TEACHER GUIDE

Space Careers Wayfinder

The Artemis Exhibition |
Data Collection and Analysis

This activity engages students in the development of a networked digital system for a new exhibition in a space education centre. The exhibition will feature NASA's Artemis Program, which aims to put the first female and first person of colour on the Moon by 2026. Eventually as part of the program, NASA and other space agencies will build a base on the Moon to support human settlement, ultimately providing a launchpad for a mission to Mars.

The task

Students become employees of the company chosen to develop the digital systems for the education centre.

Information

The following requirements are supplied to students as provided by the client.

The client would like:

- To collect anonymous feedback from visitors to the new exhibition - including visitor postcodes to help inform future marketing campaigns
- Track and record the number of visitors to the new exhibition space
- Compare the number of visitors to the new exhibition space with the total number of visitors to the education centre

Other digital technologies tasks include:

- If possible, track and record the number of times an exhibit is visited
- If possible, monitor the length of time the exhibit is in use
- Design a game which captures the essence of the Artemis Program.

NOTE – the centre management will consider a range of games. These might cover gamifying a fully crewed mission to the Moon or a smaller component such as docking the capsule with Gateway or landing the lunar lander at the pre-staging site on the Moon.

Further information is supplied to students regarding the actual physical exhibition

- The exhibition space will contain 18 exhibits, of which 12 will be interactive hands-on exhibits and 6 will contain information. Your team will develop 2 of the interactive exhibits including the game.

The space education centre's communication and marketing manager has put forward a proposal for an annual membership to the centre. The membership will not only help with revenue but will also offer a means of direct marketing.

A number of questions posed as ***considerations*** are supplied to provide a degree of guidance for the activity, these include:

- Who will be the users of your digital system?
- What will your digital system look like? What are the main components and any peripheral devices?
- Considering the different ways visitors will interact with the exhibits - what type of user interface/s will you use?
- The education centre needs accurate figures of visitors to the exhibition but cannot manually collect these. How will these be collected?
- Different types of data collected may need to be presented in a way non-IT personnel can access and understand
- Any data containing personal details will need to be validated and stored securely
- How might you enrol visitors in the membership program?
- How will you manage the membership program i.e. membership renewals?

As the overall activity has a number of individual components and tasks, specific tasks might be set to meet targeted curriculum areas.

For example, the integration of human presence detection as a means of monitoring visitor numbers to the Artemis exhibition space – will traditional PIR motion sensors be appropriate for this application?

How can the space education centre management be confident the feedback given by visitors is impartial and non-biased?

How can personal data collected during membership recruitment be securely stored and meet privacy and confidentiality regulations?

Australian Curriculum

Digital technologies

Explain how hardware specifications affect performance and select appropriate hardware for particular tasks and workloads (AC9TDI8K01)

Investigate how hardware and software manage, control and secure access to data in networked digital systems (AC9TDI10K01)

Investigate how data is transmitted and secured in wired and wireless networks including the internet (AC9TDI8K02)

Acquire, store and validate data from a range of sources using software, including spreadsheets and databases (AC9TDI8P01)

Develop techniques to acquire, store and validate data from a range of sources using software, including spreadsheets and databases (AC9TDI10P01)

Design algorithms involving nested control structures and represent them using flowcharts and pseudocode (AC9TDI8P05)

Design algorithms involving logical operators and represent them as flowcharts and pseudocode (AC9TDI10P05)

Design the user experience of a digital system (AC9TDI8P07)

Design and prototype the user experience of a digital system (AC9TDI10P07)

Select and use emerging digital tools and advanced features to create and communicate interactive content for a diverse audience (AC9TDI10P11)

Use simple project management tools to plan and manage individual and collaborative agile projects, accounting for risks and responsibilities (AC9TDI10P12)

Apply the Australian Privacy Principles to critique and manage the digital footprint that existing systems and student solutions collect (AC9TDI10P14)