Space Experiment Module 8

Payload Bay

Overview

Eye lenses, seeds, water, DNA, and steel are just some of the materials that will be the subjects of student research on the eighth flight of the Space Experiment Module (SEM) project, NASA's educational initiative to increase access to space for students from kindergarten to college. All together, 13 passive experiments will be flown on STS-106.

Since the first SEM flight in 1996, tens of thousands of students have flown experiments in space that they have created, designed, and built with the help of teachers or mentors. NASA provides the experiment modules, or containers, which are placed in standard 5-cubic-foot getaway special canisters that are mounted in the orbiter's payload bay.

SEM-08 Experiments

Water, Water Everywhere
Town of Tonawanda School District, Buffalo, N.Y.; Edgemont Union Free School District, Scarsdale, N.Y.; Auxiliary Services for High Schools, New York City Board of Education

Students will observe the effects of space on samples taken from natural bodies of water. The students assume that changes in radiation, gravity, and temperature will have no effect on the abiotic and biotic levels in the samples.

Houston, We Have an Eye Problem
Irwin Altman School 172, Floral Park, N.Y.

The purpose of this experiment is to determine if the high radiation of space will cause the layers of eye lenses to become cloudy and transmit less light. Lenses from sheep and cows will be used in this investigation. Contact lenses also will be tested to determine the effects of radiation on the amount of light they transmit.

Investigation of Antibiotic-Resistant Mutations in a Microgravity Environment
Shoreham-Wading River High School Science Research Program, Shoreham, N.Y.

This experiment will analyze differences in the mutation rates of antibiotic-resistant plasmid DNA exposed to microgravity and controls exposed to Earth's gravity.

R.S.V.P. (Rams Space Variety Package)
Parkside High School, Salisbury, Md.

Students will study the effect of space on seeds, film, minicassettes, and a radiation dosimeter.

The Pittsburgh Steelers in Space
The DePaul Institute for the Deaf, Pittsburgh, Penn.

Students will determine the effects of microgravity and radiation on the oxidation of various types of steel and the minerals involved in the manufacture of steel.

Medicine Cabinet in Space
North Kingstown High School, North Kingstown, R.I.; Cannon School, Concord, N.C.; Williston Northampton School, Easthampton, Mass.; South Middle School, St. Peters, Mo.; Holy Family School, Harrisburg, Pa.; Ramstein American High School, Ramstein Air Base, Germany

The experiment is designed to determine how common items from the medicine cabinet, items that could potentially be found on a long space mission, are altered by the space environment.

Mars Lunch Box
Trinity Lutheran School, Cedar Rapids, Iowa, partnered with students from Wales; Washington Junior High School, Rock Island, Ill., partnered with students in Australia; Northside Middle School, Hampton, Va., partnered with students in Iceland

This experiment will study the effects of space travel on the growth of vegetable seeds.

SINBAD (Scientific and Instructional Ballast Alternative Device)
Florida Institute of Technology, Geospace Physics Laboratory, Melbourne, Fla.

This experiment will study the frequencies of the orbiter during launch, orbit, and landing; examine the effects of space flight on palm tree seeds; and study the reaction of acrylic latex caulking and its outgassing of water vapor.

PEESOIL
Gates Chili High School, Rochester, N.Y.; Mynderse Academy, Seneca Falls, N.Y.; Northampton High School, Northampton, Mass.

The students are studying whether microgravity and radiation have an effect on the fertility of soil samples as determined by the soil's biodiversity. The experimenters will determine the average number of different organisms found before and after the soil is exposed to space.

Process of Germination and Plant Growth
Frank Elementary School, Guadalupe, Ariz.

This experiment will determine how the space environment affects seed germination and plant growth. Kentucky Wonder and Quest seeds will be used in this investigation.

Spaced Popped Popcorn
South Shore Elementary School, Crownsville, Md.

The students predict that unpopped popcorn exposed to microgravity and radiation will pop at a different rate and volume than the control group, which will remain on Earth.

Bounce and Stretch
South Shore Elementary School, Crownsville, Md.

The students predict that microgravity and radiation will affect the physical characteristics of elastic materials, including balls and rubber bands.

Germ Killers in Space
Walter S. Mills-Parole Elementary, Annapolis, Md.

This experiment will study the effects of microgravity, radiation, and temperature on mouthwash and antibacterial hand gel.

History/Background

The Space Experiment Module program is one of a number of educational initiatives of NASA's Shuttle Small Payloads Project. Recognizing the need to provide easy access to space for all students, NASA began the SEM program in 1995. SEM participants are encouraged to focus on the educational act of creating experiments rather than the complexities of engineering.

More information about the SEM program can be found at http://www.wff.nasa.gov/~sspp/sem/sem.html.

Benefits

The SEM program offers simplified access to space for students at every grade level. It uses cross-curriculum learning, particularly in math, science and technology, to promote interest in space exploration.
