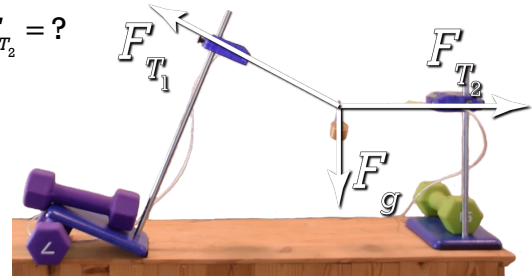
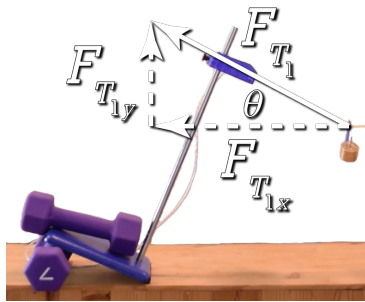
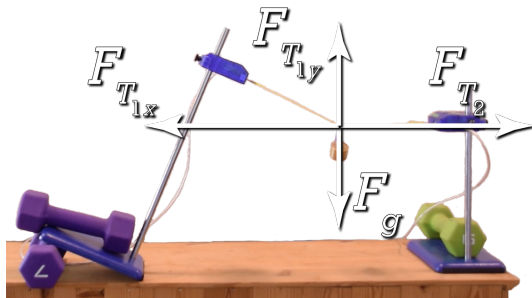


Flipping Physics Lecture Notes:
An Introductory Tension Force Problem

$$m_{\text{hanging}} = 155.0g \times \frac{1kg}{1000g} = 0.155kg; \theta = 28^\circ; F_{T_1} = ?; F_{T_2} = ?$$



$$\sin \theta = \frac{O}{H} = \frac{F_{T_{1y}}}{F_{T_1}} \Rightarrow F_{T_{1y}} = F_{T_1} \sin \theta \quad \& \quad \cos \theta = \frac{A}{H} = \frac{F_{T_{1x}}}{F_{T_1}} \Rightarrow F_{T_{1x}} = F_{T_1} \cos \theta$$



$$\sum F_y = F_{T_{1y}} - F_g = ma_y = m(0) = 0 \Rightarrow F_{T_{1y}} - F_g = 0 \Rightarrow F_{T_{1y}} = F_g \Rightarrow F_{T_1} \sin \theta = mg$$

$$\Rightarrow F_{T_1} = \frac{mg}{\sin \theta} = \frac{(0.155)(9.81)}{\sin(28)} = 3.238854 \approx \boxed{3.2N}$$

$$\sum F_x = F_{T_2} - F_{T_{1x}} = ma_x = m(0) = 0 \Rightarrow F_{T_2} - F_{T_{1x}} = 0 \Rightarrow F_{T_2} = F_{T_{1x}} = F_{T_1} \cos \theta$$

$$\Rightarrow F_{T_2} = (3.238854) \cos(28) = 2.85974 \approx \boxed{2.9N}$$

Note: The mass hanging is an object in translational equilibrium because the net force acting on it equals zero.