



THRUPP PRIMARY SCHOOL: Progression of skills in Construction, Mechanisms, Structures and Digital World
(Year B) for EYFS, KS1 and KS2

		Kestrels	Hawks	Buzzards	Eagles	Owls
		(YR) Structures: Junk modelling	(Y1) Mechanisms: Making a moving story book	(Y3) Structures: Making a castle	(Y6) Electrical systems: Steady hand game (Y5) Mechanisms: Pop Up book	(Y5) Digital world: Monitoring devices (Y6) Structures: Playgrounds
Skills	Design	EYFS • I can make verbal plans and material choices. • I can develop a junk model. Y1 I can learn the importance of a clear design criteria. • I can include individual preferences and requirements in a design.	Y1 • I can explain how to adapt mechanisms, using bridges or guides to control the movement. • I can design a moving story book for a given audience. Y2 • Can I create a class design criteria for a moving story book. • Can I design a moving story book for a specific audience in accordance with a design criteria.	Y3 • I can design a castle with key features to appeal to a specific person/purpose. • I can draw and label a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours. • I can design and/or decorate a castle tower on CAD software. Y4 • I can design a stable castle structure that is aesthetically pleasing and selecting materials to create a desired effect. • Building frame structures designed to support weight.	Y4 • I can design a shape that reduces air resistance. • I can draw a net to create a structure from. • I can choose shapes that increase or decrease speed as a result of air resistance. • I can personalise a design. Y5 • I can design a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. • I can build frame structures designed to support weight. Electrical systems • I can design a steady hand game, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.	Y5 Digital world • I can research (books, internet) for a particular (user's) animal's needs. • I can develop design criteria based on research. • I can generate multiple housing ideas using building bricks. • I can understand what a virtual model is and the pros and cons of traditional and CAD modelling. • I can place and manoeuvre 3D objects, using CAD. • I can change the properties of, or combining one or more 3D objects, using CAD. Y5 • I can design a stable structure that is able to support weight. • I can create a frame structure with a focus on triangulation. Y6 I can design a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.

	Make	EYFS • I can improve fine motor/scissor skills with a variety of materials. • I can join materials in a variety of ways (temporary and permanent). • I can join different materials together. • I can describe their junk model, and how they intend to put it together. Y1 • I can make stable structures from card, tape and glue . • I can follow instructions to cut and assemble the supporting structure.	Y1 • I can follow a design to create moving models that use levers and sliders. Y2 • Can I make linkages using card for levers and split pins for pivots. • Can I experiment with linkages adjusting he widths, lengths and thicknesses of card used. • Can I cut and assemble components neatly.	Y3 • I can construct a range of 3D geometric shapes using nets. • I can create special features for individual designs. • I can make facades from a range of recycled materials Y4 • Creating a range of different shaped frame structures. • Making a variety of free standing frame structures of different shapes and sizes. • Selecting appropriate materials to build a strong structure and cladding. • Reinforcing corners to strengthen a structure. • Creating a design in accordance with a plan. • Learning to create different textural effects with materials.	Y4 • I can measure, mark, cut and assemble with increasing accuracy. • I can make a model based on a chosen design. Y5 • I can create a range of different shaped frame structures. • I can make a variety of free standing frame structures of different shapes and sizes. • I can select appropriate materials to build a strong structure and cladding. • I can reinforce corners to strengthen a structure. • I can create a design in accordance with a plan. • I can learn to create different textural effects with materials. Electrical systems • I can make a game with a working electrical circuit and switch. • I can use appropriate equipment to cut and attach materials. • I can assemble a game according to the design and success criteria.	Y5 Digital world • I can understand the functional and aesthetic properties of plastics. • I can programme to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range. Y5 • I can make a range of different shaped playground equipment.. • I can independently measure and mark wood accurately. • I can select appropriate tools and equipment for particular tasks. • I can use the correct techniques to saws safely. • I can identify where a structure needs reinforcement and using card corners for support. • I can explain why selecting appropriating materials is an important part of the design process. • I can understand the basic wood functional properties. Y6 • I can build a range of play apparatus structures drawing upon new and prior knowledge of structures. • I can measure, mark and cut wood to create a range of structures. • I can use a range of materials to reinforce and add decoration to structures.
--	------	---	---	--	--	---

	Evaluate	EYFS • I can give a verbal evaluation of their own and others' junk models with adult support. • I can check to see if their model matches their plan. • I can consider what they would do differently if they were to do it again. • I can describe my favourite and least favourite part of their model. Y1 • I can understand that the shape of materials can be changed to improve the strength and stiffness of structures. • I understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). • I am beginning to understand that different structures are used for different purposes. • I know that a structure is something that has been made and put together.	Y1 • I can test a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed. • I can review the success of a product by testing it with its intended audience. Y2 • Can I evaluate my own designs against design criteria. • Can I use peer feedback to modify a final design.	Y3 • I can evaluate my own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. • I can suggest points for modification of the individual designs. Y4 • I can evaluate structures made by the class. • I can describe what characteristics of a design and construction made it the most effective. • I can consider effective and ineffective designs.	Y4 • I can evaluate the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance. Y5 • I can evaluate structures made by the class. • I can describe what characteristics of a design and construction made it the most effective. • I can consider effective and ineffective designs. Electrical systems I can evaluate electrical products. • I can test and evaluate the success of a final product.	Y5 Digital world • I can state an event or fact from the last 100 years of plastic history. • I can explain how plastic is affecting planet Earth and suggesting ways to make more sustainable choices. • I can explain key functions in my program (audible alert, visuals). • I can explain how my product would be useful for an animal carer including programmed features Y5 • I can adapt and improve my own designs by identifying points of weakness and reinforcing them as necessary. • I can suggest points for improvements of my own designs and those designed by others. Y6 • I can improve a design plan based on peer evaluation. • I can test and adapt a design to improve it as it is developed. • I can identify what makes a successful structure.
--	----------	---	--	--	---	---

Knowledge	EYFS • I know there are a range to different materials that can be used to make a model and that they are all slightly different. • I can make simple suggestions to fix their junk model. Y1 • I know that a client is the person I am designing for. • I know that design criteria is a list of points to ensure the product meets the clients needs and wants.	Y1 • I know that a mechanism is the parts of an object that move together. • I know that a slider mechanism moves an object from side to side. • I know that a slider mechanism has a slider, slots , guides and an object. • I know that bridges and guides are bits of card that purposefully restrict the movement of the slider. Y2 • I know that mechanisms are a collection of moving parts that work together as a machine to produce movement. • I know that there is always an input and output in a mechanism. • I know that an input is the energy that is used to start something working. • I know that an output is the movement that happens as a result of the input. • I know that a lever is something that turns on a pivot. • I know that a linkage mechanism is made up of a series of levers.	Y3 • I understand that wide and flat based objects are more stable. • I understand the importance of strength and stiffness in structures. Y4 • I can understand what a frame structure is. • I know that a ‘free-standing’ structure is one which can stand on its own.	Y4 • I understand that all moving things have kinetic energy. Y5 • I understand what a frame structure is. • I know that a ‘free-standing’ structure is one which can stand on its own. Electrical systems • I understand that electrical conductors are materials which electricity can pass through. • I understand that electrical insulators are materials which electricity cannot pass through. • I know that a battery contains stored electricity that can be used to power products. • I know that an electrical circuit must be complete for electricity to flow. • I know that a switch can be used to complete and break an electrical circuit.	Y5 Digital world • I know that a ‘device’ means equipment created for a certain purpose or job and that monitoring devices observe and record. • I know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose. • I understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met. Y5 • I understand some different ways to reinforce structures. • I know that properties are words that describe the form and function of materials. • I understand why material selection is important based on properties. • I understand the material (functional and aesthetic) properties of wood. • I understand how to carry and use a saw safely. Y6 • I know that structures can be strengthened by manipulating materials and shapes.
------------------	---	---	--	---	---

Additional Knowledge

- I know some real-life objects that contain mechanisms.

Y3

- I know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose.
- I know that a façade is the front of a structure.
- I understand that a castle needed to be strong and stable to withstand enemy attack.
- I know that a paper net is a flat 2D shape that can become a 3D shape once assembled.
- I know that a design specification is a list of success criteria for a product.

Y4

- I know that cladding can be applied to structures for different effects.
- I know that aesthetics are how a product looks.
- I know that a product's function means its purpose.
- I understand that the target audience means the person or group of people a product is designed for.
- I know that architects consider light, shadow and patterns when designing.

Y4

- I understand that products change and evolve over time.
- I know that aesthetics means how an object or product looks in design and technology.
- I know that a template is a stencil you can use to help you draw the same shape accurately.
- To know that it is important to assess and evaluate design ideas and models against a list of design criteria.

Y5

- I know that a pavilion is a decorative building or structure for leisure activities.
- I know that cladding can be applied to structures for different effects.
- I know that aesthetics are how a product looks.
- I know that a product's function means its purpose.
- I understand that the target audience means the person or group of people a product is designed for.
- I know that architects consider light, shadow and patterns when designing.

Y5 Digital world

- I understand key developments in thermometer history.
- I know events or facts that took place over the last 100 years in the history of plastic, and how this is changing our outlook on the future.
- I know the 6Rs of sustainability.
- I understand what a virtual model is and the pros and cons of traditional vs CAD modelling.

Y6

- I understand what a 'footprint plan' is.
- I understand that in the real world, design, can impact users in positive and negative ways.
- I know that a prototype is a cheap model to test a design idea.