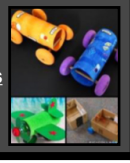
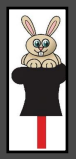
Mechanisms

(Updated September 2023)

EYFS	KS1	LKS2	UKS2
Substantive Knowledge (Nursery) * Understand that materials (blocks etc.) can be joined together to make something new. * Understand that objects can be moved on wheels. * Understand that materials can be joined in different ways e.g. glue, clips etc. * Understand and use key vocabulary (see below). **Substantive Knowledge (Reception)** * Understand that wheels can be attached to a longer piece to keep them working (they will consolidate the name 'axle' in KS1). * Understand that not everything works first time and changes may need to be made. * Understand products can be created in different ways. * Understand and use key vocabulary (see below). **Key Skills (Nursery)** * Explore, build and play with a range of materials and construction kits including wheels. * To experiment with joining materials. **Key Skills (Reception)** * Explore and choose from a variety of materials and constructions kits including wheels and axles. * Begin to adapt and change if something does not work. * Share creations and compare similarities and differences to others work.	**As EYFS plus:** **Vehicles** **Substantive Knowledge** * To understand that different materials can be joined more effectively in different ways. * To understand the role of an axle in a vehicle. * To understand how to make wheels and axles using a range of different materials. * To understand how to use a hacksaw accurately and safely. * To understand how to attach wheels to a chassis. * Understand and use key vocabulary (see below). **Disciplinary Knowledge** * Explore the development of vehicles, including Henry Ford and fire engines from 1066 to present day. **Key Skills** * Join appropriately for different materials and situations e.g. glue, tape. * Try out different axle fixings and their strengths/weaknesses. * Make vehicles with construction kits which contain free running wheels. * Use a range of materials to create models with wheels and axles e.g. tubes, dowel. * Roll paper to create tubes. * Cut dowel using hacksaw and bench hook. * Attach wheels to a chassis using an axle. **Levers and Sliders** **Substantive Knowledge** * To understand the benefits and steps of using a template. * To develop awareness of neat cutting along different lines. * To understand how to use a hole punch and paper fasteners. * To understand how levers and sliders can be used to make 2D things move. * Understand and use key vocabulary (see below). **Disciplinary Knowledge** * Explore the first moving pictures by Eadweard Muybridge and explore a range of 2D levers and sliders. **Key Skills** * Mark out materials to be cut using a template. * Fold, tear and cut paper and card. * Cut along lines, straight and curved. * Use a hole punch. * Insert paper fasteners for card. * Experiment with levers and sliders to find different ways of making things move in a 2D plane.	**As KS1 plus:** **Substantive Knowledge** * To understand the key terms levers and linkages, and how they work in simple terms. * To understand that linkages can increase overall movement. * Understand and use key vocabulary (see below). **Disciplinary Knowledge** * Explore existing mechanical/pop-up books and existing products with levers and linkages. **Key Skills** * Use mechanical systems such as gears, pulleys, levers and linkages. * Use lolly sticks/card to make levers and linkages. * Use linkages to make movement larger or more varied.	***(Combined with Electrical Systems & ICT - see separate progression map).***
Design * Select pictures to help covey and develop what they wish to make. **Make** * Explain what they are making. * Name the tools they are using. **Evaluate** * Explore existing products and investigate how they have been made. * Talk about what they have made and how.	**Design** • Use kits/reclaimed materials to develop more than one idea. • Model ideas with kids/reclaimed materials. **Make** • Name the tools they are using. • Discuss their work as it progresses. **Evaluate** • Note changes made during the making process as annotation to plans/drawings. • Say what they like and do not like about items they have made and attempt to say why. • Discuss how closely their finished product meets their criteria and how well it meets the needs of the user.	**Design** • Begin to use cross-sectional and exploded diagrams. • Develop more than one design or adaptation of an initial design. **Make** • Select from techniques for different parts of the process. **Evaluate** • Explore existing products and investigate how they have been made. • Decide which design to develop. • Say what they like and do not like about items they have made and attempt to say why. • Discuss how closely their finished product meets their criteria and how well it meets the needs of the user. • Investigate key events and individuals in Design and Technology.	

EYFS	KS1	LKS2	UKS2
Key Vocabulary Wheel, tyre, move, join, glue, clip, blocks, Lego, construction, change, similar, different	**Vehicles Key Vocabulary** **EYFS plus:** vehicle, axle, chassis, hacksaw, dowel, bench hook, fire engine, Keeling, pump, ladder, water, squirt **Levers and Sliders Key Vocabulary** **EYFS plus:** template, hole punch, fasteners, lever, slider, 2D	**Key Vocabulary** **KS1 plus:** mechanisms, slider, levers, linkages, pivot, loose, fixed, movement, design brief, annotated sketch	
 **Nursery - Summer 1** **Mysterious Monsters** **Design and make a monster truck for a class race using blocks/construction kits with wheels.** **Reception - Autumn 2** **Planes, Trains and Automobiles** **Design and make transport vehicle for a teddy.** 	**Year 1 - Autumn 2** **Ice and Fire (Vehicles)** **Design and make a fire engine using wheels, dowels etc.**   **Year 2 - Spring 1** **Dungeons and Dragons (Levers and Sliders)** **Design and make mechanical posters which tell a story using sliders and levers.** 	**Year 3 - Summer 1** **Water, Water** **Design and create a mechanical poster advertising 'Save Our Seas' using levers and linkages.**  	

Mechanisms

EYFS - Children in Nursery work with materials and construction kits, including wheels to create a monster truck for a class race, developing this further throughout Reception to **include axles and a greater range of materials**.
Children in Reception also **begin to adapt and change their initial designs** if they don't initially work and begin to compare to other work, **identifying similarities and differences**.

KS1 - Children expand their understanding of making vehicles to **include key terms 'axle' and 'chassis'**. They exercise **greater independence** by **choosing from a greater choice of (recycled) materials** to design and make a fire engine which meets the design brief of a local fire worker. Children continue to join materials in a greater number of different ways, **choosing the most appropriate method of joining** depending on the task.
New Skills - Children are **introduced to mechanisms sliders and levers**, using what they learn to create their own moving robot card.

LKS2 - Children begin by **recapping how levers work before investigating how linkages can be used to provide a larger and/or more varied movement**. They **create their own linkages and levers** before designing non-fiction mechanical posters giving tips and advice for saving our seas from single-use plastics.

UKS2 - *(Combined with 'Electrical Systems & ICT' unit - see separate progression map).*