

Lunar Nautics (LN)

Discovery Place Museum

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PROGRAM DESCRIPTION

Lunar Nautics is a technologically challenging, exciting opportunity for students in grades 6-8 to learn about the Moon, its environment and its resources. Development of this project has produced space science educational activity guides and interactive software. These products focus on research, discovery and exploration of the Moon by robots and humans, as well as other technologies for sustainability and advancement of future exploration.

This project features 40 activities that challenge students to assume the roles of workers at Lunar Nautics Space Systems, Inc., a fictional aerospace company specializing in mission management, lunar exploration design, and scientific research. Educator and student guides, in combination with accompanying software, includes information to teach the basics on Newton's Laws of Motion, rocket design, microgravity, and the lunar concepts. Students design, test, and analyze a model lunar lander, a robot, and a soda can rocket. They also build edible models, a solar oven to cook hot dogs, and a microgravity sled while underwater.

PROGRAM RELEVANCE TO NASA

In Lunar Nautics, mission scenarios are linked to the three Lunar Exploration priorities of the Exploration Systems Mission Directorate (ESMD) Research Office. These priorities include Exploring the Moon, Human Presence on the Moon, and Enabling Future Exploration

PROGRAM BENEFITS TO SOCIETY

Lunar Nautics educates and excites students, in grades 6-8, about our next great American frontier by offering an exploratory launching point: the moon. Specific societal benefits include, but are not limited to, stimulating student interest in space exploration, motivating student interest and participation in science, technology, engineering and mathematics concepts and careers, encouraging the active participation and professional growth of educators in technical disciplines while meeting national education standards, and by highlighting space exploration development for the benefit of humankind.

PROGRAM GOALS

Under Outcome 3, Lunar Nautics 2007 (LN 2007) set the following goals: Objective 3.1 Resources (**Engage**) Provide informal education support resources that use NASA, themes and content, and Objective 3.2 Professional **Development for Informal Ed Providers (Engage)** Provide opportunities to improve the competency and qualifications of science technology, engineering, and mathematics (STEM) informal educators.

In order to achieve these goals, LN 2007 established 5 specific plans which included 1) compiling informational Lunar Educator and student Guides 2) creating Lunar Nautics software package 3) hosting workshops for Educators 4) conducting valid evaluations of workshops and 5) distributing NASA-approved Lunar Nautics materials

PROGRAM ACCOMPLISHMENTS

Lunar Nautics 2007 produced the following NASA approved products: all available at www.nasa.gov/education/lunarnautics

- ***Lunar Nautics (Formal)Educators Guide*** (158-page downloadable PDF)
Educators can use this guide in a variety of settings and formats, such as week-long day camps, after-school programs, or a classroom unit.
- ***Lunar Nautics Student Employee Handbook*** (97-page downloadable PDF)
contains the student sheets that accompany the lessons and activities in the educator guide.
- ***Lunar Nautics CD-ROM*** <http://catalog.core.nasa.gov/core.nsf/item/400.1-91>
This software guides students through designing mission patches, lunar vehicles, and a lunar habitat for lunar explorers. This software is available for purchase at **Central Operation of Resources for Educators (CORE)**.

Annual Performance Goals were met as follows:

Measures 3.1.1 / 3.1.2 / 3.1.3

Three (3) Lunar Nautics products received approval from Communications Material Review (CMR) and educational content review by Classroom of the Future (COTF)

- Educator Guide
- Student Handbook
- CD

All were created, in collaboration with Discovery Place. Both the Educators Guide and CD were approved as 508 compliant.

Measure 3.1.6

Dissemination of 2,500 Lunar Nautics CD-ROM.

Measure 3.1.8

Lunar Nautics is currently on the NASA Portal: www.nasa.gov/education/lunarnautics

Measure 3.2.5

Educator Reply Cards containing a NASA Education Evaluation Information System (NEEIS) link are included inside every guide and with each CD-ROM.

Measure 3.2.7

Lunar Nautics was disseminated through Association of Science-Technology Centers (ASTC) and a MSFC Educator Resource Center (ERC) Workshop in November 2008

Additionally, MSFC and Discovery Place achieved each of the plans as follows:

Host Workshops for Educators

MSFC hosted a one-day workshop for educators to be trained on Lunar Nautics

- Majority Educator profile: medium to large school; middle-school educators
- Projected student impact: 325 students taught from LN this year; 2,460 students to be taught this year

- All participants plan to utilize LN with their students

Workshops Evaluations

Submitted with the Final report for Lunar Nautics 2007 was a complete project evaluation which included studies from focus group and surveys, analysis of survey results, student opinion surveys, activity descriptions, and a focus group protocol.

Distribution of Lunar Nautics

During 2007, distribution of Lunar Nautics included full inclusion on the NASA portal at www.nasa.gov/education/lunarnautics

Dissemination

Total reproduced: 2,500

Approved dissemination plan includes

- 1,000 CD-ROM discs sent to CORE
- 75 given to ESMD
- 85 given to the network of ERC and NASA Educational Technologies Services (NETS)
- 28 given to Aerospace Education Services Project (AESP)
- 25 reserved for ESMD events
- 210 NES sites and coordinators
- 100 Discovery Place Museum
- 50 Cynergy Inc.
- 700 Museum Alliance
- 20 4-H mailing List (reserved)
- 100 to national conferences
- 107 MSFC
- 1000 Promotional, CMR approved, color flyers have been disseminated