1988

NASA/ASEE SUMMER FACULTY FELLOWSHIP PROGRAM

MARSHALL SPACE FLIGHT CENTER
THE UNIVERSITY OF ALABAMA

REFINING, REVISING, AUGMENTING, COMPILING AND DEVELOPING COMPUTER ASSISTED INSTRUCTION K-12 AEROSPACE MATERIALS FOR IMPLEMENTATION IN NASA SPACELINK ELECTRONIC INFORMATION SYSTEM

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ABSTRACT

"NASA Spacelink is an electronic information service operated by the Marshall Space Flight Center. It contains extensive NASA news and educational resources that can be accessed by anyone with a computer and modem". (4)

Spacelink provides updates and information on:
1. Current NASA News
2. Aeronautics
3. Space Exploration: Before the Shuttle
4. Space Exploration: The Shuttle and Beyond
5. NASA Installations
6. NASA Educational Services
7. Materials for Classroom Use
8. Space Program Spinoffs

I was privileged to participate in the development of Spacelink during the periods of its gestation, birth and infancy. In addition to compiling and developing more material for implementation in Spacelink (including lesson plans and activities for Grades K-12), Summer 1988 was spent refining, revising, and augmenting the material prepared during the previous summer.

Material for the above was extracted from existing NASA publications on aerospace activities as well as from materials developed by other NASA activities (including NASA Educational Workshop for Elementary School Teachers (NEWEST) held at Marshall Space Flight Center, Huntsville, Alabama).

ACKNOWLEDGEMENT

My deepest gratitude is hereby extended to the NASA/ASEE Summer Faculty Fellowship Program and its directors for the very rewarding experience afforded me this summer. I pay special tribute to Dr. C. R. Chappell, Mrs. Ernestine Cothran and Dr. Mike Freeman, the directors of this program whose effervescence permeated the weekly seminars as they gave their support, and guidance. I especially thank my NASA colleague, Bill Anderson, who afforded me the privilege of working on material for Spacelink, and lent his support and encouragement from day to day. The staff in Public Affairs needs special mention because each in a small or large manner contributed to enriching my summer's experience. Special recognition is due Jim Sahli who kindly loaned me his office for the entire 10-week period. A million thanks to one and all!

1. Introduction

The National Aeronautics and Space Administration offers educators a wide range of educational services including speakers, publications, audiovisual materials, software, advanced educational technology, curriculum assistance, electronic communications, workshops, in-school satellite programs, student programs and training opportunities. One of the latest development is the educational service called Spacelink.

"NASA Spacelink runs on a Data General MV-7800 super-minicomputer located at the NASA George C. Marshall Space Flight Center in Huntsville, Alabama. NASA Spacelink software was developed and donated to NASA by the Data General Corporation of Westboro, Massachusetts. The system can communicate with eight callers simultaneously. NASA Spacelink is a dynamic system that will change and expand daily. It was made available to the public in January, 1988.

Initial funding for NASA Spacelink was provided by the Educational Affairs Division at NASA Headquarters. The NASA Spacelink data base is maintained by the Public Services and Education Branch of the Marshall Space Flight Center Public Affairs Office. Operational support is provided by the Information Systems Office at the Marshall Center. Information on NASA scientific projects and educational programs is provided to NASA Spacelink by education specialists at NASA Headquarters and the NASA field centers.

While NASA understands that people from a wide variety of backgrounds will use NASA Spacelink, the system is specifically designed for teachers. The data base is arranged to provide easy access to current and historical information on NASA aeronautics and space research. Also included are suggested classroom activities that incorporate information on NASA projects to teach a number of scientific principles. Unlike bulletin board systems, NASA Spacelink does not provide for interaction between callers. However it does allow teachers and other callers to leave questions and comments for NASA which may be answered by regular mail". (4)

2. The Process

The material, compiled on the word processor, was first loaded into a "working" Spacelink program and thence into the "real" Spacelink program. The material covers the following areas: Aeronautics, Space Exploration: Before the Shuttle, Space Exploration: The Shuttle and Beyond, NASA Installations, NASA Educational Services, Materials for Classroom Use, and Space Program Spinoffs.

Materials for Classroom Use include:
1. Living In Space Activities
2. Space Science Activities
3. Astronomy Information
4. Careers in Aerospace

The lesson plans and activities for living in space cover:
Food
Clothing
Communication
Health
Housing
Working, and information on
Space Station Research and Design.

Other space science lesson plans and activities cover:
Astronauts
Atmosphere
Magnetosphere
Aeronautics
Rockets
Technological Advances
Unmanned Earth Satellites
Unmanned Solar System Exploration
Man in Space
Projections
Solar Cells
Miscellaneous Activities.

The Appendix contains a partial listing of the areas and topics covered.

APPENDIX

A Listing of some of the areas and topics from which documents were prepared for Spacelink, 1988.

Areas

Art
Astronomy
Biology
Chemistry
Communication
Earth Science
Engineering
Fine Arts
Geography
Geology
Health
Home Economics
Language
Life Science
Mathematics
Nutrition
Physical Science
Physics
Political Science
Science
Social Science
Social Studies

Topics

Accomplishments and Benefits of the Space Program
Application Procedures for Employment with Marshall Space Flight Center
Artificial Intelligence
Atmospheric Flight Research Design and Testing
Bernoullis Law, Airplane Design
Breathing Volume
Career Opportunities in Aerospace Technology
Crystal Growth
Earth Observation
Exercise and Pulse Rate
Exploration of Earth Resources from Space
Flight Design
Flight Research and Exploration

Group Dynamics
Helicopters
Image Interpreting
Imaging Systems
Launch Systems
Launch Vehicles
Living and Working in Space
Living Systems
Lunar Features
Lunar Prospecting
Lunar Science
Magnetic Fields
Manned/Unmanned Space Flight
Map Making
Naming an Orbiter
Navigation
Payload Packaging
Photography from the Air and Space
Planetary Science
Reaction Time
Rocketry and Propulsion
Satellite Communication
Science and Society
Shuttle Layout
Solar Cells
Solar Energy
Solar System
Solar System Exploration
Solar System Research
Space-Age Robotics
Spacecraft Thermal Control
Spacecraft Power Systems
Space Flight
Space Food
Space Poetry
Space Station
Space Telescope
Space Travel
Space Words
Stellar Astronomy
Sunspots
Task Performance
The Astronaut's Hall of Fame
The Nature of Stars
Time in Space
Toys in Space

CONCLUSIONS and RECOMMENDATIONS

Every university professor will underscore the fact that work at the college level is made easier when entering college students are academically prepared for college. Everyone also knows that academic foundation is very important. The elementary school and high school experience should be rewarding and well laid. I, therefore, count it a great privilege to contribute in this small manner to helping elementary and secondary teachers through the medium of Spacelink. I feel that the lessons and activities when used will help increase the number of scientists in the nation, and will make our entering college students better prepared for college work.

NASA, an agency dedicated to achieving excellence, has for many years contributed to excellence in education in the nation's schools. The material prepared for Spacelink is for use in Grades K-12 which is in keeping with NASA's effort and is available to anyone within and outside the United States. NASA is hereby applauded and encouraged to continue this worthwhile endeavor.

REFERENCES

1. Career Opportunities in Aerospace Technology, NN-100 NASA, Marshall Space Flight Center, Huntsville, Alabama

2. NASA Aerospace Education Services Project Oklahoma State University, Stillwater, Oklahoma

3. NASA Facts, NF-150/1-86, Marshall Space Flight Center, Huntsville, Alabama

4. NASA Spacelink, Marshall Space Flight Center, Huntsville, Alabama

5. NASA Educational Workshop for Elementary School Teachers (NEWEST), Marshall Space Flight Center, Huntsville, Alabama

6. Tennessee Space Week TEA * NASA Lesson Plan Tennessee Lesson Plans #20, Rocket Launch System Activities