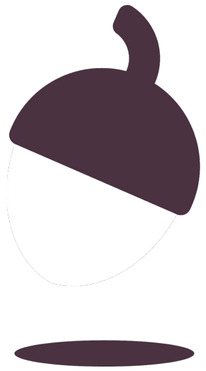
Combined Science - Physics - Key Stage 4 - Forces

Momentum (HT ONLY)

Mr Saville



OAK NATIONAL ACADEMY

Independent Practice

1. Define momentum

2. Which of the following examples would have a larger measure of momentum?
   - A 78 kg person walking at a speed of 1.5 m/s
   - A 78 kg person running at a speed of 3.0 m/s
   - A 78 kg person cycling at a speed of 6.0 m/s

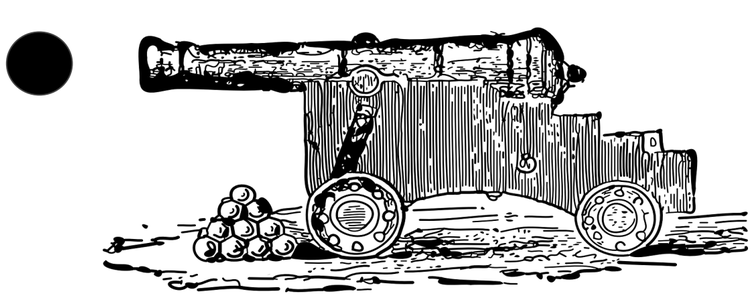
3. Explain your answer for question 2.

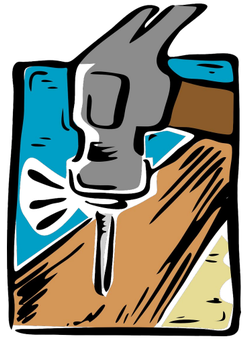
Independent Practice

1. An athlete of mass 60 kg running at a velocity of 10 m/s. Calculate the momentum.
2. A car of mass 800 kg travelling at a velocity of 0 m/s. Calculate the momentum.
3. A ship of mass 20 000 tonnes travelling at a velocity of 5 m/s. (1 tonne = 1000 kg) Calculate the momentum.
4. Calculate the mass of a sprinter when travelling at 9.5 m/s that has a momentum of 617.5 kg m/s.
5. Calculate the velocity of a car of mass 700 kg that has a momentum of 620 kgm/s
6. An object of mass 300 g is moving with velocity of 5 m/s. What is its momentum?
7. An object has momentum of 50 kg m/s. If the object has a mass of 25 kg, what is its velocity?
8. What is the momentum of a bullet of mass 50 g travelling at 300 m/s?

Independent Practice

1. Using the conservation of momentum to describe the following situations. (hint: state the momentum before and after, the direction of each momentum after collision/explosion.





2. A rifle has a bullet loaded with a mass of 0.02 kg. What will the momentum of the bullet be before the rifle is fired? Explain why.
3. Once the rifle is fired, the bullet reaches a speed of 400 m/s. Calculate the momentum of the bullet.
4. What could you assume the momentum would be of the rifle's recoil? Why?

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