

1 Crash test dummies

Aim

To perform your own crash tests

Equipment

- dynamics trolley
- ramp
- ruler
- chalk
- a solid barrier such as a brick or wall
- plasticine or playdough
- talcum powder
- sticky tape

Method

- 1 Mould a small plasticine person. Lightly powder it so that it loses its stickiness.
- 2 Sit it on the dynamics trolley.

Part A

- 3 Set the ramp up on a shallow slope and let the trolley run down it and onto the floor. Carefully note what happens to the plasticine person.
- 4 Place a chalk mark every 20 cm up the ramp, and place a brick on the flat near the ramp's end.
- 5 Model a head-on collision by releasing the trolley from a 20 cm mark on the ramp (see Figure 6.3.9). Repeat from the rest of the marks. Note what happened to the plasticine

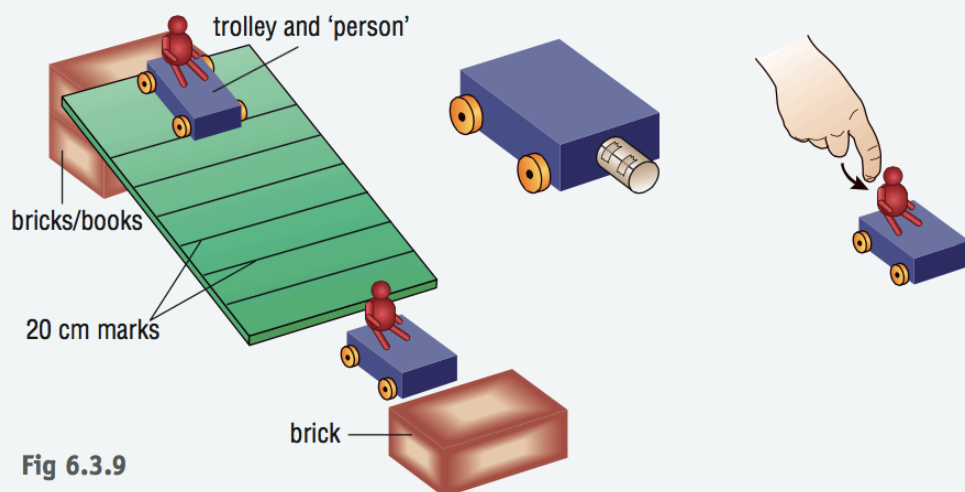


Fig 6.3.9

person, particularly to any parts of the body that moved a lot and any parts that moved little. Test which 20 cm mark you consider to be 'life threatening' to the plasticine driver.

Part B

- 6 Build a sticky-tape seatbelt for the driver and repeat. Are there any differences in the results? Which 20 cm mark is now the 'life-threatening' one?
- 7 Take the belt off, but this time add a 'crumple zone' to the front of the trolley. Once again, which 20 cm mark do you consider to be 'life-threatening'?

Part C

- 8 Place the trolley and its driver on a flat desk.
- 9 Model a rear-end collision by hitting or flicking the back of the trolley with your hand or a ruler. Once again, note which parts moved. Build a safety feature that would minimise injuries in this type of collision.

Questions

- 1 Your backside is probably the least affected part of your body in a car crash. **Explain** why inertia keeps heads, arms and legs moving but seems to be less effective on your backside.
- 2 **Predict** what would stop the forward movement in a car when no seatbelts are worn.
- 3 **Predict** the injuries that are likely to occur in a head-on collision while not wearing a seatbelt.
- 4 Modern cars are designed to crumple in an accident. **Propose** reasons why.
- 5 **Propose** reasons for the use of headrests in a car.