**SACE Stage 1 Physics Name:**

**Science as a Human Endeavour Task – Transport Technology**

Transport used by humans has evolved through many forms over history.

* On land, transport has changed from the horse and cart to trains and the automobiles, both petrol-driven and electric.
* On the sea, transport had changed from rowing to sailing, motorboats, and submarines.
* In the air transport has changed from hot air balloons to aeroplanes.
* Rockets, space shuttles, and spacecraft have been developed to explore space.
* Human-powered technology such as the bicycle has also evolved.

Physics has been essential to the development and understanding of all these technologies.

You have been commissioned by an online magazine to publish an article on the development and physics of one particular *new* mode of transport, showing how it demonstrates at least one of the key concepts of science as a human endeavour (see subject outline pages 12 and 13). You need to select a specific form of modern transportation, identifying the model of car, train, boat, plane, spacecraft etc and highlight the role of science and scientists in its development.

The magazine editor has requested that you:

* describe the propulsion system used by the mode of transport you have chosen as your focus, using relevant physics concepts such as energy transformations, forces, speed, acceleration, energy efficiency and power
* include ONE safety feature that is incorporated into the technology and describe it using the relevant physics (e.g. Newton’s Laws of Motion)
* describe the major factors in society and the role of science that led to the development of that mode of transport (i.e. did some ‘need’ or ‘desire’ drive the development or was it ‘blue-sky’ fundamental research that led to the technology). Show how it links to at least one of the key concepts of science as a human endeavour
* discuss the impact that the change in the technology in this mode of transport has had on society.
* justify your conclusion to the readers of the magazine about the technology, its use in the mode of transport researched, and how it shows the interaction between science and society.

You may either focus on a selected specific example (e.g. the Toyota Prius) or a general form of the transport technology (e.g. the automobile).

You may prepare a written article (1000 words maximum) or a video (6 minutes) suitable for publishing online.

**Science as a Human Endeavour Task Student: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Transport Technology Marking Rubric**

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| --- | --- | --- | --- |
|  | KA1 | KA3 | KA4 |
| Evidence | * Discussion of physics of propulsion of transport technology. * Discussion of physics of safety precautions in transport technology. | * Discussion of factors that lead to development of transport technology. * Discussion of impact of transport technology on society * Link to key concept(s) in science as a human endeavour. | * Spelling, pronunciation and/or grammar * Sentence and paragraph structure * Appropriate use of physics terminology * Neat and clear presentation * Engaging format |
| A | Demonstrates deep and broad knowledge and understanding of a range of physics concepts. | Critically explores and understands in depth the interaction between science and society. | Communicates knowledge and understanding of physics coherently with highly effective use of appropriate terms, conventions, and representations. |
| B | Demonstrates some depth and breadth of knowledge and understanding of a range of physics concepts. | Logically explores and understands in some depth the interaction between science and society. | Communicates knowledge and understanding of physics mostly coherently with effective use of appropriate terms, conventions, and representations. |
| C | Demonstrates knowledge and understanding of a general range of physics concepts. | Explores and understands aspects of the interaction between science and society. | Communicates knowledge and understanding of physics generally effectively, using some appropriate terms, conventions, and representations. |
| D | Demonstrates some basic knowledge and partial understanding of physics concepts. | Partially explores and recognises aspects of the interaction between science and society. | Communicates basic physics information, using some appropriate terms, conventions, and/or representations. |
| E | Demonstrates limited recognition and awareness of physics concepts. | Attempts to explore and identify an aspect of the interaction between science and society. | Attempts to communicate information about physics. |
| I | No evidence | No evidence | No evidence |

Overall Grade:

Comment: