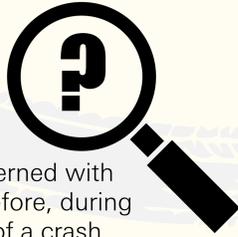


BE A CRASH INVESTIGATOR

What is Crash investigation



Crash investigation is concerned with the way vehicles behave before, during and after a crash. The role of a crash investigator is to reconstruct the crash as much as they can from the marks and other physical evidence left at the scene.

Students from Lockerbie Academy worked with crash investigators from Police Scotland to investigate scaled-down reproduction of real crashes, using mathematics and physics principles to find out what had really happened.

The science behind crash investigation

When a car accident happens, it is not always obvious to see what was the cause and who was at fault. Crash investigators are called to the scene to collect evidence and analyse evidence. But how do they proceed? What kind of analysis do they do? How can they make sure that the evidence is reliable?

Crash investigators used the following methods:

Observation **Hypothesising** **Recording/Noting** **Measuring**
Calculating **Concluding** **Evaluating**

Crash Investigators look at different kinds of evidence:

Skid test: A skid test is carried out to find a value for the friction between the sliding tyres of the car(s) involved in the collision. This can then be used to calculate the speed of the vehicle when it started to skid (brake?) as well as the speed of the vehicle when it hit something, for example a pedestrian. The crash investigators can then determine whether the driver tried to brake, when and if there was anything that caused the braking time to be longer than usual.

$$v^2 = u^2 + 2as$$

Where
 v = Final velocity = 0
 u = Initial velocity = ?
 a = acceleration = -6.80 ms^{-2} (- figure due to it being a deceleration obtained from skid test results)
 s = displacement = _____ (total length of the tyre skid mark)

A Royal Society Partnership Grant project,
Lockerbie Academy and Inspector Neil Hewitson,
Police Scotland



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Pedestrian impact

If a pedestrian is involved in the accident, crash investigators can find out where and how he/she was hit. Direct frontal impacts are those in which the pedestrian is struck by any part of the front of the vehicle, other than the corners.

At impact, the pedestrian is accelerated up to the speed of the vehicle. If it wasn't, the vehicle would have to pass straight through the pedestrian. Usually the vehicle brakes during the impact. In this situation the velocity of the pedestrian first matches the velocity of the vehicle, then is higher than the vehicle. This is because the pedestrian is not affected by the vehicle braking; the vehicle's velocity is reduced by braking. The pedestrian flies through the air ahead of the vehicle until it is brought to rest after hitting the ground. The direction in which the pedestrian is projected depends on a variety of factors including:

- the point of impact on the vehicle
- the shape of the vehicle
- the pre-impact speed and direction of the pedestrian
- the speed of the vehicle.



Crash scene investigation

