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SPARKING SPACE CURIOSITY: ILEAD AND DREAMUP'S HANDS-ON ACTIVITIES TO SET EDUCATORS AND STUDENTS ON A PATH TO SPACE SCIENCE AND STEAM SUCCESS

Abstract

Our present frontier is space, and what better way to invite future explorers into the conversation than by engaging them in microgravity science? Space science cuts across disciplines, so by guiding K-12 educators in the foundational concepts of microgravity, space science can be integrated into any aspect of a teacher's science, technology, engineering, arts, and mathematics (STEAM) curriculum to ignite students' engagement, curiosity, and authentic learning. Space excites students, sparking interest in their own learning and related STEAM content, and offering a reason and connection for students to pursue STEM-related careers.

While opportunities abound for students to interact with microgravity research, teachers often lack the skills to take the first steps to bring microgravity concepts into their classroom. iLEAD Schools, a network of public charter schools using project-based learning and socio-emotional learning as the educational delivery system, and DreamUp, a company bringing space to classrooms and classrooms into space, have partnered to conduct innovative workshops demonstrating key microgravity concepts for the classroom. With simple activities, educators are empowered to guide their students on a path of space exploration. This paper will describe the hands-on and affordable tools demonstrated in these workshops that educators can use with any students to transform their classroom into a laboratory for authentic space researchers engaged in STEAM.

In these workshops, educators are led through key activities to impart knowledge of microgravity concepts. Interwoven in these demonstrations are simple strategies and tools that educators can utilize immediately. For example, in the "Microgravity – Explanation and Demonstrations" activity, a facilitator asks educators what causes astronauts to float, establishing a common knowledge base. Following this, participants use an interactive note sheet while watching a video explaining why objects float in space. Next, the facilitator leads a discussion about how the participants' previous assumptions may have been challenged.

Next, using a Predict, Observe, and Explain (POE) tool, participants construct microgravity demonstrations, including free fall demonstrations using water and a Styrofoam cup and a paper astronaut in a bottle. From these simple exercises, educators can explain microgravity, demonstrate it, and actively engage the learners in their classroom in the process of scientific observation. From this foundational set of tools, educators are empowered to add their own creative expertise to develop projects that uniquely meets the needs of their learners, setting them on a path to engage in more advanced space science in the future.