Part 1

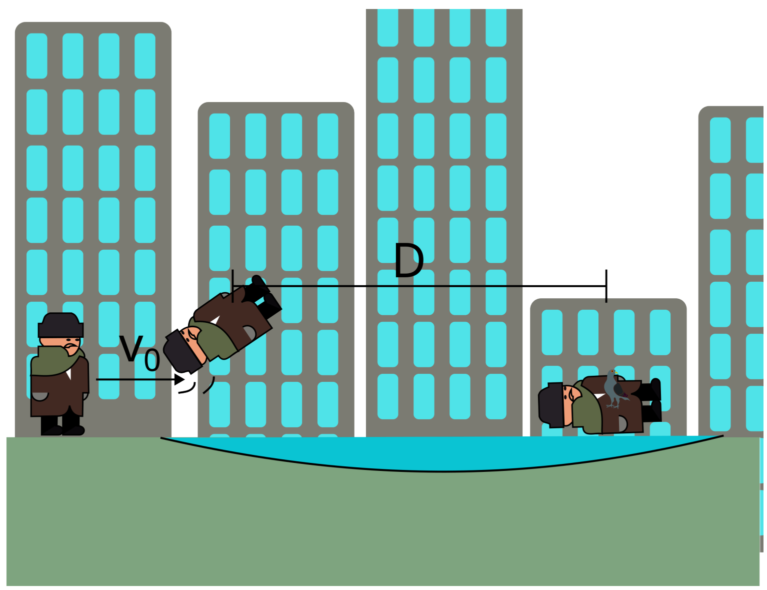


Figure 1: Harry slipping on the ice and sliding to a stop

Harry and Marv are chasing Kevin McAllister through New York City on Christmas eve. Harry ($m = 70\ kg$) tries to take a shortcut across a frozen pond in Grand Central park. At a full sprint ($v_0 = 5\ m/s$), Harry comically slips on the ice. He slides for 15 meters and comes to a stop.

a. Draw a free body diagram and kinetic diagram for Harry while he's sliding on the ice (include any forces that you think will bring him to a stop on the ice)

b. If you only consider friction between the ice and Harry, the equation of motion is $a = -\mu g$. What is the value of dynamic coefficient of friction, μ, for Harry sliding on ice?

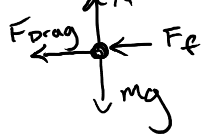
Part 2

In Module 01, we discussed definitions of **kinetics** and **kinematics**. Define the following three **kinetic** terms,

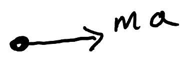
a. Force
b. Impulse
c. Work

1 a

FBD



KD



b) $T_1 = \frac{1}{2}mv^2$

$T_2 = 0$

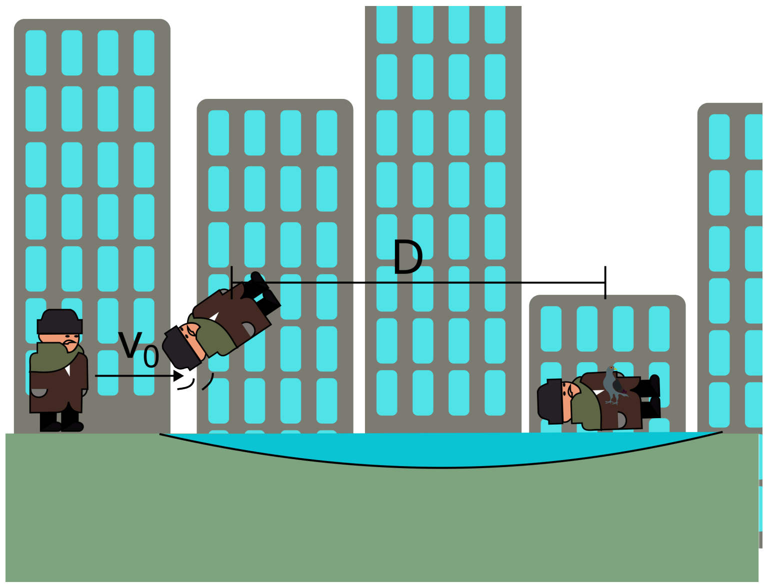
$W^{1\to2} = -\mu mg\Delta x$

$T_1 - \mu mg\Delta x = 0$

$v^2 - 2\mu mg\Delta x = 0$

$\mu = \frac{v^2}{2 mg \Delta x}$

Part 1



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Part 2

In Module 01, we discussed definitions of **kinetics** and **kinematics**. Define the following three **kinetic** terms,

a. Force → (mass)(acceleration) = $\frac{d}{dt}$(momentum)

b. Impulse → (mass)(change in velocity) = change in momentum

c. Work → change in (kinetic + potential energy) = [force × distance]