

**Crumple Zones & Plastic Parts** → its all about slower crashes

- Older cars were designed with lots of rigid, inflexible steel. Cars came to a (crashing) stop very quickly. Think about the physics you know.

Quick stops = huge \_\_\_\_\_

Remember Newton's 2<sup>nd</sup> Law:  $F_{net} = ma$  so.....

Huge \_\_\_\_\_ mean huge \_\_\_\_\_ and these do us serious damage!

- Crumple zones – in the hood and trunk are designed to crumple and this dissipates energy.

They also \_\_\_\_\_ time to stop. This \_\_\_\_\_ acceleration.

Remember kinematics:  $a = \frac{v_2 - v_1}{t}$

$a \propto 1/t$  ( acceleration varies inversely with time)

so...if I \_\_\_\_\_ time, then I \_\_\_\_\_ a

smaller acceleration = \_\_\_\_\_ force experienced!

- Plastic → reduces the mass of the car.

Can you explain how reducing the mass of the car reduces the force experienced by the passengers?

**Air Bags**

- Write down the chemical reaction that occurs:

\_\_\_\_\_ + \_\_\_\_\_ → \_\_\_\_\_

- Deploy at \_\_\_\_\_ km/h !!!

- With airbags, you don't hit the wheel or the dashboard but also you \_\_\_\_\_ the time to stop and thus \_\_\_\_\_ force experienced.

Young children should not be in the front seat with air bags!!