DeKalb County School System

Fernbank Science Center

Title: Galaxy Game Show (1415)
Level: 4th Grade
Location: Planetarium
Type: Planetarium
Length: 40 minutes
Limit: 300

Program Description

Three contestants randomly chosen from our Milky Way audience will compete to win the ultimate prize: an all expense paid trip to the galaxy of their choice. Cheer them along as they answer questions about the planets, stars, constellations, and much more!

Georgia Performance Standards

S4E1a. Recognize the physical attributes of stars in the night sky such as number, size, color and patterns.
S4E1d. Identify how technology is used to observe distant objects in the sky.
S4E2a. Explain the day/night cycle of the earth using a model.
S4E2b. Explain the sequence of the phases of the moon.
S4E2d. Demonstrate the relative size and order from the sun of the planets in the solar system.

Vocabulary

Earth
Jupiter
Mars
Mercury
Moon
Neptune
planet
Pluto
revolution
rotation
Saturn
Uranus
Venus

Pre-Visit Activities

Check out NASA's StarChild web site for an excellent solar system introduction:
http://starchild.gsfc.nasa.gov/docs/StarChild/solar_system_level2/solar_system.html

Post-Visit Activity

1415 Galaxy Game Show (see below)

Resource Harcourt Georgia Science 4: Unit A, Chapter 2, Lesson 2, pp. 69-76.
AIMS Grade 4: pp. 299-317.

Note: Planetarium programs begin PROMPTLY at 9:30 a.m., 10:45 a.m. and 12:30 p.m. Your group must arrive in time to check in and be ready to be seated at least 15 minutes before the program begins.

Galaxy Game Show

4th Grade Planetarium Program
Post-Visit Activity

Now that you have been to the planetarium program and learned a little about each of the planets in our solar system, you can discover both how high you could jump on another planet and how much you would weigh.

Materials Needed: meterstick, pencils, paper

Vocabulary: gravity, mass, weight

Model: Ask a student to jump as high as he/she can. This is one example of how high one person can jump on one planet, the Earth.

Observation: Give another student a meterstick to hold vertically, touching the floor. Have a second student kneel so that he/she can see the meterstick in order to measure the height of the original student's jump. Have the first student repeat the jump, and ask the third (kneeling) student to observe the height of the jump.

Speculation: Ask your students to speculate about factors that would influence the height of the jump. (gravity, strength)

Experiment: Have your students record the height of their jump on earth, and use the following table to calculate how high they could jump on other planets.

I jump _____ cm on the Earth.

Object	Math Operation	Result
Sun	divide by 30	
Mercury	multiply by 5 and then divide by 2	
Venus	multiply by 10 and then divide by 9	
Earth's Moon	multiply by 6	
Mars	multiply by 5 and then divide by 2	
Jupiter	multiply by 2 and then divide by 5	
Saturn	multiply by 7 and then divide by 8	
Uranus	multiply by 11 and then divide by 12	
Neptune	multiply by 5 and then divide by 7	
Pluto	multiply by 30	

Example Calculation:

I jump 5 cm on the Earth. On the Sun I would jump 5/30 cm = 0.16 cm.

The surface gravity of a star, planet, moon, etc. depends upon the object's mass (the amount of stuff present), and the object's radius. The radius is a factor because

(1) an object's gravity acts as though its source is at the object's center, and (2) the "strength" of an object's gravity diminishes with distance. For example, suppose that two planets have the same mass, but unequal radii. The planet with the smaller radius will have a stronger surface gravity.

Activity Two: How much would you weigh on another planet?

I weigh _____ pounds on the Earth.

Object	Math Operation	Result
Mercury	Multiply by 0.39	
Venus	Multiply by 0.91	
Earth's Moon	Multiply by 0.16	
Mars	Multiply by 0.38	
Jupiter	Multiply by 2.6	
Saturn	Multiply by 1.1	
Uranus	Multiply by 0.88	
Neptune	Multiply by 1.14	
Pluto	Multiply by .05	

Example Calculation: I weigh 60 pounds on the Earth. On Mercury I would weigh 60 X 0.39 pounds, or 23 pounds.

Reference: Astronomical Society of the Pacific, Project Astro, *Hands on Universe*, Activity C-12, pp. 68-71.