

Answer on Question #50659-Physics-Mechanics-Kinematics-Dynamics

Gravitational force work downward. If a ball is placed on a table from ground, then the work done by gravitational force = $-mgh$. When any agent do this it becomes $=mgh$. Why it is positive here?

How does gravitational force work in 1st case without external agent? Is it possible?

Answer

"If a ball is placed on a table from ground, then the work done by gravitational force = $-mgh$."

No. The force of gravity did no work here. Whoever lifted that ball to the table did the work. And from the work function $QE = Wh = mgh$ is the work that person did to get it atop the table h high.

"How does gravitational force work in 1st case without external agent?"

It doesn't. The person does the work by exerting a force $F > W$, just a tad, to lift the ball against the force of gravity W . We typically ignore the little extra force needed to get the lifting started.

Note by doing work on the ball, the lifter is storing energy in that ball. We call that potential energy; so the work $QE \rightarrow PE$ is converted into potential energy and conserved.

When doing energy problems, let the physics decide the signs. They are plus signs when energy is added to the system by doing work on it. They are negative signs when energy is lost from the system as the system does the work.

In lifting that ball, work is done on the system (ball) so energy is added and the sign is plus.

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