

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Structures for Space Education (2)

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FROGS IN ORBIT: BRINGING SPACE RESEARCH INTO THE CLASSROOM

Abstract

The practice of scientific research and technology development has changed significantly over the last 50 years. The traditional role of the scientist working independently to push the boundaries of knowledge has been replaced with large scale projects undertaken in teams, that are often global in nature, driven by commercial forces, multi-disciplinary, significantly technologically linked, and often having significant community implications. The changing nature of contemporary science and the skills needed by scientists have implications for how science should be represented in the curriculum and the skills that need to be developed.

To develop these skills educators need programs that are multidisciplinary, encourage team work and problem solving, explore the appropriate use of technology and expose students to active areas of research and researchers. In 2008 the Victorian Space Science Education Centre (VSSEC), Ecolinc and the Japan Aerospace Exploration Agency (JAXA) jointly developed the Frogs in Orbit outreach program for secondary school students that incorporated each of these elements.

Frogs in Orbit uses the Japanese Frogs in Space (FRIS) experiment as the context for teaching Biology, Ecology and Physics. In December 1990 six adult Japanese tree frogs were sent to the Mir Space Station for eight days, to observe and record their behaviour in microgravity. The findings of this experiment helped to expand our understanding of how animals behave in microgravity and the engineering of artificial habitats.

Thanks to one of the lead scientists of the FRIS experiment, Assoc. Prof. Izumi-Kurotani, this information is made available to students as part of the Frogs in Orbit program. Students study frog anatomy and physiology and investigate frog habitats on Earth. Students then explore what can be learnt from working in a microgravity environment, and the ethics of animal testing. Drawing on all this knowledge students then investigate how to engineer artificial habitats

The lessons lead to open-ended enquiry and self directed learning, and offer the opportunity for extension, group and individual work. Students apply their understanding to issues significant to themselves and to society; including ecotourism, tourism in space, a clean and healthy environment, and the ethics of science research. Feedback from teachers has been very positive, indicating that the emphasis on enquiry-based learning has increased the engagement of students.

This paper will explore the Frogs in Orbit program and how the partnering of education and research facilities can produce resources for educators that are aligned with the curriculum, stimulating for students and develop relevant skills.