

OCR A Physics GCSE

8.1 - Physics on the Move

Flashcards

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State a typical value for the speed of sound.



State a typical value for the speed of sound.

330 m/s



What is a typical value for human walking speed?



What is a typical value for human walking speed?

1.5 m/s



What is a typical value for human running speed?



What is a typical value for human running speed?

3 m/s



What is a typical value for human cycling speed?



What is a typical value for human cycling speed?

6 m/s



What is the stopping distance of a vehicle equal to?



What is the stopping distance of a vehicle equal to?

The sum of thinking distance and braking distance.



For a given braking distance, if the vehicle's speed is increased, what can be said about its stopping distance?



For a given braking distance, if the vehicle's speed is increased, what can be said about its stopping distance?

The stopping distance is increased with an increase in speed.



Give a typical range of values for human reaction time.



Give a typical range of values for human reaction time.

0.2 seconds - 0.9 seconds



Give three factors which can affect a driver's reaction time.



Give three factors which can affect a driver's reaction time.

1. Tiredness
2. Drugs
3. Alcohol



Give two factors which may affect braking distance.



Give two factors which may affect braking distance.

1. Adverse (wet/icy) road conditions.
2. Poor tyre/brake conditions.



Describe the energy transfers that take place when a car applies its brakes.



Describe the energy transfers that take place when a car applies its brakes.

- Work is done by the frictional force between the brakes and wheel.
- Kinetic energy of the wheel is converted to heat and is dissipated to the surroundings through the brake discs.



To stop a car in a given distance, if its velocity is increased, what must happen to the braking force applied?



To stop a car in a given distance, if its velocity is increased, what must happen to the braking force applied?

The braking force must also be increased.



State two consequences of a vehicle undergoing very large decelerations.



State two consequences of a vehicle undergoing very large decelerations.

1. Kinetic energy is converted rapidly to heat, causing brakes to overheat.
2. Loss of control of the vehicle.



How could you measure human reaction times?



How could you measure human reaction times?

- Ruler drop test.
- Person A and B hold each end of a ruler with the 0 cm mark at the bottom and the 30cm mark at the top (with person A).
- Person A drops the ruler without telling person B.
- Person B catches it.
- The distance between the start can be used to work out their reaction time.



Why is it important that the 0cm mark is at the bottom?



Why is it important that the 0cm mark is at the bottom?

So you can obtain the distance directly without having to calculate it.



Why are very large decelerations dangerous for cars?



Why are very large decelerations dangerous for cars?

The larger the deceleration, the greater the force that acts on the passengers, increasing the risk of harm.



Give a typical value for an average acceleration of a road car under normal conditions.



Give a typical value for an average acceleration of a road car under normal conditions.

3-5 m/s²



What equation can be used to estimate a braking force if car mass, velocity and stopping time are known?



What equation can be used to estimate a braking force if car mass, velocity and stopping time are known?

Force = change in momentum / time

Where: change in momentum = mass x
initial velocity

(Since final velocity is zero)

