Work, Energy, Power, and Machines   Name _____   Period ___ WS1

Work (W = Fd)

1. How much work is done on your car by applying 200 N of force for 12 meters?

2400J

2. How much work is done holding a 5 kg bag of groceries and carrying it across the room for a horizontal distance of 5 m?

0J

3. A box was lifted 8-meters resulting in 129 joules of work, how much does the force was applied (or how much does the box weigh)?

16N

4. A little girl did 125 joules of work when pushing her big brother in his wheelchair with a force of 25- N. How far did she push him?

5m

5. A 10,000-N cart of a rollercoaster is pushed with 8,000 N of force up an incline for a total distance of 70m, a 50m height. How much work was done?
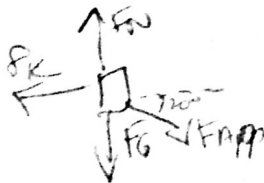
$$W = F_u d$$
$$= (8000N)(70m) = 560,000 J$$

Wgravity = 10,000 N × 50m
= 500,000 J

Wnet = 40,000J

6. A grocery cart with mass of 18 kg is pushed at a constant speed along an isle by an applied force F_A = 12N. The applied force acts at a 20 degree angle with the horizontal.

a. Draw a free body diagram, labeling all the forces acting on the cart.

b. Find the work done by each of the force on the cart **and** the net work if the aisle is 15 m long.

$W_N = W_G = 0$

$W_{fr} = -170N$

$W_{app} = 12N\cos 20 (15m) = 170N$

$W_{net} = 0J$

Kinetic Energy (KE = ½ mv²), W = ΔKE

1. A car with occupants has a mass of 1000-kg. If it is going 30m/s, what is its kinetic energy?

$$450,000 J$$
$$(4.5 \times 10^5 J)$$

3. A car with occupants has a mass of 1000-kg. If it accelerates from 70 to 100 m/s, how much k

$$2,550,000 J$$
$$(2.5 \times 10^6 J)$$

4. How much kinetic energy must be removed from the 1000-kg car that is going 20 m/s in order t
car gong 40 m/s or 60 m/s?

a) $200,000 J$ $(2 \times 10^5 J)$

b) $800,000 J$ $(8 \times 10^5 J)$

c) $1,800,000 J$ $(1.8 \times 10^6 J)$

5. A 70-kg man is falling at 70 m/s. How much kinetic energy is that?

$$1.7 \times 10^5 J$$

6. How much work is required to accelerate a 1000 kg car from 20 m/s to 30 m/s?

$$2.5 \times 10^5 J$$