# Value of "g" Acceleration due to gravity at different locations

| Place | Latitude | Altitude | "g" in $m/s^2$ |
|---|---|---|---|
| North Pole | 90° | 0m | 9.832 |
| Green Land | 70° | 20m | 9.825 |
| Stockholm | 59° | 45m | 9.818 |
| Brussels | 51° | 102m | 9.811 |
| Benff | 51° | 1376m | 9.808 |
| New York | 41° | 38m | 9.803 |
| Chicago | 42° | 182m | 9.803 |
| Denver | 40° | 1638m | 9.796 |
| San Francisco | 38° | 114m | 9.800 |
| Canal Zone | 9° | 6m | 9.782 |
| Java | 6°South | 7m | 9.782 |
| New Zealand | 37°South | 3m | 9.800 |

Taken from http://www.haverford.edu/educ/knight-booklet/accelarator.htm

Earth's Gravity (from Wikipedia)

Precise values of *g* vary depending on the location on the Earth's surface. The *standard acceleration due to gravity* at the Earth's surface is, by definition, 9.806650 $m/s^2$. This quantity is known variously as $g_n$, $g_e$ (though this sometimes means the normal equatorial value on Earth, 9.78033 $m/s^2$), $g_0$, gee, or simply *g* (which is also used for the variable local value). The variation in gravitational strength per unit distance is measured in inverse seconds squared or in eotvoses, a cgs unit of gravitational gradient.

When measuring *g* with precision, it is important to distinguish between the *actual* strength of gravity and the *apparent* strength of gravity. Local variations in the *actual* strength of the Earth's gravitational field arise because the earth is not a perfect sphere and is not of uniform density. The main deviation from sphericity is the earth's equatorial bulge, which causes gravity to be weaker at the equator than the poles. The local topography (such as the presence of mountains) and geology (the density of rocks in the vicinity) also influence the gravitational field to a small extent.

Other forces acting on an object may augment or oppose the earth's actual gravitational field, causing variations in the *apparent* force of gravity (see also Apparent weight.) One example is the fictitious centrifugal force caused by the earth's rotation, which imparts an upwards force opposing gravity and diminishing its apparent effect. This effect is stronger at lower latitudes (i.e. nearer the equator), reducing to zero at the poles. Another example is buoyancy: even in air, objects experience a small supporting force which reduces the apparent strength of gravity. Finally, the gravitational effects of the Moon and the Sun (also the cause of the tides) also have a small effect on apparent gravity, depending on their relative positions; typical variations are 2 µm/s² (0.2 mGal) over the course of a day.

In combination, the equatorial bulge and the effects of centrifugal force mean that sea-level gravitational acceleration increases from about 9.780 m/s² at the equator to about 9.832 m/s² at the poles, so an object will weigh about 0.5% more at the poles than at the equator [1]. See acceleration due to gravity for further information.

Gravity also decreases with altitude (since greater altitude means greater distance from the earth's centre). All other things being equal, an increase in altitude from sea level to the top of Mount Everest (8,850 metres) causes a weight decrease of about 0.28%. It is a common misconception that astronauts in orbit are weightless because they have flown high enough to "escape" the earth's gravity. In fact, at an altitude of 250 miles (roughly the height that the space shuttle flies) gravity is still nearly 90% as strong as at the earth's surface, and weightlessness actually occurs because orbiting objects are in free-fall.

If the earth was of perfectly uniform composition then, during a descent to the centre of the earth, gravity would decrease linearly with distance, reaching zero at the centre. In reality, the gravitational field peaks within the Earth at the core-mantle boundary where it has a value of 10.7 m/s².

## Comparative gravities of various cities around the world

The table below shows gravitational acceleration or various cities around the world.[1]

| | | | | | |
|---|---|---|---|---|---|
| Amsterdam | 9.813 m/s² | Glasgow | 9.816 m/s² | Paris | 9.809 m/s² |
| Athens | 9.807 m/s² | Havana | 9.788 m/s² | Rio de Janeiro | 9.788 m/s² |

| | | | | | |
|---|---|---|---|---|---|
| Auckland, NZ | 9.799 m/s² | Helsinki | 9.819 m/s² | Rome | 9.803 m/s² |
| Bangkok | 9.783 m/s² | Kuwait | 9.793 m/s² | San Francisco | 9.800 m/s² |
| Brussels | 9.811 m/s² | Lisbon | 9.801 m/s² | Singapore | 9.781 m/s² |
| Buenos Aires | 9.797 m/s² | London | 9.812 m/s² | Stockholm | 9.818 m/s² |
| Calcutta | 9.788 m/s² | Los Angeles | 9.796 m/s² | Sydney | 9.797 m/s² |
| Cape Town | 9.796 m/s² | Madrid | 9.800 m/s² | Taipei | 9.790 m/s² |
| Chicago | 9.803 m/s² | Manila | 9.784 m/s² | Tokyo | 9.798 m/s² |
| Copenhagen | 9.815 m/s² | Mexico City | 9.779 m/s² | Vancouver, BC | 9.809 m/s² |
| Nicosia | 9.797 m/s² | New York | 9.802 m/s² | Washington, DC | 9.801 m/s² |
| Jakarta | 9.781 m/s² | Oslo | 9.819 m/s² | Wellington, NZ | 9.803 m/s² |
| Frankfurt | 9.810 m/s² | Ottawa | 9.806 m/s² | Zurich | 9.807 m/s² |

Taken from http://en.wikipedia.org/wiki/Gravity_(Earth)