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| **Lesson 4** | Key question:  |
| **Building on from lesson 3:**  | Designing their car  |
|  **Key DT focus*–*** *Skills developed with guidance* | * To select from and use a range of tools and equipment to perform practical tasks.
* Generate, develop, model and communicate ideas through talking, drawing, templates ,mock ups and where appropriate ,information and communication technology.
* Evaluate ideas and products against design criteria.
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| **Teaching Objectives** | LO To build a moving vehicle * I can make a wheel and axle mechanism

I can evaluate my design to make it even better |
| **Key Vocabulary**: Axle ● Axle holder ● Chassis ● Design ● Evaluation ● Fix ● Mechanic ● Mechanism ● Model ● Test ● Wheel |
| **Resources**Have ready * Children’s vehicle design sheets from Lesson 3 (see ‘‘
* Materials for making vehicles, such as card boxes, cotton reels, straws, pipe cleaners,
* Dowel pre-cut to 20cm lengths for the axles, or alternative suitable materials (two lengths per pupil)

Materials for decorating vehicles, such as tissue paper, glitter, googly eyes (optional) | **Locality context barriers to learning**Brand new learning- children may not be keen to experiment. Explain that this is a chance to explore and discover. Words and concepts that would mostly be unknown. Allow time to pre-teach words using actions to colour the meaning. | **Protective Characteristics**Think about who the target market could be for…Age? Gender? Profession? Model different designs that allow children choice-  | **Weblinks**Watch * *Teacher video: Wacky races*
* *Pupil video: Wacky races*
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| **Before the session:** Have ready * Children’s vehicle design sheets from Lesson 3 (see ‘‘
* Materials for making vehicles, such as card boxes, cotton reels, straws, pipe cleaners,
* Dowel pre-cut to 20cm lengths for the axles, or alternative suitable materials (two lengths per pupil)

Materials for decorating vehicles, such as tissue paper, glitter, googly eyes (optional)**Retrieval task:** Recap from last lesson What are we making? Explain your design to a friend? Which car would move the best? Why? Display different car designs. End of unit quiz – complete knowledge catcher at later date- spaced retrieval What is a chassis? **Oracy Starter:** Presentation: Wacky races Display the *Presentation: Wacky races*, and highlight the various designs of the vehicles. Recap the design criteria that you shared as a class in *,* including any of the children’s suggestions:* The vehicle should have round wheels that balance the body.
* The wheels need to be attached to an axle.
* The axle needs to fit inside an axle holder but not be attached to the axle holder.Use Slides 9 and 10 in the *Presentation: Wacky races* to provide a visual if necessary.

 Remind the children of the instructions they composed at the end of the last lesson, such as:1. Cut your axle holders with scissors to the right size and tape them to the body/chassis.
2. Attach one wheel to each side of the axle and then thread through the axle holder.
3. Attach the other wheel to other end of the axle.

 Ask the children if they have any questions and point out where they can find the relevant materials and equipment for making their vehicles.Play the *Pupil video: Wacky races* and consider leaving this to run during the lesson so the children can continue to refer to it.Pupil video: Wacky races Display on your interactive whiteboard and consider leaving to run so children can refer to it**Main teaching:** Give each child:* Their vehicle design sheet from Lesson 3.
* Two 20 cm pre-cut lengths of dowel (or other suitable materials) for the axle.

 Ask pupils to refer to their design sheets and gather all the materials they will need.Stress the need for accurate cutting and using the correct amounts of glue or masking tape, as using too much could affect the overall look of their product. **Top tip:** Give children a labelled plastic wallet to keep all of their parts in and keep tools and offcuts in clear labelled trays. Re-cap and demonstrate how to attach the axle holders to the chassis, using card pieces (see *Teacher video: Wacky races)*or play the *Pupil video: Wacky race*s again.Give the children time to attach their axle holders to their own vehicles.Once most pupils have completed the first section, model attaching the axle to the wheel using glue or masking tape, then threading it into the axle holder before attaching the last wheel (or play the relevant part of the *Pupil video: Wacky races*).  Children then complete this second stage.Encourage children to work together especially on the more fiddly parts.Depending on your agreed design criteria and time available, you may want to give children time to decorate their vehicles, using paint, tissue paper glitter, etcQuestions to Ask the children:  |
| SEN Provision | **PKF** | WTS | EXS | GDS |
| . Pupils needing extra support: May benefit from working with a partner on the more practical elements of construction and may need reminding of what their next step is. |  Pupils with secure understanding indicated by: Making a moving vehicle which works (wheels move correctly) or if the vehicle doesn’t work, can explain what must be changed so that the vehicle can work. Pupils working at greater depth indicated by: Explaining how their model works and how they could improve it further using technical vocabulary. Pupils working at greater depth: Should evaluate how accurate their design is in relation to their model. Can they adapt their plan/model further to make their vehicle work better? Have they tested their vehicle? How?  |
| **End of lesson reflection** Working in their table groups, explain that the children will be a judging panel and will look at each model vehicle on their table and decide if the model meets each item on the design criteria list (display the design criteria on the board).* If the model does not meet each item on the design criteria list, the judging panel should make suggestions on what the next steps should be to make sure the design criteria are met.
* If the model does meet each item on the design criteria list, the judging panel should suggest ideas for how the model could be made even better.

 Remind children to be sensitive when giving feedback as the judging panel and to think about how they would feel if they were receiving the suggestions. Praise groups who do this task constructively.Finally, give the children time to test their cars, possibly while playing the link: on VideoLink. The most important thing to check is that the wheels turn correctly. |
| **Outcomes*** **Majority**
* **Most**
* **Some**
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| **Lesson evaluation notes and next steps** |