

Laws of Nature

Isaac Newton (1642-1727) offered a new theory of inertia. He schooled himself in mathematics, later inventing what is now called calculus. His conception of the universe was published in 1687, the *Principia (Mathematical Principles of Natural Philosophy)*, and described an orderly world subsumed under a single set of laws. Following the observations suggested by Galileo, Newton's First Law of Motion states that an object at rest will remain stationary unless acted upon by some outside force, and an object in motion will continue in motion in a straight line and at a constant velocity, unless acted upon by some outside force.

The Second Law of Motion states that the acceleration of an object is directly related to the force exerted upon the object. The more force exerted, the faster the object moves. The less force exerted, the slower the object moves. And the acceleration of an object is inversely related to the mass of the object. The force exerted on an object of large mass will result in less acceleration than the same force exerted upon an object of smaller mass.

The Third Law of Motion states that for every action there is an equal and opposite reaction. No force may be exerted upon any body that does not affect a second body. From these universal laws of gravitation, Newton calculated the movement of the planets around the sun as well as the movement of an apple from a tree. The gravitational pull of the sun or the earth is inversely proportional to the square of a planet's or an apple's distance from the sun or the earth.

What applies in the solar system applies in one's back yard.

For the first time in human history, a concise and rigorous theory was proposed that maintained that the physical universe can continue movement indefinitely without an animate or a divine power regulating it. The universe is an orderly and predictable universe, governed by great mechanical forces. These forces are implicit within the autonomous laws of the universe, laws that are as absolute as that which they govern, i.e., space and time. And these are laws that are knowable by man, to be observed and used by man.

