Car Safety (HT ONLY)

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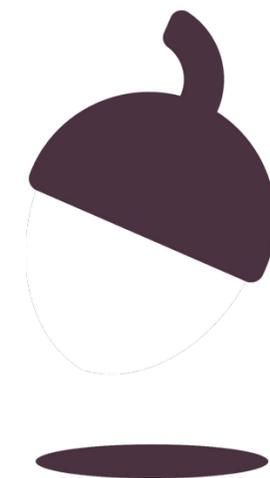
OAK
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Recap - Calculate Momentum

3000 kg

v = 30 m/s

3000 kg

v = 50 m/s

Independent Practice

1. A cannon ball with a mass of 14 kg strikes the side of a stationary ship with a velocity of 150 m/s. After the collision, the cannon ball continues moving with a velocity of 140 m/s. If this is true, what would be the velocity of a piece of wood with a mass of 2 kg?

150 m/s	0 m/s	140 m/s	V = ?
14kg	2kg	14kg	2kg

1. Two cars collide head-on with each car travelling at 30 m/s. One car has a mass of 2000 kg and the other has a mass of 3000 kg. After the collision, the 3000 kg car has a velocity of – 27 m/s, what is the final velocity of the 2000 kg car? Assume that the velocity of the 3000 kg car is initially positive.

30 m/s	-30 m/s	-27 m/s	V = ?
3000kg	2000kg	3000kg	2000kg

1. A 10,000 kg lorry travelling at 20 m/s collides with a 4000 kg car travelling at 10 m/s in the same direction. If the lorry carries on moving at 10 m/s, what is the final velocity of the car?

20 m/s	10 m/s	10 m/s	V = ?
10,000kg	4000kg	10,000kg	4000kg

3

Independent Practice

1. Explain why wearing a seatbelt reduces the risk of serious injury in a crash? Explain why padded safety helmets reduce the risk of head injuries during an accident? (3)

1. Seat belts help protect people in car crashes, identify two other safety features of a car that work in a similar way. (2)

1. Children's seat belts are a lot narrower than adult seat belts. Explain why this is possible. (2)

Independent Practice

1. a) If a car and driver have an initial momentum of 60,000 kg m/s and come to rest in 0.3 seconds. What stopping force is exerted on the driver?

b) A seat belt brings the driver to rest in 0.8 s. What force does the seat belt exert on the driver?

2. a) If a car has an initial momentum of 50,000 kg m/s and comes to rest in 0.25 s. What stopping force is exerted on the car?

b) The air bag brings the driver to rest in 0.75 s. What force does the airbag exert on the driver?

3. a) If a van has a mass of 4000 kg and is travelling at 12 m/s, what is the initial momentum of the van?

b) What force is exerted on the van if it takes 0.6 s to stop?