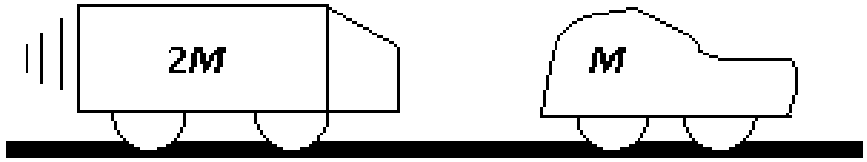
A 2000 kg truck hits a 1000 kg car.



How does the force felt by the truck compare to the force felt by the car?

A. Force felt by truck is greater than force felt by car
B. Force felt by car is greater than force felt by truck
C. Force felt by each is equal
D. Not enough info

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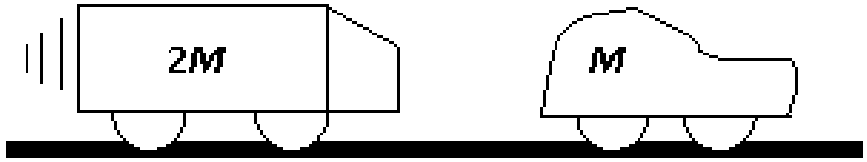


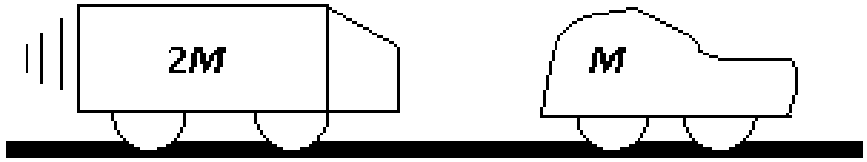
Suppose the **truck** slows down by **5 m/s** during the collision.

Does it sound reasonable to say the **car** speeds up by **10 m/s**?

A. Yes

B. No

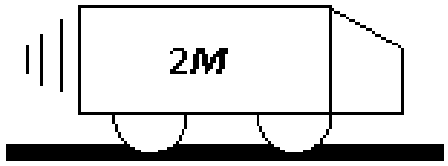
acceleration



Acceleration of the truck is less than (exactly half) the acceleration of the car

Equal force felt by each!

Force = mass x acceleration

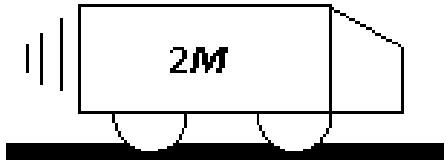


More mass less acceleration

Less mass more acceleration

Equal force felt by each!

Force = mass x acceleration



twice mass half acceleration

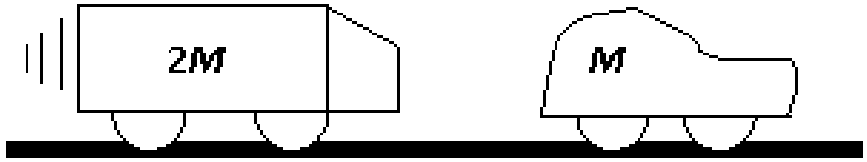
half mass twice acceleration

Cause and Effect

Force is the Cause

Acceleration is the Effect

A 2000 kg truck hits a 1000 kg car.



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Push on roller blades

If David pushes Eugenia,

A. Eugenia will roll forward and David will stay where he is
B. Eugenia will roll forward and David will roll backwards
C. Eugenia will stay where she is and David will roll backwards

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Push on roller blades

If David pushes Eugenia, who rolls faster?

A. David
B. Eugenia
C. Same speed

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If David pulls Eugenia,

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B. Eugenia will roll forward and David will roll forward
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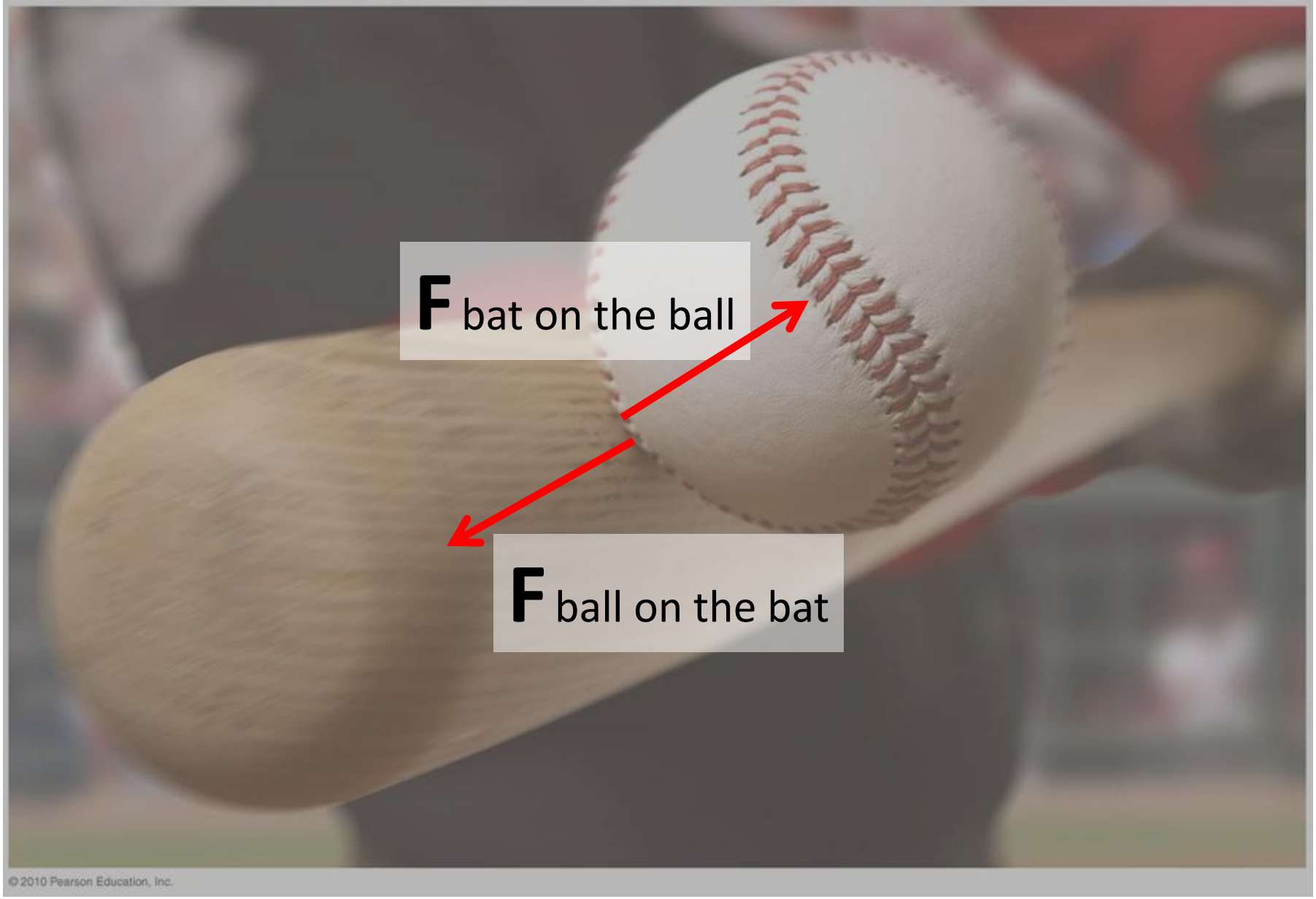
Pairs of Forces

- Force of A on B and Force of B on A

- Force of truck on car
- Force of car on truck
- Force of David pulling Eugenia
- Force of Eugenia pulling David
- Force of David pushing Eugenia
- Force of Eugenia pushing David



Bat and Ball – only objects of interest

Basketball player jumps

F ground on player

F player on ground

Ball toss

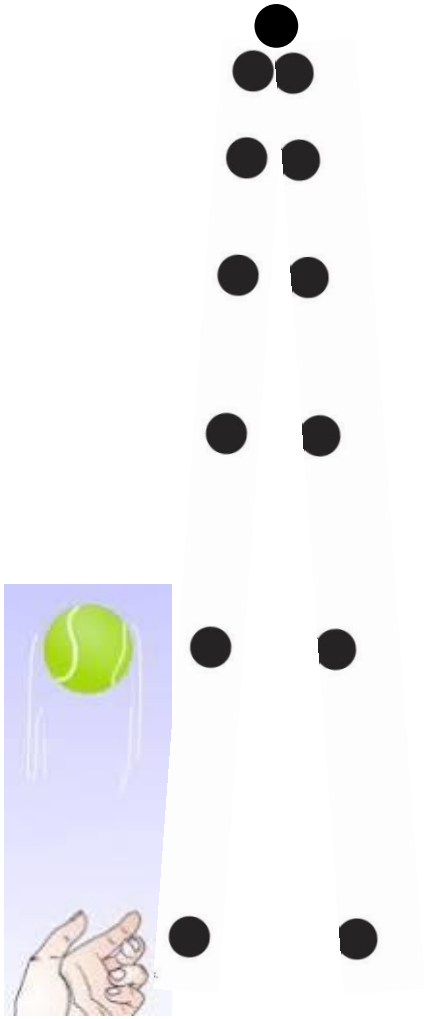
A boy tosses a tennis ball over the fence. Let's say he tosses it with a speed of 10 m/s. When the ball reaches its highest point, it's velocity is

A. zero

B. 10 m/s

C. -10 m/s

D. Not enough info



Both ways are “**free fall**” because the only force is gravity.
Physically it’s the same.

Speed changing by 9.8 m/s every second in the downward direction.

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Ball toss

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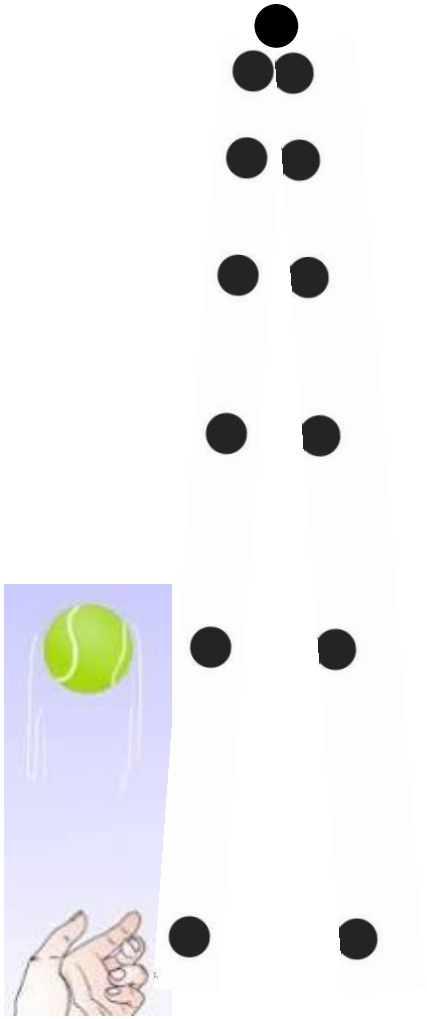
A. zero

B. 9.8 m/s^2

C. -9.8 m/s^2

D. Not enough info



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