**Stage 1 Digital Technologies**

**Assessment Type 1: Project Skills**

**Exploring Innovations: Autonomous Vehicles**

**Purpose**

Current innovative technology lies in the automation of vehicles, which are capable of sensing their environment and navigating without human intervention. Although in their infancy, the technology has the potential benefit of increased safety for passengers and a reduction in infrastructure costs. Regardless of these benefits there are significant ethical implications that must be addressed before fully automated vehicles are permitted on public roads.

The purpose of this task is to research the main systems that this technology employs as well as the benefits, impacts and ethical considerations of this innovation.

The purpose of this task is to:

* identify the benefits that drive the direction of this technology
* research the techniques that autonomous cars use to sense and react to their environment
* identify the potential impacts this technology has on passenger safety and infrastructure
* consider ethical considerations of this technology.

**Assessment Description**

* You will work collaboratively in groups of 2-3 for the duration of this task.
* Research the benefits that guide the direction of this technology.
* Research the techniques that autonomous cars use to sense and react to their environment.
* Research the expected impacts this technology could have on passenger safety and infrastructure.
* Consider the ethical considerations of this technology.

**Assessment Conditions**

* As a group, summarise your findings and recommendations, and present them in a suitable format.
* Keep an electronic record of evidence (notes, reflections, draft design annotations etc.) of your contributions, and others’, to the collaborative project.

**Assessment Design Criteria**

CT1 Application of computational thinking skills to explore problems and possible solutions

DE2 Evaluation of the effectiveness of a digital solution or prototype

DE3 Contribution to collaborative work

RE1 Research into and discussion of ethical considerations in digital solutions and/or data use

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|  | **Computational Thinking** | **Development and Evaluation** | **Research and Ethics** |
| **A** | Insightful and sustained application of computational thinking skills to explore problems and possible solutions.  Focused development and strategic application of a wide range of programming skills to create a digital solution or prototype.  In-depth analysis of patterns and relationships in data sets and/or algorithms to draw insightful conclusions. | Purposeful and well-considered development and application of program-design skills to create digital solutions or a prototype that include innovative features.  Insightful evaluation of the effectiveness of a digital solution or prototype.  Insightful and proactive contribution to collaborative work. | In-depth research into and discussion of the ethical considerations in digital solutions and/or data use. |
| **B** | Some insights in the application of computational thinking skills to explore problems and possible solutions.  Thorough development and well-considered application of a range of programming skills to create a digital solution or prototype.  Some depth in analysis of patterns and relationships in data sets and/or algorithms to draw well-informed conclusions. | Well-considered development and application of program-design skills to create digital solutions or a prototype that include one or more innovative features.  Well-considered evaluation of the effectiveness of a digital solution or prototype.  Mostly consistent and effective contribution to collaborative work. | Some depth in research into and discussion of the ethical considerations in digital solutions and/or data use. |
| **C** | Application of computational thinking skills to explore problems and possible solutions.  Competent development and application of programming skills to create a digital solution or prototype.  Description, with some analysis of patterns and relationships in data sets and/or algorithms, to draw generally informed conclusions. | Development and application of program-design skills to create digital solutions or a prototype that may include one or more innovative features.  Description, with some evaluation of the effectiveness, of a digital solution or prototype.  Effective contribution to collaborative work. | Considered research into and discussion of the ethical considerations in digital solutions and/or data use. |
| **D** | Some application of basic computational thinking skills to describe problems and possible solutions.  Basic development and some application of programming skills to create one or more partial solutions or prototypes.  Basic description of patterns and relationships in data sets and/or algorithms to draw one or more basic conclusions. | Some development and application of program-design skills to create one or more partial solutions or prototypes.  Basic description of a digital solution or prototype and one or more aspects of its effectiveness.  Some contribution to collaborative work. | Basic research into and discussion of the ethical considerations in digital solutions and/or data use. |
| **E** | Attempted application of a limited number of simple computational thinking skills to describe a problem and/or possible solution.  Attempted development and/or application of basic programming skills.  Attempted description of one or more patterns and relationships in data sets and/or algorithms. | Attempted development and application of program-design skills.  Attempted description of a digital solution or prototype.  Limited contribution to collaborative work. | Attempted discussion of an ethical consideration in digital solutions and/or data use. |