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Opinion Article

# Space Programme at the Powerhouse Museum: The Mission to Mars Programme

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## DESCRIPTION

The Paths to Space programme at the Powerhouse Museum in Sydney and the Mission to Mars programme at the Victorian Space Science Education Centre in Melbourne are the two programmes that are the subject of this study. The programmes include modern scientific practises and show students many facets of science's nature and methods that may not be readily apparent in classroom science activities, including inquiry-based learning. These qualities of scientific investigation, the function, standing, and traits of the information it produces, the way in which scientists manage uncertainty, the way in which scientists collaborate as a social community, and the ways in which research has an impact are just a few of these elements., The social context in which it is situated has an impact on it. Astrobiology is multidisciplinary, making it accessible to many sections of school science curricula and serving as an example for students of how many scientific fields interact. Although the objectives of these two initiatives to involve students in the scientific method are similar, their approaches are different. The ultimate objective of Pathways is to identify and support students interested in space-related courses and occupations as part of an attempt to develop future talent for an expanding Australian space programme. Pathways contains a 140 square metre Mars Yard and robotics lab that is scientifically realistic. It also functions as a "living lab" where undergraduate and graduate students do research projects and conduct Martian robotics and science study. The project's robotics and science research components are combined with its high school education programme component. The high school kids participate in a one-day session where they create a Mars rover mission in Think space, the museum's digital learning studio, and then carry it out in the Mars Yard with the help of a university robotics research engineer. They also take into account the evidence for the origins of life on Earth and its connection to the search for geological and environmental proof of potential past or current life on Mars. The Mars Education team at Arizona State University in collaboration with NASA's Jet Propulsion Laboratory offers students the chance to participate in a NASA student research project if they later "self-identify" as being interested in more exposure to the subject. Depending on how it is delivered, the Mars Student Imaging Program can be finished in 5 weeks to a year; the Powerhouse is nearing the end of the first programme. Schools can choose to complete pre- and post-visit experiences relating to the Victorian State science curriculum as part of the Mission to Mars programme at the Victorian Space Science Education Centre. Students role-play in a mission control centre and a mock martian crater during their one-day tour to the centre, collecting samples that are then analysed in a lab using collegiate-level equipment. Students conduct experiments while wearing spacesuits as they enter the crater. It resembles the strategy used by Challenger centres both domestically and abroad.

The programmes give hands-on experiences that illustrate the nature of science and the work of scientists that can be challenging to achieve in the science classroom by focusing on getting students involved in the scientific processes. In order to find the answer to one of science's most important questions—whether or not we are alone in the universe—collaboration with NASA's Jet Propulsionboth programmes ask students to use their imagination and creativity to solve the kinds of issues that astrobiologists encounter when researching other planets. For instance, in Paths to Space, students plan their mission while keeping in mind the limitations imposed by engineering. Students in Mission to Mars are challenged to think of original solutions to the imagined issues they face while on their expedition. Examining how these activities affect students' attitudes and understandings is the goal of this study. The fact that there are few reliable statistics on programme efficacy published in the literature indicates that many outreach initiatives do not incorporate any meaningful kind of evaluation beyond gathering data. In order to contextualise the findings in terms of the type of student pursuing these programmes, and thereby provide a more useful data set, this research specifically characterises the study participants.

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