



a WOW Lab

**BLUEPRINT**

Polymer Bouncy Balls

## Lesson Logistics

### Learning Outcomes

| Grades 9-10        | Grades 11-12      |
|--------------------|-------------------|
| Atoms and Elements | Organic Chemistry |

### Class Organization

This activity can be performed individually, or in groups of two or three.

Ensure that each student or group has a *Student Handout*, two paper cups, two stir sticks, access to the borax solution, liquid latex, vinegar, cornstarch and white glue.

### Notes

Liquid latex can be very difficult to remove from clothes once it has hardened and should therefore be handled with care.

It is recommended to wear gloves and cover the desks with newspaper as the activity can get quite messy.

Latex balls can be stored for two to three years. PVA/cornstarch balls should not be stored for extended periods of time, as they will grow mold.

### Further Exploration

To visually demonstrate a polymer, ask the students to be “monomers” and join hands to form a straight “polymer” chain. Ask the student at the head of the line to guide the other students around the room, making note of how it is still quite easy to move around the room in a chain, but not as easy as each student moving independently. Now arrange the students into three separate lines and ask the student at the head of each line to move his or her line around the room. Observe how it is still rather easy to move around, but not as easy as a single line moving on its own. To demonstrate the relationship between cross-linkage and elasticity, arrange the students into three separate lines, except for two or three volunteers who will represent the “cross-links”. Each “cross-link” will join together two lines, or “polymers”, by standing between the lines and holding onto one “monomer” from each line, so that all three lines are connected. Now ask one of the students to lead the group around the room. The students will notice how it is more difficult to move as a large group and that the group has more elasticity than the straight polymer chain. The elasticity is provided by the arms of the “cross-links” which can be compressed and stretched to some extent before the linkage is broken.