Year 7 – Design Brief

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| Year 7- Self-Driving Car | | | |
| Design Brief: Design and program a self-driving car using an Arduino which considers ethical, social and sustainability issues and can sense the road, map the road and negotiate its place on the road. | | | |
| **Lesson Number** | **Focus** | **Australian Curriculum**  **General Capabilities** | **Australian Curriculum Content**  **Descriptors** |
| **Design and technologies project:**  Design and program a self-driving car | | * **Critical and creative thinking** – inquiring – identifying, exploring and organising information and ideas * **Critical and creative thinking –** generating ideas, possibilities and actions   **• Critical and creative thinking –** reflecting on thinking and processes  **• Critical and creative thinking –** analysing, synthesising and evaluating reasoning and procedures  **• Personal and social capability –** social management   * **ICT capability** – Applying social and ethical protocols and practices when using ICT * **ICT capability** – managing and operating ICT | **• Design and technologies –** Analyse how motion, force and energy are used to manipulate and control electromechanical systems when designing simple, engineered solutions (ACTDEK031)   * **Design and technologies –** Analyse ways to produce designed solutions through selecting and combining characteristics and properties of materials, systems, components, tools and equipment (ACTDEK034) * **Design and technologies –** processes and production skills (ACTDEP035), (ACTDEP036), (ACTDEP037), (ACTDEP038), (ACTDEP039) * **Digital technologies -** Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032) * **Digital technologies -** Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031) |

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| **Lesson**  **Number** | | **Focus** | | **Learning outcomes** | **Resources** |
| **7** | | Generate and refine ideas | | * Understand the requirements of the design brief * Create 3 x self-driving car design ideas, Draw and label each system and describe how it works (in consideration of ethical, social and sustainability issues) * Evaluate and select a final design | Year 7 generating and refining ideas worksheet**– Group task**    Arduino kits |
| **8** | | Production plan | | * Collaborate with group members * Select an online collaboration tool for planning and storing files * Draw and label final self-driving car design and describe how it works (in consideration of ethical, social and sustainability issues) * List components in the self driving car * List risks and risk management strategies * Write pseudo-code for Arduino programming * Create production steps and allocate group roles | Year 7  Investigating components worksheet**– group task**  Year 7 production plan ‘Bringing it Together’ worksheet -**Group task**    Arduino kits |
| **9** | | Producing and implementing | | * Collaborating and managing the production process * Safely use appropriate materials to collaboratively execute the production of the self-driving car design * Create and debug Arduino program collaboratively * Test product meets design brief specifications | Completed Year 7 production plan ‘Bringing it Together’ worksheet for each group – **group task**    Arduino kits |
| **Lesson**  **Number** | **Focus** | | **Learning outcomes** | | **Resources** |
| **10** | | evaluating | | * Evaluate and reflect on self-driving car design * Explain use of code, evaluate and reflect on programming Arduino * Evaluate and reflect on collaboration skills and strategies * Explain future use of designed product in the community, including ethical, social and sustainability considerations | Year 7 evaluation worksheet **–individual task** |
| **11** | | Presenting | | * Groups present their designed product to an audience * Groups explain their self-driving car design and Arduino program to the class | Completed Year 7 worksheets – **group task**    Each group’s designed product |