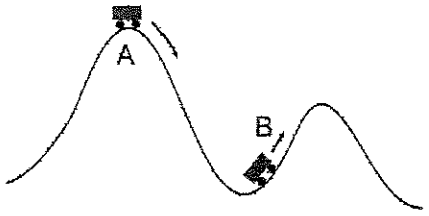
Name: _____

Potential and Kinetic Energy Quiz Review

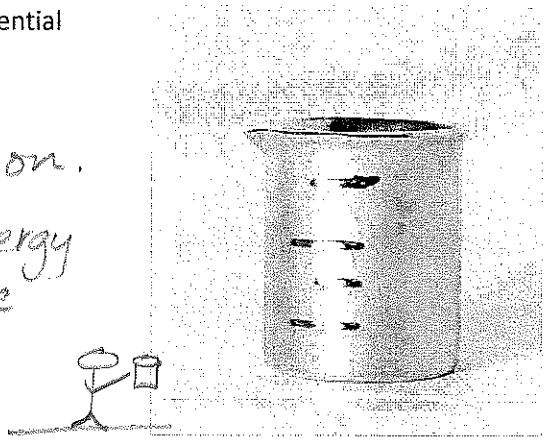
1. Circle the correct response:
   a. At Point A, gravitational potential energy is (HIGH)/LOW.
   b. At Point A, kinetic energy is HIGH/(LOW)
   c. At Point B, gravitational potential energy is HIGH/(LOW)
   d. At Point B, kinetic energy is (HIGH)/LOW.



2. Define potential energy and explain how I could increase the potential energy of this beaker which is currently sitting on the floor?

Potential energy is energy that an object has because of its position.

I can increase the potential energy of the beaker by raising it above the ground more.



3. What is the formula for calculating gravitational potential energy? What does each variable stand for?

$GPE = m \cdot g \cdot h$ ← height (m)

m ↑ mass (kg)

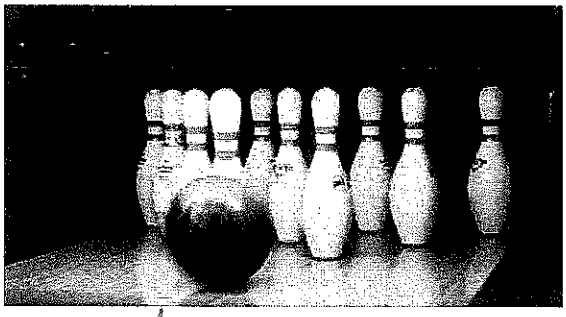
g ↑ gravitational acceleration

4. Find the gravitational potential energy of a 10 kilogram object that is raised 5 meters above the ground. (Show your work and label the units!)

$m = 10\,kg$
$h = 5\,m$
$GPE = ?$

$GPE = m \cdot g \cdot h$
$GPE = (10\,kg)(9.8\,m/sec^2)(5\,m)$
$GPE = 490\,J$

5. Define kinetic energy and explain how I could decrease the kinetic energy of this bowling ball which is currently moving at 5 m/s.



Kinetic energy is energy of motion.

I could slow this ball down by applying a force in the opposite direction of motion.

6. What is the formula for calculating kinetic energy? What does each variable stand for?

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

mass (kg) — velocity (m/sec)

7. Find the kinetic energy of a 1 kg object that is traveling at 3 meters/second. (Show your work and label the units!)

$m = 1\ kg$

$V = m/sec$

$KE = \frac{1}{2} m v^2$

$= \frac{1}{2} (1\ kg)(3\ m/sec)^2$

$= 4.5\ J$

8. As mass increases, the gravitational potential energy of an object increases.

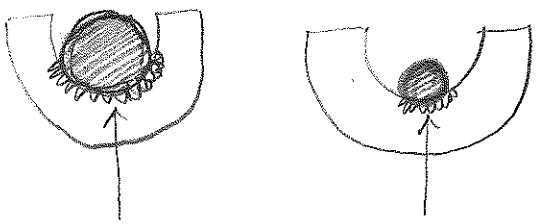
As the height above the ground decreases, the GPE of an object decreases.

As mass increases, the kinetic energy of a moving object increases.

As velocity increases, the kinetic energy of a moving object increases.

9. In our roller coaster investigation in class, we calculated the potential energy of the marble at the beginning of the track and the kinetic energy of the marble as it left the track. Explain why the kinetic energy at the end was less than the potential energy at the beginning. (Think about the law of conservation of energy.)

Some of the potential energy from the top of the track is lost to friction between the marble and the foam. This was especially true of the large marble that rubbed against the sides of the track.

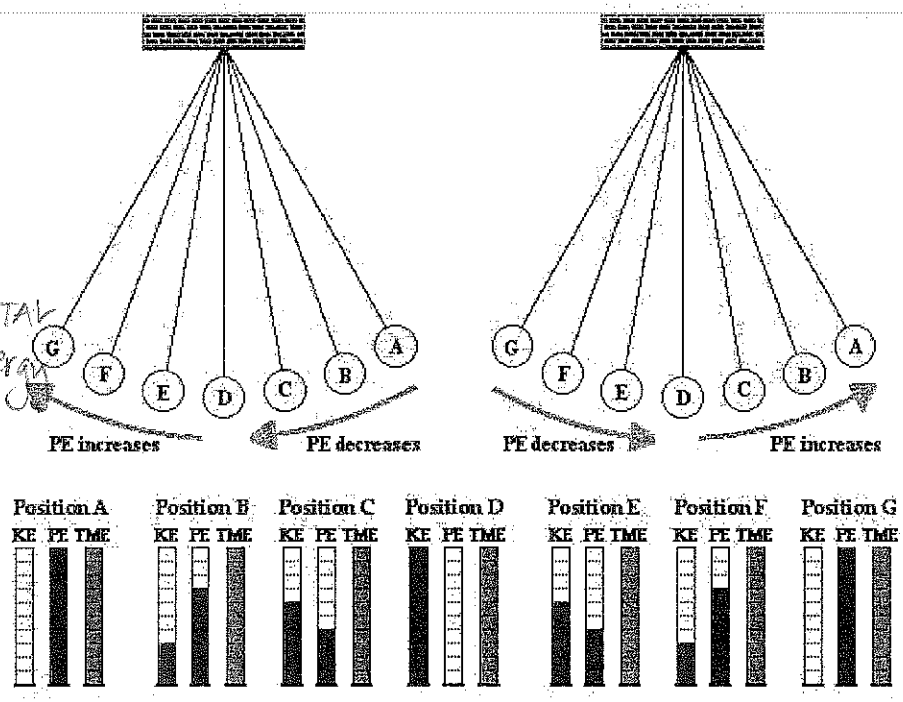


contact area was greater between the large marble and the track.

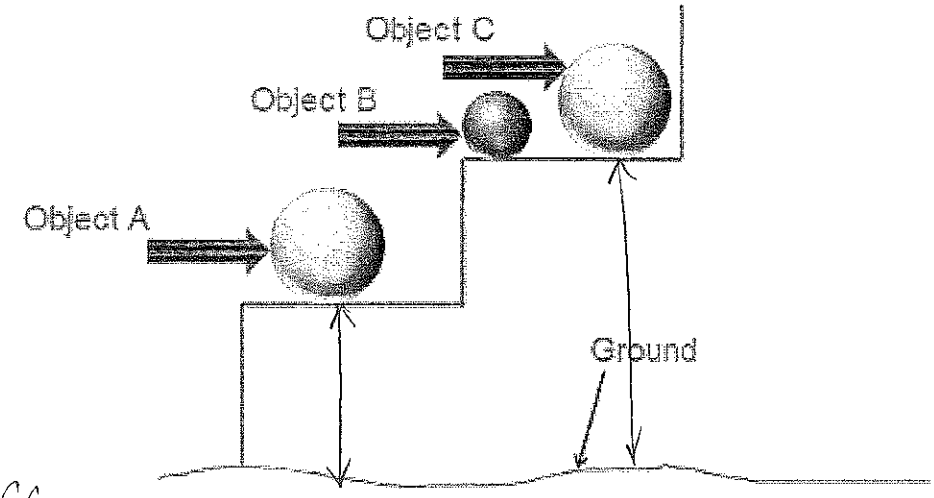
10. Describe the relationship between **potential energy**, **kinetic energy**, and **total energy** of this pendulum.

KE + PE = TME

Kinetic energy + potential energy = TOTAL energy



11. Potential Energy exists between two objects. In this example it exists between the ball and the ground (the Earth). The amount of potential energy changes as objects are placed further from one another. Does object A or object C have more potential energy? Why?



Object C has more potential energy because it is higher off the ground.