ways to reinforce structures.</li> <li>• To understand how triangles can be used to reinforce bridges.</li> <li>• To know that properties are words that describe the form and function of materials.</li> <li>• To understand why material selection is important based on properties.</li> <li>• To understand the material (functional and aesthetic) properties of wood.</li> </ul>	<ul style="list-style-type: none"> <li>• To understand what a frame structure is.</li> <li>• To know that a 'free-standing' structure is one which can stand on its own.</li> </ul>
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## Mechanisms/Mechanical Systems

		Year 1		Year 2	
National Curriculum		Making a moving storybook	Wheels and axles	Fairground wheel	Making a moving monster
Skills	Design	<ul style="list-style-type: none"> <li>• Explaining how to adapt mechanisms, using bridges or guides to control the movement.</li> <li>• Designing a moving story book for a</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move.</li> </ul>	<ul style="list-style-type: none"> <li>• Selecting a suitable linkage system to produce the desired motion.</li> <li>• Designing a wheel.</li> </ul>	<ul style="list-style-type: none"> <li>• Creating a class design criteria for a moving monster.</li> <li>• Designing a moving monster for a specific audience in accordance with a</li> </ul>

		given audience.	<ul style="list-style-type: none"> <li>• <i>Creating clearly labelled drawings that illustrate movement.</i></li> </ul>		design criteria.
	Make	<ul style="list-style-type: none"> <li>• <i>Following a design to create moving models that use levers and sliders.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Adapting mechanisms, when:</i> <ul style="list-style-type: none"> <li>➤ they do not work as they should.</li> <li>➤ to fit their vehicle design.</li> <li>➤ to improve how they work after testing their vehicle.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <i>Selecting materials according to their characteristics.</i></li> <li>• <i>Following a design brief.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Making linkages using card for levers and split pins for pivots.</i></li> <li>• <i>Experimenting with linkages adjusting the widths, lengths and thicknesses of card used.</i></li> <li>• <i>Cutting and assembling components neatly.</i></li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• <i>Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed.</i></li> <li>• <i>Reviewing the success of a product by testing it with its intended audience.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Testing wheel and axle mechanisms, identifying what stops the wheels from turning, and recognising that a wheel needs an axle in order to move.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Evaluating different designs.</i></li> <li>• <i>Testing and adapting a design.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Evaluating own designs against design criteria.</i></li> <li>• <i>Using peer feedback to modify a final design.</i></li> </ul>

Knowledge	Technical	<ul style="list-style-type: none"> <li>• <i>To know that a mechanism is the parts of an object that move together.</i></li> <li>• <i>To know that a slider mechanism moves an object from side to side.</i></li> <li>• <i>To know that a slider mechanism has a slider, slots , guides and an object.</i></li> <li>• <i>To know that bridges and guides are bits of card that purposefully restrict the movement of the slider.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>To know that wheels need to be round to rotate and move.</i></li> <li>• <i>To understand that for a wheel to move it must be attached to a rotating axle.</i></li> <li>• <i>To know that an axle moves within an axle holder which is fixed to the vehicle or toy.</i></li> <li>• <i>To know that the frame of a vehicle (chassis) needs to be balanced.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>To know that different materials have different properties and are therefore suitable for different uses.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>To know that mechanisms are a collection of moving parts that work together as a machine to produce movement.</i></li> <li>• <i>To know that there is always an input and output in a mechanism.</i></li> <li>• <i>To know that an input is the energy that is used to start something working.</i></li> <li>• <i>To know that an output is the movement that happens as a result of the input.</i></li> <li>• <i>To know that a lever is something that turns on a pivot.</i></li> <li>• <i>To know that a linkage mechanism is made up of a series of levers.</i></li> </ul>
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National Curriculum		Year 4	Year 6
National Curriculum		Making a slingshot car	Automata toys
Skills	Design	<ul style="list-style-type: none"> <li>• <i>Designing a shape that reduces air resistance.</i></li> <li>• <i>Drawing a net to create a structure from.</i></li> <li>• <i>Choosing shapes that increase or decrease speed as a result of air resistance.</i></li> <li>• <i>Personalising a design.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement.</i></li> <li>• <i>Understanding how linkages change the direction of a force.</i></li> <li>• <i>Making things move at the same time.</i></li> <li>• <i>Understanding and drawing cross-sectional diagrams to show the inner-workings of my design.</i></li> </ul>
	Make	<ul style="list-style-type: none"> <li>• <i>Measuring, marking, cutting and assembling with increasing accuracy.</i></li> <li>• <i>Making a model based on a chosen design.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Measuring, marking and checking the accuracy of the jelutong and dowel pieces required.</i></li> <li>• <i>Measuring, marking and cutting components accurately using a ruler and scissors.</i></li> <li>• <i>Assembling components accurately to make a stable frame.</i></li> <li>• <i>Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles.</i></li> <li>• <i>Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set.</i></li> </ul>



	Evaluate	<ul style="list-style-type: none"> <li>• Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating the work of others and receiving feedback on own work.</li> <li>• Applying points of improvement to their toys.</li> <li>• Describing changes they would make/do if they were to do the project again.</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>• To know that air resistance is the level of drag on an object as it is forced through the air.</li> <li>• To understand that the shape of a moving object will affect how it moves due to air resistance.</li> </ul>	<ul style="list-style-type: none"> <li>• To understand that the mechanism in an automata uses a system of cams, axles and followers.</li> <li>• To understand that different shaped cams produce different outputs.</li> </ul>

## Cooking and Nutrition

		Year 1	Year 3
National Curriculum		Fruit and vegetables	Eating seasonally
Skills	Design	<ul style="list-style-type: none"> <li>• Designing smoothie carton packaging by hand or on ICT software.</li> </ul>	<ul style="list-style-type: none"> <li>• Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Chopping fruit and vegetables safely to make a smoothie.</li> <li>• Identifying if a food is a fruit or a vegetable.</li> <li>• Learning where and how fruits and vegetables grow.</li> </ul>	<ul style="list-style-type: none"> <li>• Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination.</li> <li>• Following the instructions within a recipe.</li> </ul>

	Evaluate	<ul style="list-style-type: none"> <li>• <i>Tasting and evaluating different food combinations.</i></li> <li>• <i>Describing appearance, smell and taste.</i></li> <li>• <i>Suggesting information to be included on packaging.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Establishing and using design criteria to help test and review dishes.</i></li> <li>• <i>Describing the benefits of seasonal fruits and vegetables and the impact on the environment.</i></li> <li>• <i>Suggesting points for improvement when making a seasonal tart.</i></li> </ul>
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National Curriculum		Year 5	Year 6
National Curriculum		What could be healthier?	Come dine with me
Skills	Design	<ul style="list-style-type: none"> <li>• <i>Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients.</i></li> <li>• <i>Writing an amended method for a recipe to incorporate the relevant changes to ingredients.</i></li> <li>• <i>Designing appealing packaging to reflect a recipe.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Writing a recipe, explaining the key steps, method and ingredients.</i></li> <li>• <i>Including facts and drawings from research undertaken.</i></li> </ul>
	Make	<ul style="list-style-type: none"> <li>• <i>Cutting and preparing vegetables safely.</i></li> <li>• <i>Using equipment safely, including knives, hot pans and hobs.</i></li> <li>• <i>Knowing how to avoid cross-contamination.</i></li> <li>• <i>Following a step by step method carefully to make a recipe.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Following a recipe, including using the correct quantities of each ingredient.</i></li> <li>• <i>Adapting a recipe based on research.</i></li> <li>• <i>Working to a given timescale.</i></li> <li>• <i>Working safely and hygienically with independence.</i></li> </ul>

	Evaluate	<ul style="list-style-type: none"> <li>• <i>Identifying the nutritional differences between different products and recipes.</i></li> <li>• <i>Identifying and describing healthy benefits of food groups.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Evaluating a recipe, considering: taste, smell, texture and origin of the food group.</i></li> <li>• <i>Taste testing and scoring final products.</i></li> <li>• <i>Suggesting and writing up points of improvements when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process.</i></li> <li>• <i>Evaluating health and safety in production to minimise cross contamination.</i></li> </ul>
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## Textiles

		EYFS	Year 2	Year 4
National Curriculum		Bookmarks	Pouches	Fastenings
Skills	Design	<ul style="list-style-type: none"> <li>• <i>Designing a pouch.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Using a template to create a design for a puppet.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Writing design criteria for a product, articulating decisions made.</i></li> <li>• <i>Designing a personalised book sleeve</i></li> </ul>
	Make	<ul style="list-style-type: none"> <li>• <i>Developing fine motor/cutting skills with scissors.</i></li> <li>• <i>Exploring fine motor/threading and weaving (under, over technique) with a variety of materials.</i></li> <li>• <i>Using a prepared needle and wool to practise</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Selecting and cutting fabrics for sewing.</i></li> <li>• <i>Decorating a pouch using fabric glue or running stitch.</i></li> <li>• <i>Threading a needle.</i></li> <li>• <i>Sewing running stitch, with evenly spaced, neat,</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Making and testing a paper template with accuracy and in keeping with the design criteria.</i></li> <li>• <i>Measuring, marking and cutting fabric using a paper template.</i></li> </ul>

		threading.	even stitches to join fabric. <ul style="list-style-type: none"> <li>• <i>Neatly pinning and cutting fabric using a template.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Selecting a stitch style to join fabric, working neatly by sewing small, straight stitches.</i></li> <li>• <i>Incorporating fastening to a design.</i></li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• <i>Reflecting on a finished product and comparing to their design.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Troubleshooting scenarios posed by teacher.</i></li> <li>• <i>Evaluating the quality of the stitching on others' work.</i></li> <li>• <i>Discussing as a class, the success of their stitching against the success criteria.</i></li> <li>• <i>Identifying aspects of their peers' work that they particularly like and why.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Testing and evaluating an end product against the original design criteria.</i></li> <li>• <i>Deciding how many of the criteria should be met for the product to be considered successful.</i></li> <li>• <i>Suggesting modifications for improvement.</i></li> <li>• <i>Articulating the advantages and disadvantages of different fastening types.</i></li> </ul>

## Electrical Systems (KS2 only)

		Year 4	Year 6
National Curriculum		Torches	Steady hand game
Skills	Design	<ul style="list-style-type: none"> <li>• <i>Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Designing a steady hand game - identifying and naming the components required.</i></li> <li>• <i>Drawing a design from three different perspectives.</i></li> <li>• <i>Generating ideas through sketching and discussion.</i></li> </ul>

			<ul style="list-style-type: none"> <li>• <i>Modelling ideas through prototypes.</i></li> </ul>
	Make	<ul style="list-style-type: none"> <li>• <i>Making a torch with a working electrical circuit and switch.</i></li> <li>• <i>Using appropriate equipment to cut and attach materials.</i></li> <li>• <i>Assembling a torch according to the design and success criteria.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Constructing a stable base for a game.</i></li> <li>• <i>Accurately cutting, folding and assembling a net.</i></li> <li>• <i>Decorating the base of the game to a high quality finish.</i></li> <li>• <i>Making and testing a circuit.</i></li> <li>• <i>Incorporating a circuit into a base.</i></li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• <i>Evaluating electrical products.</i></li> <li>• <i>Testing and evaluating the success of a final product.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Testing own and others finished games, identifying what went well and making suggestions for improvement.</i></li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>• <i>To know that an electrical circuit must be complete for electricity to flow.</i></li> <li>• <i>To know that a switch can be used to complete and break an electrical circuit.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>To know that batteries contain acid, which can be dangerous if they leak.</i></li> <li>• <i>To know the names of the components in a basic series circuit, including a buzzer.</i></li> </ul>

## Digital World (KS2 only)

		Year 3	Year 5
National Curriculum		Electronic charm	Monitoring devices
Skills	Design	<ul style="list-style-type: none"> <li>• <i>Problem solving by suggesting potential features on a Micro: bit and justifying my ideas.</i></li> <li>• <i>Developing design ideas for a technology pouch.</i></li> <li>• <i>Drawing and manipulating 2D shapes, using computer-aided design, to</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Researching (books, internet) for a particular (user's) animal's needs.</i></li> <li>• <i>Developing design criteria based on research.</i></li> <li>• <i>Generating multiple housing ideas using building bricks.</i></li> </ul>

		produce a point of sale badge.	<ul style="list-style-type: none"> <li>• <i>Understanding what a virtual model is and the pros and cons of traditional and CAD modelling.</i></li> <li>• <i>Placing and manoeuvring 3D objects, using CAD.</i></li> <li>• <i>Changing the properties of, or combining one or more 3D objects, using CAD.</i></li> </ul>
	Make	<ul style="list-style-type: none"> <li>• <i>Using a template when cutting and assembling the pouch.</i></li> <li>• <i>Following a list of design requirements.</i></li> <li>• <i>Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch.</i></li> <li>• <i>Applying functional features such as using foam to create soft buttons.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Understanding the functional and aesthetic properties of plastics.</i></li> <li>• <i>Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range.</i></li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• <i>Analysing and evaluating an existing product.</i></li> <li>• <i>Identifying the key features of a pouch.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Stating an event or fact from the last 100 years of plastic history.</i></li> <li>• <i>Explaining how plastic is affecting planet Earth and suggesting ways to make more sustainable choices.</i></li> <li>• <i>Explaining key functions in my program (audible alert, visuals).</i></li> <li>• <i>Explaining how my product would be useful for an animal carer including programmed features.</i></li> </ul>

Knowledge	Technical	<ul style="list-style-type: none"><li>• <i>To understand that, in programming, a 'loop' is code that repeats something again and again until stopped.</i></li><li>• <i>To know that a Micro:bit is a pocket-sized, codeable computer.</i></li></ul>	<ul style="list-style-type: none"><li>• <i>To know that a 'device' means equipment created for a certain purpose or job and that monitoring devices observe and record.</i></li><li>• <i>To know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose.</i></li><li>• <i>To understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met.</i></li></ul>
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