Task. A body of mass 1.50 kg is dropped from a height of 12 m. What is the force acting on it during its fall?

Solution. If we ignore the air resistance, then a unique force acting on the body is the gravitation force. It is equal to

$$F = mg,$$

where $m = 1.5$ kg the mass of the body and $g = 9.81\, m/s^2$ is the acceleration due to gravity. In fact g depends on the distance to the center of the Earth. But since the height is too small with respect to the radius of the Earth (≈ 6400 km), we can assume that g is constant. Thus the force acting on the body is the same during its fall and is equal to

$$F = 1.5 * 9.81 = 14.715N.$$