



a WOW Lab

**BLUEPRINT**

Polymer Bouncy Balls

## Inquiry Approaches

### Initial Inquiry

What are some properties objects can have?

Different objects can have many different properties, including shape, size, colour, density, weight, texture, volume, hardness, buoyancy and elasticity.

What is the difference between a chemical change and a physical change? Give examples for both types of change.

Physical changes are changes which do not alter the composition of the substance. Some examples of physical changes are melting ice cubes, shaping plasticine and cutting paper. A chemical change is a change which alters the molecules of an object to form a new substance. Examples of chemical changes include rust forming on cars, burning logs on a fire and cooking pancakes.

### 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.

Is the change from liquid to solid that occurs when vinegar is added to the latex mixture a chemical or physical change?

Adding the vinegar to the latex results in a chemical change because a new substance is formed.

### In-Depth Inquiry

Why do you think the latex balls bounce higher than the PVA/cornstarch balls?

Although the two kinds of bouncy balls look very similar, they are made of different materials which have different properties. The height to which the balls bounce depends on these properties, including elasticity and density.