

Gravity in the Solar System

By Carolyn Hollis

Materials: Tape measure hung vertically on a wall. The bottom needs to be in reach of all students. The top must be above jumping reach of the students.

Directions:

We can compare the effect of gravity by computing how high we can jump on different worlds. Gravity is an attractive force that holds us to Earth. If the gravity is less the strength of our legs will let us jump higher. If the force of gravity increases we can't jump as high.

All objects exert a gravitational force on every other object. The strength of this force is based on two things. 1) The size of the object. The greater the mass of the object the more force it exerts. 2) Your distance from the center of the object. The greater the distance from the center of the object the weaker the gravitational force it exerts on you. It is the relationship between the mass of a planet and its diameter that determines the gravitational force you would experience standing on its surface.

Work with a partner to determine how high you could jump on each planet.

- Reach as high as you can on the tape measure. Record the number you touch.
- Have your partner watch as you jump and touch the tape measure. Your partner will tell you the number you reached.
- Subtract the initial and jump numbers to determine how high you can jump on earth.
- Divide by the relative gravity/ conversion factors on the chart to determine how high you could jump on other planets.

Planet	Relative gravity/conversion factor	Height you can jump
Mercury	0.4	
Venus	0.9	
Earth	1	
Mars	0.4	
Jupiter	2.4	
Saturn	1.1	
Uranus	0.9	
Neptune	1.2	
Pluto	0.1	