

VELOCITY INCREASE.



# Momentum



## Momentum

#### Can a rain drop have more momentum than a tank?



What is momentum?????? Inertia in Motion

$$p = m * v$$

## Practice

A 145 g baseball is zipping toward home plate at 90 mi/hr. How much momentum does it have?





 $p = 5.8 \ kg \ m/s$ 

Jane takes a bowling ball (7.3 kg) and rolls it down the lane at the Jimmy pins with the same momentum the baseball had in the problem before. How fast is the bowling ball going?





Defined as the **change in momentum** 



## **Practical Application**

 $Ft = m(v_f - v_i)$ 



### They are the Equal and Opposite



Jane pushes Jimmy's wagon up to a speed of 25 m/s. What impulse did Jane give Jimmy?



130 kg

$$J = m(v_f - v_i)$$
  

$$J = (130)(25 - 0)$$

$$J = 3250 kg m_i$$

If Jane pushed with a net force of 35 N, how long did she push on the wagon?

$$Ft = m(v_f - v_i)$$
$$35t = 3250$$
$$t = 93s$$



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Once the wagon is going, Jimmy decides to jump out. He does so and lands on the ground with a speed of zero. How fast is the wagon going?





Jimmy's wagon (50kg) keeps running down the road till it hits the Blob (400kg). If the wagon rebounds off the blob with a speed of 20 m/s and the collision takes 60 seconds, what is the force between the blob and the wagon?

+++++This way is Positive!!!!!!! +++++

65 m/s



$$Ft = m(v_f - v_i)$$

$$(F)(60) = (50)(-20 - 65)$$

$$F = -70.83N$$

$$F = \frac{(50)(-85)}{60}$$