

Curious Question – What makes a vehicle move?

NC Objectives	End Point Task- How will you know if children have achieved the main objectives of the unit? (Answering the curious question)
Pupils should be taught to: - Design purposeful, functional, appealing products for themselves and others based on design criteria. - Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. - 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 - Explore and evaluate a range of existing products. - Evaluate their ideas and products against design criteria. - 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.	Children can explain how wheels move on a vehicle. Children can identify and explain what stops a vehicle from moving. Children to design a vehicle. Children can make a moving vehicle. Children can evaluate their vehicle against the design criteria.

	Step 1	Step 2	Step 3	Step 4	Step 5
Week	Prior learning: knowledge, skill, vocabulary	Lesson Objective: Setting the scene – linking to prior learning (where appropriate the key concept)	Learning tasks to practise and apply the new knowledge, skills and vocabulary	Suggested adaptations for SEND- what will the learning task need to look like without trying to cut out key content from the NC?	Lesson End Point: Assessing the new knowledge, skills and vocabulary.

1	Links to Autumn 2 – Junk Modelling - EYFS. What can you tell me about these vehicles? (Have a collection of a variety of toy vehicles)	To understand how wheels move.	Starter: Using presentation (attention grabber) wheels and axis and a selection of toy vehicles and discuss how each one moves. What is a wheel? What is an axle? How is this vehicle structured? (linking to balanced wheels) Main Task: In groups, children create their own diagram of a wheeled object. Option for Year 2: Should be encouraged to work independently and comment on the materials used for each part. Problem solving: Practical activity using a selection of equipment, children investigate creating their own moving vehicle. Plenary: As a class, discuss how wheels are used in everyday life. Vocabulary: axle, diagram, wheel, axle holder, mechanism.	Provide examples of vehicles for children to annotate with the vocabulary. Provide children with a word bank (Could use the <i>Activity: Wheels and axles – key vocabulary - Kapow</i>)	Children can explain how wheels move on a vehicle.
2	Pull up an image from last weeks session. Children to ask and answer questions linking to wheels, axels, movement.	To identify what stops wheels from turning.	Starter: Watch Sid the science kid – How wheels work. Explain that today, we are problem solvers and must work out why these vehicles don't work. Main Task: Children to create repair tickets for vehicles that are broken by identifying the changes needed to make them work suitably. Option for Year 2: Should be pushed to use more technical and precise language to explain the problems and solutions; could also be asked to design another broken car (with a different defect). Plenary: How will this lesson help you to design your vehicle next week? Create a class design criteria. Vocabulary: axle, equipment, axle holder, mechanism, wheel, design criteria.	Group MA problem solvers – starter. Children could be asked more questions or given scenarios to help them identify solutions; could benefit from working with a partner to write down shared ideas on the repair tickets.	Children can identify and explain what stops a vehicle from moving.

3	Gimme Five (Kapow) Think of five things you can remember about wheels, axels and joins. (Talk partners)	To design a moving vehicle.	Starter: Use attention grabber PowerPoint: vehicles. Discuss how vehicles have changed, what is the same about the vehicles? (Linking to design). Discuss how modes of transport have changed over time (link to Henry Ford – vehicle designer). In groups, children should use the design criteria from last week's lesson to create a moving vehicle by turning cardboard tubes (tissue boxes or similar) into a moving vehicle (refer to main event). Discuss structure and provide ways in which structure can be improved. Main Task: Children to create a design using the vehicle design sheet. Option for Year 2: Should measure each of the items in their design and add these measurements to their designs, possibly drawing their vehicles to scale; could download the <i>Extention activity: ICT Flag design template – NEW</i>, the <i>Resource: Pupil's PowerPoint draw tutorial</i> to draw a flag and a laptop or tablet to use Microsoft Powerpoint's drawing tools to create a flag. (Alternatively, use an online drawing application such a Sketchpad). Plenary: As a class, make a set of instructions for the next lesson for making their vehicles (refer to wrapping up section) Vocabulary: axle, chassis, wheel, axle holder, mechanism, design criteria.	Could benefit from using the <i>Activity: Vehicle design sheet with template</i> so that they can focus on drawing the mechanism.	Children to design a vehicle.
4	Brain dump! Discuss with a partner everything you have learnt about Henry Ford – cars.	To build a moving vehicle.	Starter: Using the attention grabber slideshow, discuss the designs within the vehicles. Then, discuss design criteria last weeks lesson. Ensure the children know and understand the design criteria before moving on. Main Task: Children to use their design sheets from last weeks lesson to construct a car. Children will need time to make, test and refine their	Could benefit from working with a partner on the more practical elements of construction; could need reminding of what their next step is. Could benefit from a step-by-step instruction sheet to help them with the process (this could be made visual where possible)	Children can make a moving vehicle.

			product. Refinements may be needed if the vehicle does not move initially. Option for Year 2: Could adapt their plan/model further to make their vehicle work better; should test their vehicle. Plenary: In groups, create a judging panel that will assess each vehicle against the design criteria. Encourage the children to give reasonable feedback. Model good feedback and poor feedback to the children. Vocabulary: refine, axle, chassis, mechanism, axle holder dowel, wheel.		
5	What did our design criteria include? (quiz) Incorporate some true / false questions for criteria that was and wasn't in the design criteria. No more than 8 questions.	To evaluate a product.	Starter: Discuss refinements – did anyone need to change their design during the making process? Did anyone need to amend/refine their product after testing it because it didn't work? Discuss skills used to achieve their product (joining, shaping, cutting, designing, making etc) Discuss what the term 'evaluation' means linking to your design criteria. Discuss products made. Did they all meet the needs of the criteria? If not, why? Main Task: Children to evaluate their own vehicle using the evaluation worksheet. Option for Year 2: Should evaluate how accurate their design is in relation to their model. Develop suggested worksheet further for your children incorporating these skills. Plenary: Show children a range of working / broken vehicles (linking to sections of the design criteria.) Can children identify which would / wouldn't work using effective reasoning and evaluation skills.	Children to be supported with reading the worksheet. Worksheet to be adapted where needed (visual aids) Children to work in small groups to complete the evaluation with peer / adult support.	Children can evaluate their vehicle against the design criteria.

			Vocabulary: Evaluation, refine, design criteria, shaping, making, cutting, joining.		
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