1. What is the work required to move a 10000 kg train car a distance of 200 m assuming a force of 2000N is applied to move a car?

 $W = F \cdot S$ W = (2000 N)(200m) W = 400000 J

2. How far must a 650 N student fall before the force of gravity has done 7000 J of work?

3. With how much force must Bad Bart exert in order to do 1000 J of work while moving his cart of laundry 50 m from one side of the prison laundry room to the other?

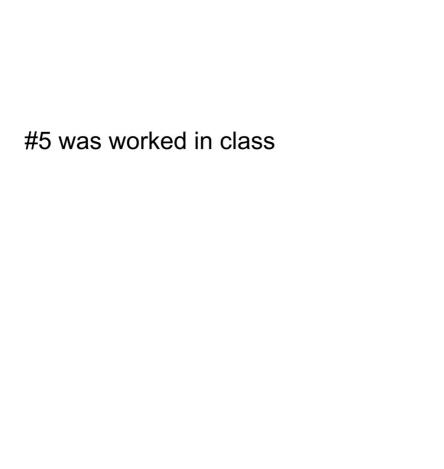
$$W = Fs$$

$$F = \frac{W}{5} = \frac{10005}{50m} = 20N$$

4. If the force of friction between the floor and a desk is 400 N and 3 bears apply a total of 1000 N in order to slide the desk 20 m across the room, what is the work done by the bears? What is the work done by friction? What is the net work done?

$$W_B = F_B S = |000N(20m) = 20000J$$

 $W_F = F_F S = 400N(20m) = 8000J$
 $W_{net} = 12000J$



6. How much work is done by gravity in settling a 25000 kg house by 3.0 cm?

$$W = FS$$

$$\frac{5}{100 \text{ cm/m}}$$

$$W = (25000 \text{kg})(9.81 \text{m/s})(0.03 \text{m}) = 7257.5 \text{ J}$$

$$W = 7400 \text{ J}$$

7. How much work is done on a sturdy concrete wall by a man who pushes with a force of 450 N for 24 hours on the wall?

$$W = Fs \qquad S = 0$$

$$W = 0$$

8. If a 25 kg object accelerates at 2.0 m/s² along a surface (mu=0.3) for a distance of 4.5 m, what is the work done by friction? What is the net work done? What is the work done by the monkey pushing the object?

$$W_{f} = F_{f} S = (0.3)(25)(9.8|_{M_{3}z})(4.5) = 330 \text{ }$$

$$F_{f} = \mu m_{0}$$

$$W_{net} = F_{net} S = (25)(2.0)(2.0)(2.5)(4.5) = 225 \text{ }$$

$$F_{net} = m_{0}$$

$$W_{nonkey} = V_{f} + W_{net} = 555 \text{ }$$

9. 2000 J of work are done by a person pulling an object at a constant velocity with a spring. If the object is pulled a distance of 10 m, how much would the spring have been stretched during the trip (k=500 N/m)?

$$W = FS = KXS$$

$$F = KX$$

$$X = \frac{7000 \text{ fm}}{KS} = \frac{7000 \text{ fm}}{500 \text{ fm}} = 0.4 \text{ m}$$

10. How much work is done on one gram of blood which is pumped from your heart to the top of your head?

 $W = F_{5}$ $V = M_{9} = (0.001 \, kg) (9.8 \, lm_{5}) (0.5 \, m)$ $W = 4.9 \times 10^{-3} +$