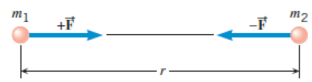
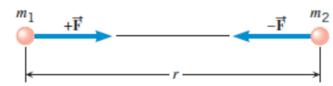
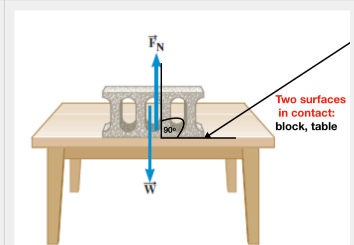
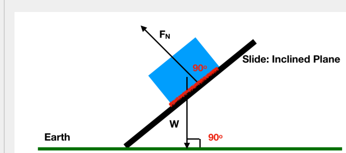
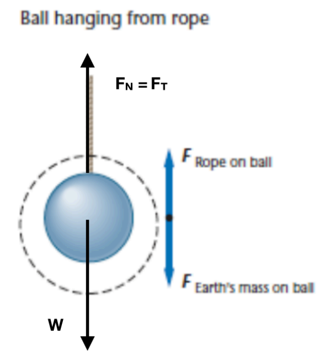
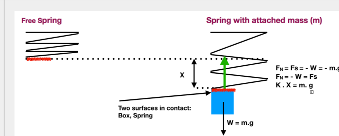
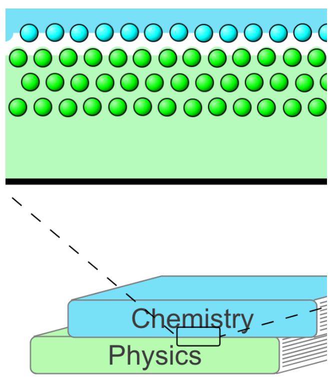
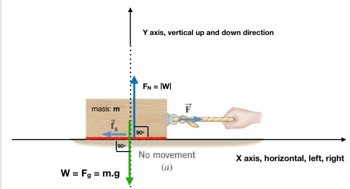
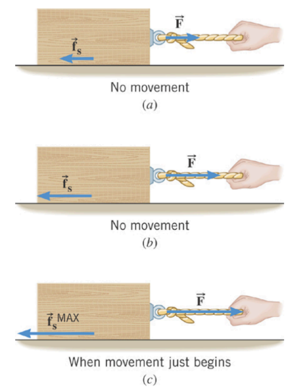
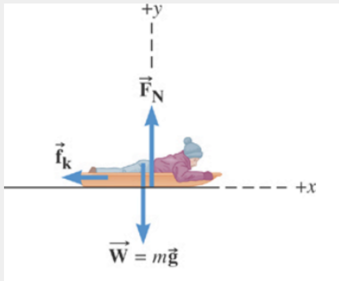
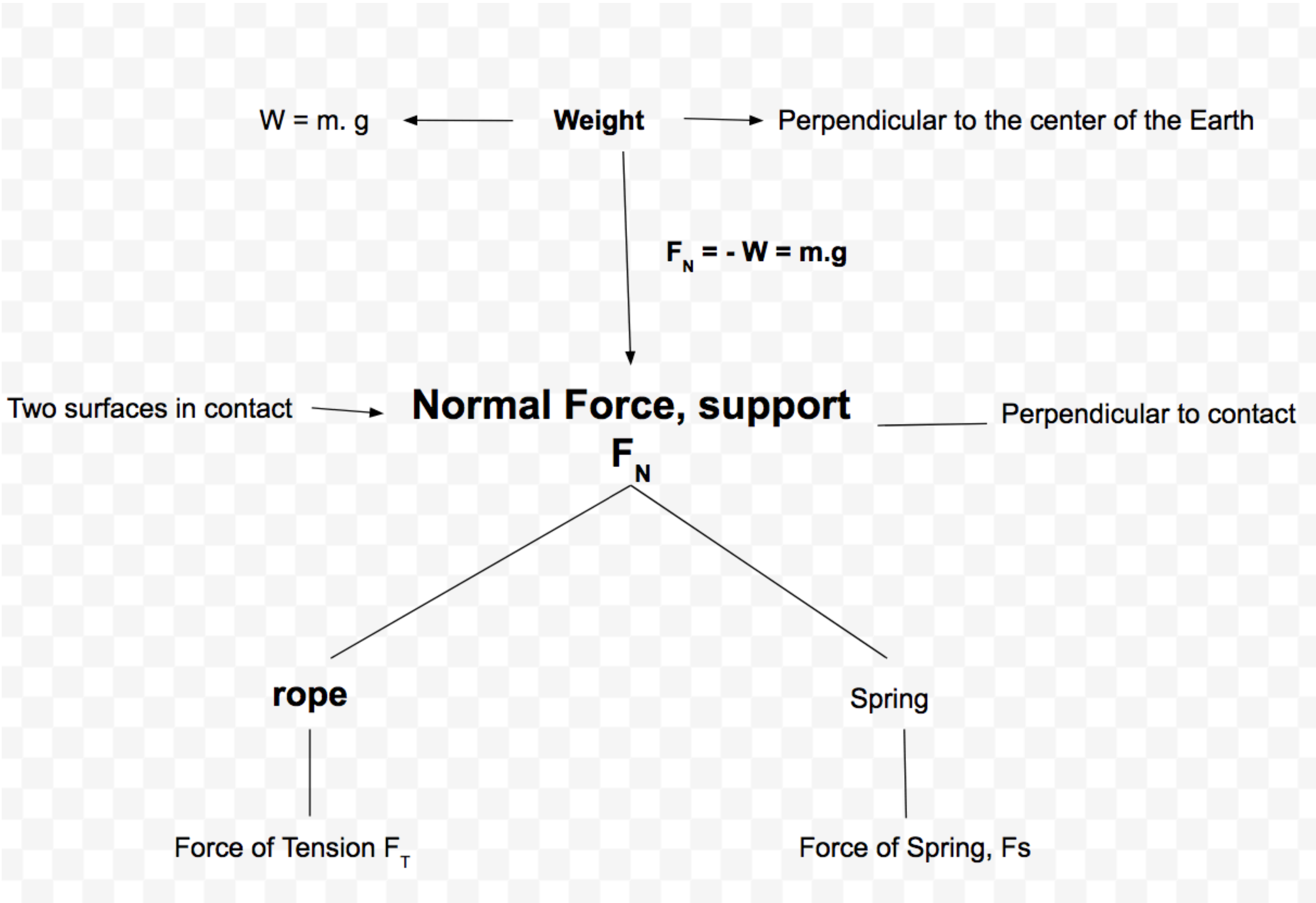
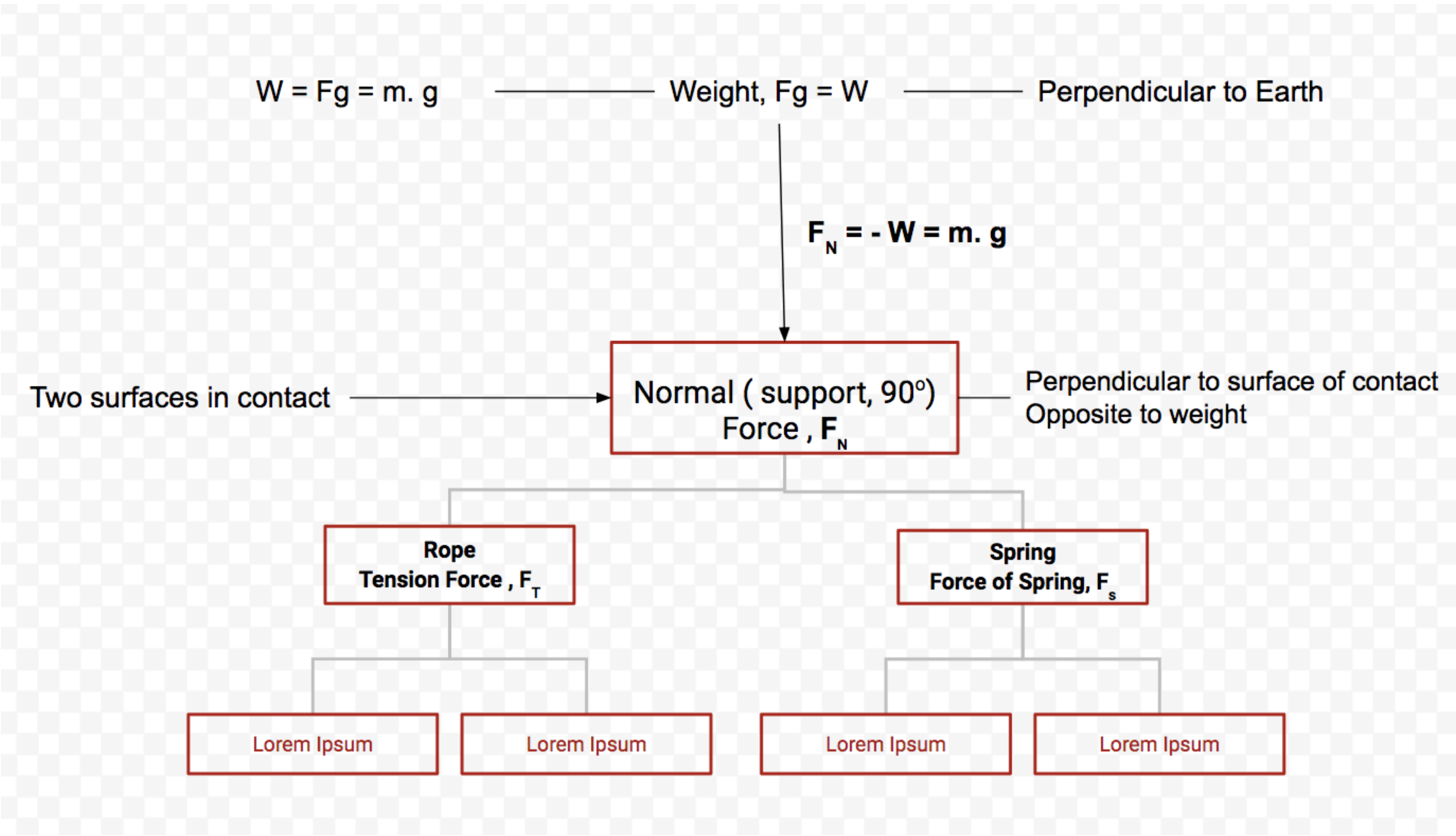
Force	Symbol	Definition	Equation/Formula	Direction	Example
Gravitational ***illusion*** It is an effect of space that a mass does.	$\vec{F}$	It is the force of attraction between 2 objects of non-zero mass and separated by a distance r (between the centers) 	Newton's law of universal gravitation $F = G\frac{m_1 m_2}{r^2}$ F = force G = gravitational constant m_1 = mass of object 1 m_2 = mass of object 2 r = distance between centers of the masses $G = 6.673 \times 10^{-11} Nm^2/kg^2$	It is directed along a line joining the centers of particles. 	At rest, on or near the surface of the Earth, the **gravitational force** equals your **Weight** **$W = F_g = m \times g$** **$= m \times 9.8$**
Normal **Support**	F_N	It is the force pushing two surfaces **in contact** together.	$F_N = - W = - m.g$	**1) perpendicular (90°) to the surface of contact** 2) opposite direction to the weight and 3) equal weight. 4) W and F_N cancel each other. **$W + F_N = 0$**	

Force	Symbol	Definition	Equation/Formula	Direction	Example
Tension	F_T	Is the force acting on a rope when attached to something (pulled by forces acting from opposite sides)	$F_N = F_T = - W$ $= - m.g$ For Equilibrium.	Away from the mass , in the direction of the rope at the point of attachment.	
Spring	F_S	Stress is proportional to strain	$F_S = K . x$ $F_S = F_N = - W$ $K. x = m.g$	Opposite to the Weight. Opposite to the direction of the stretch.	

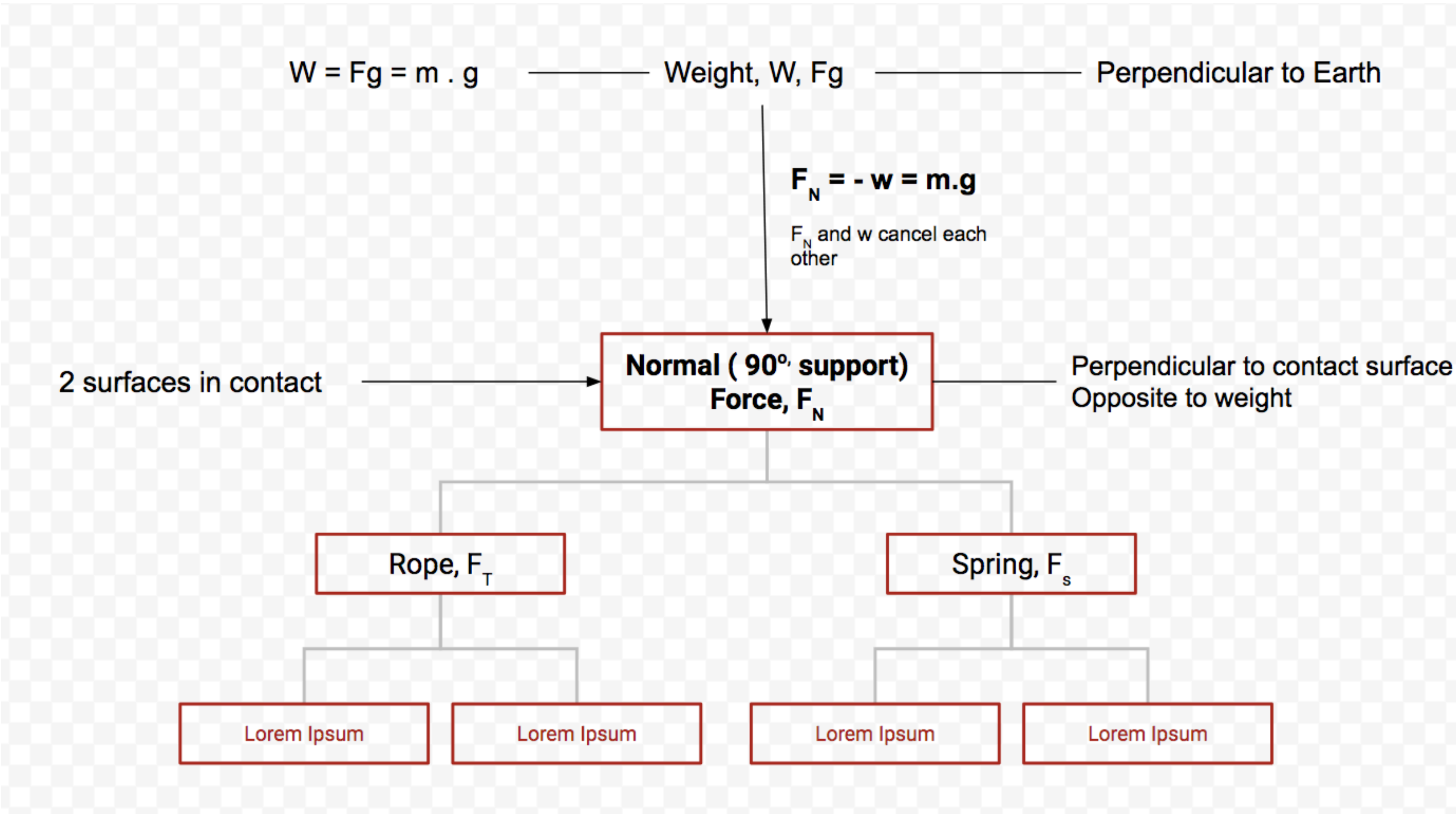
Force	Symbol	Definition	Equation/Formula	Direction	Example
Static Frictional (**Not in motion, rest, no movement**)	$\mathbf{f_s}$	Force: 1) between the particles of 2 surfaces in contact, 2) **not in motion (rest)** attempt to move. 3) Resists the force to move (slide) the object. 4) Object only moves when the applied force F > fs max 	f_s = (coefficient of static friction) F_N $f_s = \mu_s F_N$ $f_s = \mu_s m.g$	**fs** 1) **Parallel** to the surface of contact 2) **Opposite** to the direction of sliding. 	Object only moves when the applied force (F) exceeds the maximum static frictional force (fs max) **F > fs max** 

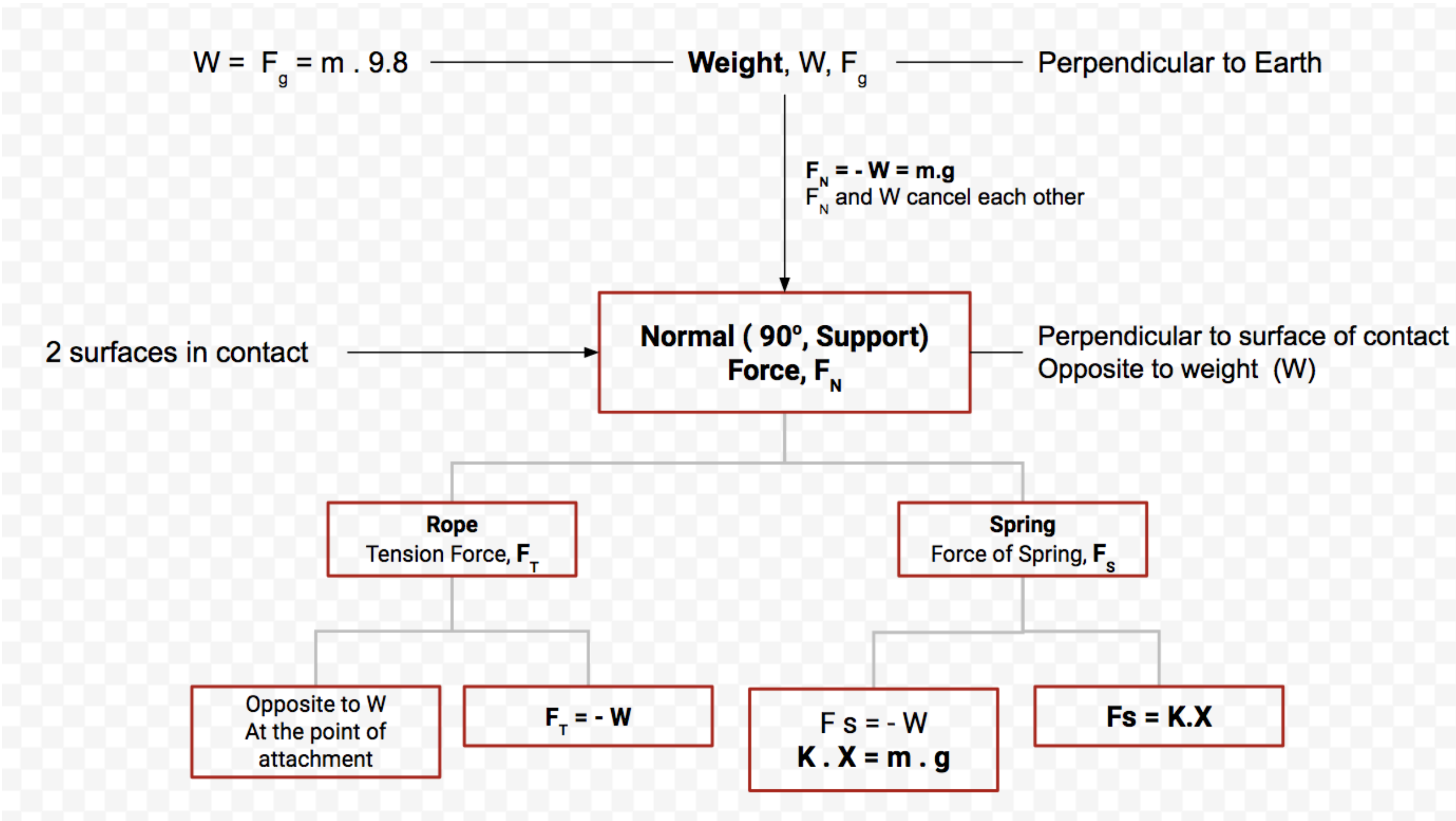
Force	Symbol	Definition	Equation/Formula	Direction	Example
Kinetic Frictional M**otion,** **Moving,** **Sliding,**	$\mathbf{f_k}$	Force: 1) between the particles of 2 surfaces in contact, 2) **in motion (moving, sliding)** 3) Resists the force to slide the object.	f_k = (coefficient of kinetic friction) F_N $f_k = \mu_k F_N$ $f_k = \mu_k m.g$	1) **Parallel** to the surface of contact 2) **Opposite** to the direction of sliding.	

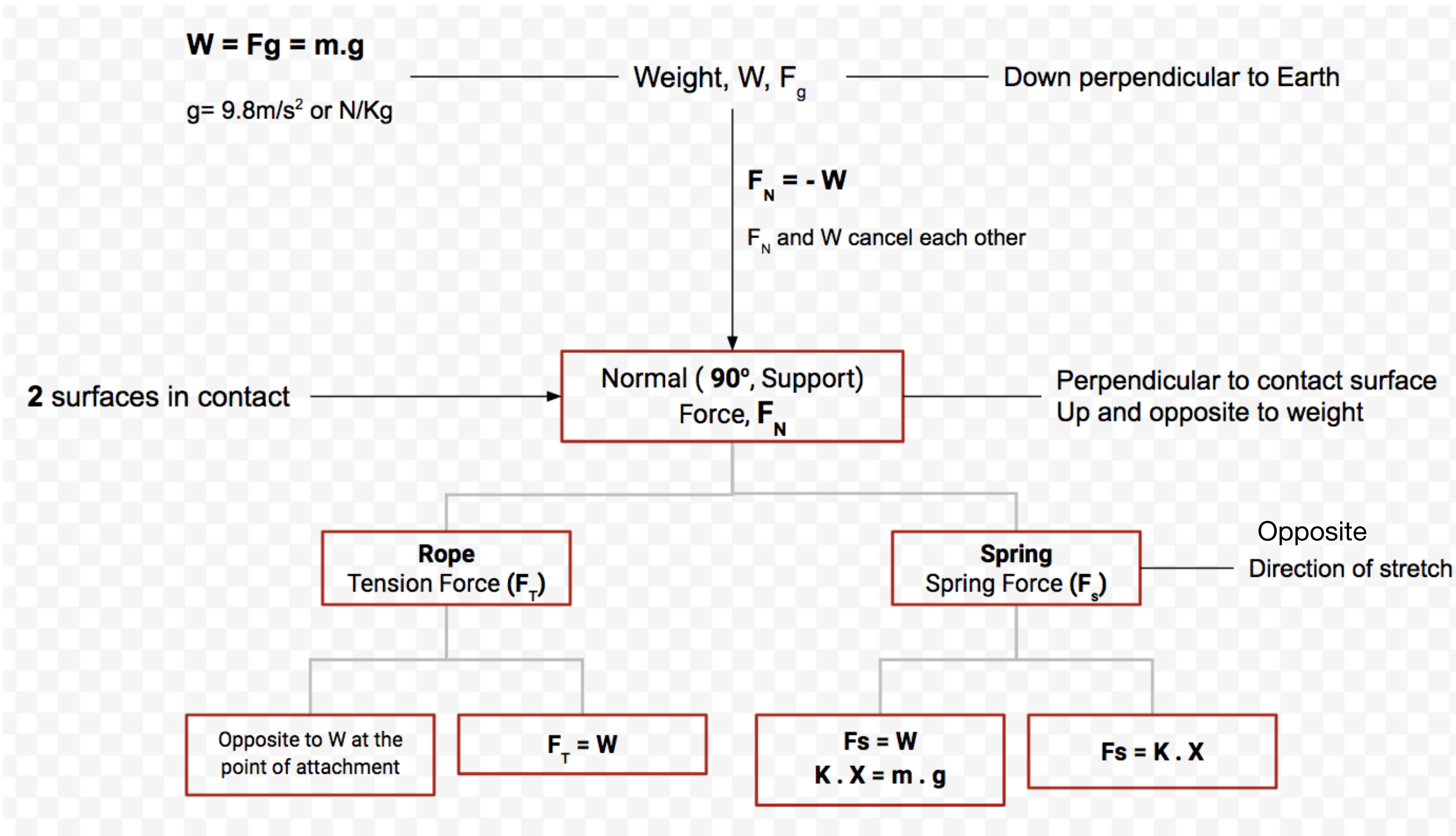

W = m. g
Weight
Perpendicular to the center of the Earth
F_N = - W = m.g
Two surfaces in contact
Normal Force, support
F_N
Perpendicular to contact
rope
Spring
Force of Tension F_T
Force of Spring, Fs



W = Fg = m. g
Weight, Fg = W
Perpendicular to Earth
F N = - W = m. g
Two surfaces in contact
Normal (support, 90º) Force , F N
Perpendicular to surface of contact
Opposite to weight
Rope
Tension Force , F T
Spring
Force of Spring, F s
Lorem Ipsum
Lorem Ipsum
Lorem Ipsum
Lorem Ipsum


W = Fg = m . g
Weight, W, Fg
Perpendicular to Earth
F_N = - w = m.g
F_N and w cancel each other
2 surfaces in contact
Normal (90° support) Force, F_N
Perpendicular to contact surface
Opposite to weight
Rope, F_T
Spring, F_s
Lorem Ipsum
Lorem Ipsum
Lorem Ipsum
Lorem Ipsum


W = F g = m . 9.8
Weight, W, F g
Perpendicular to Earth
F N = - W = m.g
F N and W cancel each other
2 surfaces in contact
Normal (90º, Support)
Force, F N
Perpendicular to surface of contact
Opposite to weight (W)
Rope
Tension Force, F T
Spring
Force of Spring, F s
Opposite to W
At the point of attachment
F T = - W
F s = - W
K . X = m . g
Fs = K.X


W = Fg = m.g
g= 9.8m/s² or N/Kg
Weight, W, Fg
Down perpendicular to Earth
FN = - W
FN and W cancel each other
2 surfaces in contact
Normal (90°, Support) Force, FN
Perpendicular to contact surface
Up and opposite to weight
Rope
Tension Force (FT)
Spring
Spring Force (Fs)
Opposite
Direction of stretch
Opposite to W at the point of attachment
FT = W
Fs = W
K . X = m . g
Fs = K . X