

PAUL PARKER

explains the energy change between gravitational potential and kinetic energy as well as conservation of energy



By _____

Q Paul, the change in energy doesn't just start once you have jumped out of the aeroplane, it starts as the aeroplane starts to move down the runway and the kinetic energy starts to increase. Can you explain how the gravitational potential energy changes as the aeroplane takes off and gains altitude?

A _____

Q Once you have jumped from the plane how does the kinetic energy and gravitational energy change?

A _____

Q What is meant by "conservation of energy" Paul? This is something we hear about very often but I am unsure that I am clear about the meaning. Could you also give an example?

A _____

Paul thank you so much for your time, I'm sure that our readers appreciate it and good luck with your next jump.

Energy Calculations

Love 'em or Hate 'em

Energy calculations can be a particularly difficult skill for non-math readers, so our maths guru explains how to take the pain out of them.

By

To calculate **gravitation potential energy**

gravitational potential energy = mass x gravitational field strength x height

or

$$E = m \times g \times h$$

$$E = 5 \times 10 \times 3$$

$$E = 150 \text{ J}$$

Given:

mass is 5kg

g is 10 N/kg

height is 3m

Now let's do this step by step

Step 1:

$$E = m \times g \times h$$

Step 2:

Make a note of the information that has been given:

Step 3

$$E = 5 \times 10 \times 3$$

Step 4

$$E = 150\text{J}$$

Writing out your equation is important because

Collecting all of the given information is important because:

When you are doing this it is important to check that you are using the right units because

When you are doing your final calculation it is important to use the right units and the right amount of decimal places because

Energy Calculations

More Examples

Here are some further examples using both the kinetic energy and gravitational potential energy equations:.

Gravitational Potential Energy

$$E = \text{mass} \times \text{gravitational field strength} \times \text{height}$$

A diver with a mass of 58kg dives from a 5m platform. Calculate how much gravitational energy she has while standing on the platform.

Kinetic Energy

$$\text{Kinetic Energy} = \frac{1}{2} \text{ mass} \times \text{velocity}^2$$

A diver with a mass of 58 kg dives from a 5m platform. Just before impacting the water she is moving at a velocity of 10m/s. Calculate her kinetic energy just before she enters the water.



Answer : 2900J

Answer 2900J

Another diver with a mass of 60kg dives from a platform. At the very top of the platform he has 9000J of gravitational potential energy. What is the height of the platform?

A diver with a mass of 60kg dives from a platform. Just before hitting the water he has 9000J of Kinetic Energy. What is his speed?

Answer : 15m

Answer : 10m/s