Bugle School

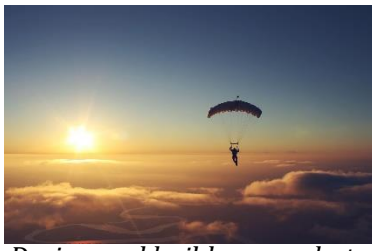
Aspire Academy Trust

D&T Curriculum

	Spring Term	
	Design Technology	
	Spring 1	**Spring 2**
Year 1		**Mechanisms** *Wind-up landscape scene (Seasons and weather)* 
Year 2	**Structures** *Build a house (India)* 	
Year 3		**Mechanisms** *Design and build a wind turbine (Rivers & Mountains)* 
Year 4	**Structures** *Design an earthquake proof building (Volcanoes& Earthquakes)* 	
Year 5		**Structures** *Design and build a parachute that will fall to earth and protect its cargo* 
Year 6	**Electrical** *Design and build a vehicle (Rainforests)* 	

	Spring Term		Spring Term	
	Seasons & Weather		**Country study: India**	
	Year 1		Year 2	
	Spring 1	Spring 2	Spring 1	Spring 2
Overview		**Mechanisms**  *Wind-up scene of a landscape.*	**Structures**  *Build a house.*	
Final Outcome	**Create a landscape scene with winding mechanisms made out of reclaimed materials (Seasons and Weather).**		**Design and construct houses that could be found in New Delhi using recycled materials.**	
Key Skills	Understand simple winding mechanisms Follow instructions of construction kits Use tools accurately and safely Assembly, join and combine materials Create stable structures Evaluation of completed work based on agreed criteria		Relate the way things work to their intended purpose Examine materials involved in the construction of an object Assemble, join and combine materials Recognise shapes and application in simple structures Make models which reflect ideas Evaluate products noting strengths and possible changes	
Key Vocab	mechanism stable fixture axle connecting attaching		model join surface framework equipment user	

	Spring Term		Spring Term	
	Mountains and Climates		**Volcanoes and Earthquakes**	
	Year 3		Year 4	
	Spring 1	Spring 1	Spring 2	Spring 2
Overview		**Mechanisms**  *Design and build wind turbine.* *(Can link to Science)*	**Structures**  *Design and build an earthquake proof house*	
Final Outcome	**Design, create and evaluate a wind turbine with a number of different mechanisms – it must lift a weighted cup off the floor (Mountains & Climates).**		**Design and build an earthquake proof house that passes the 'shake' test (Volcanoes & Earthquakes).**	
Key Skills	Consider sustainability Choose suitable tools for making Incorporate levers and linkages Create simple mechanisms Join assemble and combine materials accurately Incorporate movement Plan for production Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect Evaluate systematically and make on-going modifications		Develop an understanding of stable structures Apply use of triangulation in structures Disassemble and evaluate products Strengthen materials through a variety of strategies Undertake a variety of joining methods	
Key Vocab	resistance efficiency rotation force speed pivot adhesive scoring temporary linear hinge		component layering stable strengthen stiffen reinforce free-standing sturdy	

	Spring Term		Spring Term	
	Science - Forces		**Rainforests**	
	Year 5		**Year 6**	
	Spring 1	**Spring 1**	**Spring 2**	**Spring 2**
Overview		**Structure**  *Design and build a parachute that will fall to earth and protect its cargo*	**Electrical**  *Design and build a vehicle.*	
Final Outcome	***Design, create and evaluate a parachute that is Scientifically accurate and effective (Forces).***		***Design and make a controllable, battery powered vehicle using card, wood, reclaimed materials and a variety of mechanical and electrical components (Rainforests).***	
Key Skills	Identify and describe the purpose Explain how parts of their product will work Generate innovate ideas and choose materials based on suitability Represent ideas in annotated diagrams Choose suitable tools to measure, mark, cut and shape Join, assemble and combine materials Evaluate the product on design and appearance		Develop construction ideas by considering the needs of users Sketch and work with technical components Mark, measure and join materials with increasing accuracy Use a variety of tools with precision and care Use simple mechanisms to provide a transmission system Use simple electrical circuits	
Key Vocab	prototype annotation components modify function structure strengths weaknesses develop evaluate		mechanism components assemble annotation offset shaft circuit chassis motor spindle pulley	

Progression of skills

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design, make, evaluate and improve.	• Explain what they are making and which materials they are using. • Design products that have a clear purpose and an intended user. • Use pictures and words to convey what they want to make. • Make products, using a range of tools to cut, shape, join and finish. • Say what they like and don't like about their product and explain why. • Talk about how closely their finished product meets their design criteria. • Begin to use software to represent 2D designs.		• Investigate existing products, including drawing them to analyse and understand how they are made. • Plan a sequence of actions to make a product. • Develop more than one design. • Develop prototypes • Generate design with annotated sketches and computer-aided design (CAD) where appropriate. • Refine work and techniques as work progresses, continually evaluating the product design. • Identify strengths and weaknesses of their design ideas. • Talk about how closely their finished product meets their design criteria and meets the needs of others.		• Undertake research to inform design process. This may include surveys and interviews. • Use prototypes, cross-sectional diagrams, exploded diagrams and CAD software to represent designs. • Consider the views of others when evaluating their own work. • Ensure products have a high-quality finish, using art skills where appropriate. • Justify their decision about materials and methods of construction. • Make suggestions on how their design/produce could be improved.	
Construction, mechanics and electronics.	• Mark out materials to be cut using a template. • With support cut strip wood/dowel using a hacksaw. • Make vehicles using construction kids which contain free running wheels.	• Use a range of materials to create models with wheels and axles. E.g. tubes, dowel and cotton reels. • Use materials to practice drilling, screwing, nailing and gluing to strengthen products.	• Create series circuits. • Strengthen frames using diagonal struts, • Begin to use mechanical systems in their products e.g. gears, pulleys and levers.	• Create series and parallel circuits. • Investigate how to make structures more stable e.g. by widening the base. • Understand and use mechanical structures in their products e.g. gears, pulleys and levers.	• Create a model using an ICT control model. • Use a glue gun with close supervision. • Join materials using appropriate methods. Use a hand drill to drill tight and loose fit holes.	• Create circuits that employ a number of components (such as LEDs, resistors and transistors). • Cut wood accurately to 1mm. Build frameworks using a range of materials e.g. wood, card and corrugated plastic.
Materials	• Fold, tear, and cut paper or card. • Investigate strengthening sheet materials. • Roll paper to create tubes. • Demonstrate a range of joining techniques such as gluing or taping. • Measure and mark out lines.	• Demonstrate a range of joining techniques such as gluing, taping or creating hinges. • Cut materials safely using tools provided. • Demonstrate a range of cutting and shaping techniques such as tearing, cutting, folding and curling. • Use simple pop-ups.	• Measure and mark out accurately. • Cut materials accurately and safely by selecting appropriate tools. • Cut slots.	• Measure and mark out to the nearest mm. • Use and explore complex pop-ups. • Cut slots and internal shapes. • Create nets.	• Cut material with precision. • Cut accurately and safely to a marked line. • Join/combine materials with temporary, fixed or moving joints.	• Cut materials with precision and refine the finish with appropriate tools (such as sanding wood). • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape.
Take inspiration from design throughout history.	• Explore objects and designs to identify likes and dislikes. • Explore how products have been created. Key Inventor: Brunnel		• Disassemble products to understand how they work. • Improve on existing designs, giving reasons for choices. • Identify some of the great designers in different areas of study to generate ideas from their designs. Key inventor: The Wright Brothers		• Use knowledge of inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products to create their own innovative designs. Key inventors: Da Vinci, Kwolek and Benz	