



# CAR SAFETY INFOGRAPHIC

With Newton's laws



The seatbelt helps with to prevent the effects of inertia, newton's first law. An object in motion remains in motion unless acted on by an opposite force. This means, that the person inside the car without a seatbelt, will fly forward due to newtons first law. This safety feature was implemented in order to prevent this, and so that you are stopped by the seatbelt before flying forwards. When your body suddenly moves forward with a seatbelt on, the seatbelt brakes your fall and pushes back on you with a larger force that stops you from flying forwards.



This is a prime example of newtons second law,  $\text{force} = \text{mass} \times \text{acceleration}$ .

The crumple zone is the part of a car, which crumples easily with impact. This decelerates the car, before it reaches the passengers inside. Although the mass is the same, by decelerating, due to the formula, we are decreasing the force that is places on the human. By slowing down, we are also protecting ourselves via newtons first law. As we would fly forward quickly, with the car moving slower, our body will also fly forwards less, meaning the impact on us is reduced.



This is another safety feature that works with the first law. When the passenger hits the airbag, then the force working against them will allow them to slow down. This also works with newtons third law. For every action, there is an equal and opposite reaction. When the passenger hits the airbag, the airbag absorbs this force and pushes back with the same force. This allows the passenger to reduce acceleration and come to a stop.

In all car safety features, all 3 of newton's laws apply to ensure that the passenger is safe and either the law is utilised to protect someone, or the safety feature protects someone from the effects of it, such as in Newton's first law.