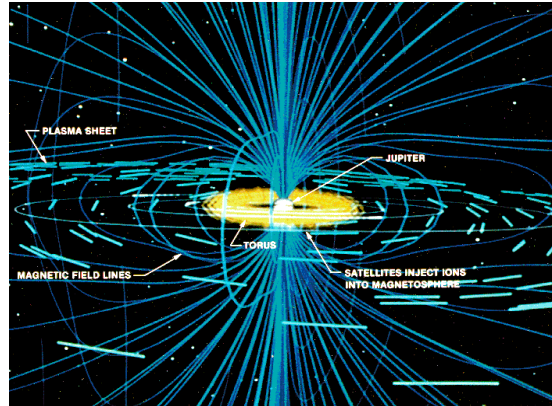


Scientists use, and create, many different kinds of equations to help them quantify their data, and make predictions.

A scientific theory describes how quantities ought to be logically related to each other, and provides a mathematical procedure for working with nature in a symbolic way.



A model of Jupiter's magnetic field.

Equations are used to extract information from data, and to model how qualities (speed, distance, temperature etc) are interrelated.

- Equations help scientists extract information from basic data, and allow them to make predictions.

Here's how to do it!

If a pebble falls from the top of a building and takes 10.0 seconds to reach the ground, how high is the building? This equation predicts the distance of the fall (H) based on the time (T)

$$H = 9.8 T^2$$

with T=10.0 seconds :

$$H = 9.8 (10)^2 \text{ meters} = 980 \text{ meters}$$

Now you try!

Evaluate the following equations for the indicated values of the variables:

1) $d = d_0 + V_0T + 1/2 a T^2$ for $a = 32$, $V_0 = 25.7$, $d_0 = 5.5$ and $T = 15.7$

2) $E = m c^2$ for $m = 15$ and $c = 299,792.5$

3) $L = 4\pi R^2 S T^4$ for $R = 6.9 \times 10^{10}$, $S = 0.000058$ and $T = 5770.0$

4) $M = 9.54 \times 10^{15} T m^3$ for $T = 3987.6$ and $m = 30.5$