

Bouncing Balls I

Apparatus

selection of balls; for example super-balls, tennis balls, balls of blu-tac or play –dough

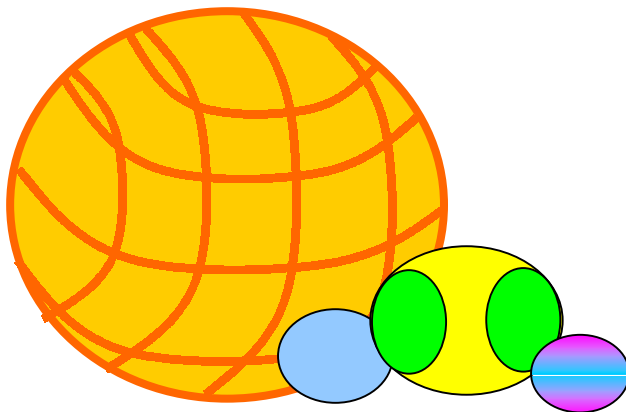
Action

The students experiment with dropping and throwing down the different balls. They should consider the energy changes as the balls fall, collide with the floor, and then bounce up again.

The Physics

Balls that lose less energy to non-mechanical forms on impact rise higher than balls that lose more energy. Balls of blu-tac or play-dough lose a lot of energy to internal frictional forces as they deform on impact. This energy is dissipated as thermal energy. Balls which undergo more elastic collisions bounce higher as they lose less kinetic energy.

No ball which is dropped (from rest) will bounce higher than the height it was dropped from. A ball can bounce higher than the original height if thrown down. These balls start off with kinetic energy and gravitational potential energy instead of just gravitational potential energy.



Accompanying sheet

Bouncing Balls I

Drop the balls from the same height.
Why do some balls bounce higher than others?

Can you make any of the balls bounce higher than the original height?
Does this contradict conservation laws?