

# Eating in Space

## Lesson Plan

**Grade Level:** 3-5

**Curriculum Focus:** Space Exploration

**Lesson Duration:** Two class periods

### *Student Objectives*

- Learn how foods are dehydrated
- Observe how dehydrated foods are used by astronauts

### *Materials*

- Discovery School video on *unitedstreaming: People and Space*  
Search for this video by using the video title (or a portion of it) as the keyword.

Selected clips that support this lesson plan:

- Living in Space

You may want enough of the following ingredients so that each student in your class can sample all foods, or you may want small amounts of each food for volunteer tasters only.

- Dehydrated foods—for example, dehydrated bananas and figs, dehydrated peanuts, beef jerky, dehydrated instant pudding, Tang or other dehydrated fruit crystals, dehydrated ice cream
- Plastic sandwich bags
- Straws
- Scissors
- Water

### *Procedures*

1. Ask students what they know about the food astronauts eat in space. Make sure students come to understand that to preserve the food and to reduce cargo weight on a long space trip, food is dehydrated (explain that *dehydration* means “the removal of water”).
2. Explain that with some dehydrated foods liquid is later put back in either by stimulating the saliva in the eater’s mouth or by adding water to the product before eating it.
3. Even here on Earth, people sometimes use dehydrated foods. Ask students if they can think of any examples. Show students examples of dried fruits, and make the point that they are eaten without the addition of water.

4. Using pictures make a list with students of other dehydrated foods that can be found in a supermarket or other shops. Then from that list, prepare a meal that might be enjoyed by astronauts out in space but that will be consumed by your students while in their classroom on Earth. Here is a sample menu and suggestions for ingestion in a gravity-free environment:
  - Hors d'oeuvres: dehydrated bananas and figs (to be rehydrated in the mouth) and dehydrated peanuts (rehydration not necessary)
  - Main course: beef jerky (to be rehydrated in the mouth) and dehydrated instant vegetable or fruit pudding (rehydrate with water in a sandwich bag, snip off a corner of the bag with scissors, and slurp out contents)
  - Drink: Tang or other dehydrated fruit crystals (rehydrate with water in a sandwich bag and use a straw to sip out the contents)
  - Dessert: dehydrated ice cream, available from stores such as Nature Company (follow instructions on the package for rehydration procedures)
5. After feasting on your space meal, have students rate their experience with each food and discuss their willingness to survive on dehydrated food for a long time.

### **Assessment**

Use the following three-point rubric to evaluate students' work during this lesson.

- 3 points: Students were active in class discussions; clearly rated their experience with each food.
- 2 points: Students participated in class discussions; rated their experience with most of the food tried.
- 1 point: Students did not participate in class discussions; did not rate their experience with any of the foods tried.

### **Vocabulary**

#### **dehydrate**

*Definition:* The act of removing water from food to preserve it.

*Context:* The astronauts' supply of fresh vegetables will be dehydrated so that they will not go bad during the long stay on the Space Station.

#### **freefall**

*Definition:* Motion experienced by an object when being affected by the gravitational pull of a planet and no other significant forces.

*Context:* Because astronauts orbiting the Earth in the Space Shuttle are in gravitational freefall toward the Earth, they experience the illusion of weightlessness.

### **microgravity**

*Definition:* A condition of real or apparent reduced gravity experienced on orbiting space vehicles.

*Context:* Orbiting astronauts experience microgravity conditions partly because they are farther away from the Earth, and mostly because they are in a state of freefall as they orbit the Earth.

### **rehydrate**

*Definition:* The act of restoring water to preserved food that has been dehydrated.

*Context:* Dehydrated, preserved food isn't very tasty, so astronauts will rehydrate their dried food as needed during their stay on the Space Station.

## ***Academic Standards***

### **National Academy of Sciences**

The National Science Education Standards provide guidelines for teaching science as well as a coherent vision of what it means to be scientifically literate for students in grades K-12. To view the standards, visit <http://books.nap.edu>.

This lesson plan addresses the following science standards:

- Earth and Space Science: Earth in the solar system

### **Mid-continent Research for Education and Learning (McREL)**

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit <http://www.mcrel.org/compendium/browse.asp>.

This lesson plan addresses the following national standards:

- Technology: Understands the interactions of science, technology, and society.
- Science – Physical Science: Understands forces and motion

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## **Support Materials**

Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the [DiscoverySchool.com](http://DiscoverySchool.com) Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- <http://school.discovery.com/teachingtools/teachingtools.html>

