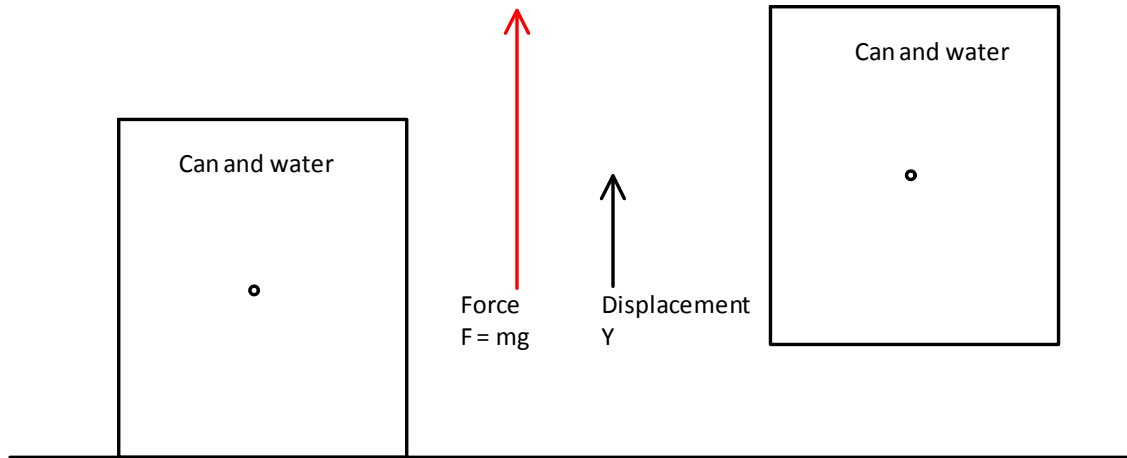Question 2.

Calculate the height of the garbage can and water assuming that all the energy transference into the nitrogen is used to do work lifting the can and water up.

Work done in lifting the garbage can filled with water
Work = **F*d** = mgY

*Estimate the mass of the garbage can and water
Weight of garbage can = about 5 lb
Weight of 32 gallons of water
(8.35lb/gallon)(32gallon) = 267 lb
Total weight = 270 lb
Mass
(270lb)(1kg/2.2lb) = 120kg

Height of garbage can filled with water

Energy transferred into nitrogen = Work done in lifting can and water

$15,000J = mgY = (120kg)(9.8m/s^2)(Y)$

Y = 13m (43 ft) wow!

*I am not sure the 32 gallon garbage can has a volume of 32 gallons. I think I found the can used in the video on Walmart's website.

http://www.walmart.com/ip/Rubbermaid-Commercial-Brute-Recycling-Round-Gray-Plastic-Container-32-gal/16352361?findingMethod=rr

The numbers for its dimensions give a volume of 170 liters. This is equal to 45 (liquid) gallons.