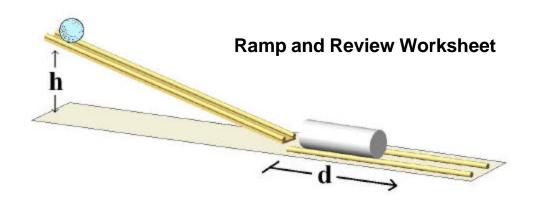
Name: Date:



1. Measure and record the mass of the golf ball.

$$m_{ball} = \underline{\hspace{1cm}} kg$$

2. Measure and record the height, **h**, of the yardstick.

3. Run several trials of the ball rolling down the track and into the cup. Record the average value of how far the cup slides.

4. What was the potential energy of the ball at height **h**?

$$PE =$$
_____J

5. What was the kinetic energy of the ball right before it hit the cup?

$$KE =$$
_____J

6. What was the velocity of the ball right before it hit the cup?

7. What was the ball's momentum right before it hit the cup?

$$V = \underline{\hspace{1cm}} m/s$$

 $Momentum = \underline{\hspace{1cm}} kg m/s$

8. How much work did friction do to stop the cup? Work from friction = _____J Hint: The kinetic energy of the ball + the work done by friction should equal zero.

9. Using the distance the cup slid, **d**, and the work done by friction, what was the frictional force on the cup?

| Force = | N |
|---------|---|

Energy of Motion Equations

Potential Energy

$$\mathbf{Momentum} = m \times V$$

$PE = m \times g \times h$

Work and Force

Where:

Kinetic Energy

$$W = F \times d$$

$$F = W \div d$$

m = mass

 $g = gravity (9.81 meters/sec^2)$

h = height

V = velocity

F = force

d = distance

$$KE = \frac{1}{2} \times m \times V^2$$

$$V = \sqrt{\frac{2 \times KE}{m}}$$