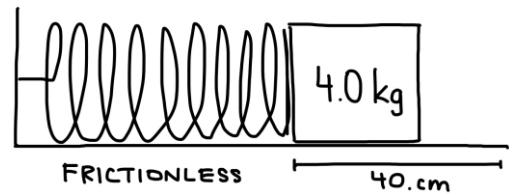


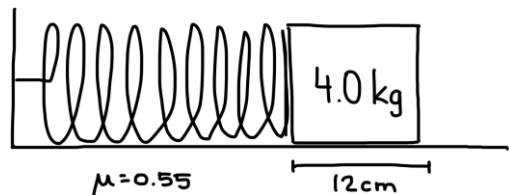
Spring Force and Hooke's Law

1. A spring has $k = 150 \text{ N/m}$. How much force is needed to stretch it 0.06 m ?
2. A force of 18 N compresses a spring 3.0 cm . What is the spring constant?
3. A spring constant is 400 N/m . How far will the spring stretch under a 10 N force, in **cm**?
4. A spring stretches from **12.0 cm to 15.8 cm** when a 14 N force is applied. What is k ?
5. What force is required to compress a spring (spring constant of 240 N/m) by 5.0 cm ?

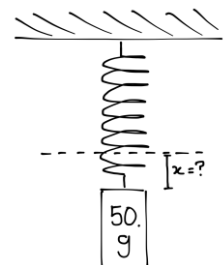
6. A 4.0 kg mass is on a horizontal frictionless surface. It is pressed against a spring (spring constant 320 N/m) so that it is 40 cm from its equilibrium position as shown. What is its acceleration immediately after it is released?



7. A 4.0 kg mass on a horizontal surface, $\mu = 0.55$, pulled by $k = 440 \text{ N/m}$ spring displaced 12 cm . Find acceleration when released.



8. A 6.0 kg block on a rough surface ($\mu = 0.28$) is pulled by a $k = 380 \text{ N/m}$ spring stretched 20 cm . Will the block move? If yes, what is its acceleration?
9. A spring is 20 cm long when a load of 10 N is hanging from it, and 30 cm long when a load of 20 N is hanging from it. Determine its spring constant and equilibrium position.
10. A spring's natural length is unknown. Under 6 N it measures **18.4 cm** , and under 14 N it measures **23.6 cm** . Determine k and natural length.
11. A 50 g mass hangs from a $k = 140 \text{ N/m}$ spring. How much is the spring stretched?



12. Two springs in series (16 cm & 12 cm natural lengths; $k_1 = 120$, $k_2 = 240$) are pressed so total length = 20 cm . Determine compression of each.

