



## Origami Galaxies Discovery Based Activity Sixth Grade Earth Science

### Summary

Students will participate in a discussion on galaxies and the Hubble space telescope. Students will observe photographs taken by the Hubble that show various types of galaxies and their structure. Students will then construct a spiral “galaxy” using origami paper.

**Duration of Activity:** 50 minutes

### Associated Web Sites

[www.ccssc.org](http://www.ccssc.org) - Coca-Cola Space Science Center

<http://www.universetoday.com/> - Latest news about astronomy, great pictures.

<http://www.nineplanets.org/> - Good source for research on our Solar System.

<http://hubble.stsci.edu/gallery/> - Look no further for the best that Hubble has to offer!

<http://sse.jpl.nasa.gov/index.cfm> - This site has lesson plans/activities related to latest missions.

<http://www.jpl.nasa.gov/missions/mer/> - Latest news and pictures from the Mars rovers.

<http://www.badastronomy.com/bad/index.html> - Cool site that debunks common misconceptions and other pseudoscientific ideas.

<http://www.solarviews.com/ss.html> - Source for Solar System research and icosahedrons.

<http://www.kidsastronomy.com> - Great site for young astronomers.

<http://www.nasa.gov> - This site has it all.

<http://spacelink.msfc.nasa.gov/> - NASA site for educational resources.

<http://spacescience.nasa.gov/education/educators/links/> - Space Science Education/Public Outreach Sites

<http://www.pbs.org/wgbh/nova/mars/> - Nova website on Mars rovers.

[http://www.exploratorium.edu/ronh/solar\\_system/](http://www.exploratorium.edu/ronh/solar_system/) - use to make a scale model of solar system

## GPS Objectives

### Co-Requisite – Characteristics of Science

#### Habits of Mind

**1S6CS1. Students will explore the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.**

- 1a. Understand the importance of—and keep—honest, clear, and accurate records in science.
- 2b. Understand that hypotheses are valuable if they lead to fruitful investigations, even if the hypotheses turn out not to be completely accurate descriptions.

**2S6CS2. Students will use standard safety practices for all classroom laboratory and field investigations.**

- 1a. Follow correct procedures for use of scientific apparatus.

**1S6CS5. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.**

- 1a. Observe and explain how parts are related to other parts in systems such as weather systems, solar systems, and ocean systems including how the output from one part of a system (in the form of material, energy, or information) can become the input to other parts. (For example: El Nino's effect on weather)
- 2b. Identify several different models (such as physical replicas, pictures, and analogies) that could be used to represent the same thing, and evaluate their usefulness, taking into account such things as the model's purpose and complexity.

#### The Nature of Science

**1S6CS8. Students will investigate the characteristics of scientific knowledge and how it is achieved.**

Students will apply the following to scientific concepts:

- 0c. As prevailing theories are challenged by new information, scientific knowledge may change and grow.

### Co-Requisite-Content

**1S6E1. Students will explore current scientific views of the universe and how those views evolved.**

- 1a. Relate the Nature of Science to the progression of basic historical scientific models (geocentric, heliocentric) as they describe our solar system, and the Big Bang as it describes the formation of the universe.
- 2b. Describe the position of the solar system in the Milky Way galaxy and the universe.
- 3d. Explain the motion of objects in the day/night sky in terms of relative position.
- 4e. Explain that gravity is the force that governs the motion in the solar system.

#### English/Language Arts

**ELA6R1 The student demonstrates comprehension and shows evidence of a warranted and responsible explanation of a variety of literary and informational texts.**

- i. Compares traditional literature and mythology from different cultures.

e. Follows multi-step instructions to complete or create a simple product.

**ELA6R2 The student understands and acquires new vocabulary and uses it correctly in reading and writing. The student**

- a. Determines the meaning of unfamiliar words by using word, sentence, and paragraph clues.
- b. Uses knowledge of Greek and Latin affixes to understand unfamiliar vocabulary.

**ELA6RC1 The student reads a minimum of 25 grade-level appropriate books or book equivalents (approximately 1,000,000 words) per year from a variety of subject disciplines. The student reads both informational and fictional texts in a variety of genres and modes of discourse, including technical texts related to various subject areas.**

**ELA6RC3 The student acquires new vocabulary in each content area and uses it correctly. The student**

- a. Demonstrates an understanding of contextual vocabulary in various subjects.
- b. Uses content vocabulary in writing and speaking.
- c. Explores understanding of new words found in subject area texts.

**Listening/Speaking/Viewing**

**ELA6LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions. The student**

- a. Initiates new topics in addition to responding to adult-initiated topics.
- b. Asks relevant questions.
- c. Responds to questions with appropriate information.
- d. Confirms understanding by paraphrasing the adult's directions or suggestions.
- e. Displays appropriate turn-taking behaviors.
- f. Actively solicits another person's comments or opinions.
- g. Offers own opinion forcefully without being domineering.
- h. Responds appropriately to comments and questions.
- i. Volunteers contributions and responds when directly solicited by teacher or discussion leader.
- j. Gives reasons in support of opinions expressed.
- k. Clarifies, illustrates, or expands on a response when asked to do so.

## Social Studies

**SS6RC1 Students will enhance reading in all curriculum areas by:**

- c. Building vocabulary knowledge
  - Demonstrate an understanding of contextual vocabulary in various subjects.
  - Use content vocabulary in writing and speaking.
- d. Establishing context
  - Determine strategies for finding content and contextual meaning for unknown words.

## Matrices

### INFORMATION PROCESSING SKILLS

## Information Processing Skills

1. compare similarities and differences
11. draw conclusions and make generalizations
12. analyze graphs and diagrams

# Mathematics

## Geometry

### **M6G1 Students will further develop their understanding of plane figures.**

- a. Determine and use lines of symmetry.
- b. Investigate rotational symmetry, including degree of rotation.

### **Process Standards**

### **M6P1 Students will solve problems (using appropriate technology).**

- a. Build new mathematical knowledge through problem solving.
- b. Solve problems that arise in mathematics and in other contexts.
- c. Apply and adapt a variety of appropriate strategies to solve problems.

### **M6P3 Students will communicate mathematically.**

- c. Analyze and evaluate the mathematical thinking and strategies of others.

### **M6P4 Students will make connections among mathematical ideas and to other disciplines.**

- c. Recognize and apply mathematics in contexts outside of mathematics.

### **M6P5 Students will represent mathematics in multiple ways.**

- a. Create and use representations to organize, record, and communicate mathematical ideas.
- c. Use representations to model and interpret physical, social, and mathematical phenomena.