Eversley Primary School– Knowledge Organiser

Design & Technology	Mechanics	Year 4	Autumn Term

Statutory Requirements

- use research and develop design criteria to design innovative, functional, appealing products that are fit for purpose and aimed at a target market,
- generate, develop, model and communicate ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design (CAD)
- select and use a wider range of tools & equipment to perform practical tasks [cutting, shaping, joining, finishing],
- select materials and components, according to their functional properties and aesthetic qualities
- investigate & analyse a range of existing products
- evaluate ideas and products against own design criteria & consider the views of others to improve their work
- **understand and use mechanical systems in their products [e.g, gears, pulleys, cams, levers & linkages]**

Mechanics Opportunities

Mechanics (Pneumatics/Pulleys/Gears)
Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as winding mechanisms, pneumatics, pulleys and gears)

Prior learning

Mechanics taught in Year 2 with a focus on levers

Experiences
(e.g. pneumatic toy)

- Investigate different existing ideas on the market.
- Investigate how pulleys, gears and pneumatics work to make something that moves.
- Practice using practical skills to experience pulley, gears and pneumatics.
- Create design ideas to meet needs of target market.
- Make basic product (prototype) and evaluate to decide on improvements for making final design.
- Evaluate the whole process continuously.
- Use CAD (e.g. make a template using purple mash)
- Make own final product with improvements.

Vocabulary & Knowledge (Mechanics)

Gears	Are toothed wheels which lock together and rotate one another. They act as levers and rotate on an axel at their centre.
Driver	The driver is the original gear moving.
Follower ('driven')	The other gears are said to be 'driven' or follow the driver gear.
Moment	Is the turning effect of a force
Pulleys	Are wheels which do not lock together but are joined by a belt
Pneumatics	the use of pressurised air to make things move
Hydraulics	The use of liquid to make things move

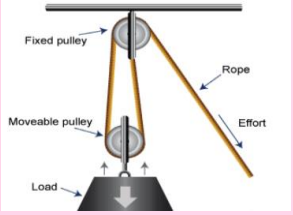
Additional Vocabulary: speed, movement, direction, force, fixed, moveable, weight, load, axels

Key Vocabulary & Knowledge

Components	Parts of something which together make a whole.
Functional	To serve a certain purpose
Aesthetics	Things to make products looks nice
Prototype / mock-up	A trial/test of a product before the final version.
Design specification	A list of criteria the final product should meet to be successful.

Mechanical techniques

Pulleys
https://youtu.be/ClwfCxkZ5Wk



Gears
https://youtu.be/nWx5zCJSOU8

Pneumatics
https://youtu.be/BFYkCz1q-b0

Hydraulics
https://youtu.be/KEs_h-ucJEs