

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Ignition - Primary Space Education (1)

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THE STANFORD YOUNG ASTRONAUTS PROGRAM: A MODEL FOR SUSTAINABLE OUTREACH

Abstract

The Stanford Young Astronauts program, run by volunteer graduate students from Stanford University, teaches space science and engineering to third- and fourth-grade students at two local elementary schools. Since 1985, it has sustainably fostered excitement and interest in learning about science and engineering.

A sequence of nine hour-long lessons is taught spanning the academic year. The topic areas include a breadth of lessons such as forces, structures, and electricity, culminating in each student building and launching a model rocket. Each lesson explores a different topic but builds on previous material. As a result, important concepts are reinforced throughout the year.

The Young Astronauts program has demonstrated success as a result of certain key features, which could be adopted by other outreach programs around the world. Its focus on generating excitement about learning through hands-on activities and eye-opening demonstrations ensures that students actually learn and retain the key scientific concepts that are taught. The longevity of the Young Astronauts program is based on its effectiveness as well as its flexible structure and affordability, which ensure that students over many years will continue to benefit from the program.

This paper describes the general topics that constitute the current curriculum along with reasons for the continued success of the program. The lesson descriptions include examples of simple explanations of advanced concepts, methods for deconstructing misconceptions, and ways to promote scientific reasoning. The program's sustainability is supported by the minimal requirement on volunteers, the affordability of materials used, and the broad topic areas that can be tailored yearly to leverage different expertise and current events. Case studies are presented of specific lesson changes that improved their effectiveness and incorporated current knowledge. Program costs are outlined, with a discussion of how the lessons can be tailored to fit any budget. Teacher testimonials attest to the impact of the program on their students.

Stanford student volunteers have maintained this successful program for over 25 years - this paper is presented with the hope of inspiring other student groups to follow in their footsteps.