**2023**

**Year 12 Integrated Science – Unit 4**

**Task 11: Vehicle Safety Investigation - Validation**

**Assessment Type: Extended Response**

**Weighting: 10%**

**Duration: 45 minutes**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| --- | --- |
| **Total Mark** |  |

*Please see SEQTA for teacher feedback and comments.*

*For questions 1-4, describe how each principle can minimise injury (link to you knowledge of Physics) and give an example of a* ***modern*** *car feature that uses this principle and how it does so.*

1. **Principle A: Increase in the time of collision or in the time the occupants take to stop**
   1. How can this minimise personal injury? (1 mark)

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* 1. What Physics concept support this principle? (1 mark)

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* 1. Provide an example of a modern car feature using Principle A. (1 mark)

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*Principle B is split into two parts.*

1. **Principle B: Spread the forces of impact over largest possible area**
   1. How can this minimise personal injury? (1 mark)

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* 1. Provide an example of a modern car feature using this part of Principle B. (1 mark)

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**Principle B: Ensure stability of the vehicle**

* 1. How can this minimise personal injury? (1 mark)

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* 1. Which Physics concept support this principle? (1 mark)

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* 1. Provide an example of a modern car feature using this part of Principle B (1 mark)

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1. **Principle C: Minimize contact of the person with the vehicle interior**
   1. How can this minimise personal injury? (1 mark)

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* 1. Which Physics concept support this principle? (1 mark)

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* 1. Provide an example of a modern car feature using Principle C. (1 mark)

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1. **Principle D: keep the person inside the vehicle**
   1. How can this minimise personal injury? (1 mark)

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* 1. Which Physics concept support this principle? (1 mark)

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* 1. Provide an example of a modern car feature using Principle D. (1 mark)

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1. A crash in an early model car (pre-1960s) was very unsafe. This is because it did not have the safety principles listed in questions 1-4.
   1. Describe one feature (or lack of feature) an early model car had which made it unsafe. (1 mark)

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* 1. Which physics concept shows the feature above (or lack of feature) is unsafe?

(1 mark)

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**END OF ASSESSMENT**