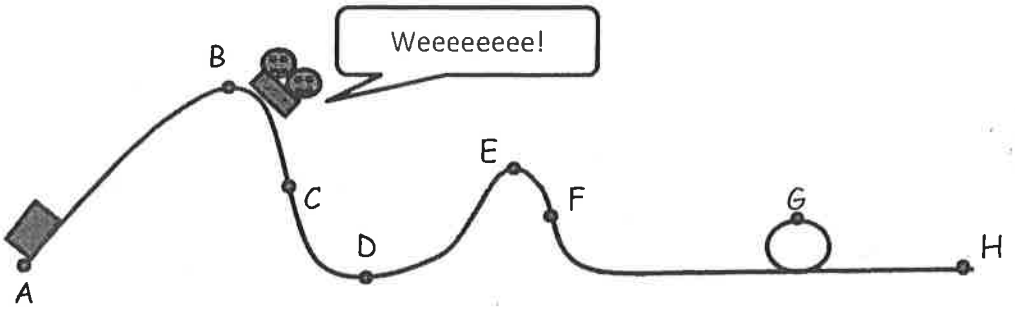
Academic Physics

Work & Energy Conservation

Name: _____

Rollercoaster Energies



1. You and a friend are going on a rollercoaster. Determine the total **mass** of the 200 kilogram cart plus you and your friend. (Hint: 1 lb = 4.45N, so 1 lb = 0.45 kg)

2. At position A the rollercoaster is at the reference level and is not moving. What is its total mechanical energy?

3. Work is done by a motor to pull the rollercoaster up to position B. How much work is done to raise it to its maximum height of 40 meters?

4. What is the total mechanical energy of the rollercoaster at position B before it starts to go down the first hill? What form of energy is this?

5. Find the missing values in the table below. (The total ME must remain constant.)

Position	h (m)	PE = mgh (J)	v (m/s)	KE=$\frac{1}{2}mv^2$ (J)	TME=PE+KE (J)
B (top of 1st hill)				0	
C (going down 1st hill)			14		
D (bottom of 1st hill)		0			
E (top of 2nd hill)	25				
F (going down 2nd hill)			23		
G (top of loop)		$\frac{1}{2}$ of total			
H (after loop)	0				

6. Sketch a graph of the potential, kinetic and total mechanical energy.