Bouncing Balls II

Apparatus

two balls, one large and one small – for example a basketball and a tennis ball

Action

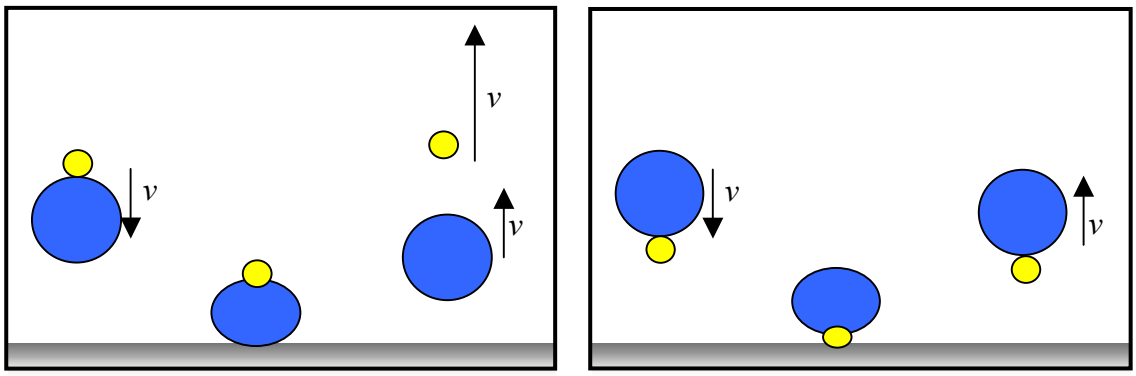
The students hold the small ball on top of the large ball and drop them together. They then repeat this with the large ball on top. They should try to explain their observations in terms of conservation of momentum.

The Physics

The small ball held over the big ball bounces off higher as some momentum is transferred from the big ball to the small ball, increasing its velocity. Momentum has been conserved during the collision and the change in momentum of the small ball is large. The results are most spectacular when the small ball is held exactly vertically above the large ball before they are released.

If the balls are switched around the momentum is still conserved, but the transfer of momentum from the small to the big ball makes little difference to the big ball's velocity due to its large mass.

Note: a reasonably clear space is needed for this activity as the small ball will gain a large amount of momentum and can fly off very fast and a long way.



Accompanying sheet

Bouncing Balls II

Hold the little ball on top of the big ball and drop them together.
What happens and why?

Does the same thing happen if you hold the big ball on top and drop them?