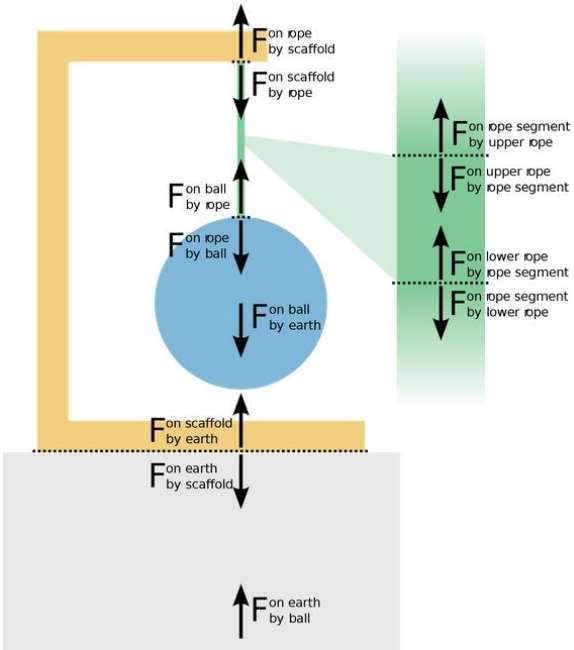
In physics, tension is the pulling force exerted by a string, cable, chain, or similar solid object on another object. It results from the net electrostatic attraction between the particles in a solid when it is deformed so that the particles are further apart from each other than when at equilibrium, where this force is balanced by repulsion due to electron shells; as such, it is the pull exerted by a solid trying to restore its original, more compressed shape. Tension is the opposite of compression. Slackening is the reduction of tension.

As tension is the magnitude of a force, it is measured in newtons (or sometimes pounds-force) and is always measured parallel to the string on which it applies. There are two basic possibilities for systems of objects held by strings: Either acceleration is zero and the system is therefore in equilibrium, or there is acceleration and therefore a net force is present. Note that a string is assumed to have negligible mass.



It's very close to Hooke's law, where we may view a rod of any elastic material as a linear spring. The rod has length L and cross-sectional area A. Its extension (strain) is linearly proportional to its tensile stress σ by a constant factor ε, the inverse of its modulus of elasticity E, such that

$$E\varepsilon = \sigma.$$

We can see plot "Stress-strain", where strain is $\varepsilon = \frac{\Delta L}{L}, L - initial\ lenght.$