

Answer on Question #52666-Physics-Mechanics-Kinematics-Dynamics

A man throws one ball vertically upwards and another ball vertically downwards with same speed which one will reach ground with higher speed?

Answer

Ignoring air resistance, they will hit the ground at the same speed.

It is because the conservation of energy. Consider the ball thrown straight up with velocity v . It has kinetic energy $\frac{1}{2}mv^2$. It goes up to its peak and returns to the point it was thrown from. When it returns to that point, it has the same amount of kinetic energy. So its speed is the same but in the opposite direction, exactly like the ball that was thrown down. So they both hit the ground at the same speed.

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