name_____

ID# _____

Experiment 6

Work, Energy, and Mechanical Advantage

Finding the Mechanical Advantage and Efficiency

Mass of Cart = _____ **Weight of cart =** _____

TMA = _____

Mass hanging on the string = _____

Weight hanging on the string (F_1) = _____

MA = _____

Efficiency = _____

Finding μ_k

Mass on the string = _____

Weight on the string (F_2)= _____

f =_____

Show equations and sample calculations:

(8 points)

What happens when you push an object up a ramp? What happens to the force you have to apply compared to the force you have to apply to lift something straight up? What happens to the distance? Does the total work you do change? Don't forget about friction! Why is using a ramp sometimes easier than lifting it, sometimes not? How do you decide?

If the cart wheels roll without slipping there is no kinetic frictional force between the wheels and the plane. This is because the surfaces on the turning wheel actually move perpendicular to the plane instead of sliding along it as the cart did in last week's experiment so there is static friction between the wheels and the plane. There is also kinetic friction between the wheels and the shaft of the cart.

Questions

1. Last week you pulled a box up the inclined plane. This week you pulled a cart with wheels up and down the same plane. In which case do you think you lost more energy to friction? Explain your answer in detail. **(4 points)**

2. What would happen if there were no friction between the wheels and the inclined plane? **(4 points)**

3. Why was the wheel a great invention? **(4 points)**