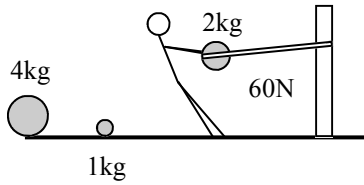


## 2009 Forces 6



- Slim Jim makes a giant slingshot that can provide 60N of force. He launches three objects: 1 kg; 2 kg; 4 kg.
  - Calculate the acceleration for each mass.
 

1 kg	2 kg	4 kg
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- Which mass has the smallest acceleration?
- Which mass has the largest acceleration?

- Slim Jim is also a cave explorer (known as a spelunker). A mining company asks our famous spelunker to explore part of their gold mine. Slim Jim is a slim 60 kg and the bucket is a hefty 980 kg.

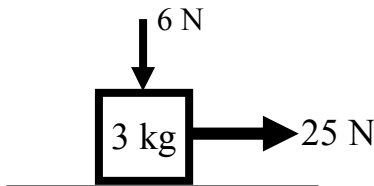


- On the dot at the left, draw all of the forces acting on the bucket.
- What is the total mass of Jim and the bucket?

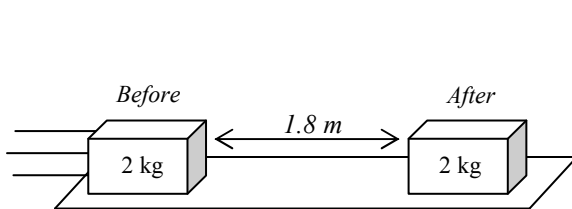
- What is the total weight of Jim and the bucket?

- Calculate the tension in the rope when he begins to accelerate downward at  $-1.5 \text{ m/s}^2$ .

$\mu_s = 0.22$   
 $\mu_k = 0.16$



- From the "Surface Friction" notes:*
- What is the weight of the 3 kg mass?
    - What is the normal force pushing up on the mass?
  - Calculate the forces of static and kinetic friction acting on the mass.
    - If the object starts at rest, is the 25N force enough to start it moving?
    - If it is moving, calculate the acceleration of the object.



- A 2 kg box slides to a stop in 0.65 seconds.
  - Use a kinematic equation to calculate the acceleration of the object.
    - Calculate the force of friction that stopped the object.
    - Since it was sliding, was this kinetic or static friction?
    - What is the normal force acting on the object?
    - Calculate the coefficient of friction of the surface.

