National Aeronautics and Space Administration

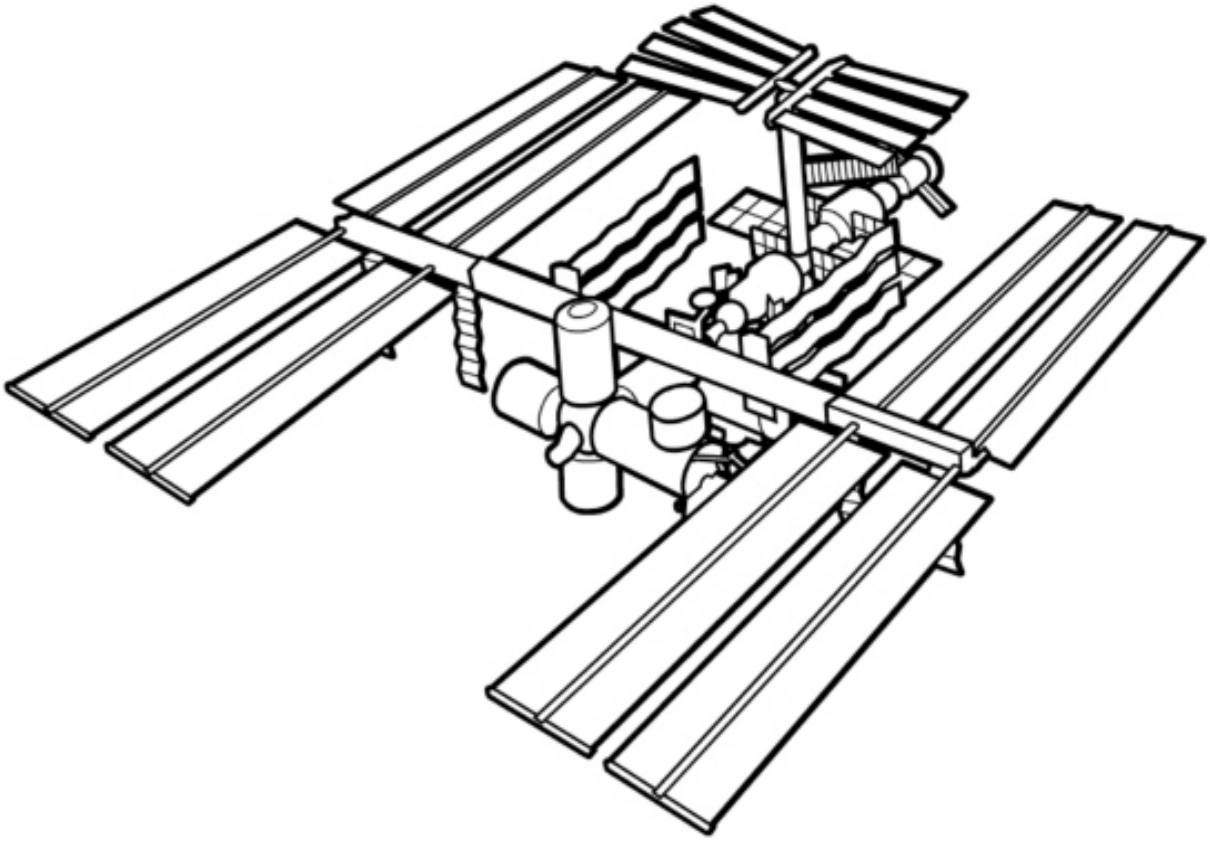
Mass vs. Weight
Design Your Own Experiment

MASS VS WEIGHT

Objective
To design an experiment that could be performed in the microgravity environment of the International Space Station (ISS).

Description
Students will develop and design an experiment they would like performed by the astronauts on the ISS. They will describe their experiment, identify objectives they want to accomplish, determine materials needed, and compose questions they expect an observer to answer once the experiment is completed.

Materials
- ***Mass vs. Weight* video clips**
- **Copies of list of available items on the ISS (see Procedure step 4)**



Procedure

1. Watch the *Mass vs. Weight* video clips. These clips give the students a brief exposure to living and working on-board the ISS and how astronauts perform some types of experiments.
2. Have students meet in small groups to discuss possible ISS experiments and select one for further development.
3. Facilitate a class discussion of student groups experiment ideas.
4. Explain that experiment supplies and materials are limited on the ISS. Students should plan on using only these materials in their experiment. The list of available ISS items that can be found on the ISS for the experiment can be downloaded at: (each student group should have a copy of the list) http://www.nasa.gov/pdf/406241main_Kids_In_Micro_g_Supplies_19Nov09.pdf
5. Have students describe their experiment on the student data sheet.

Extensions

1. Have the students research actual experiments conducted on the International Space Station and learn if any experiment has been done similar to the one they designed. The additional *Mass vs. Weight* video clips show a sample of educational experiments performed on the ISS. More information about the ISS and the experiments performed on-board can be found at: http://www.nasa.gov/mission_pages/station/main/index.html
2. Have student teams gather materials and demonstrate their 1g version of their experiment to the rest of the class.

Standards

National Science Education Standards

Science as Inquiry

- Abilities necessary to do scientific inquiry

Science and Technology

- Abilities of technological design

National Mathematics Education Standards

Process Standards

- Problem Solving
- Communication
- Connections
- Representation

Name: _____

Design Your Own International Space Station Experiment
Student Data Sheet

View the *Mass vs. Weight* video clips to observe a sample of education experiments astronauts performed on the International Space Station (ISS).

If you could design your own experiment for the astronauts to perform on the International Space Station, what would it be? Here is your chance to be a designer, researcher and scientist. Remember, items available to the astronauts on the ISS are limited. A list of available materials will be given to you by your teacher or it can also be found at the following website:

http://www.nasa.gov/pdf/406241main_Kids_In_Micro_g_Supplies_19Nov09.pdf

1. Briefly describe your experiment and the objectives you want accomplished: (use back of page if needed)

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2. What reasons do you want your experiment done in space on the ISS? (use back of page if needed)

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3. What materials will be needed by the astronauts to complete your experiment on the International Space Station? Remember, items and supplies are limited on the ISS, be resourceful. (use back of page if needed)

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4. What questions do you want observers to answer after they would watch the astronauts perform your experiment in space? (use back of page if needed)

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5. On a separate sheet of paper, draw a design for your experiment.

More information about the International Space Station can be found at:
http://www.nasa.gov/mission_pages/station/main/index.htm