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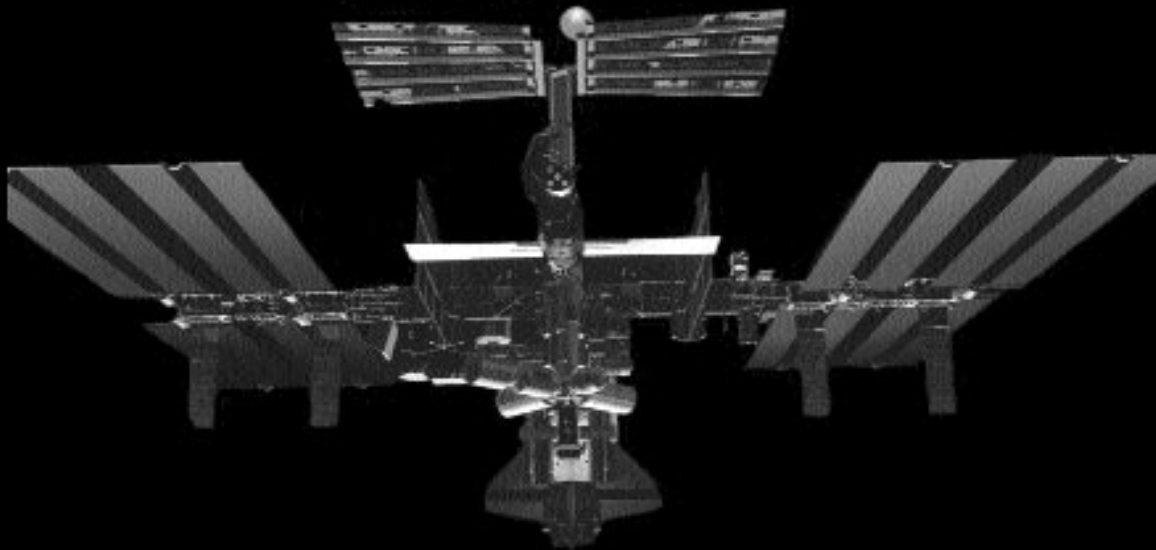
Educators

Grades K-8

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SPACE FOOD AND NUTRITION

An Educator's Guide With Activities in Science and Mathematics





Space and Food Nutrition—An Educator's Guide With Activities in Science and Mathematics is available in electronic format through NASA Spacelink—one of the Agency's electronic resources specifically developed for use by the educational community.

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Space Food and Nutrition

An Educator's Guide With Activities in Science and Mathematics

Acknowledgments

National Aeronautics and Space Administration
Office of Human Resources and Education
Education Division
Washington, D.C.

Education Working Group
NASA Johnson Space Center
Houston, Texas

Writers

Angelo A. Casaburri
Aerospace Education Services Program
NASA Johnson Space Center
Houston, Texas

Cathy A. Gardner
Dickinson Independent School District
Dickinson, Texas

Editor

Jane A. George
Teaching From Space Program
NASA Headquarters
Washington, D.C.

*Special thanks to the following
contributors and reviewers*

Charles T. Bourland, Ph.D.
System Manager, Space Station Food
Flight Crew Support Division
NASA Johnson Space Center

Debbie A. Brown
ISS Education Liaison
Education Working Group
NASA Johnson Space Center

Gregory L. Vogt, Ed.D.
Crew Educational Affairs Liaison
Education Working Group
NASA Johnson Space Center

Karol L. Yeatts, Ed.D.
1998 Einstein Fellow
Miami Dade County Public Schools
Miami, Florida

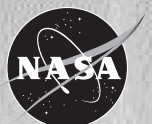


Table of Contents

National Science Education Standards	v
National Mathematic Standards	vi
Introduction	1
Mercury	2
Gemini	3
Apollo	4
Skylab	5
Apollo-Soyuz Test Project	6
Space Shuttle	7
International Space Station	8
Food Systems Engineering Facility	9
Types of Space Food	10
Microgravity	11
Classroom Activities	14
Activities for Grades K–4	
1. Food Preparation for Space	15
2. Food Selection	17
3. Planning and Serving Food	20
Activities for Grades 5–8	
4. Classifying Space Food	21
5. Ripening of Fruits and Vegetables	23
6. Mold Growth	25
7. How Much Is Waste?	30
8. Dehydrating Food for Space Flight	33
Appendices	
Appendix A: Baseline Space Shuttle Food and Beverage List	34
Appendix B: International Space Station Daily Menu Food List	37
Appendix C: Gemini Standard Menu (4-day cycle).....	41
Appendix D: Space Shuttle Standard Menu (4 days of a 7-day menu)	42
Appendix E: International Space Station Standard Menu (4-days of a 30-day menu)	43
Appendix F: Space Tortilla Formulation (Recipe)	44
Appendix G: USDA Food Guide Pyramid	45
References	46
NASA On-Line Resources for Educators.....	47
Educator Reply Card	49



National Education Standards



National Science Education Standards National Research Council, 1996 Grades K–8

	Food Preparation for Space	Food Selection	Planning and Serving Food	Classifying Space Food	Ripening of Fruits and Vegetables	Mold Growth	How Much Is Waste?	Dehydrating Food for Space Flight
Science as Inquiry Abilities necessary to do scientific inquiry	√	√	√	√	√	√	√	√
Life Science Matter, energy, and organization in living systems	√	√	√		√	√		
Science in Personal and Social Perspectives Personal Health	√	√	√	√	√	√		√
Physical Science Properties of objects and materials		√					√	
Position and motion of objects			√					

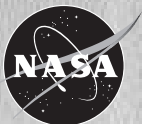


National Mathematic Standards



National Mathematic Standards National Council of Teachers of Mathematics, 1988 Grades K–8

	Food Preparation for Space	Food Selection	Planning and Serving Food	Classifying Space Food	Ripening of Fruits and Vegetables	Mold Growth	How Much Is Waste?	Dehydrating Food for Space Flight
Computation	√	√	√				√	√
Measurement	√				√	√	√	√
Reasoning	√	√	√	√	√	√	√	√
Observing	√	√	√	√	√	√	√	√
Communicating	√	√	√	√	√	√	√	√



Introduction

From John Glenn's mission to orbit Earth to the International Space Station program, space food research has met the challenge of providing food that tastes good and travels well in space. To better understand this process, we can look back through history. Explorers have always had to face the problem of how to carry enough food for their journeys. Whether those explorers are onboard a sailing ship or on the Space Shuttle, adequate storage space has been a problem. Food needs to remain edible throughout the voyage, and it also needs to provide all the nutrients required to avoid vitamin-deficiency diseases such as scurvy.

Early in history, humans discovered that food would remain edible longer if it were dried and stored in a cool dry place until it was time to be consumed. Early food dehydration was achieved by cutting meat, fish, and certain fruits into thin strips and drying them in sunlight. Rubbing food with salt or soaking it in salt water, an early

form of curing food, also helped preserve it. Later techniques were developed for cooking, processing, preserving, and storing food in sealed containers. With the developments of pasteurization and canning, a much larger variety of foods could be stored and carried on long journeys. More recently, refrigeration and quick-freezing have been used to help preserve food flavor and nutrients and prevent spoilage.

While these forms of packaged food products are fine for travel on Earth, they are not always suitable for use on space flights. There are limitations to weight and volume when traveling and the microgravity conditions experienced in space also affect the food packaging. Currently, there is limited storage space and no refrigeration. To meet these challenges, special procedures for the preparation, packaging, and storing of food for space flight were developed.

