

EXPLORATION IDEA PROFILE: CubeSats

EXPLORATION IDEA

Can we create a full scale model of a CubeSat using 3D design and printing skills? These models could be disassembled and reassembled to better understand how the pieces fit together and interact with one another. In addition, the modularity of CubeSats makes it easily adaptable to 3D printing so that creating a 1U up to 12U is possible on many standard printers. The CubeSat also allows for the integration of COTS (commercial off the shelf software), such as Arduino, Raspberry Pi, and Spacecraft bus to be utilized.

TARGET AUDIENCE(S)

There are two main audiences:

- K-Undergrad: students at various grade levels can explore information about sensors and spacecraft instruments as they create a 3D model of a CubeSat.
- Engineers: Creating cubist prototypes can aide with equipment fit testing and instrument size determination.

POTENTIAL IMPACT

This project provides a less expensive alternative to exploration of CubeSat design and mechanics. It will also provide an attainable way to inspire a new generation of spacecraft designers.



RELATED IDEAS/INNOVATIONS

- Modular CubeSat design methodology
- Leveraging COTS products into aerospace technology

MATERIALS/EQUIPMENT

- 3D printer
- Free or Third Party Modeling Software
- Free or Third Party Slicer (3D Printer Software)

PROJECT TEAM

- **Team Lead:** Patrick Haas (NSSEC)
- **Team Members:** Lani Sasser (NSSEC), Paul Mirel (NSSEC)
- **Resource:** go.nasa.gov/2KmY19h

CubeSats

Exploration Idea Profiles are developed through a guided process involving a step-by-step guide/worksheet where participants are invited to consider additional topics that include:

- Connections to other technologies
- Connections to existing information/research
- Connections to educational standards
- Connections to existing activities/projects
- Universal design
- Next steps

HOW TO CONNECT

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