

# Activity 3:

## Planning and Serving Food

---

### Objective

The students will plan a 5-day flight menu and design a food tray that can be used in space.

### Science Standards

- **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:** Position and motion of objects

### Mathematics Standard

- **Computation**

### Helpful Hints

1. For K—1 students, food pictures from magazines and ads can be used to plan the menu. The students may also cut and paste pictures to construction paper to simulate the Space Shuttle food tray.
2. Some possible materials that can be used to build the food trays are boxes, cardboard, hook and loop tape (Velcro), magnets, foil, wood, construction paper, and glue. Encourage students to be creative in their designs.

### Materials

USDA Food Pyramid Guide (Appendix G)  
Food group and suggested daily servings chart  
(Activity 4)

### Background

Astronauts use special trays in space because of the special microgravity environment. These trays are designed to hold everything in place while food is being prepared and eaten. On the Space Shuttle, the trays used have straps on the back so that the astronauts can attach them to either the wall or their leg in order to hold them in place. They also have hook and loop tape on them to attach to the foods and drink packages; utensils are held in place with magnets. The ISS food tray has compartments to hold special bowl-like containers. They snap into place and hold the food in the tray. These containers are similar to single-serving frozen food dishes that can be found in the grocery store. The only difference is that

they are made of a hard plastic instead of aluminum or cardboard.

### Procedure

The students will plan a nutritionally balanced 5-day menu for astronauts. It is important that astronauts receive the recommended daily caloric intake so they can maintain their energy level and good health. Use the Food Pyramid Guide in the appendix to nutritionally balance the meals. Using the recommended food group and suggested daily servings chart listed in Activity 4, choose foods that will fulfill the recommended daily allowances for the astronauts.

The students will design and build a tray to hold their meals. To help the astronauts eat their meals on the Space Shuttle, a special tray has been devised to help hold the different food types and packages in place. This prevents food from drifting in a microgravity environment.

### Discussion

1. What types of problems might you face while trying to eat in space?
2. Are there other ways to serve space food?
3. Why is it important for astronauts to receive the recommended daily caloric and nutritional intake?

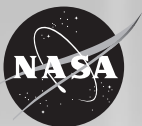
### Extensions

Have the students plan and prepare a space food luncheon. The food trays the students designed and built will be used. The menu for the day will be selected from the International Space Station Daily Menu Food List. The school administration should be invited as well as community leaders and parents. Remember to invite the local media.

Students can cut food pictures from actual food containers and place rehydratables in zip-locking bags for Space Shuttle food. For ISS frozen foods, food pictures from frozen food packages can be cut to fit the recycled plastic frozen food containers. Foam core or plaster of paris can be used to give the package actual weight.

### Assessment

Evaluate each food tray for design and usability. Verify that the meals planned are nutritionally balanced.



# Activity 4:

## Classifying Space Food

---

### Objective

To classify the space food manifested on the Space Shuttle or International Space Station food lists into the major food groups found in the Food Pyramid Guide.

### Science Standards

- **Science as Inquiry:** Abilities necessary to do scientific inquiry
- **Science in Personal and Social Perspectives:** Personal health

### Materials Needed

Baseline Space Shuttle Food and Beverage List  
(Appendix A)

International Space Station Daily Menu Food List  
(Appendix B)

USDA Food Guide Pyramid  
(Appendix G)

### Background

The Food Guide Pyramid has been established to help people maintain a diet that is adequate in nutritional value. Maintaining good health in space is important, and to help do this, a good diet is imperative. Balanced meals of good nutritional food will help ensure that the astronauts will be able to perform their jobs in space.

The U.S. Department of Agriculture (USDA) has made recommendations for a healthy diet. Foods are grouped according to the nutrients they provide. Many foods, such as corn, are hard to place into a specific group. Sweet corn can be counted as a starchy vegetable, but corn tortillas are in the grain group. Dry beans and peas (legumes) can be counted as either a starchy vegetable or a meat.

The following is a web site that can be used to obtain more indepth information about the Food Guide Pyramid and nutrition:

<http://www.usda.gov/fcs/cnpp/using.htm>

### Food Groups and Suggested Daily Servings Chart

---

Food Groups	Suggested Daily Servings
Grain (Bread, Cereal, Rice, and Pasta)	6 to 11 servings
Fruit	2 to 4 servings
Vegetable	3 to 5 servings
Meat (Meats, Poultry, Fish, Eggs, and Nuts)	2 to 3 servings
Dairy (Milk, Yogurt, and Cheese)	2 to 3 servings
Oil (Fats and Sweets)	Use sparingly

### Procedure

---

Using the Baseline Space Shuttle Food and Beverage List or the International Space Station Daily Menu Food List, classify the foods into the major groups as shown above.

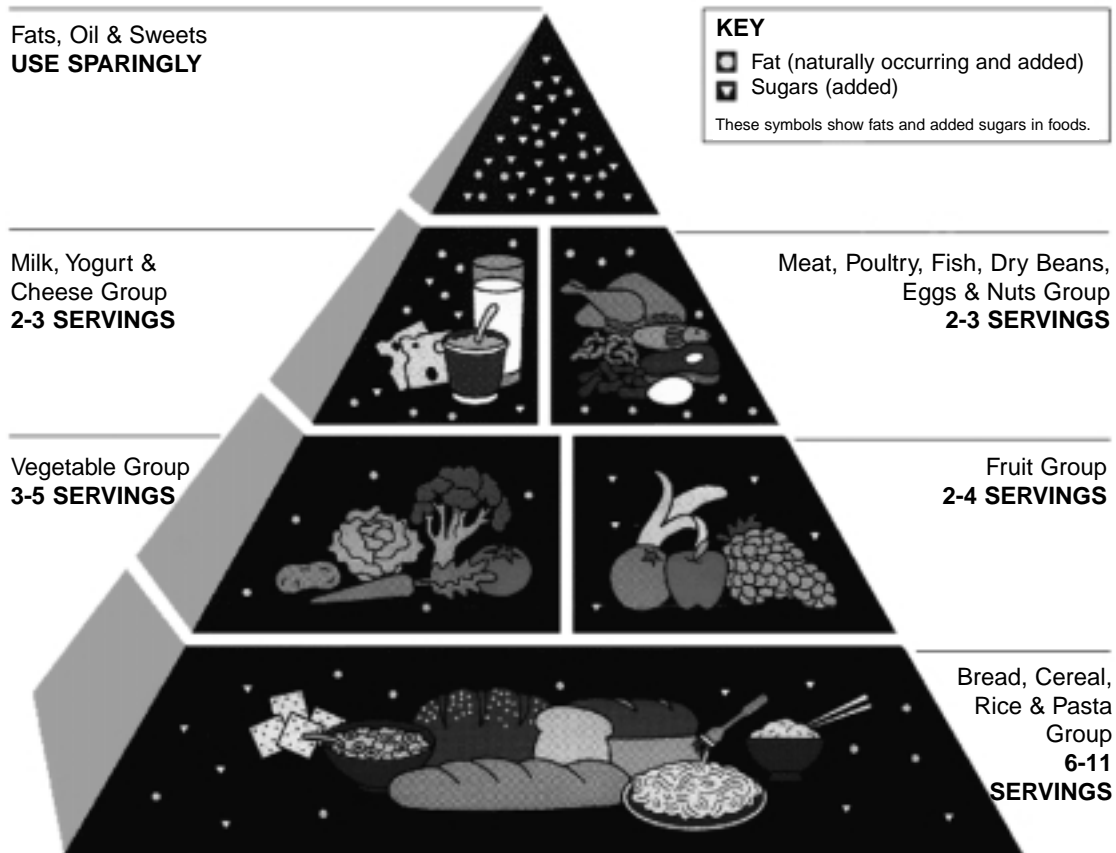
### Discussion

---

1. Which foods did you find that can fit into more than one food group?
2. In your opinion, which food group had the better selection of foods?
3. Why is it important to maintain good health in space?
4. How does a balanced diet maintain good health?



# Appendix G: USDA Food Guide Pyramid



Source: U.S. Department of Agriculture/Department of Health and Human Services

