Gravitational Potential Energy and Kinetic Energy

Gravitational Potential Energy (g.p.e.) is the energy stored in something when it is lifted up

$$\boldsymbol{g.p.e. = mass\ x\ g\ x\ height} \qquad \text{(g = 10 N/kg)}$$

e.g. If a mass of 10kg is lifted up by 3 metres then the gravitational potential energy gained is equal to 10 x 10 x 3 = <u>300 joules</u>

Kinetic Energy (k.e.) is the energy of a moving object

$$\boldsymbol{k.e. = \frac{1}{2}\ x\ mass\ x\ speed^2}$$

e.g. If a mass of 10kg is moving at a speed of 3m/s then the kinetic energy is 0.5 x 10 x 3^2 = <u>45 joules</u>

TASK

Position a ball at the top of a ramp and measure the height to the ball. Also measure the mass of the ball. Use the equation to work out the g.p.e. of the ball at the top of the ramp. Now, roll the ball down a ramp and video the ball rolling along the floor at the bottom of the ramp. Remember to use a ruler for scale. Use LoggerPro to work out the speed of the ball. Use the equation to work out the kinetic energy of the ball.

Compare your values for g.p.e. and k.e.

Does the ball have k.e. at the top of the ramp?

Does the ball have g.p.e. on the floor?

What has happened to g.p.e. and k.e. as the balled rolled down the ramp?