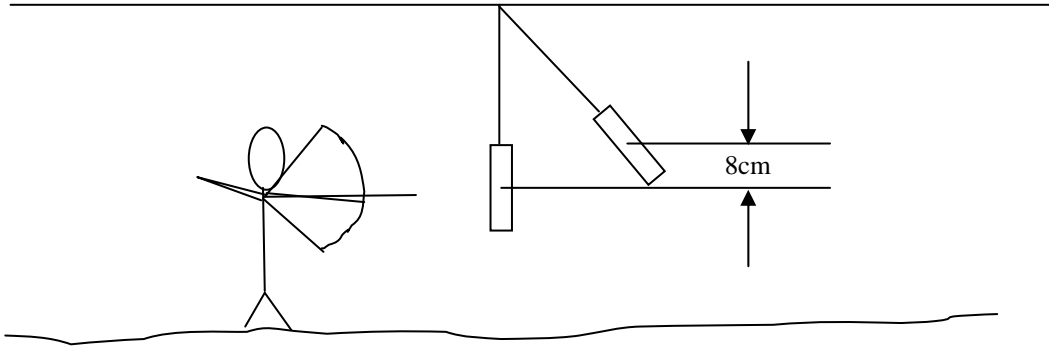


CP Physics – Work, Energy, Power, and Momentum **Name:** _____

1. A 3000kg roller coaster starts from rest at the top of a 15m hill. What is the speed of the roller coaster at the bottom of the hill?
2. A 2kg pendulum bob swings from some initial height so that its speed at the bottom of the swing is 2.5 m/s. From how many degrees from vertical was the pendulum bob released?
3. The spring constant of a spring is 500N/m. If it is compressed 0.5m, how much energy is stored in the spring?
4. If the spring in problem 3 is used to launch a 1kg object, what is the speed of the object the instant it leaves the spring?
5. What is the maximum possible height the object in problem 4 could reach if it were released vertically from the spring?
6. An ambitious Physics student runs up a flight of stairs. The student has a mass of 80kg, and the vertical height of the stairs is 5m. If the student is capable of producing 900Watts while running, how long will it take the student to go from the bottom of the stairs to the top?

7. Mr. Cote' wishes to find out how fast his new bow can shoot an arrow, so he sets up a little experiment. He hangs a 10kg target from the ceiling, stands in front of the target, and fires a 25g arrow into it. The arrow sticks, and the target swings through a vertical displacement of 8cm. Calculate the velocity with which the arrow left the bow.



8. A 1000 Watt motor is used to hoist a 750kg piano from the sidewalk to a 3rd story apartment (10meters). How long does it take to lift the piano from the sidewalk to the 3rd story?