Year 5 – Term 6

Has the time come to trust machines more than humans?

DESIGN TECHNOLOGY

National Curriculum Links:

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.
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 accurately.
Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities.
Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
Understand how key events and individuals in design and technology have helped shape the world.
Understand and use mechanical systems in their products (for example: gears, pulleys, cams, levers and linkages).

Essential Prior Learning:

Children should have had experience of axles, axle holders and wheels that are fixed or free moving.

They will have knowledge of different cutting and joining techniques with a range of materials including card, plastic and wood.
They will have an understanding of how to strengthen and stiffen structures.

Progression in Skill:

Develop a simple design specification to guide their thinking.
Model their ideas through cross-sectional drawings and exploded diagrams.
Generate innovative ideas, drawing on research.
Make design decisions, taking account of constraints such as time, resources and cost.
Formulate step-by-step plans as a guide to making.
Explain their choice of tools and equipment in relation to the skills and techniques they will be using.
Evaluate their final products against their original design specification.
Consider the views of others, including intended users, to improve their work.
Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make.
Investigate and analyse existing products.
Find out about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.
Mechanical and electrical systems have an input, process and output.
Know how mechanical systems such as cams, pulleys or gears create movement.
Know how to reinforce and strengthen a 3D framework.

Long-term Memory Knowledge:

A pulley is a simple machine that can be used to change the direction of a force, and can also be used to reduce the force required to lift a load.
A gear is a toothed wheel. Gears can work together as a 'gear train' in order to change the speed or direction of rotation.

Key Vocabulary	
gear	a wheel with teeth around its circumference
drive belt	the belt which connects and transfers movement between two pulleys
pulley	a grooved wheel over which a drive belt can run
gearing up or down	changing the rotational speed of a product by the use of pulleys or gears; when a small pulley or gear is used to drive a larger one the rotational speed is reduced and the product has been geared down.
driver	the gear or pulley that provides the input movement to the system
follower	the gear or pulley that provides the output movement to the system
mesh	the point where two gears join together and transfer movement
motor spindle	the rod on the end of the motor onto which a gear or pulley is attached

Progression in Resources:

examples of everyday products/toys with pulleys or gears
electrical circuit components
construction kit pulleys and gears of different sizes
hacksaws, glass paper, G-clamps, bench hooks, hand drill, wire strippers
PVA glue, sticky pads, masking tape, dowel, double-sided tape, card triangles, square section wood, card

Relevance	
Now	Children will understand how different mechanisms help humans in their everyday life.
Future	Children will be able to design, use, repair and evaluate simple mechanisms.
Aspiration	Children will use their mechanical knowledge to go on to become engineers and designers.