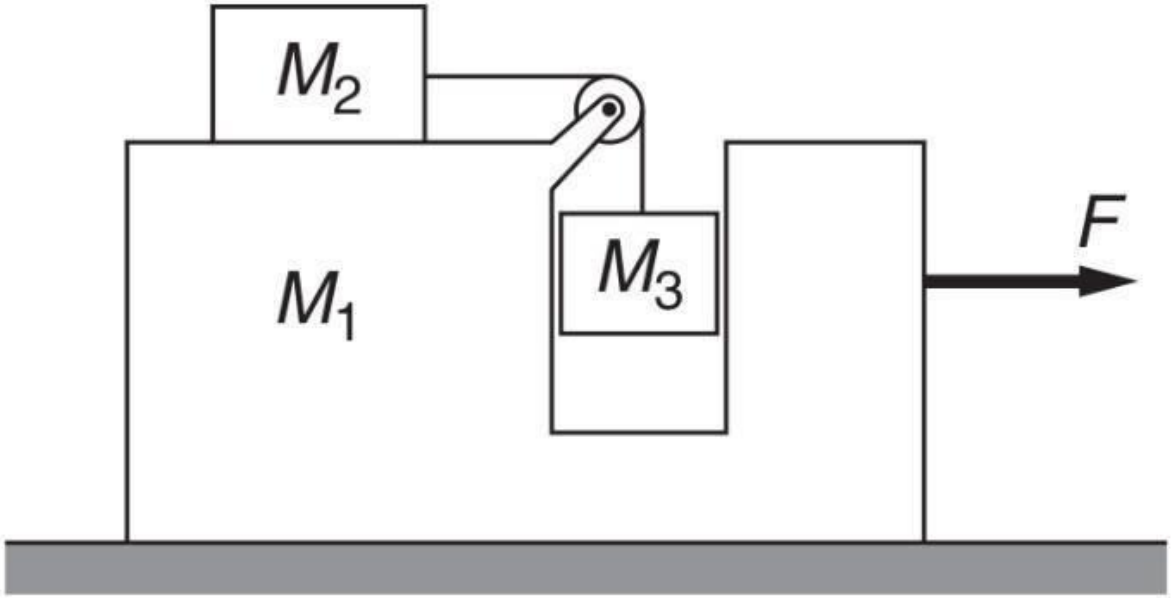
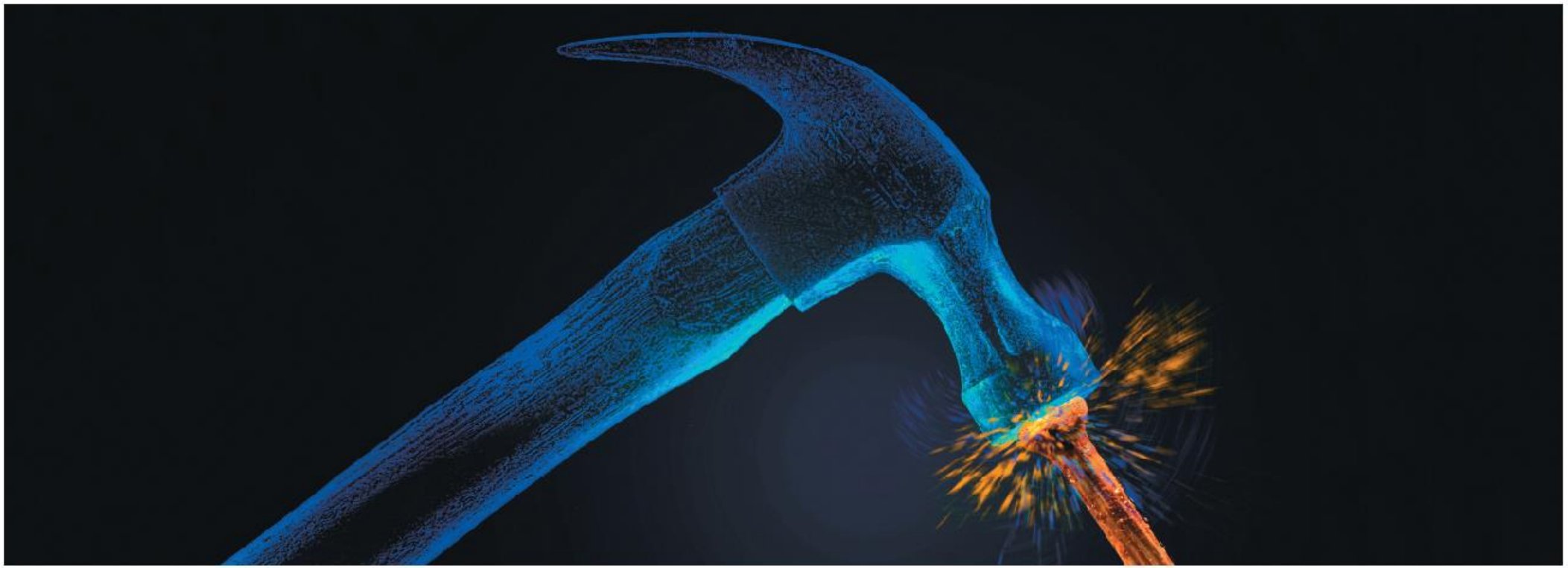
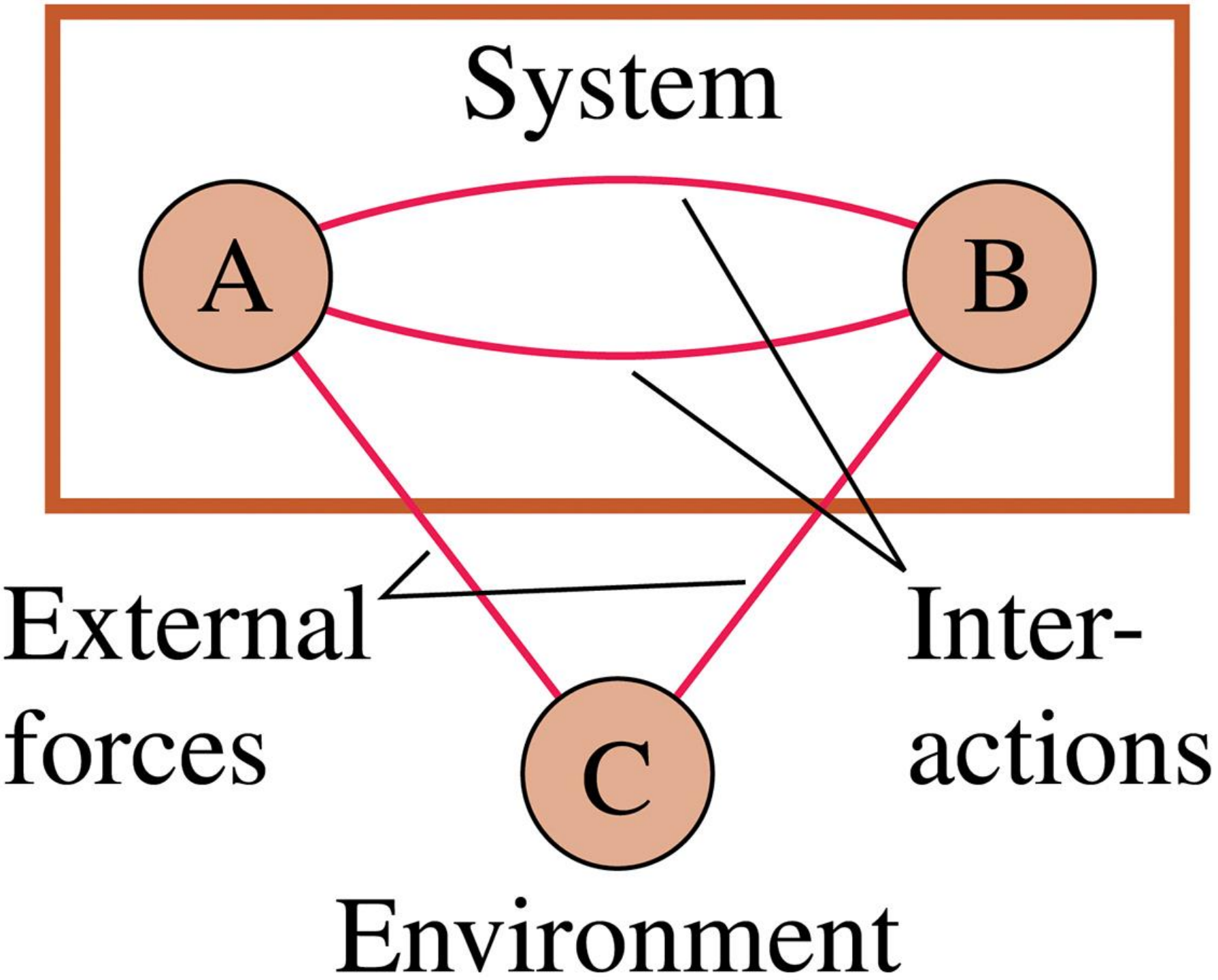
A “pedagogical machine” has no friction. What force F must be applied so that M_3 maintains a constant height?

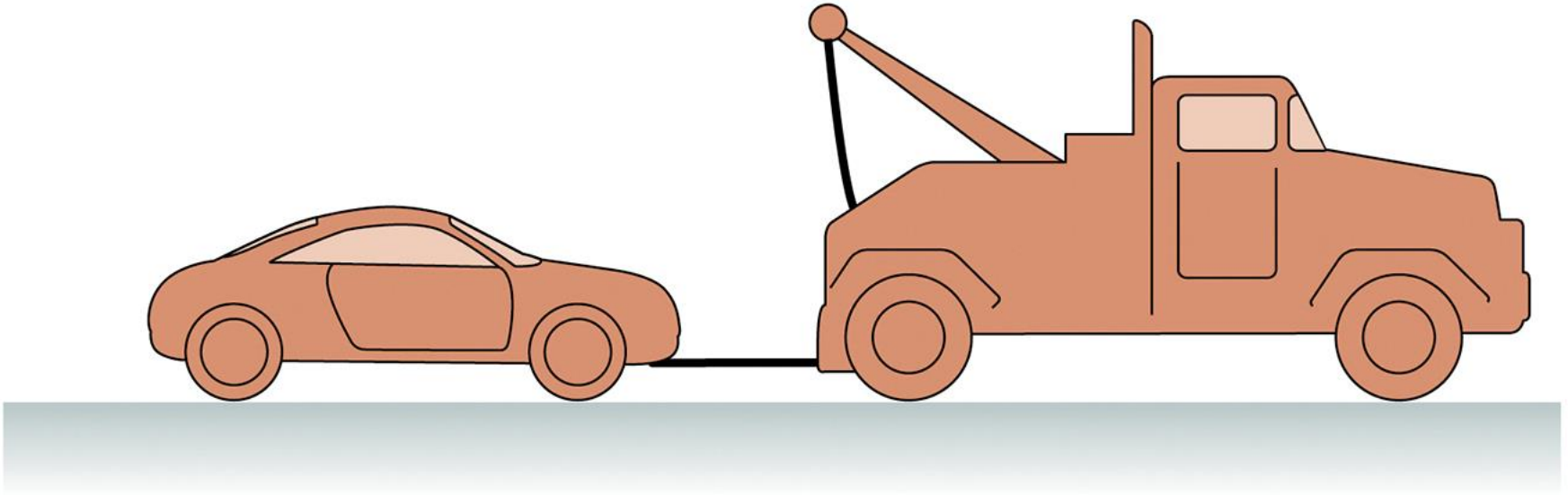


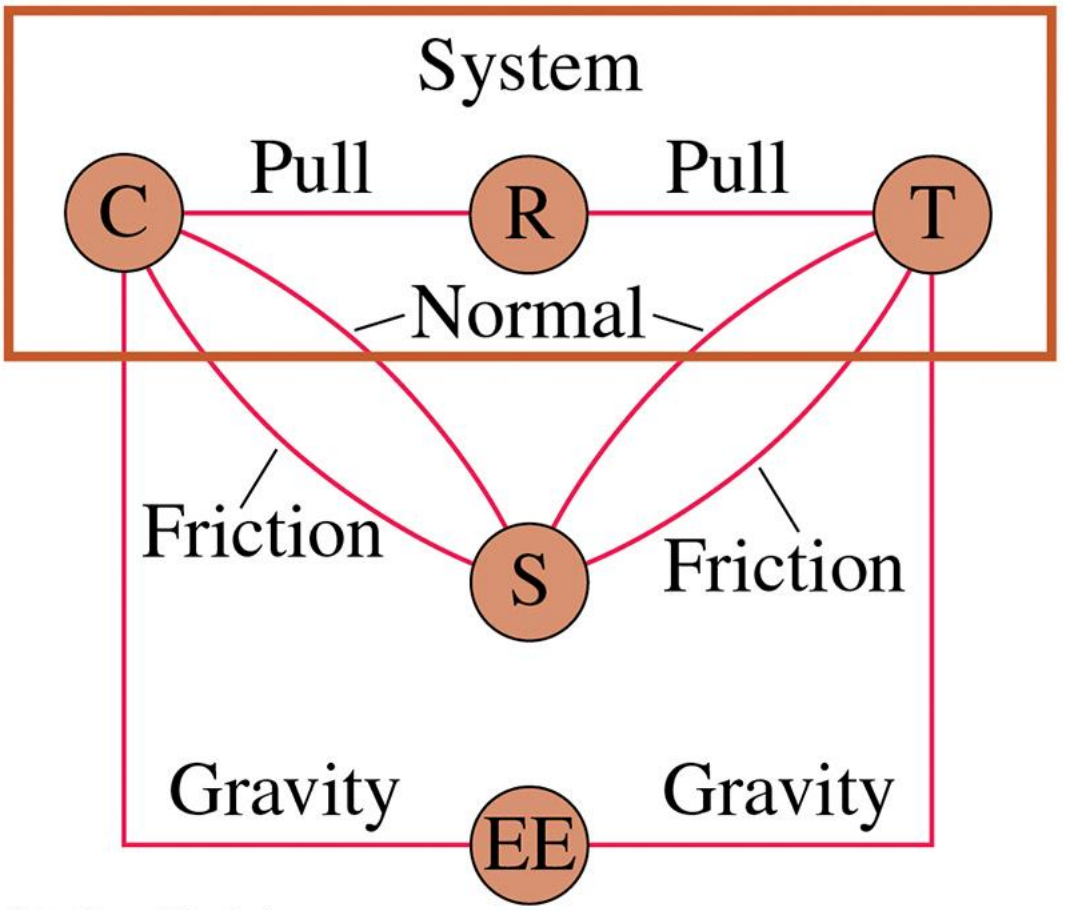
Chapter 7 – Newton's Third Law

- Newton's Third Law
- Objects/Systems/Environment
- Acceleration Constraints





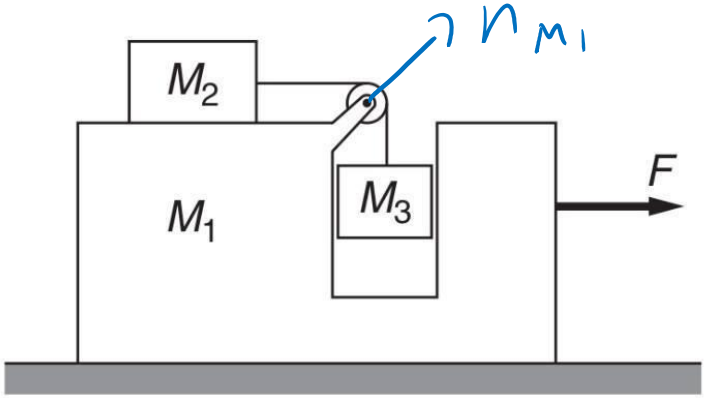




C = Car
R = Rope
T = Truck
S = Surface
EE = Entire earth

Team Up Questions

What is F so M_3 does not rise/fall? There is no friction.



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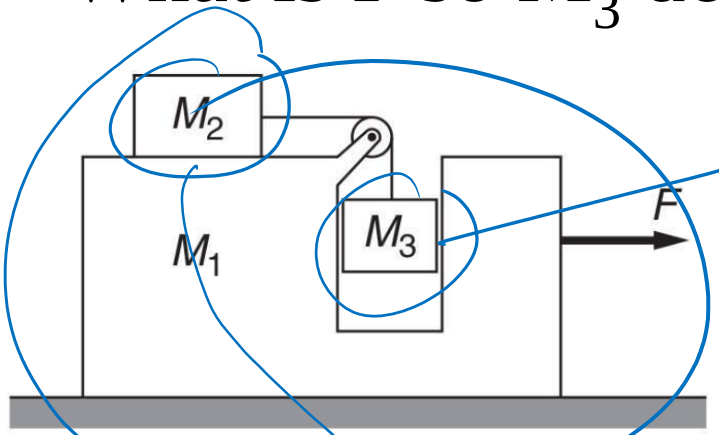

system 2

$y: m_3 g = T$

system 1

system 3

$F = (m_1 + m_2 + m_3)\, a$

$x: m_2 a = T$

$m_2(a) = m_3 g$

$F = (m_1 + m_2 + m_3)\frac{m_3}{m_2} g$