

Y5 – D&T – Squashed Tomato Challenge (Model pulley system) (Mechanisms)

Inspiration Creativity -		Partnership with parents Community	
Key Questions		Key concepts	
Design - Levers – How does a lever work? (L1-plank and log – small piece of wood and a pencil) - Pulleys – How does a pulley work? (L2 -make one) - Gears – How does a gear work? (www.bbc.co.uk) - Pulleys – will 9 year olds beat Britain’s strongest man. - Gears – moving a piano uphill - Levers – How do levers work) - How can we design a model to transport tomatoes down the mountain?		- Mechanisms (gears and pulleys)	
Make - How can we make a model to transport tomatoes down the mountain?		Skills	
Evaluate - How do our solutions compare to the real solution? Video of what they do in Nepal. (Practicalaction.org/squashed-tomato-challenge.) - What might I do differently next time? - How could I improve my design?		- Generally, there is a good understanding of opportunities for design. - Planning of work flows and careful selection of materials mean work is generally carried out efficiently. - Generally, designs are evaluated and refined throughout a project. - Appropriate tools are generally chosen to safely cut out materials. - There is generally accurate measurement and marking to the nearest millimetre. - Appropriate techniques are generally chosen to cut and shape materials. - Appropriate joining techniques are generally selected and used well. - Generally, science knowledge is applied well	
Also covered in: <ul style="list-style-type: none"> - Y1 – Books with levers and sliders - Y2 - Wacky Races - Y4 – Cam Mechanisms 			
By the end of this unit, children will be able to: <ul style="list-style-type: none"> - Understand how levers, gears and pulleys work - Apply their science knowledge to solve a problem - Evaluate and refine a design to improve the quality - Understand that different situations have different design constraints (i.e. no electricity – Nepal mountains) 			
Knowledge Practicalaction.org/squashed-tomato-challenge. <ul style="list-style-type: none"> - Levers, gears and pulleys allow a smaller force to have a greater effect - Pulleys are more by looping a rope over one or more wheels. Looping the rope over more wheels increases the upwards force. Using two wheels means you can lift something twice as heavy using the same force. However you would have to pull it twice as far. (Pulley activity – On the move – NUSTEM) - Gears are rotating wheels with teeth or cogs cut into the edge which fit into the teeth of a second wheel. They can change the speed of applied forces. - Real life engineering has constraints of technology, resources including finance. 			
Topic Specific Vocabulary Pulley, lever, gear, force, ratio, work, load, transport, developing country, constraint, fulcrum, pivot,		NC Subject content <ul style="list-style-type: none"> - Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individual’s groups - Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design - Select from and use a wider range of tools and equipment to perform practical tasks - Select from and use a wider range of components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities - Investigate and analyse a range of existing products (BBC videos) - Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work - Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. - Understand and use mechanical systems in their products. (pulleys 	
Subject Specific/Academic Vocabulary This vocabulary should be explicitly taught in context. Other tier 2 words should also be explored as they are encountered.			
Year 3	Year 4	Year 5	Year 6
Appropriate, features, specific, concept, range, sequence, structure	Economic, identified, potential, procedure, process, variables	Affect, analyse, criteria, demonstrate, specify	Technique, component, justify, outcome
We are Product Designers/Being a Product Designer/I am a Product Designer (entrepreneur) Design and make a model to solve a real life problem using pulleys.			