

SPACE WEIGHT, GRAVITY, AND DISTANCE

1. SPACE WEIGHT

- Gravity is a universal natural force. It is the pull towards the centre of an object.
- All objects exert a gravitational force on all other objects.
- When you weigh yourself you are measuring the amount of gravitational attraction exerted on you by the earth. The larger the object, the greater the gravitational pull.
- What is your weight on earth? _____
- To calculate your weight on other planets simply multiply your earth weight by the number given.

Planet	Multiply weight by:	New weight
Mercury	0.4	
Venus	0.9	
Earth	1	
Moon	0.17	
Mars	0.4	
Jupiter	2.5	
Saturn	1.1	
Uranus	0.8	
Neptune	1.2	
Pluto	0.01	

- a) Which is the largest planet above? _____
- b) Which is the smallest planet above? _____
- c) What would your mass (not weight) be on Saturn? _____

2. GRAVITY *"Gravity cannot be blamed for people falling in love." (Einstein)*

- An object will fall to the surface of the earth at approximately 9.8 m/s^2 (gravitational constant for earth). An object will fall to the surface of the moon at approximately 1.67 m/s^2 (gravitational constant for moon).
 - Equation: $d = 1/2 \times g \times t^2$ (d = distance, g = gravitational constant, t = time)
- a) If a stone is dropped from the top of a building on earth that is 100 metres high, how long will it take to reach the ground?
-
-
-
-
-
-
-
-
-
-
- b) If a stone is dropped from the same height on the moon, how long will it take to reach the ground?

3. SPACE DISTANCES

- 1 Astronomical Unit (AU) = 93 million miles (distance from Earth to Sun)

Planet	Distance from the sun (in millions of miles)	AU Equivalent
Mercury	36	
Venus	67.27	0.7
Earth	93	1
Mars	141.7	
Jupiter	483.9	
Saturn	887.1	
Uranus	1783.98	
Neptune	2795.5	
Pluto	3675.3	

- The speed of light is approximately 186,000 miles/second.
 - The distance light travels in 1 year is called a "light year".
- a) How many light years away is Pluto?