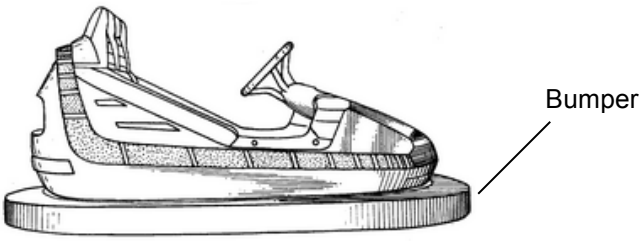
1 The diagram shows a bumper car. It is designed to reduce impact of collisions. The bumper car has rubber bumpers.




1 (a) (i) The car, with a mass of 100 kg, hits a wall at a speed of 2 m/s.

Calculate the momentum with which the car hits the wall.

Use the correct equation from the equation sheet

Show your working clearly and give the unit.

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Momentum ……..…….

(3 marks)

1 (a) (ii) Explain how the rubber bumper reduces the impact force of the car on the wall.

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(3 marks)

1 (a) (iii) The bumper car manufacturer decided to try different thicknesses of rubber to decide which thickness would be best for reducing impact. They tested two thicknesses. Each thickness of rubber was tested once.

Suggest **two** reasons why more tests are needed before the best thickness of rubber can be decided.

Reason 1: .....

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Reason 2: .....

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(*2 marks)*

1 (b) The bumper manufacturer had the idea to use scrap car tyres for making the bumper.

Suggest why this idea might benefit the environment.

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(1 mark)

**(Total 11 marks)**