



PHYSICS

NCERT - NCERT PHYSICS(TAMIL ENGLISH)

WORK AND ENERGY

Example

1. A boy pushes a book kept on a table by applying a force of 4.5 N. Find the work

done by the force if the book is displaced through 30 cm along the direction of push.



[Watch Video Solution](#)

2. Calculate the work done by a student in lifting a 0.5 kg book from the ground and keeping it on a shelf of 1.5 m height.

$$(g = 9.8m / s^2)$$



[Watch Video Solution](#)

3. A box is pushed through a distance of 4m across a floor offering 100N resistance. How much work is done by the resisting force ?



[Watch Video Solution](#)

4. A ball of mass 0.5 kg thrown upwards reaches a maximum height of 5m. Calculate the work done by the force of gravity during this vertical displacement considering the value of $g = 10m / s^2$.





[Watch Video Solution](#)

5. Find the kinetic energy of a ball of 250 g mass, moving at a velocity of 40 cm/s.



[Watch Video Solution](#)

6. The mass of a cyclist together with the bicycle is 90 kg. Calculate the work done by cyclist if the speed increases from 6km/h to 12 km/h.



[Watch Video Solution](#)

7. A block of 2 kg is lifted up through 2m from the ground. Calculate the potential energy of the block at that point.



[Watch Video Solution](#)

8. A book of mass 1 kg is raised through a height h . If the potential energy increased by 49 J, find the height raised.



[Watch Video Solution](#)

9. A person performs 420 J of work in 5 minutes. Calculate the power delivered by him.



[Watch Video Solution](#)

10. A woman does 250 J of work in 10 seconds and a boy does 100 J of work in 4 seconds. Who delivers more power ?



[Watch Video Solution](#)

Let Us Improve Our Learning Reflections On Concepts

1. What is work according to science and write its units.



[Watch Video Solution](#)

2. Give few examples where displacement of an object is in the direction opposite to the force acting on the object.



[Watch Video Solution](#)

3. Write few daily life examples in which you observe conservation of energy.



[Watch Video Solution](#)

4. Give some examples for renewable sources of energy



[Watch Video Solution](#)

Let Us Improve Our Learning Application Of Concepts

1. A man carrying a bag of total mass 25 kg climbs up to a height of 10 m in 50 seconds. Calculate the power delivered by him on the bag.



[Watch Video Solution](#)

2. A 10 kg ball is dropped from a height of 10m. Find (a) the initial potential energy of the ball.

(b) the kinetic energy just before it reaches the ground, and (c) the speed just before it reaches the ground.



[Watch Video Solution](#)

3. Calculate the work done by a person in lifting a load of 20 kg from the ground and placing it 1 m high on a table



[Watch Video Solution](#)

4. Find the mass of a body which has 5J of kinetic energy while moving at a speed of 2m/s
(AS_1)



[Watch Video Solution](#)

5. A cycle together with its rider weighs 100 kg. How much work is needed to set it moving at 3 m/s (AS_1)



[Watch Video Solution](#)

Let Us Improve Our Learning Higher Order Thinking Questions

1. What is potential energy ? Derive an equation for gravitational potential energy of a body of mass $.m.$ at a height $.h..$ (AS_1)



[Watch Video Solution](#)

2. Derive an expression for kinetic energy in pure rolling.



[Watch Video Solution](#)

3. When you lift a box from the floor and put it on an almirah the potential energy of the box increases but there is no change in its kinetic energy. Is it violation of conservation of energy? Explain. (AS_7)



[Watch Video Solution](#)

4. When an apple falls from a tree what happens to its gravitational potential energy

just as it reaches the ground ? After it strikes
the ground ? (AS_7)



[Watch Video Solution](#)

Multiple Choice Questions

1. S.I. unit of work

A. N-m

B. kg-m

C. N/m

D. $N - m^2$

Answer:



Watch Video Solution

2. The energy possessed by a body by virtue of its motion is called as

A. potential energy

B. kinetic energy

C. Attractive energy

D. Gravitational energy

Answer:



Watch Video Solution

3. Two objects with same masses have been dropped from same height at same time.

Which of the following will remain same in case of these objects

A. Speed

B. Gravitational force

C. Potential energy

D. Kinetic energy

Answer:



Watch Video Solution

4. A person is climbing a ladder with a suitcase on his head. Then the work done by that person on that suitcase is

A. Positive

B. Negative

C. Zero

D. Can not be defined

Answer:



Watch Video Solution

5. IF you have lifted a suitcase and kept it on a table, then the work done by you will depend on

- A. The path of the motion of the suitcase
- B. The time taken by you to do the work
- C. Weight of the suitcase
- D. Your weight.

Answer:



Watch Video Solution

Think And Discuss

1. A wooden chair is dragged on the level floor and brought to the same place. Let the distance covered be s . and frictional force acted on the chair by the floor be f . . What is the work done by the frictional force



[Watch Video Solution](#)

2. Lift an object up from the ground. Work done by the force exerted by you on the object moves it in upward direction. Thus the force

applied is in the direction of displacement. However there exists a force of gravitation on the object at the same time • Which one of these forces is doing positive work? • Which one is doing negative work? • Give reasons



[Watch Video Solution](#)

3. What would happen if nature does not allow the transfer of energy? Discuss with few examples.



[Watch Video Solution](#)

4. Why is it easier to stop a lightly loaded truck than heavier one that has equal speed



[Watch Video Solution](#)

5. Does the Kinetic energy of a car change more when it goes from 10 m/s to 20 m/s or when it goes from 20 m/s to 30 m/s.?



[Watch Video Solution](#)

6. A person starts from rest and begins to run. The runner puts a certain momentum into himself. What is the momentum of ground? And the runner puts a certain amount of kinetic energy into himself. What is the kinetic energy of the ground.?



[Watch Video Solution](#)

7. Does the international space station have gravitational potential energy



[Watch Video Solution](#)

8. Someone wants to sell you a super ball claims that it will bounce to a height greater than the height from which it is dropped. Would you buy this ball ? If yes explain, if not explain



[Watch Video Solution](#)

9. A ball, initially at the top of the inclined hill, is allowed to roll down. At the bottom its speed is 4 m/s. Next the ball is again rolled

down the hill, but this time it does not start from rest. It has an initial speed of 3 m/s. How fast is it going when it gets to the bottom ?



[Watch Video Solution](#)

10. The work done by a force F_1 is larger than the work done by another force F_2 . Is it necessary that power delivered by F_1 is also larger than that of F_2 ? Why



[Watch Video Solution](#)

11. Is the firewood obtained by cutting of trees renewable or non renewable source of energy?

Why?



Watch Video Solution