

KS1.CA.T1	<p>Area of study: Mechanisms (Wheels and Axles)</p> <p>Unit aims / outcome:</p> <ul style="list-style-type: none"> to use wheels and axles to create a moving vehicle for early years age children. <p>Design</p> <ul style="list-style-type: none"> 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 <p>Make</p> <ul style="list-style-type: none"> 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 <p>Evaluate</p> <ul style="list-style-type: none"> explore and evaluate a range of existing products evaluate their ideas and products against design criteria <p>Technical knowledge</p> <ul style="list-style-type: none"> 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.
<p>Design and Technology concepts to organise knowledge:</p> <p>Structures: refers to the arrangement of parts.</p> <p>Mechanisms: systems of parts working together in a machine</p> <p>Textiles: materials that are often made by weaving and knitting fabrics together.</p> <p>Systems (electrical or mechanical): groups of related things that work together as a whole.</p>	
<p>Key concepts of learning:</p>	
<p>Disciplinary knowledge:</p> <p>□</p> <p>Design–</p> <ul style="list-style-type: none"> draw ideas as drawings Say how the product works <p>Make–</p>	

- Assemble, join and combine materials
 - Use tools safely
- Evaluate-
- Talk about the design
 - Explore toys—likes and dislikes
- Technical knowledge-
- Know how a wheel and axle works

Learning in Reception:	Tier 2	Tier 3
<ul style="list-style-type: none"> • I know how to join materials using glue or masking tape. • I know how to handle some tools safely and with increasing control. • I know wheels are used on lots of everyday things. • I know wheels allow things to move. <p>By the end of Reception, we will have learnt how to:</p> <ul style="list-style-type: none"> • Begin to explore and use the language of designing and making, e.g. join, build, shape. • Select tools and techniques needed to shape, assemble and join a variety of different materials. • Use a range of tools, e.g. scissors, hole punches, staplers, woodworking tools, rolling pins, pastry cutters competently, safely and confidently. 	<p><u>New</u></p> <p>Axle A rod passing through the centre of a wheel.</p> <p>Wheel A circular object that revolves on an axle and is fixed below a vehicle or another object to enable it to move easily over the ground.</p> <p>Fixed axle: where the axle is fixed with the wheel free to rotate around it.</p> <p>Free axle: where the wheel is attached tightly to the axle and the axle is free to rotate.</p> <p>Chassis: A chassis is the frame upon which the rest of the vehicle is built. The axle needs to be attached to the chassis.</p> <p>Assemble</p>	<p><u>New</u></p> <p>Mechanism A system of parts working together in a machine.</p> <p>Procedure A series of actions needed to take in order to achieve a finished product.</p> <p><u>Review</u></p> <p>Wheel Axle Chassis Fixed axle Free axle</p>

	<p>Design Evaluation template</p> <p>Review – Reception</p> <p>join build shape cut scissors glue</p>	
NC objective:	Vocabulary and crucial knowledge:	
<p>Design</p> <ul style="list-style-type: none"> ♣ 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 <p>Make</p> <ul style="list-style-type: none"> ♣ select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] 	<p><u>Context of study:</u></p> <p>This topic will built on what the children have already learnt in Reception. They will know some language and tools needed to build and create. Children will also know a range of materials they can use which links with Science (KS1CAT2). They will further build on this by designing products for a target audience using a range of materials and tools competently, safely and confidently. The children will evaluate products for a target audience by reflecting on their choice and making amendments where necessary. Children will learn that wheels and axles are a type of machine. Children will understand the axle and wheel are two circles that move together. Children will understand that using wheels makes it easier to move objects and different materials will need to be joined together using different methods.</p> <p><u>Crucial Knowledge:</u></p> <p>Children need to know wheels are a circular object that revolves on an axle and is fixed below a vehicle or other object to enable it to move easily over the ground: Children need to know axles are an axle is a rod that passes through the centre of a wheel. Children know that the wheel and the axle are a type of mechanism.</p>	

<p>♣ select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</p> <p>Evaluate</p> <p>♣ explore and evaluate a range of existing products</p> <p>♣ evaluate their ideas and products against design criteria</p> <p>Technical knowledge</p> <p>♣ build structures, exploring how they can be made stronger, stiffer and more stable</p> <p>♣ explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.</p>	<p>Children know that the wheel and the axle are two circles that move together.</p> <p>Children need to understand using wheels makes it easier to move objects.</p> <p>Children need to understand and investigate that different materials can be joined together using different methods.</p> <p>Children need to see the picture of the underside of a vehicle. Focus their attention on the wheels and axle. Disassemble a toy car so children can see all the parts that work together to make it move. Explain that children will be using construction kits with wheels and axles to make a vehicle which moves.</p> <p>Demonstrate to children using construction kits how wheels and axles may be assembled as either fixed axles or free axles. 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.</p> <p>Children need to use the construction kits to create both fixed and free axles.</p> <p>Children need to explore and decide which is the better axle and why?</p> <p>Technical Knowledge: Children need to know how a wheel and axle works.</p> <p><u>Design:</u> Explain that the children are going to solve a dilemma – we do not have enough moving vehicles in Early Years for the younger children in our school to access during provision. The children are going to create a moving vehicle. Introduce the design criteria:</p> <ul style="list-style-type: none"> • Is a vehicle used for a specific purpose, for e.g. a tractor, fire engine or a bus. • Has either a free or a fixed axle. • Is made out of junk modelling. • Is suitable for 3-4 year olds. <p>Children need to know and understand the design criteria and the purpose.</p> <p>Children need to find existing examples of how wheels and axles are used in everyday life e.g. toys, cars and decide strengths and weaknesses.</p> <p>Children need to see examples and think about size, position, methods of fixing wheels and axles together.</p> <p>Children need to design and draw an example of a wheeled product, identifying the user, purpose and labelling the main parts e.g. body, wheels etc.</p> <p><u>Make:</u> Encourage them to follow the plan they made by choosing the materials and equipment they planned to use. Children will make wheels and axles out of everyday materials.</p>
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	<p>Children decide what everyday materials to make their chassis from- which will be strong and more stable.</p> <p>Children need to know different materials and the strengths and weakness of them when making wheels and axles, for example wood would be good, paper would rip and not be strong enough. (provide children will wooden wheels and axles)</p> <p>Children need to explore materials for the chassis and body of the vehicle and hopefully will come to the conclusion that cardboard would be best for the chassis and body.</p> <p>Children need to know what a chassis is. A chassis is the frame upon which the rest of the vehicle is built.</p> <p>Children need to understand that an axle needs to be attached to the chassis (said 'shah-see').</p> <p>Children need to be taught how to mark out, hold, cut and join materials and components correctly. Working in pairs children to explore using combinations of everyday materials to assemble some examples of fixed and free axles.</p> <p>Children need to measure using a ruler and cut wooden dowels for their structure.</p> <p>Children need to use glue, tape, plasticine to connect the parts of their structure.</p> <p>Children need to know how to use small hand tools (junior hacksaw) safely and appropriately.</p> <p>Children create their final moving vehicle.</p> <p>Evaluate:</p> <p>Children need to know that evaluating means looking at the strengths and weakness of the product they have created.</p> <p>Children need to explain what they did and how they made their final product.</p> <p>Children need to compare their product to their original plan and the design criteria. Have they met the objective that was originally set out?</p> <p>Explain that through discussion children have just evaluated the wheeled toys and that this is something they will be doing throughout their learning on mechanisms.</p>
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