

Calculations with KE and GPE Interchange

9 October

Lesson Aims:

All learners:

1. Conservation of energy.

Most learners:

1. Calculations with interchange of KE and GPE.

Some learners:

1. Complete all tasks.

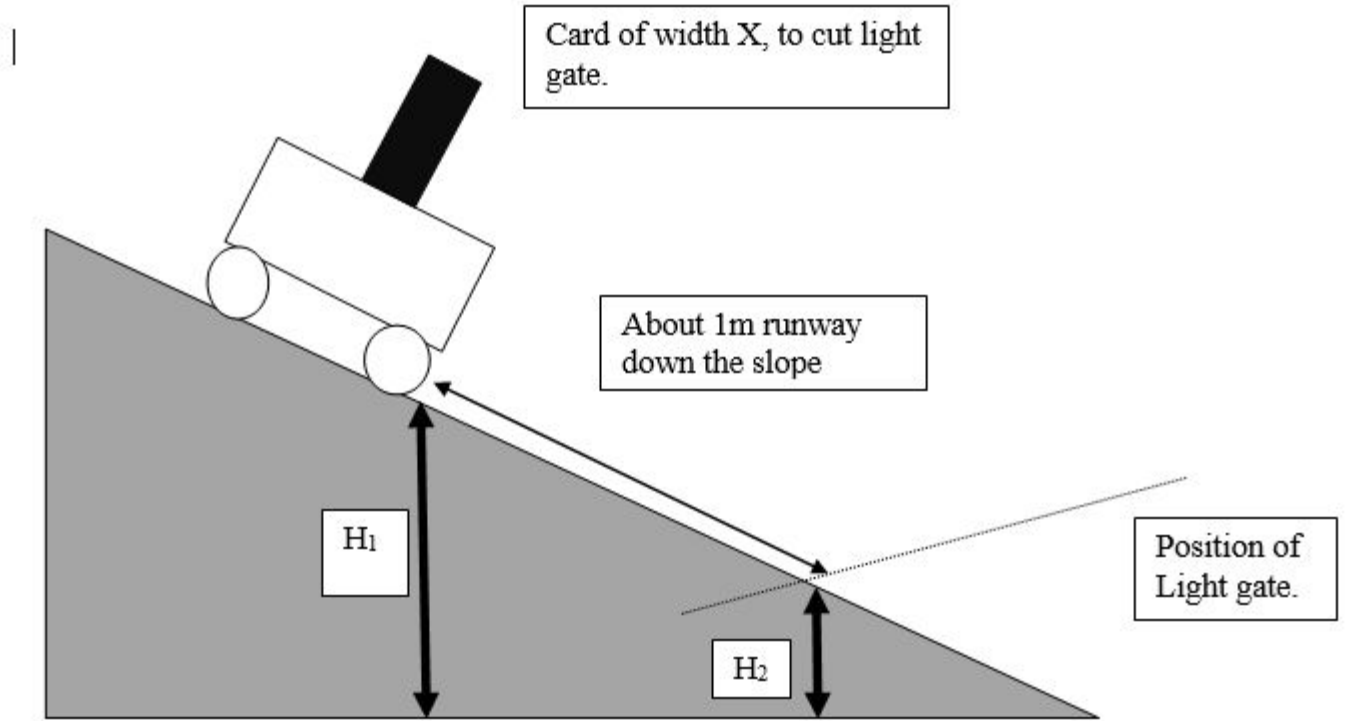
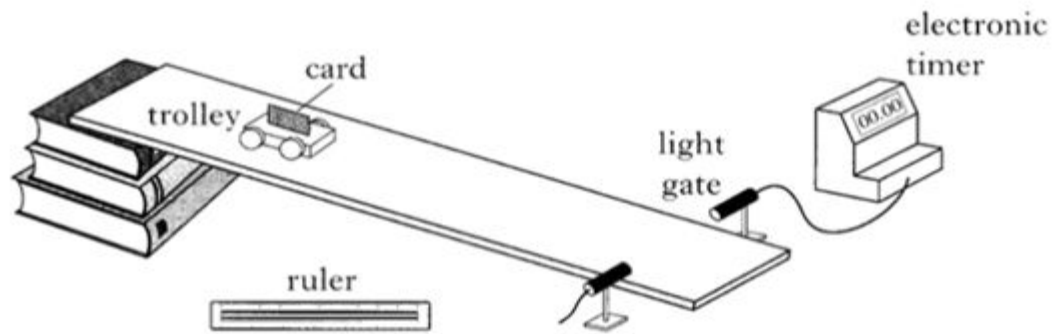


Starter !!

1. A crate is pulled with a force of 150N for 3m.
How much work was done ?
2. A plane of mass 2000kg is at a height of 2km.
How much GPE does it have ?
3. A cyclist of mass 80kg is moving at 5 m/s. What
is his kinetic energy ?

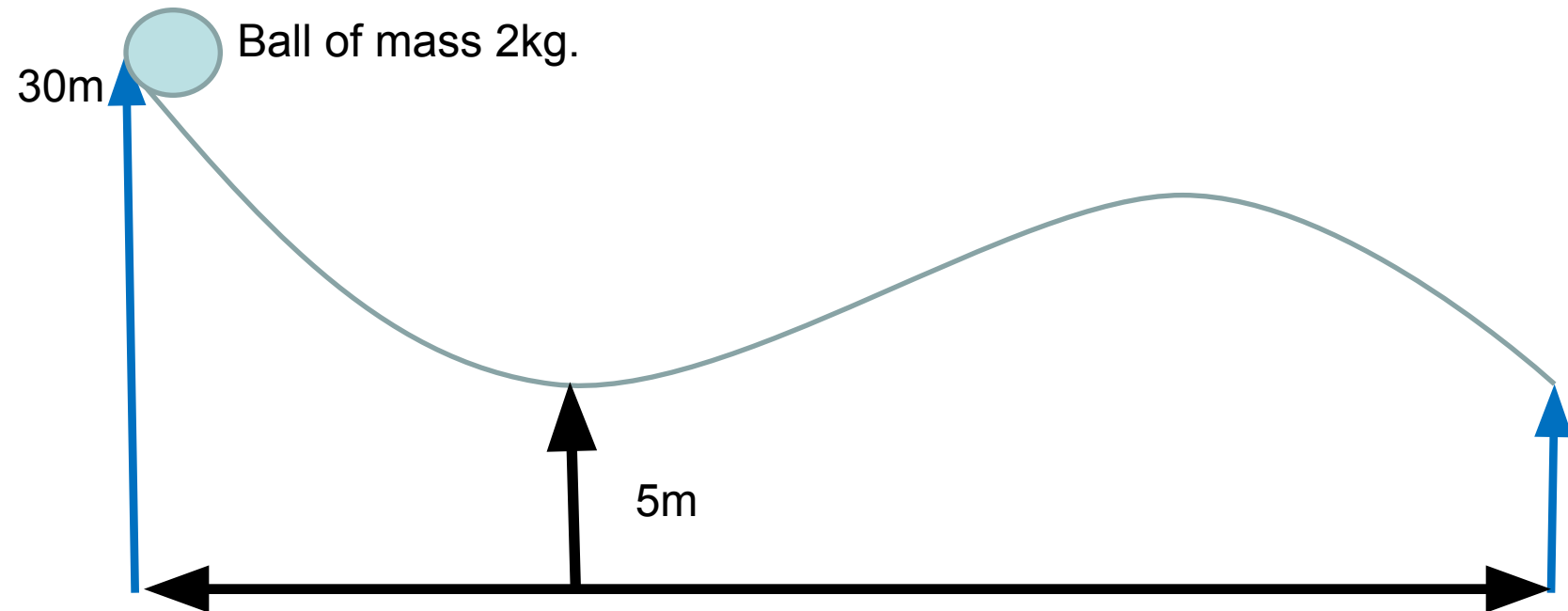
Starter !!

1. In the last investigation we did in class, name the :
 - a. independent variable
 - b. control variables
 - c. dependent variable
2. If you have done your graph, calculate the gradient of your line. What do you think it represents?



Interchange of Kinetic energy and Gravitational Energy

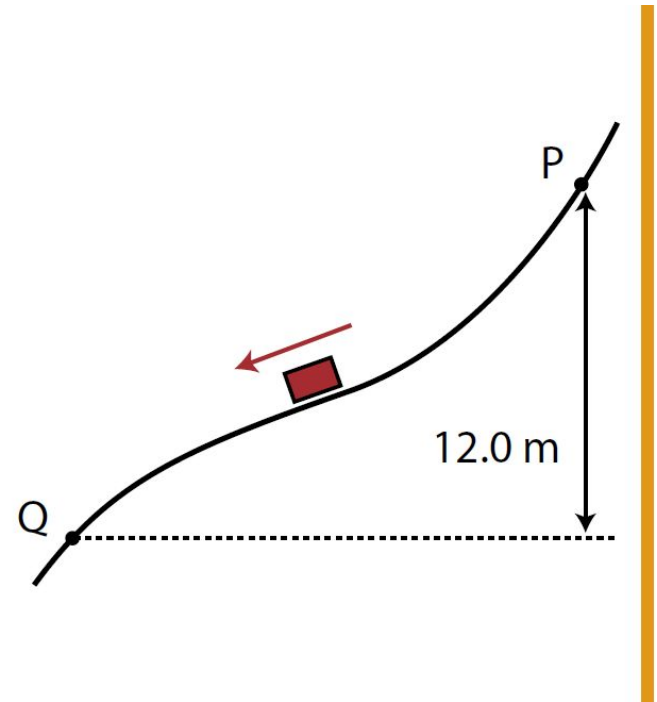
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- Calculate the GPE of the ball at the start.
- Calculate the GPE and KE when at 5m above the ground.
- Calculate the speed of the ball at this point.

A small block of wood passes through point P at a speed of 2.00 ms^{-1} and slides down a smooth curved track.

- (a) Calculate the speed of the block as it passes point Q, 12.0 m vertically below P.



- 7 The bob of a large pendulum has mass of 30 kg. The change in height of the pendulum as it swings is 0.5 m.
- Calculate the change in GPE as the bob moves from its highest to its lowest point.
 - All the GPE stored in the bob at its highest point is transferred to kinetic energy as the bob reaches its lowest point. Calculate the maximum speed of the bob.
- 8 A wrecking ball has a mass of 5000 kg. The ball is pulled sideways and rises by 6 m. When it is released it swings and hits the building to be demolished when it is at the lowest point of its swing.
- Calculate the speed of the ball when it hits the building.
 - Calculate the maximum speed of the ball if it is only pulled upwards by 3 m before being released.