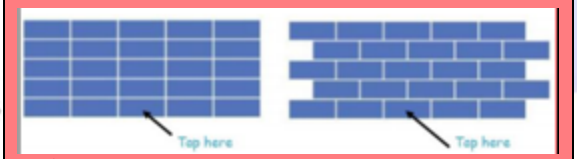
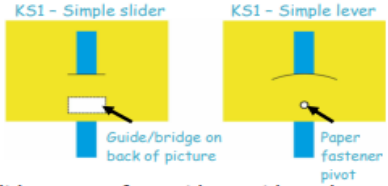
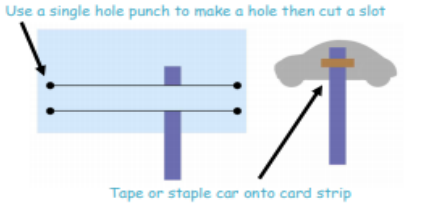
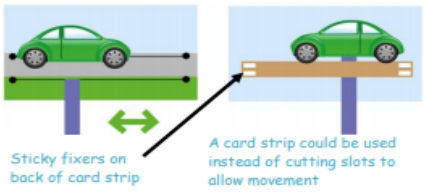
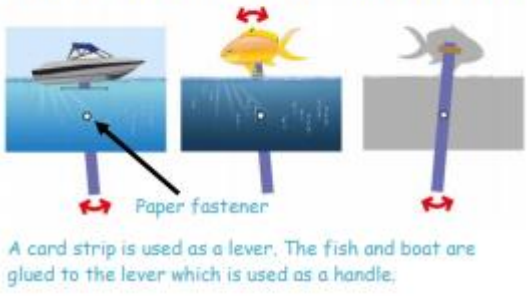
Previous knowledge
EYFS

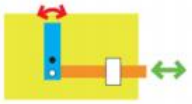
ELG:
- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
- Share their creations, explaining the process they have used.
- Make use of props and materials when role playing characters in narratives and stories.

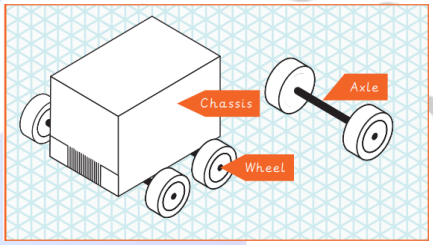
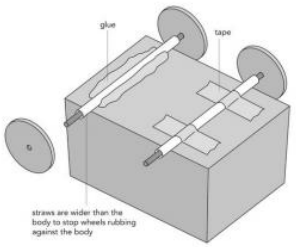
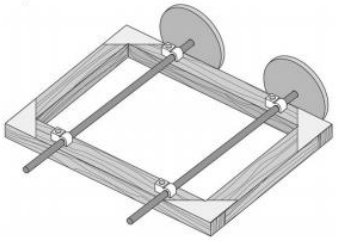
Reception:
- Return to and build on their previous learning, refining ideas and developing their ability to represent them.
- Create collaboratively sharing ideas, resources and skills

3-4 years old:
- Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park.
- Explore different materials freely, in order to develop their ideas about how to use them and what to make.
- Develop their own ideas and then decide which materials to use to express them.
- Join different materials and explore different textures.
- Create closed shapes with continuous lines,

Year 1 NC - pupils should be taught to:	**Design, make and evaluate a model house with a moving part** **How we do this in Year 1**	**Year 1** **Vocabulary / Glossary**
Design • design purposeful, functional, appealing products for themselves and other users based on design criteria; • generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. Make • select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]; • select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. Evaluate evaluate their ideas and products against design	Investigate a range of homes, draw / use photos and name the features (e.g. roof, windows, door) and materials. Relate the main features of the house to basic mathematical shapes e.g. rectangle, cuboid. Research how real Victorian houses were made, name features (e.g sash windows), materials and compare to modern homes. https://www.twinkl.co.uk/resource/comparing-victorian-and-modern-day-homes-powerpoint-t-h-235 Explore strength by building walls with different patterns  and tapping. Build a house structure with a window, door and roof from lego using stronger wall pattern. Learn how to make a hinge for a door out of paper. Select appropriate materials for model home using previous knowledge and preliminary testing.	Freestanding structure - a structure that stands on its own foundation or base without attachment to anything else. Framework - the essential supporting structure of a building, vehicle or object. Stability – in relation to a freestanding structure, the extent to which it is likely to fall over if a force is applied. Base – the lowest part or edge of something, especially the part on which it rests or is supported. Edge – the outside limit of an object, area, or surface. Surface - the outside part or uppermost layer of something. Mechanism - a device used to create movement in a product. Lever - a rigid bar which moves around a pivot. Levers are used in many everyday products. In this project children will use card strips for levers and paper fasteners for pivots. Slider – a rigid bar which moves backwards and forwards along a straight line. Unlike a lever, a slider does not have a pivot point. Slot - the hole through which a lever or slider is placed to enable part of a picture to move. Guide or bridge - a short card strip used to keep sliders in place and control movement

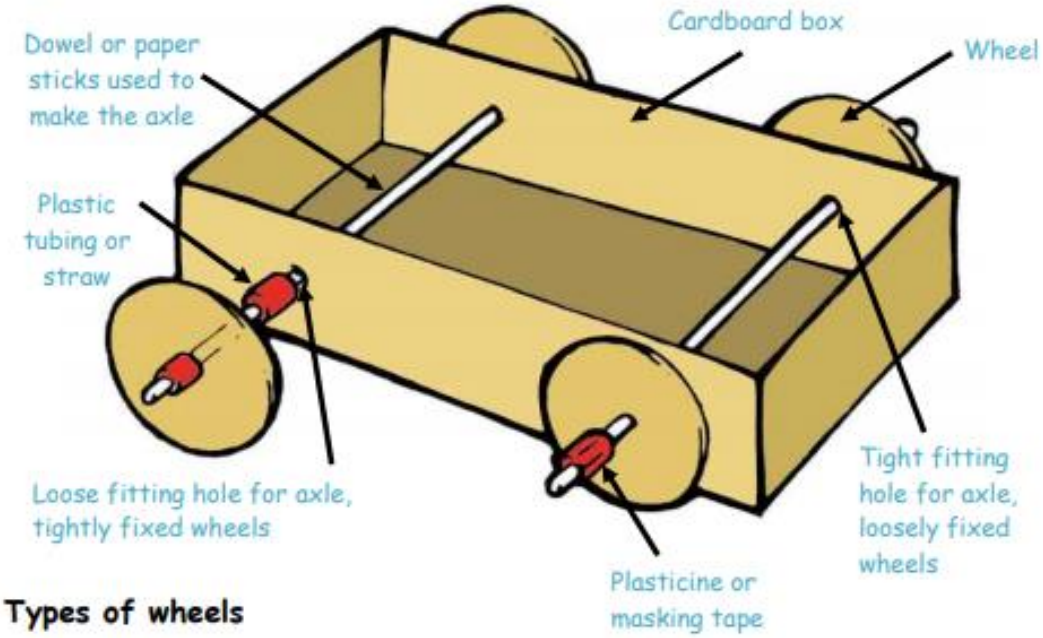
criteria. Technical Knowledge • build structures, exploring how they can be made stronger, stiffer and more stable; • explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.	Explore and evaluate a collection of books and everyday products that have moving parts, including those with levers and sliders. Develop their knowledge and skills by making a simple slider and lever using appropriate tools. Generate simple design criteria e.g. the house should stand unaided, the walls should bear weight of roof, the sash window (mechanism) should open smoothly, it should make the right type of movement. Develop ideas through talking, drawing and making mock-ups of their ideas with paper and card. Describe the main stages of making the house using technical vocabulary e.g. structure, strong, weak, wall, roof, window, brick, hinge. Evaluate their developing ideas against the original design criteria. Join and combine the materials to build the structure and incorporate moving part (slider or lever). Evaluate Victorian model house commenting on the main features and against design criteria.	**Teaching aids to demonstrate sliders and levers**  **Sliders move from side to side and up and down**    **Levers can be used with or without a slot** 

		● Fixed pivot ○ Loose pivot  **Simple mechanisms move:** in a straight line in a straight line, backwards and forwards round and round in a curve

Year 2 NC - pupils should be taught to:	Design, make and evaluate a wheeled vehicle (Fire Engine) How we do this in Year 2	Year 2 Vocabulary / Glossary
Design • design purposeful, functional, appealing products for themselves and other users based on design criteria; • generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. Make • select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]; • select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. Evaluate evaluate their ideas and products against design criteria. Technical Knowledge • build structures, exploring how they can be made stronger, stiffer and more stable; • explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.	Investigate a range of vehicles (incl fire engines) and name the features e.g. wheel, axles, chassis, body, cab. Explore how wheels, axles and chassis work together to create the base of a fire engine using construction toys. Understand that wheels and axles can be assembled in two different ways: either the wheel is attached tightly to the axle and the axle is free to rotate ***or*** the axle is fixed with the wheel free to rotate around it. Try out different ways of making axle holders e.g. using clothes pegs, punched holes in cards or boxes, thin cylinder shapes e.g. drinking straws. Investigate different ways of creating the body of a fire engine, using materials such as cardboard boxes, lolly sticks and other craft materials. Recap on levers and sliders and explore how to create moving parts, such as ladders and fire hoses, considering which materials and tools are best suited for different tasks. Participate in discussions, make notes and create initial designs their own fire engines to specific design criteria, considering which materials and tools they will need, noting their design ideas using notes and diagrams. Include moving part. Create a 3D net of moving vehicle using a computer program. https://www.purplemash.com/#app/tools/2dam (2Design and Make – Purple Mash) Describe how they are going to make their vehicle using technical vocabulary e.g. vehicle, wheels, chassis, axle, doweling, punched holes, paper fastener, pivot. Measure and cut accurately, using a range of different materials, tools and techniques to create their fire engines,. Evaluate their own fire engines, as well as fire engines made by their peers. They will consider what went well, what could be improved upon and what they could do differently if they were to	Design – to make, draw or write plans for something. Mechanism – parts of an object that move together to make something work. Wheel – a circular object that turns round, Axle— a rod that enables a wheel to rotate. The wheel can rotate freely on the axle or be fixed to, and turn with, the axle. Axle holder—the component through which an axle fits and rotates. Chassis—the frame or base on which a vehicle is built. Friction—resistance which is encountered when two things rub together. Dowel—wooden rods used for making axles to hold wheels.  Fixed axle - The axle is fixed to the body and the wheels are free to turn on the axle. Free axle - The wheels are fixed to the axle and the axle turns in a bigger tube called the bearing. Free axle—The picture shows you two ways to fix the bearings onto the body.  Fixed axle—The next picture shows you the other way to let the wheels turn. This time the axle remains fixed and the wheels turn on the axle. The axle is fastened to a wooden body with cable clips. 

	make their fire engines again.	

Example of two different ways to fix wheels



Types of wheels

Ways to hold free moving axles

Use pairs of clothes pegs glued with PVA to the underside of a box.
Check the peg holes are large enough to allow axles to move freely.
Make sure they are aligned carefully so the vehicle moves in a straight line when the wheel and axle mechanism is added.

Use card triangles with holes for the axle.
Check the holes are large enough to allow the axle to move freely.
Make sure opposite triangles are aligned carefully so the vehicle moves in a straight line when the wheel and axle mechanism is added.

Use large paper/plastic straws fixed with masking tape to the underside of a box.
Check straws are positioned carefully so the vehicle will move in a straight line when the wheel and axle mechanisms are added.
Make sure the straw hole is large enough to allow the axle to move freely. The wheels must be fixed tightly to the axle.

Cross Primary School