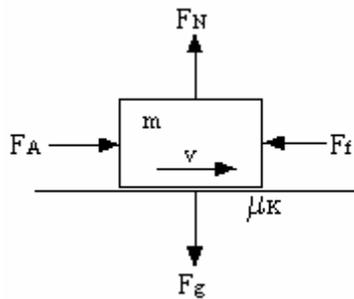


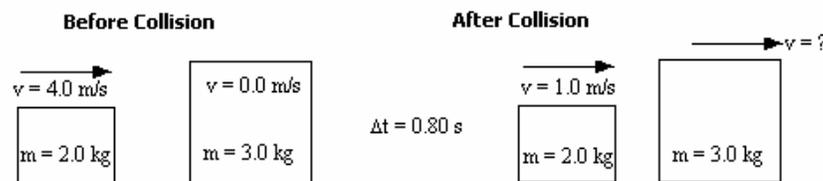
7. Two bows, A and B, are used to fire arrows X and Y respectively. The average force bow A exerts is twice that of bow B and arrow X has half the mass of arrow Y. Compare the acceleration of the arrows.
- Arrow X will have four times the acceleration of arrow Y.
 - Both arrows will have the same acceleration.
 - Arrow Y will have twice the acceleration of arrow X.
 - Arrow X will have half the acceleration of arrow Y.
 - Arrow Y will have four times the acceleration of arrow X.
9. Consider two planets, A and B. Planet A has twice the mass and twice the radius of planet B. The ratio of $F_{gA} : F_{gB}$ would be
- 1 : 4
 - 4 : 1
 - 1 : 2
 - 2 : 1
 - 1 : 1
10. Study the force system diagram pictured below and select the factor which would **NOT** influence the amount of kinetic friction.



- object's mass, m
- coefficient of kinetic friction, μ_k
- normal force, F_N
- Applied force, F_A
- gravitational field strength, g

Problem

11. A stationary box of mass 4.2 kg is given a push of 8.2 N [S] along a surface where the frictional force acting is 5.8 N [N]. The push lasts for 3.6 s and then the box is allowed to slide on its own until it comes to rest. **[Ku: 10]**
- Draw free-body diagrams to show the box being pushed and sliding on its own.
 - Determine the acceleration of the box as it is being pushed.
 - Calculate the speed of the box just as the push ceases.
 - Determine the acceleration of the box as it is sliding on its own.
12. A 2.0-kg object is sliding across a smooth surface at 4.0 m/s when it collides with a stationary 3.0-kg object. The collision lasts for 0.80 s after which the smaller object has slowed to a speed of 1.0 m/s. Using the diagram below, **[Ku: 8]**
- Determine the acceleration of the smaller object.
 - Determine the force that the smaller object exerts on the larger one.
 - Determine the speed of the larger object immediately following the collision.



13. Two children pull a toy truck of mass 2.4 kg along a rough horizontal surface. One child pulls with a force of 8.4 N [N] and the other pulls with a force of 3.6 N [S]. The coefficient of friction involved is 0.18. What is the acceleration of the truck? **[Ku: 5]**
14. An object of mass 50.0 kg rests at the surface of a planet with a mass of 6.2×10^{20} kg and a radius of 3.8×10^4 m. What would the object weigh at an altitude equivalent to the planet's radius? **[Ku: 4]**

Application

15. Design an experimental procedure by which the coefficient of kinetic friction between a pair of surfaces could be determined. **[App & T&I: 10]**