

# Swinging Pendulum Worksheet

1. What is the mass of your weight?

$$m = \text{_____ kg}$$

2. Choose a height,  $h$ , between 15 – 40 cm (.15 – .4 m).

$$h = \text{_____ m}$$

3. Calculate the potential energy of your weight at the chosen height *Remember,  $g = 10 \text{ m/s}^2$ .*

$$PE = m \cdot g \cdot h$$

$$PE = \text{_____ J}$$

4. Calculate the theoretical velocity,  $V_t$ , of your weight at the bottom of the swing. *Remember, all of the potential energy will turn into kinetic energy.*

$$KE = \frac{1}{2} \cdot m \cdot V_t^2$$

$$V_t = \text{_____ m/s}$$

5. Record the distance between the two tape markers.

$$\text{distance} = \text{_____ m}$$

6. Record four time trials

$t_1$ (sec)	$t_2$ (sec)	time ( $t_2 - t_1$ )

7. Calculate your average time

$$t_{ave} = \text{_____ sec}$$

8. Calculate your measured velocity,  $V_m$ .

$$V_m = \text{distance} \div t_{ave}$$

$$V_m = \text{_____ m/s}$$

9. How close are the theoretical and measured velocities?