1. Momentum	A. $p_f - p_i$.
2. Impulse	B. Equal to Σp.
3. Δp	C. It is important to know how big and in what direction.
4. Vector	D. How an object changes momentum.
5. Magnitude	E. The "25" in 25 kgm/s.
6. p_{net}	F. The product of mass and velocity.

Which has more momentum?

7. A bowling ball at rest or a bowling ball going 1 m/s?
8. Afast baseball or a slow bowling ball?
9. A 1000 kg object at rest or a 1 kg object moving 0.2 m/s?

10. Can an object have momentum in space?
11. If you increase a moving object's mass, how does its momentum change?
12. If an object changes momentum there must be a change of ___________ or __________.
13. How can momentum be negative?
14. How can an object have the same speed and mass, but change its momentum?
15. How can multiple objects have a net momentum of zero?

A.	B.	C.	D.
3 kg →	3 kg →	3 kg	← 3 kg
v = 5 m/s	v = 2 m/s	v = 0 m/s	v = -4 m/s

Above shows an object at different positions.

16. Calculate the object's momentum at position A.
17. Calculate Δv between positions A and B.
18. Calculate Δp between positions B and D.

Mass A	Mass B	Mass C
6 kg →	4 kg →	1 kg
v = 5 m/s	v = 3	

19. Calcu- late p_{net} of A and B above.

20. Calculate p_{net} of B and D .

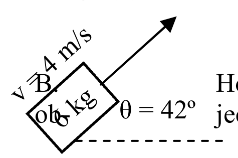
p_3

p_1

21. Calculate p_{net} of all four objects.

22. 6 N pushes to the right on a 3 kg mass for 8 seconds.
A. Calculate the impulse.
B. How much momentum was gained by the object?

23. A 15 N force pushes on an object for 10 seconds. How much momentum did it gain?



24. Find the net momentum of the following:

25. Find the p_x and p_y of the following object.

26. A 4 kg object is moving 2 m/s to the right. A 6 N force pushes to the left for 3 seconds.
A. Calculate p_{before}.