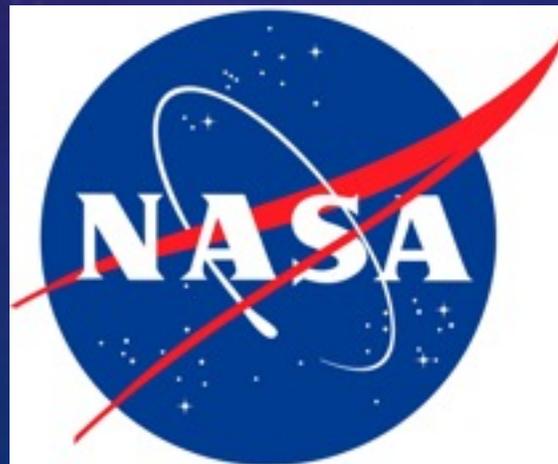


# CHALLENGER LEARNING CENTER

WOODSTOCK, ILLINOIS

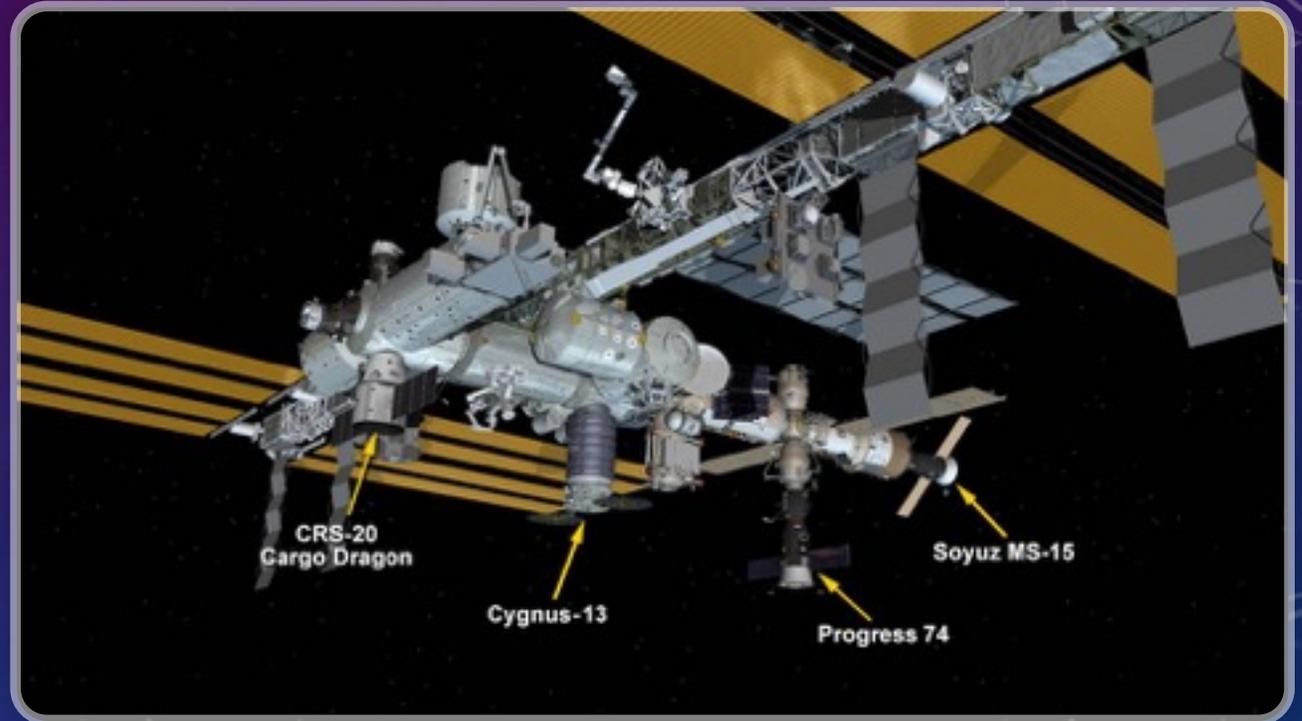


# WHEN STUCK AT HOME WHY NOT EXPLORE SPACE?

- These are some videos and activities for students to work on at home.

# INTERNATIONAL SPACE STATION

- Pressurized Module Length: 167.3 feet (73 meters)
- Truss Length: 357.5 feet (109 meters)
- Solar Array Length: 239.4 feet (73 meters)
- Mass: 925,335 pounds (419,725 kilograms)
- Habitable Volume: 13,696 cubic feet (388 cubic meters) not including visiting vehicles
- Pressurized Volume: 32,333 cubic feet (916 cubic meters)
- With BEAM expanded: 32,898 cubic feet (932 cubic meters)
- Power Generation: 8 solar arrays provide 75 to 90 kilowatts of power
- Lines of Computer Code: approximately 2.3 million

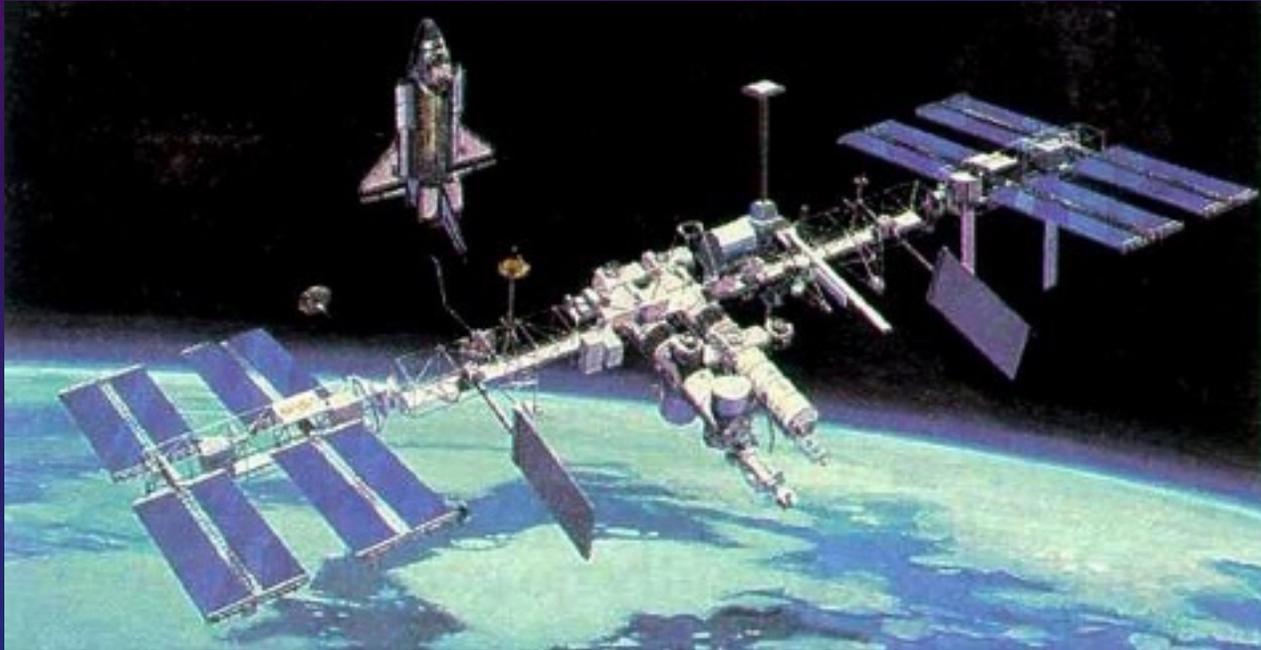


# TOUR THE STATION WITH SUNNY



<https://youtu.be/doN4t5NKW-k>

# SLOT THE STATION (CLICK LINK BELOW)



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# EAT LIKE AN ASTRONAUT



## Engineering Connection

- Engineers are involved in all aspects of space travel and living. Many astronauts are engineers! Because of the microgravity environment, eating in space is a great challenge, so NASA engineers develop creative devices to help astronauts eat while traveling in away from the Earth's gravity.

# EAT LIKE AN ASTRONAUT (DESIGN WAYS TO HELP)

## Materials List

scissors

white glue

tape (cellophane, masking, etc.)

pens and pencils

To share with the entire class:

paper

rulers

assorted building materials for their prototype devices, such as balsa wood, construction paper, toothpicks, popsicle sticks, white paper, string, aluminum foil, paper clips, styrofoam, foam core, film canisters, etc.

markers and crayons

(optional) hot glue gun (for use by the teacher)

Design Worksheet,  
one per team (also  
available  
in Spanish)

# ACTIVITY WORKSHEETS

## [Worksheets and Attachments](#)

[Design Worksheet \(pdf\)](#)

[Design Worksheet \(doc\)](#)

[Design Worksheet \(Spanish\) \(pdf\)](#)

[Design Worksheet \(Spanish\) \(doc\)](#)

[Baseline Shuttle Food List \(doc\)](#)

[Baseline Shuttle Food List \(pdf\)](#)



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# ASTRONAUT DIET

- The seven forms of food are: rehydratable, thermostabilized, intermediate moisture, natural form, irradiated, condiments and shelf-stable tortillas.
- Rehydratable* food is food or beverages that have had the water removed. To prepare, astronauts just add the water back in and heat the food up in an on-board oven. Breakfast cereals can be pre-packaged with dry milk and sugar, and are ready to eat once water is added. These foods might include soups, casseroles and appetizers (see Figure 6).
- Thermostabilized* food has been heat processed to kill organisms. These packages are heated, opened with scissors and eaten. This type of food is generally packaged in cans, plastic cups or flexible pouches. Food choices include beef tips with mushrooms, tomatoes and eggplant, and ham.
- Intermediate moisture* foods have just the right amount of water in them: not too wet (to prevent microbes from growing in the package) and not too dry (to help cut down on the amount of preparation for the astronauts). Essentially, these foods are ready-to-eat right out of the package. Examples are dried peaches, pears and apricots, and dried beef (see Figure 7)



# WHAT IS A GALAXY?

- Divide the class into teams of 2-3 students each and hand out the worksheets, one per team.
- Give teams 8-10 minutes to work on their designs and complete the worksheets. Encourage students to focus on a particular food or a specific challenge of eating in space. (Note: This is an open-ended design, so encourage creativity.) Teams may not begin building until their worksheets have been checked off.
- Once a team's worksheet is checked off, encourage students to begin building a model of their design.
- To incorporate some mathematics, establish constraints on some of the supplies and have students measure out a certain amount. For example: "you are limited to use no more than 0.4 meters of masking tape, and 2.3 meters of string." Have students work together to measure the permitted amounts. Other possible constraints include time (only one class period) and cost (assign a dollar amount to each length of material used and require students stick to a budget).
- Give teams some time before the end of class to present their ideas and designs to their peers. Discuss how well each meets the criteria and constraints of the problem.



# WHAT THEY EAT



<https://www.youtube.com/watch?v=AGR3FiEkBwA>