Assessment Task

Fire-Ed Up Task Details

Focus question: Can we make the Australian Fire Danger Rating System (AFDRS) more accurate?

Type of task: Design and computational thinking task, incorporating a portfolio and prototype solution.

Format: Practical task

Submission: Students work collaboratively to develop a prototype design solution and submit an individual portfolio.

Technology Mandatory outcomes assessed:

- **TE4-1DP** A student designs, communicates and evaluates innovative ideas and creative solutions to authentic problems or opportunities.
- **TE4-2DP** A student plans and manages the production of designed solutions.
- **TE4-4DP** A student designs algorithms for digital solutions and implements them in a general-purpose programming language.
- **TE4-10TS** A student explains how people in technology related professions contribute to society now and into the future.

Fire-Ed Up Task
The Fire-Ed Up task could be presented in different formats such as a custom folio or using the guided template. Students need to document their development of a digital prototype design solution in this folio. The prototype could include the modification of an existing Raspberry Pi Fire-Ed Up kit or students can develop an entirely different digital solution.

Task steps

Define the problem
Define the task to gain a better understanding of it. For example:

- learn about the Fire-Ed Up context – Australian Fire Danger Rating System, Fire Behaviour Index.
- take field measurements related to the Fire Behaviour Index.
- explore the use of satellite and digital twin technologies.
- use algorithms and code to simulate a localised fire danger rating system.
- analyse the problem.
- create a design brief statement.

Assessment Task

Identify the constraints
Outline specific boundaries that confine the task. For example:
- identify time available to complete the challenge.
- identify available space, tools and equipment.
- identify specific boundaries of the path.

Brainstorm solutions
Use a range of brainstorming techniques to generate innovative ideas. For example
- crazy 8's.
- drawing and sketching possible solutions.

Design
Design your prototype design solution. For example
- use divergent and convergent thinking techniques.
- produce working design drawings, algorithms or code.

Prototype
Produce a basic prototype of the digital design solution. For example:
- modify or abstract the Fire-Ed Up kit by changing the micro-python code or add input or output devices or add sensors. You may use predeveloped code you have created or library modules.
- produce an appearance, paper or rough prototype or an engineering prototype.

Evaluate
Test your Fire-Ed Up prototype. For example:
- create evaluation parameters based on the agreed success criteria from Define the problem.
- test the prototype to see if it meets the success criteria.
- complete a SWOT analysis, and a PMI.
- record prototype progress for detailed evaluation.

Iterate
Use evaluation results to adjust calculations and code that instructs the digital prototype. For example:
- Test, evaluate and reiterate code until the Fire-Ed Up kit performs as expected.
- Produce drawings or code of improved design solutions.

Communication
- Show final design solution in a folio.
- Demonstrate understanding of fire-based organisations, careers, skills and training.