What is Momentum?

Worksheet

Momentum is the product of an object's mass and velocity: p = mv, measured in kgm/s. A heavier or faster object has more momentum.

$$p = m \cdot v$$

Questions

1. A 5 kg object moves at 4 m/s. What is its momentum?

A) 9 kgm/s
B) 1.25 kgm/s
C) 20 kgm/s
D) 0.8 kgm/s

2. Which is the correct unit of momentum?

A) Nm
B) kgm/s
C) kgm/s
D) Js

3. Two objects have equal mass. Which has more momentum?

A) The slower one
B) The faster one
C) Both equal
D) Cannot be determined

4. In a closed system with no external force, total momentum is

A) Always zero
B) Always increasing
C) Conserved
D) Random

5. A 1200 kg car moves at 20 m/s. Find its momentum.

6. A 0.145 kg baseball is thrown at 40 m/s. Find its momentum.

7. A cyclist and bike have a combined mass of 75 kg moving at 8 m/s. Find the momentum.

8. Define: What is momentum?

9. Define: Is momentum a vector or scalar?

10. Define: What happens to momentum if mass doubles at the same speed?

Answer Key

1. C) 20 kgm/s - p = mv = 5 4 = 20 kgm/s.
2. B) kgm/s - Momentum = mass velocity kg m/s = kgm/s.
3. B) The faster one - With equal mass, momentum increases with velocity, so the faster object has more.
4. C) Conserved - The law of conservation of momentum: total momentum stays constant.
5. p = mv p = 1200 20 p = 24000 kgm/s
6. p = mv p = 0.145 40 p = 5.8 kgm/s
7. p = mv p = 75 8 p = 600 kgm/s
8. The product of mass and velocity: p = mv, measured in kgm/s.
9. A vector - it has both magnitude and direction (the same direction as velocity).
10. Momentum doubles too - it's directly proportional to mass.