



## LESSON: The Early Years: Mercury to Apollo-Soyuz

**Title:** The Early Years: Mercury to Apollo-Soyuz  
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**School/Org:** Fort Caroline Middle School

### Lesson Overview:

Students will use the specifications for manned spacecraft and launch vehicles from the *The Early Years: Mercury to Apollo-Soyuz Information Summaries* (RDG\_The-Early-Years.pdf) to make graphs, create ratios, and find patterns. While learning about early space exploration, they can apply math and technology skills.

**Suggested Classroom Time:** 120 minutes

**Grade Levels:** 6-10

**KLASS Module:** 2-Orientation

**Topic/Console:** NASA History

### Materials Needed:

Activity	Documents	Other Materials
1	RDG_The-Early-Years.pdf Also available for download: <a href="http://www-pao.ksc.nasa.gov/kscpao/nasafact/pdf/years.pdf">http://www-pao.ksc.nasa.gov/kscpao/nasafact/pdf/years.pdf</a>	
2	ACT_The-Early-Years-Math.doc KEY_The-Early-Years-Math.xls KEY_The-Early-Years-Math.doc	Student computers with Microsoft Excel, calculators, writing tools, rulers, and graph paper
3	AS_The-Early-Years.doc KEY_The-Early-Years.doc	Writing tools

### National Standards/Objectives:

Discipline	Standard	Objective
Science	G. History and Nature of Science	Students recognize science as a human endeavor by studying the history and historical perspectives of science.
Technology	Social, ethical, and human issues	Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.
Math	Data Analysis & Probability	Students select and use appropriate statistical methods to analyze data.
Math	Representation	Students create and use representations to organize, record, and communicate mathematical ideas.

**Desired Results:**

Students will be able to answer this essential question

- What were the specifications necessary for spacecraft and space launch vehicles for manned flight?

Students will know

- How manned space craft and space launch vehicles developed over NASA's history.

Students will be able to

- Find patterns building newer and better spacecraft and space launch vehicles using ratio and proportions.
- Represent the space craft and space launch vehicle specifications using graphs and models.

**Learning Plan/Activities:****1. Introducing the Lesson.**

Script: "We've been talking about NASA a lot lately. Did you realize NASA has been around for over 50 years? Today, we're going to review the history of manned space flight, paying close attention to how the early manned space flight systems evolved. We're also going to use mathematical concepts to show how each program has 'stood on the technological achievements of its predecessor' by discussing and comparing data sets."

Review the handout *The Early Years: Mercury to Apollo-Soyuz* (RDG\_The-Early-Years.pdf) as a reading assignment or talk through the main headings as a quick review.

**2. Discussing the Data.**

Introduce pages 8 and 9 in the information summary *The Early Years: Mercury to Apollo-Soyuz* (RDG\_The-Early-Years.pdf). Review ratios and proportions. Also, discuss types of graphs and methods for creating graphs and how to use the data to perform the calculations and create graphs.

**3. Creating Representations.**

Distribute the *The Early Years: Mercury to Apollo-Soyuz Math* activity (ACT\_The-Early-Years-Math.doc). Model how to do the first problem and guide students through the second. Then, if they are ready, students will then complete the remainder on their own.

**Assessment Evidence:**

Performance Tasks

1. Collect and evaluate the tables and graphs.
2. Evaluate the knowledge gained via the *The Early Years: Mercury to Apollo-Soyuz* assessment (AS\_The-Early-Years.doc).

Other Evidence

1. Compare the data and graphs to previously submitted samples to measure growth.
2. Perform daily classroom observation and assessment of progress and participation.

**Extensions and Going Further Resources:**

- Students could build scale models of the spacecraft and space launch vehicles. There are many lesson plans and tools on NASA's website: <http://exploration.grc.nasa.gov/education/rocket/rktsim.html>. This application allows students to change the design variables to create a virtual rocket.
- Students could build and launch rockets basing their designs on the ratios and proportions discussed in this activity.
- Students could review the "First 100 U.S. Human Space Flights" for detailed information on each of the manned space flight programs by visiting <http://www.nasa.gov/centers/kennedy/news/facts/hundred-toc.html>
- Be sure to check for student opportunities, additional educational resources and more at: <http://www.nasa.gov/education>