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

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INSPIRING THE NEXT GENERATION: CREATING ENGAGING AND ACCESSIBLE EDUCATIONAL CONTENT FOR YOUNG GIRLS IN STEM

Abstract

We conducted an outreach event with the Canadian Association for Girls in Science (CAGIS) to teach girls about science in microgravity and provide them an opportunity to conduct their own space experiment design. This paper provides a thorough event breakdown, presentation content, and outcomes of the interactive design activity, aiming to facilitate future outreach opportunities and encourage diversity in space research.

The event was part of an outreach campaign for a research project for the Canadian Reduced Gravity Experiment Design Challenge, in collaboration with the Canadian Space Agency, the National Research Council of Canada, and the Students for the Exploration and Development of Space Canada. We designed an experiment to study the effects of gravity on human telomeres and flew the payload onboard a parabolic flight in 2021. Alongside the research experiment, we conducted outreach events across North America. One event, hosted with the CAGIS, led girls and gender non-conforming youth aged 7-16 through the design of a science experiment to be run in microgravity. We hosted a lesson and discussion on microgravity research platforms including the International Space Station, parabolic flights, and drop towers, suited to youth in elementary and high schools. After, we conducted a team design challenge to encourage participants to work together to create their own microgravity experiment.

One key challenge is balancing educational merit with ease of understanding. Technical vocabulary and explanations were evaluated in order to ensure participants' understanding without reducing the scientific value of the lesson. Further, due to the varied age groups of each session, lesson plans were tailored to varying complexity levels in order to ensure engagement and educational merit. Although CAGIS events are typically run in-person, we pivoted to a virtual format due to COVID-19, while still incorporating hands-on and teamwork components.

Overall, the event encouraged girls' interest in space research, science, and engineering. It also provided a valuable team exercise in experiment design. Participants demonstrated an understanding of scientific vocabulary, and each team generated unique and meaningful experiment ideas. At the end of the session, volunteers presented their teams' experiments to the broader group.

This work provides a framework for future virtual and hybrid outreach events encouraging youth interest in science. The event's structure and activity could be adapted for other audiences, including

larger groups, in-person formats, and diverse demographics. It provides a foundation for such outreach efforts to be implemented and improved in the future.