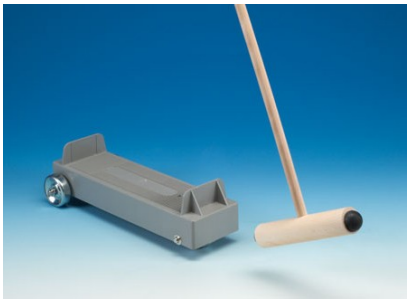


Bouncing Dart

PX-1204

BACKGROUND:

If you fell from a tree limb onto a trampoline, you'd bounce. If you fell into a large pile of leaves, you'd come to rest without bouncing. In which case, if either, is the change in your momentum greater? This activity will help you answer that question. You will compare the changes in momentum in the collision of a "bouncing dart" where bouncing does take place and where it doesn't.

Originally developed for Paul Hewitt's Conceptual Physics, the Bouncing Dart demonstrates the energy transfer that occurs in elastic and inelastic collisions. The dart has an elastic end and an inelastic end. Swing the dart so that it collides with a massive (1kg or more) dynamics cart, and compare the distances the cart moves when hit by the different ends.

PRODUCT INFORMATION:

The dart consists of a thick wooden dowel with a rubber tip on each end. Although the tips look and feel the same, the tips are made of different kinds of rubber. One end acts somewhat like a very bouncy ball. The other end acts somewhat like a lump of clay. They have different elasticities. Bounce each end of the dart on the table and you'll easily see which end is more elastic. In the activity, you'll do the same against the dynamics cart as a pendulum.

RELATED PRODUCTS:

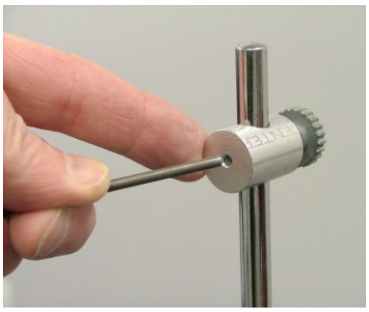
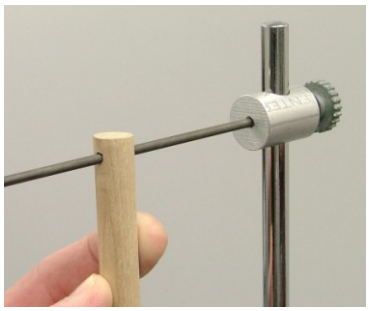
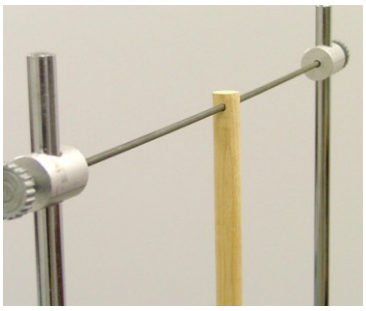
Pair of Dynamic Carts (P3-3530). High-impact plastic cars for any mechanics experiment involving linear motion.

Liquid Accelerometer (P3-3525). Illustrate accelerations in various dynamic situations.

Ring Stand Base with Rod (66-4220). Mount your support rings to this ring stand with base.

SETUP INSTRUCTIONS:

1. Using two ring stands, slide the two ring stand clamps on to the vertical ring stand rod to approximately the same height. Then insert the thin metal rod into the small hole in one of the clamps. Slide the Bouncing Dart's long vertical dowel onto the rod at the small hole provided, so that it would swing freely at a pendulum.

Then slide the other end of the thin rod into its matching hole on the other ring stand clamp. Adjust the clamp positions so that the rod is level, allows the bouncing dart to swing freely as a pendulum and that it is at the right height to strike the middle rear of the dynamics cart at the cart's lowest point.

BIBLIOGRAPHY:

Conceptual Physics Lab Manual by Paul G. Hewitt. Pearson Education, Inc. pp.65.