

SC1	STRUCTURES	ACTIVITY
(EYF S) FS1 FS2	Often structures have a certain function, they are made to do something. For example, chairs are for sitting on and tables are for putting things on. Man-made structures are made by humans. Natural structures occur naturally on their own. When designing a structure, it is important to consider shape and materials. The shapes of materials can be changed to improve the strength and stiffness of structures Structures are more stable when they have a wider base.	
Year 1 Year 2	Strength means how robust and powerful a structure is. Stability means how firm a structure is in its position. Stiffness means how rigid a structure is and if it is difficult or impossible to bend. Bridges are structures built over rivers, railway tracks and roads to allow people/vehicles to cross over. In order for a bridge to carry heavy loads, it must be made of strong materials like iron and steel. Structures can be made stronger and more rigid by making sure that parts and materials are properly joined together, e.g. with glue or tape. Shapes and structures with wide, flat bases or legs are the most stable Folding and layering (adding an extra layer) of materials can be used to strengthen and stiffen structures.	Make a bridge from art straws Test strength using weights
Year 3 Year 4	A frame structure is a structure that combines beams, columns and slabs to resist heavy load; it may have a membrane stretched over it. A shell structure is curved and hollow with a strong outer layer (eg. Morrison Shelter) Triangles are very strong shapes for building. This is because two sides of the triangle are compressed whilst the bottom side is stretched. Each side feels the force but neither side bends. (eg. Morrison Shelter / Anderson Shelter).	Make morrison shelters using wood as the main frame
Year 5 Year 6	A tie is a part of a structure under tension. A strut is a part of a structure under compression Span is the distance between two adjacent supports. A beam is a horizontal part of the frame that carries a load. Buttresses can make a structure more stable. A buttress is something that is built against a structure to give it more stability by adding width to the base.	Fairground rides

RWPA DT | Key Substantive Concept Knowledge | MECHANICAL SYSTEMS

SC2	Mechanical Systems	ACTIVITY
(EYF S) FS1 FS2	Mechanisms are a collection of moving parts that work together to produce movement Mechanisms control movement	
Year 1 Year 2	A slider is a rigid bar which moves backwards and forwards in a straight line. An axle helps wheels to move a vehicle A wheel is a circular object that revolves on an axle . A lever is something that turns on a pivot A pivot is a fixed part that holds a lever in place as it turns.	Moving pictures with split pins Vehicle that goes over the bridge
Year 3 Year 4	A pivot turns or rotates like a hinge . A hinge is a mechanical joint that allows controlled movement between two objects. A lever is a rigid bar that pivots on a fixed point (fulcrum) to create movement. A linkage mechanism is made up of a series of levers. When two or more levers are interconnected, they form what is called a linkage. A linkage is a mechanism that transmits motion and force between the levers.	Pop-up books
Year 5 Year 6	With a lever , the distance between the force applied and the fulcrum determines how much force is needed for the weight to be lifted. (See-saws are classic levers!) A cam is a shaped disc or oval that rotates on an axle or crankshaft . It has bumps, lobes, or uneven edges on its surface. These bumps on the cam are what make things move in a specific way so a cam can create different types of motion . (egg shaped, heart shaped, snail shape). A follower touches the cam and the cam moves the follower up and down or back and forth. A cam converts rotary motion (movement that goes round in a circle) into linear motion (movement in a straight line). Pulley Systems A pulley is a type of wheel that has an inner groove in its circumference. When a rope, cable or belt runs along the groove , objects can be moved and lifted with far less effort. A motor pulley system can be used to create motion. The fairground ride is joined to a rotating central axle through which the drive from the motor pulley system is transmitted to the fairground ride. The speed and rotation of the ride can be altered by adjusting the size of the driven pulley .	Cam toys Fairground ride

SC3	Electrical Systems	
EYFS		
Year 1		
Year 2		
Year 3	A circuit is a closed loop that allows electricity to flow through it.	Covered in science curriculum
Year 4	A simple circuit consists of a power source, a conductor and a load. A power source provides the electrical energy to the circuit. A conductor provides a path for electricity to flow. The load is the element that uses the electricity and converts it into another form of energy. (e.g. a light bulb converts electrical energy into light). A conductor is a material that allows electric current to pass through it easily. An insulator is a material that makes it difficult for electricity to flow through it. Batteries are common power sources for simple circuits. Simple switches can be used to open or close a circuit.	Add buzzer / LED to morrison shelters
Year 5	An electrical system can be used as part of a product (e.g. series circuits incorporating switches, bulbs, buzzers and motors]	Fairground rides
Year 6	A computer program can be used to monitor and control their products.	

SC4	Computer Programming	
	KS2	
EYFS		
Year 1		
Year 2		
Year 3	An input (like sensors) gathers information from the environment. An output causes a product to react (e.g., lights, motors).	Crumbles - through computer science
Year 4	A computer program controls inputs and outputs. <i>HOW? (crumbles Y3/4)</i> Computer programs are used to control everyday devices. Decomposition is where programming is broken down into smaller parts. Debugging is where detecting and correcting errors in a program.	
Year 5	A computer program controls inputs and outputs. <i>HOW? (microbits Y5/6)</i> A loop is a repetition of code within programs.	Micro Bits
Year 6	A variable allows us to create flexible and dynamic programs that can handle different situations. Selection allows programs to make decisions and follow different paths based on conditions. Sequencing dictates the order a computer processes information. Know that computer aided design (CAD) can be used to generate and develop ideas.	

RWPA DT | Key Substantive Concept Knowledge | **TEXTILES**

SC5	Textiles	
EYFS		
Year 1	A running stitch is a series of small, even stitches that go up and down through the fabric, creating a dashed line to join fabrics together. Templates are like pre-made blueprints used to create various things quickly and consistently.	Christmas tree decorations
Year 2		
Year 3	An overstitch is a versatile stitch used in sewing for both functional and decorative purposes. A backstitch is a versatile stitch used in both embroidery and sewing. It's known for its strength	Christmas Pouches
Year 4		
Year 5	An overstitch is a versatile stitch used in sewing for both functional and decorative purposes. A backstitch is a versatile stitch used in both embroidery and sewing. It's known for its strength The blanket stitch is a decorative stitch used to finish the edges of fabric,. A prototype is a preliminary version of a product, system, or process	'Bag for life with plaited strap and phone pocket in shape of animal.
Year 6		