

# Center of Gravity Encyclopedia Article

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# Center of Gravity

In the study of **mechanics** the center of **gravity** refers to the point in an object that moves in a **gravitational field** as though the entire **mass** of the object were concentrated at that point. For other than extremely large objects approaching planetary dimensions, when considering application of forces the object moves as if the **gravitational force** acting on the object was applied at the **center of mass**.

Every object is a collection of an incredibly large number of atoms. Each **atom** is attracted to the center of the Earth by the pull of gravity. The **weight** of any object is the total pull on all the atoms that make up the object. It is usually impossible, however, to analyze the countless forces acting on different atoms in the object. It is much more convenient to think of all the forces acting as though they were applied to one point within the body. The resultant of the application of such forces is the same as if all of the mass of the body were located at the center of mass (i.e., the point of **force** application).

Often, the balancing point of an object is determined by its center of mass and the center of gravity of an object, therefore, is that point in the object through which the total weight (force of gravity) appears to act.

In most cases the center of gravity is considered to be the point in a object about which the weight of the object body is uniformly distributed. It is possible to obtain a reasonable estimate of the position of the center of gravity of an object by experiment. Whenever an object is suspended at a point it will turn about the center of gravity until the center of gravity lies beneath the suspension point. The object can be suspended from various points and at each position a line drawn vertically downward. The center of gravity will be located at the intersection of the lines.