



a WOW Lab

BLUEPRINT

Polymer Bouncy Balls

Inquiry Approaches

Initial Inquiry

Where can polymers be found?

Polymers can be found everywhere and can be natural or man-made. There are polymers in car tires (rubber), in hair (keratin) and in food (protein and starch).

Experimental Procedure Inquiry

Why are the bouncy balls rolled down a ramp before going over the ball jump instead of being bounced?

Rolling the balls down the ramp ensures that all of the bouncy balls start off with the same initial velocity and acceleration, which allows for a comparison of the rebound heights of different balls.

Why does the addition of vinegar cause the liquid latex mixture to solidify?

Liquid latex is an emulsion of latex beads in water and contains a chemical called a preservative that prevents coagulation of the beads. Vinegar neutralizes the preservative, making it ineffective and causing the latex beads to coagulate into a solid.

In-Depth Inquiry

Why does the latex ball bounce higher than the PVA/cornstarch ball?

The molecules of the latex ball are more tightly packed than the molecules of the PVA/cornstarch ball. Therefore, they move less when they hit the floor. As fewer molecules rub against each other, less energy is lost to friction and more kinetic energy is transferred to elastic potential energy, causing the latex ball to bounce higher.

Why does the smaller latex ball bounce higher than the larger latex ball?

When the balls bounce, some energy is lost to friction. When the smaller ball is bounced, less energy is lost to friction than when the larger ball is bounced and more of the kinetic energy is transformed into elastic potential energy. As a result, the smaller ball bounces higher than the larger ball.

Why don't the balls bounce back to the same height from which they were dropped?

The balls do not bounce back to the height from which they were dropped because the collision between the ball and the floor is not perfectly elastic. The collision is inelastic, which means that some of the kinetic energy of the ball is lost or transformed into another form of energy (e.g. heat, sound) as a result of the collision. As a result of the loss of energy, the ball cannot reach its original height.