

# Momentum

Which would cause greater damage, a small car or a large truck if both hit an object at high speed? Most people know that a large mass, such as a truck, will cause more damage.

Which will cause more damage, a 50 gram bullet that is fired from a gun at 500 m/s or a bullet of the same mass that is tossed slowly by a person? Again, most people know that a fast moving object will cause more damage than a slow moving object of the same mass.

The amount of energy that an object has is determined by both its mass and by its velocity. Heavy fast moving objects have a lot of energy and can do more damage than light slow moving objects.

Isaac Newton was the first to notice this. He called this property “quantity of motion”. Today, we call it **momentum**. Here is how we calculate the momentum of an object:

$$p = mv$$

p = momentum

m = mass (kg)

v = velocity (m/s)

ex. What is the momentum of a 70 kg person running at 5 m/s?