Free Fall Acceleration

About 1600, Galileo performed his famous inclined plane experiments and discovered that the acceleration of a freely-falling object is **constant -** that is, the object's acceleration does not change while the object is in free fall. The acceleration of a freely-falling object - ***any*** freely-falling object - near the surface of the Earth is about 9.8 m/s^2 (which is conveniently close to 10 m/s^2 for rough calculations). In the "customary" system of units, g = 32 ft/s^2 or about 22 mi/hr/s. This acceleration value is commonly called "g". The direction of this acceleration is downward (toward the center of the Earth).

Free fall acceleration is different on other planets - it depends on the planet's size and mass. The table below shows some approximate values of "g" for selected objects in our solar system.

Acceleration of gravity, "g" in the Solar System			
At the surface of	**g (m/s^2) is**	**Mass (kg)***	**Radius (m)***
Sun[1]	275	1.99×10^{30}	6.95×10^{8}
Mercury	3.7	3.30×10^{23}	2.44×10^{6}
Venus	8.9	4.87×19^{24}	6.05×10^{6}
Earth	9.8	5.97×10^{24}	6.38×10^{6}
Moon (of Earth)	1.6	7.35×10^{22}	1.73×10^{6}
Mars	3.7	6.42×10^{23}	3.40×10^{6}
Phobos (moon of Mars)	6.0×10^{-3}	1.08×10^{16}	1.1×10^{4}
Deimos (moon of Mars)	3.3×10^{-3}	1.80×10^{15}	6×10^{3}
Jupiter[1]	25	1.90×10^{27}	7.15×10^{7}
Ganymede (moon of Jupiter)	1.4	1.48×10^{23}	2.63×10^{6}
Europa (moon of Jupiter)	1.3	4.80×10^{22}	1.57×10^{6}
Saturn[1]	10.4	5.68×10^{26}	6.03×10^{7}
Uranus[1]	8.9	8.68×10^{25}	2.56×10^{7}
Neptune[1]	11	1.02×10^{26}	2.48×10^{7}
Pluto	0.7	1.27×10^{22}	1.14×10^{6}

[1]Assuming that these objects actually *had* a surface...