

## Why a Ball Bounces

1. When you drop a ball, gravity pulls it toward the floor. The ball gains energy of motion, known as "kinetic energy."
2. When the ball hits the floor and stops, that energy has to go somewhere. This results in both the ball and floor deforming inward.
3. This deforming takes energy from the ball's motion and stores much of it in the elastic surfaces of the floor and ball. Because the ball is softer than the floor, it does most of the deforming and stores most of the energy. By the time the ball comes briefly to a stop, most of its energy has been stored in its deformed surface.
4. The ball then rebounds. It returns to its normal shape and rises up into the air to a fraction of its original height. This is called the rebound height. The rebound height does not depend on how much energy the ball had to begin with. It depends only on the elasticity of the ball itself.
5. When you drop a ball from a greater height, it has more kinetic energy just before it hits the floor and stores more energy during the bounce. It deforms further as it comes to a stop. When the ball rebounds, its stored energy reappears and it leaps higher into the air than it would have had you dropped it a shorter distance.

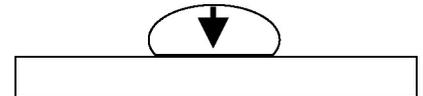
ball falling to floor



ball contacting floor



bottom of ball flattens (deforms) as it strikes floor



ball springs back up

