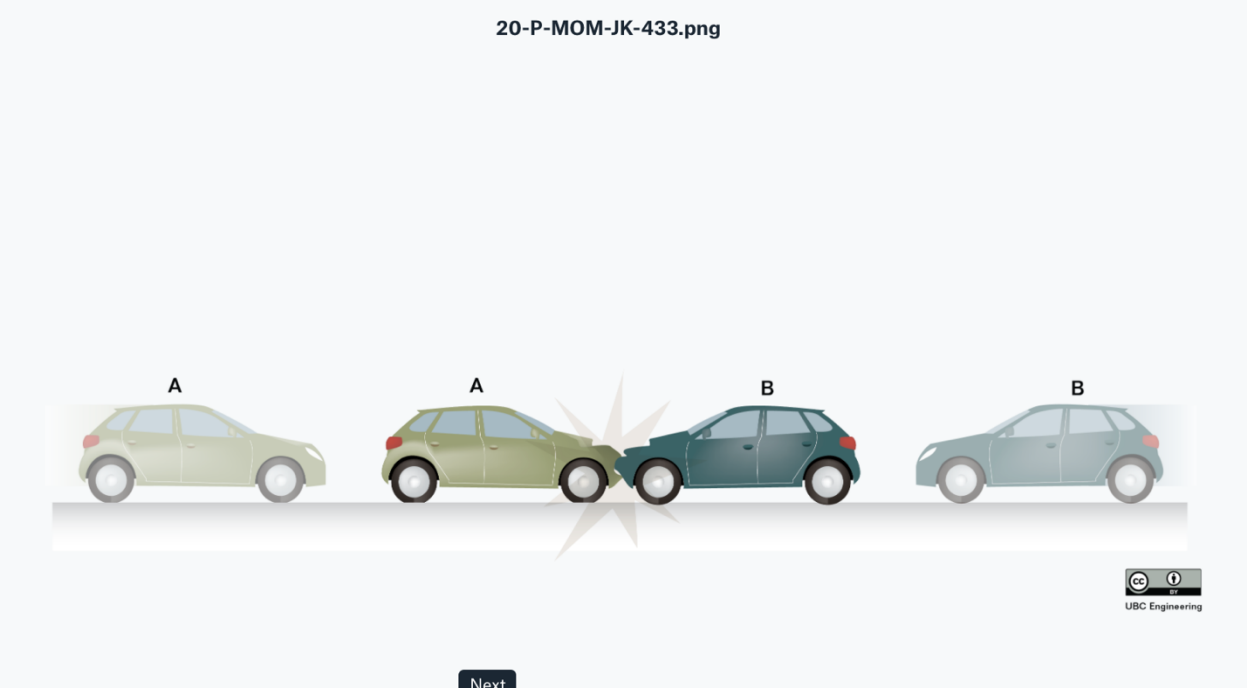
**20-P-Mom-JK-433**

**Momentum Conservation**
**Two cars collide head on**




**Question One – momentum conservation**
What would be the final velocity of both the cars immediately after the collision? Assume this is a perfectly inelastic collision. Assume the two cars were travelling towards each other. They collide and stick together. Assume that car A has a mass of 1210 kilograms and was heading to the right at 27.0 metres per second. Car B has a mass of 1710 kilograms and was heading to the left at 22.0 metres per second before the collision.

Answers

mA = 1210 kg
mB = 1710 kg

vA = + 27.0 m/s
vB = - 22.0 m/s

total momentum before = mAvA + mBvB = 5000 kg m/s to the left
or - 5000 kg m / s if to the right was positive

by the law of conservation of momentum
total momentum after = total momentum before = - 5000 [kg m / s]

total momentum after = (mA + mB) vAFTER

vAFTER = (-5000 kg m/s) / (mA + mB)

v AFTER = 1.70 [m/s] to the left
v AFTER = - 1.70 [m/s]

v AFTER = ( mAvA + mBvB ) / (mA + mB)