Resistant Materials (skills and knowledge)

What does the progression of skills and knowledge look like?

Phase	Progression objectives	Vocabulary
EYFS	- Begin to cut and tear materials. - Stick and glue materials together. - Use junk objects to create their own designs. - Begin to consider how they join materials together.	**Tier 2** create, rough, strong, stretchy, smooth, hard, squashy, soft, make, build, junk, recycle **Tier 3** model, cut, join, make, build, card, plastic, paper, foam, wood, metal, glue, scissors, tape
Key Stage 1	- Follow basic procedures for safety. - Cut materials safely using scissors. - Tear, fold and curl materials. - Join using gluing and taping. - Begin to use a simple hinge. - Select materials and tools based on their properties. - Create products based on a design. - Explore and use simple mechanisms [e.g. levers, sliders, wheels and axles], in their products. - Build structures, exploring how they can be made stronger, stiffer and more stable.	**Tier 2** weaker, stronger, stable, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved, metal, wood, plastic, cuboid, cube, cylinder **Tier 3** lever, slider, wheel, axle, hinge, cut, fold, join, fix, structure
Lower Key Stage 2	- Follow procedures for safety. - Cut, tear and shape materials with increasing accuracy. - Use a wider range of joining methods (e.g. fasteners, tabs, flange) - Choose appropriate materials and tools for a product based on their functional properties and aesthetics. - Strengthen, stiffen and reinforce a product using suitable materials. - Make mechanical /moving elements (e.g. pulleys, levers and linkages) - Choose appropriate materials by testing their properties using a prototype. - Incorporate a simple electrical system into their product.*	**Tier 2** accurate, accuracy, decision, suitability, appropriate, purposeful, product, function **Tier 3** framework, structure, marking out, scoring, refining, tabs, fasteners, flange, adhesives, joining, assemble, material, design choice, mechanism, electronics, circuit, prototype, pulleys, levers and linkages
Upper Key Stage 2	- Follow procedures for safety with a wider range of tools and processes. - Cut and shape materials based on their design with increasing accuracy. - Choose appropriate tools and methods to cut and form a wider range of materials. - Choose appropriate materials by testing their properties using prototypes, justifying their choices. - Make mechanical /moving elements (e.g. gears, cams and pneumatics) - Use a wider range of joining methods (e.g. inserts, wrap, gusset, notch) - Incorporate a more complex electrical system into their designs (e.g. more than one component / adding a switch).* - Use computing to program, monitor and control their products.	**Tier 2** stiffen, strengthen, stability, temporary, permanent, complex, **Tier 3** reinforce, element, refinement, gears, cams, hydraulics, inserts, wrap, gusset, notch, electrical system, program,
Key Stage 3	- Be competent in workshop health and safety, to be able to identify potential hazards and understand how to avoid them in the workshop	**Tier 2** Accuracy, Efficiency, Identical, Personalised, Quality

	- Use specialist tools and equipment with accuracy and independence. - Understand how to correct manufacture errors as they arise. - Understand the difference between similar tools and be able to correctly chose the appropriate tool (e.g. Hegner Saw, Coping Saw, Tenon Saw) - Be competent using tools and equipment for timber, metal & polymers. - Have a knowledge of the use of motion and mechanical systems (e.g the use of CAM's) - To have knowledge of a range of resistant materials and their environmental impact (Timbers; hardwood, softwood and manufactured boards, Metals; ferrous and non-ferrous, Polymers; thermoplastic and thermosetting plastics) - Accurately dimension and mark out materials following given dimensions /plans. Using the correct tools and equipment (e.g. steel rule, try square, engineers square, marking gauge etc) - To have knowledge of permanent and temporary joining methods for a range of materials (e.g. Timbers; traditional wood joints, components; screws. Metals; rivets, Plastics; solvent glue) - To have knowledge of finishing methods and finishes for a range of materials (e.g. Sanding, Timbers; Oil, Wax, Varnish, Wood Stain, Metal; Filing/abrasives, Polish, Paint etc) - Be able to incorporate the use of CAD /CAM into products where possible - To understand the use of electronics and electronic components *<u>links to science</u> - To understand the considerations of products are created in industry (considerations of accuracy, efficiency, cost, quantity, quality, jigs, templates etc)	**<u>Tier 3</u>** alloy, coping saw, Chamfer, , engrave. Ferrous, Finish. Forstner Bit, Glass paper, Hegner saw, Industrial Manufacture,, Jig, Manufactured board, pine, Pillar Drill. Plane, Recycle, Reduce, Renew, Replant, Rivet, Temporary, Tenon, timber, Tin snips, Life cycle, Marking out, Metal, Mortise Machine, Non-ferrous, Ore, ,

*Linked to science curriculum