Stage 2 Digital Technologies

Assessment Type 2: Collaborative Project

**Purpose**

Collaboratively create a digital solution to a problem of interest.

**Description of Assessment**

Work collaboratively to solve a problem of interest to your group, school or your local community. At the start of the project, the group assigns clearly defined roles to each member. The group agrees on a method of recording each student’s contribution to the project. Collaboratively, the group:

* identifies a problem that is manageable and has an associated client or clients from the school or local community
* communicates with the client at key stages of the project
* analyses data and uses it to scope the solution
* uses an iterative project development plan to create a digital solution for the problem, which could be a working prototype, or proof of concept.

1. As a group, determine the individual roles for each student in the group.

These may include: project manager, designing the interface and graphics, coding, testing, user documentation, project documentation, client liaison, final presentation.

Once you have identified the problem, break it down into tasks and determine who has the best knowledge, skills and resources in your group to complete the tasks.

1. As a group, choose a problem that is of interest to the group, school, or the community.

Ensure that the problem is manageable and there is a client or clients that the group can communicate with at key stages. Investigate if there are any existing solutions to the problem.

Before proceeding, discuss this problem with your teacher for approval.

Examples of problems include (but are not limited to):

* teaching a concept effectively to primary school students (e.g. fractions)
* improving performance for an activity at a local sports club (e.g. goal kicking)
* stock management for the school canteen
* planning a community garden or green space
* improving the health and fitness of primary school students.

1. Source and analyse relevant data

Source data that is relevant to the problem. This could include:

* data that the client may have collected
* data available from online and public datasets e.g. Data.SA datasets (<http://data.sa.gov.au/data/dataset>) or ABS.Stat (<http://stat.abs.gov.au/>)
* data that the group collects, ensuring that you have time to collect sufficient and reliable data
* for practical tasks (e.g. kicking goals), analysis of video footage.

The data you collect and analyse should help you to draw conclusions and/or make predictions in order to develop an innovative solution to the problem.

1. Create a project plan

As a group, create a project plan to:

* decide if the solution is a working prototype, or proof of concept
* determine the features to be included in your solution
* define a timescale to create the solution based on the features of your project.

Dates may change as the project progresses (except for the completion date). The project plan should include communication with the client or clients throughout the development of the solution. Identify potential risks and note any strategies to minimise these risks.

1. As a group, check in with the teacher to monitor how well your collaboration is working.
2. Create the digital solution using the project plan

As a group, use the project plan to create the digital solution; for example:

* for a model or prototype, code, test, and integrate each feature separately
* add or remove features as the solution develops, and use client feedback to inform the process
* monitor progress regularly against the project plan for timescale, risk, and resources
* the solution must transform data into information using a digital system. If your group presents a model, there should enough programming present to clearly explain how the solution will produce an output
* the digital solution is to be no more than 1GB.

**Assessment Conditions**

Each group presents their digital solution and a project evaluation to the client or clients. Each group member explains their individual role and contribution to the project. Your digital solution, evaluation and explanation should be in a digital or multimodal format. Each student has up to 5 minutes to present their explanation and evaluation; this presentation should be oral and multimodal, and recorded.

1. **Digital solution** (no more than 1GB)

The digital solution should be a model, working prototype, or proof of concept. The solution must transform data into information using a digital system. If your group presents a model, there should enough programming present to clearly explain how the solution will produce an output.

1. **Project evaluation**

The project evaluation should detail:

* the effectiveness of the solution
* the process used to develop the solution.

1. **An explanation of your role in the project**

Each group member explains his or her role in and contribution to the project.

Discussion points could include:

* participation and contribution – how involved were you in group discussions, problem solving and activities? To what extent did you share your thoughts and ideas?
* quality of your work – how did you ensure that your work was of high quality?
* time management – how well did you meet regular deadlines?
* flexibility – how did you respond to the needs of the group, to help get the task completed?
* working with others – how effectively did you respect the ideas and work of others in the group, and listen to and value their ideas and opinions?
* self-reflection – what have you learnt from reflecting on the value of your contribution to and impact on the group?

| *Learning Requirements* | *Assessment Design Criteria* |
| --- | --- |
| 1. apply computational thinking skills, including abstraction, to approach, identify, deconstruct, and solve problems of interest 2. analyse data sets related to problems of interest, to identify patterns and/or trends, draw conclusions, and make predictions 3. apply iterative project - development techniques to manage and evaluate proposed digital solutions to problems of interest 4. apply design and programming skills to create and document digital solutions 5. research and discuss ethical considerations in digital technologies 6. work individually and collaboratively to create and explain digital solutions. | Computational Thinking  The specific features are as follows:  CT1 Application of computational thinking concepts and techniques, to identify and deconstruct problems of interest  CT2 Use of abstraction to identify core concepts and ideas  CT3 Analysis of relationships in datasets to draw conclusions and make predictions  CT4 Application of skills and processes to develop solutions to problems of interest  Development and Evaluation  The specific features are as follows:  DE1 Design and creation of digital solutions or a prototype  DE2 Application of iterative development, testing, modification, and documentation of a digital solution or prototype  DE3 Evaluation of the effectiveness of a digital solution or prototype  DE4 Explanation, with supporting evidence, of own role in and contribution to projects  Research and Ethics  The specific features are as follows:  RE1 Research into and discussion of the ethical considerations in digital technologies. |

Performance Standards

| - | Computational Thinking | Development and Evaluation | Research and Ethics |
| --- | --- | --- | --- |
| A | Astute and creative application of computational thinking concepts and techniques to clearly identify and deconstruct problems of interest.  Insightful use of abstraction to identify core concepts and ideas.  In-depth analysis of relationships in data sets to draw insightful conclusions and make well-justified predictions.  Highly purposeful application of skills and processes to develop highly efficient and logical solutions to complex problems of interest. | Clear and consistent use of initiative in the design and creation of digital solution or prototype that includes innovative features.  Highly purposeful and strategic application of iterative development, testing, modification, and documentation of an innovative digital solution or prototype.  Insightful evaluation of the effectiveness of a digital solution or prototype.  Insightful explanation, supported by clear and highly convincing evidence of own role in and contribution to projects. | In-depth research and discussion of the ethical considerations in digital technologies. |
| B | Well-considered application of computational thinking concepts and techniques to identify and deconstruct problems of interest.  Some insights in the use of abstraction to identify core concepts and ideas.  Some depth in analysis of relationships in data sets to draw informed conclusions and make justified predictions.  Purposeful application of skills and processes to develop efficient and mostly logical solutions to some complex problems of interest. | Mostly consistent use of initiative in the design and creation of digital solution or prototype that includes one or more innovative features.  Mostly purposeful application of iterative development, testing, modification, and documentation of a digital solution or prototype, with some innovation.  Well-considered evaluation of the effectiveness of a digital solution or prototype.  Some depth in explanation, supported by clear and mostly convincing evidence of own role in and contribution to projects. | Some depth in research and discussion of the ethical considerations in digital technologies. |
| C | Application of computational thinking concepts and techniques to identify and deconstruct problems of interest.  Some use of abstraction to identify core concepts and ideas.  Description, with some analysis, of relationships in data sets to draw generally informed conclusions and make predictions, with some justification.  Application of skills and processes to develop generally efficient and logical solutions to problems of interest. | Some use of initiative in the design and creation of digital solution or prototype, which may include one or more innovative features.  Competent application of iterative development, testing, modification, and documentation of a digital solution or prototype, with one or more innovative features.  Description of the effectiveness of a digital solution or prototype, with evaluation of some features.  Explanation, supported by generally clear evidence, of own role in and contribution to projects. | Considered research and discussion of the ethical considerations in digital technologies. |
| D | Partial application of basic computational thinking concepts and techniques to identify and describe problems of interest.  Identification and description of some basic core concepts and/or ideas.  Identification and use of one or more simple relationships in data sets to draw a partial conclusion and/or make a prediction based on limited evidence.  Partial application of skills and processes to develop solutions to simple problems of interest. | Partial design and creation of digital solution or prototype.  Basic application of some iterative development, testing, modification, and/or documentation of a digital solution or prototype.  Partial description of the effectiveness of a digital solution or prototype.  Basic explanation of own role in and/or contribution to projects, with limited supporting evidence. | Basic research and discussion of one or more ethical considerations in digital technologies. |
| E | Attempted application of a limited number of basic computational thinking concepts or techniques to describe a problem of interest.  Attempted identification and description of a core concept or idea.  Attempted use of limited, simple data sets to draw a conclusion or make a prediction.  Attempted application of skills and processes to develop partial solutions to some simple problems of interest. | Attempted design and creation of digital solution or prototype.  Attempted application of simple iterative development, testing, modification, or documentation of a digital solution or prototype.  Limited description of a digital solution or prototype.  Limited description of own participation in projects. | Attempted research and discussion of ethical considerations in digital technologies. |