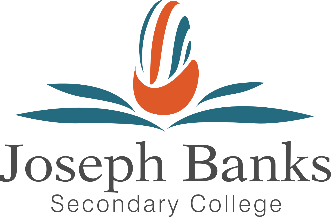
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**Year 12 Integrated Science General 2020**

TASK 4: Extended Response – Vehicle Safety Devices

**Introduction:**

As the number of vehicles on Western Australian roads increases, with over 5 million registered vehicles (Australian Bureau of statistics, 2015), the need for safety is more important than ever. The number of road deaths per 100, 000 population in WA has dropped over the past four decades, from 28.9 in 1970 to 4.1 in 2014 (Transport for NSW, 2014), heavily contributed to by the introduction of safety features. These safety features, specifically seatbelts, low speed zones, airbags, and crumple zones, are heavily involved in the reduction of the likelihood or impacts of hospitalisations and fatalities in accidents. The main aim of many car safety features is to absorb the kinetic energy from the crash in the car. These help in reducing the acceleration and force on the person, decreasing the intensity of injuries.

Car Safety is divided into two sections: active and passive. An active safety feature diminishes the chance of an accident or failure before they arise. Active safety features include pressure monitoring systems, brake assist, and parking assist. These features are always working in the background with computer technology. Passive safety features are for cars to reduce the disaster and the risk of injuries and deaths if an event does go wrong. Airbags, head rests, seat belt lock engagement are examples of passive safety.

**Topic:**

The extended response questions will be based around a comparison of vehicle safety devices, how they function to prevent passenger injury, how these devices have improved over time and how Newton’s Laws of Motion have aided in the design of these devices.

Your research notes should include information about all of the above topics (utilise the unit content dot points to assist you as well).

You will get the most out of your research notes if you summarise the information, rather than just copying it word for word.

**Unit Content Covered:**

* SIS - interpret a range of scientific and media texts, and evaluate processes, claims and conclusions by considering the quality of available evidence; and use reasoning to construct scientific arguments
* SHE - scientific knowledge and improved technology have contributed to enhancement of safety features in vehicles to protect both occupants and pedestrians
* SU - vehicle safety devices and features – airbags, seatbelts, crumple zones, anti-lock braking systems and electronic stability control – use the application of Newton’s laws and conservation of momentum in their design
* SU - Newton's Laws of Motion assist in the explanation of the resultant motion of occupants during collisions

**Useful Websites:**

* <https://www.consumerreports.org/cro/2012/04/guide-to-safety-features/index.htm>
* <https://www.ancap.com.au/understanding-safety-features>
* <https://www.science.org.au/curious/technology-future/death-defying-designs-car-safety>
* <https://www.buyautoinsurance.com/car-physics-and-newtons-laws-of-motion/>

**Task Date Details:**

Research Note Lessons: Friday 15th, Monday 18th & Tuesday 19th May 2020

Research Note requirements: 1 A4 sheet, double sided (typed and printed or handwritten)

Extended Response Test Lesson: Wednesday 25th May 2020

Weighting: 4%

**Marking information:**

Research Notes: 20% of assessment mark

Extended Response questions: 80% of assessment mark