Stage 1 Digital Technologies

Assessment Type 1: Project Skills

Data Analytics: Investigating a Local Issue

Purpose

*Dob in a Litterer* is an app launched in February 2017 by the Environment Protection Authority (EPA) of South Australia that attempts to harness people power and technology in the fight to solve the state problem of littering.

By considering your local area or community, identify and analyse a local issue that could be solved using the combined power of technology and people.

Assessment Description

* Working collaboratively in groups of 2 or 3, undertake research to identify an issue in your local area or community e.g. school, club, council etc. This could involve, but is not limited to:
  + observation or personal experience
  + speaking with appropriate people associated with the identified area or community issue
  + background research into the identified area or community issue
  + browsing available data associated with the identified area or community issue

*Note: The South Australia Government Data Directory:* [*https://data.sa.gov.au/data/dataset*](https://data.sa.gov.au/data/dataset%20%20%20)

*has datasets available from a wide range of local and state government organisation.*

*Another good source of datasets is the Australian Bureau of Statistics:* [*http://www.abs.gov.au/*](http://www.abs.gov.au/)

* Collect data associated with the identified area or community issue that will help you to investigate the extent of the issue. This could include:
  + conducting a survey to collect suitable data
  + observation and recording (e.g. measure, count, poll etc.) to collect suitable data
  + using already available dataset(s) of suitable data

*Note: Before collecting your own data (i.e. survey or observation/recording) make sure that the data to be collected is relevant in helping you to investigate the problem identified.  
You may wish to use available datasets supplemented with data that you have collected.*

* Using Microsoft Excel (or similar), investigate the extent of the identified area or community issue by analysing and comparing the data. This should include creating suitable graphs and/or tables which compare data over time and/or across different categories.
* Propose one or more possible idea(s) for a digital solution (that uses the combined power of technology and people) to solve the problem identified e.g. app, wearable technology, micro-controller system (Arduino, BBC micro:bit, Raspberry Pi) etc.. This should include:
  + a brief description of the proposed digital solution.
  + annotated sketches (digital or hand drawn) of the interface, storyboard and/or design (as appropriate).
  + an explanation of how the digital solution will solve the problem identified.

Assessment Conditions

* Multimodal report (a maximum of 5 minutes or equivalent). The report should include:
  + a brief description of the issue identified
  + an analysis of the extent of the issue identified with supporting evidence e.g. graphs, tables, observations, discussions etc.
  + the proposed idea(s) for a digital solution

Assessment Design Criteria

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

CT3 Analysis of patterns and relationships in data sets and/or algorithms to draw conclusions

DE1 Development and application of program-design skills to create a digital solution or prototype

DE3 Contribution to collaborative work

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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. |