

## Medium Term Plan: Supporting Implementation of LTP/Progression Grid

Subject: DT - Levers and linkages	Unit 1/4	Year: A Phase 2
NC/PoS:		
<ul style="list-style-type: none"><li>- To use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups</li><li>- To generate, develop, model and communicate their ideas through discussion, annotated sketches and prototypes</li><li>- To select from and use a wider range of tools and equipment to perform practical tasks accurately</li><li>- To investigate and analyse a range of existing products</li><li>- To evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</li><li>- To understand and use mechanical systems in their products</li></ul>		
Prior Learning (what pupils already know and can do)		
<ul style="list-style-type: none"><li>- Know how to design a product with a slider or lever and can explain the user and purpose. For example: a Christmas card with a moving character</li><li>- Know how to draw an annotated sketch of their slider or lever product and can label it with materials and key parts (slider/lever, slit, split pin)</li><li>- Know how to make prototypes of both sliders and levers.</li><li>- Select from PVA glue, glue sticks and scissors to cut and join materials (card and paper).</li><li>- Know a variety of real-life items that use sliders and levers such as books, games (hungry hippos), seesaws at a park, brakes on a bike etc and can explain how the slider or lever creates movement.</li><li>- Know the difference between sliders and levers.</li><li>- Know if their card is suitable for the intended user and purpose. They offer a way to improve their card with some guidance.</li></ul>		
End points (what pupils MUST know and remember)		
<ul style="list-style-type: none"><li>- Know how to design a product using more than one lever or linkage that is appealing and can explain the user and purpose. For example: a book</li><li>- Know how to draw an annotated sketch of a mechanism and can label it with materials and equipment.</li><li>- Know how to make a prototype of levers and linkages using paper/card and can identify the input, output, fixed and moving parts.</li><li>- Know how to select from PVA glue, glue sticks, paper clips, split pins and scissors to cut and join materials (card and cardboard).</li><li>- Know how to name real items that use levers or linkages: windshield wiper, scissors and bicycle brakes.</li><li>- Know if their moving product is appealing and suitable for the intended user and purpose.</li></ul>		
Key Vocabulary		
Mechanism, lever, linkage, slot, guide, bridge, loose pivot, fixed pivot, input, output, oscillating, reciprocating, prototype, evaluation		
Recommended Resources:		
<ul style="list-style-type: none"><li>- Card, paper, glue sticks, PVA glue, scissors</li><li>- Paper clips, split pins, card strips for pivots and linkages</li><li>- Real-life mechanism examples (scissor lifts, lamp arms, wipers, bike brakes)</li></ul>		

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<ul style="list-style-type: none"><li>- Annotated sketch and design templates</li><li>- Rulers for accurate measuring</li><li>- Instructional videos demonstrating levers and linkages</li></ul>
<p>Curriculum Connections:</p> <ul style="list-style-type: none"><li>- <b>Science</b></li><li>- Forces, motion, materials</li><li>- <b>Maths</b></li><li>- Measuring accurately, understanding symmetry and geometry</li><li>- <b>English</b></li><li>- Speaking and listening, explaining design choices</li><li>- What if questions and answers</li><li>- <b>Art and Design</b></li><li>- Decorative techniques, visual planning</li><li>- <b>Personal development</b></li><li>- Resilience, creativity, self-expression, collaborative working</li></ul>
<p>Career Opportunities:</p> <ul style="list-style-type: none"><li>- Mechanical Engineer</li><li>- Product Designer</li><li>- Animator/Pop-up Book Designer</li><li>- Robotics Engineer</li><li>- Industrial Mechanic</li><li>- Toy Designer</li></ul>
<p>Session 1:</p> <p>Evaluating existing products</p> <ul style="list-style-type: none"><li>- Children should explore existing products that use levers and linkages, for example: lamp with moveable arm, train wheels, digger and extended scissor lift.</li><li>- Consider how they move, the direction of movement, where the loose and fixed pivots are and the input and output.</li><li>- Children to consider where the slot, guide and bridge are and why these are required.</li></ul> <p>Vocab: lever, linkage, fixed and loose pivots, input, output, slot, guide, bridge, oscillating, reciprocating</p>
<p>Session 2:</p> <p>Practising skills</p> <ul style="list-style-type: none"><li>- Children should practise making levers and linkages with card strips and develop a prototype of a mechanical system.</li><li>- Consider how they move, the direction of movement, where the fixed and loose pivots are and the input and output.</li></ul> <p>Vocab: lever, linkage, prototype, mechanism, fixed and loose pivots, input, output, oscillating, reciprocating</p>
<p>Session 3:</p> <p>Designing</p> <ul style="list-style-type: none"><li>- Through discussion with peers and adults develop a design criterion, this should consider: Who is the intended user and what is the purpose of the mechanical system? What materials will you use? How will it be joined? How will it move? Where will the fixed and moving pivots be? Where will the input and output be? How will it be finished?</li><li>- Will a slot, guide and/or bridge be required? Where will it go?</li><li>- Present ideas through annotated sketches.</li><li>- Design: Can you design a product using more than one lever or linkage?</li></ul>

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- Innovation: Have you considered how to make the project different and better than others of the same kind?
- Individual liberty – children are encouraged to make their products different and unique.

Vocab: mechanism, slot, guide, bridge, loose and fixed pivot, oscillating, reciprocating

Session 4:

Making

- Children will select from and use appropriate tools and materials to accurately measure, mark out, score, cut, shape and join their mechanical systems using card, PVA glue, glue sticks, paper clips, split pins and scissors
- Children will use finishing and decorative techniques suitable for the product they are designing and making in order to make it appealing.
- Resilience – during the entire making process, we discuss keeping on trying and never giving up even if the task gets tricky.

Vocab: mechanism, lever, linkage

Session 5:

Evaluating

- Evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development.
- Carry out appropriate tests – Does the mechanical system move in the intended direction?
- Functionality: Does the product work for the intended purpose? Does it move effectively? Is the product appealing to the eye?
- Honesty – during the evaluation stages discuss being honest with ourselves (self-reflection) and others to ensure we can improve ourselves and our work.

Vocab: evaluation

Future learning this content supports:

Phase 2 – Pneumatics

Phase 3 – Pulleys and gears

Phase 3 - CAMs