

# ***SPINOFFS***

Spinoffs are relatively short learning modules inspired by the LTAs. They can be easily implemented to support student learning in courses ranging from prealgebra through calculus. The Spinoffs typically give students an opportunity to use mathematics in a real world context.

LTA - SPINOFF 6A Design of a Lunar Base Station  
Biomass Production Chamber

LTA - SPINOFF 6B Developing a Biomass Production Chamber

LTA - SPINOFF 6C Correlation and Regression Applied to Biomass  
in a Lunar Base Station

LTA - SPINOFF 6D Analysis of Biomass Production in  
a Lunar Base Station

**Eric Leung** - AMATYC Writing Team Member  
Harrisburg Area Community College, Harrisburg, **Pennsylvania**

**Mario Triola** - AMATYC Writing Team Member  
Dutchess Community College, Poughkeepsie, **New York**

**Dennis Chamberland** - NASA Scientist/Engineer  
Kennedy Space Center, **Florida**



## Project Grant Team

**John S. Pazdar**  
Project Director  
Capital Comm-Tech College  
Hartford, Connecticut

**Peter A. Wursthorn**  
Principal Investigator  
Capital Comm-Tech College  
Hartford, Connecticut

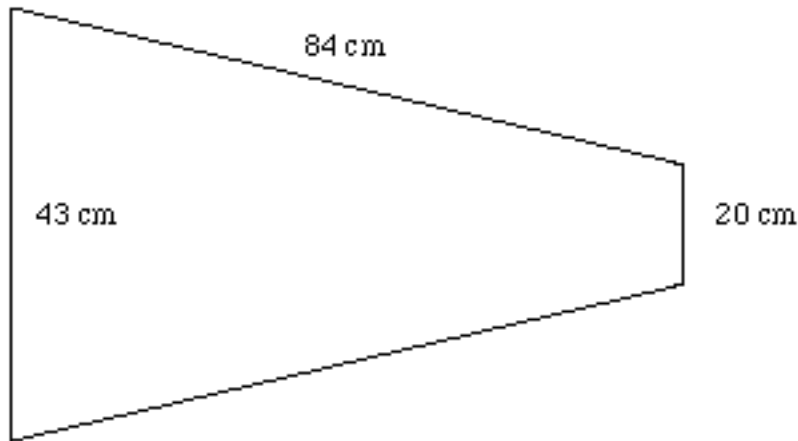
This project was supported, in part, by the  
**National Science Foundation**  
Opinions expressed are those of the authors  
and not necessarily those of the Foundation

**Patricia L. Hirschy**  
Principal Investigator  
Asnuntuck Comm-Tech College  
Enfield, Connecticut

## SPINOFF 6A

### Design of a Lunar Base Station Biomass Production Chamber

A Biomass Production Chamber (BPC) is used to grow food, generate water, and produce oxygen (all at the same time) for the inhabitants of the lunar base station. The Biomass Production Chamber contains trays of wheat, soybeans, lettuce, potatoes, and tomatoes. Each tray is in the shape of a trapezoid and has dimensions as shown in the diagram below. Assume that a crew of eight requires a total biomass growing area of  $350 \text{ m}^2$  in the chamber.



- 1) Find the area of a single tray.
- 2) How many trays are needed to provide enough food, oxygen, and water in order to support the crew of eight?
- 3) The current NASA chamber design has 16 trays per row, with 4 rows in a single chamber. If this design is used in the lunar base station, how many rows are needed? How many chambers are needed?