

Slime Science Game Plan

eCamp Chemistry Lab

Objective When you think of slime, do you imagine slugs, snails, and puppy kisses? Or does the science fiction film *The Blob* come to mind? Any way you picture it, slime is definitely slippery, slithery, and just plain icky — and a perfect forum for learning real science.

Imagine a plate of spaghetti. The noodles slide around and don't clump together, just like the long chains of molecules (called polymers) that make up slime. They slide around without getting tangled up. The pasta by itself (fresh from the boiling water) doesn't hold together until you put the sauce on. Slime works the same way. Long, spaghetti-like chains of molecules don't clump together until you add the sauce ... until you add something to cross-link the molecule strands together.

About the Experiment To make our different slimes, we'll be using borax as the cross-linking agent. There are lots of different polymers you can try, including starch, glue, and polyvinyl alcohol. The polymer (usually glue) mixture is the "spaghetti" (the long chain of molecules), and the "sauce" is the borax mixture (the cross-linking agent). You need both in order to create slime. Keep your slime in the fridge for a week, or a month in the freezer (although it might change colors). Nuke it in the microwave for a few seconds to thaw.

The How and Why Explanation The cross-linking agent in the slime mixtures can be either liquid starch or borax (sodium tetraborate). When you mix the glue and water together, you've got a cup full of long molecule chains, like a pile of ropes. When you cross-link the polymers, it's like building a net with the rope, and it happens very quickly to give you that rubbery, stretchy substance kids are so fond of.

Questions to Ask When you've worked through most of the experiments ask your kids these questions and see how they do:

1. A polymer is: (a) a long piece of spaghetti (b) an element on the periodic table (c) a long molecular chain (d) a plastic bag
2. What does a cross-linking agent do?
3. Which of the following are cross-linking agents? (a) calcium (b) borax (c) white glue (d) starch (e) guar gum
4. What does PVA stand for? What kind of water does it mix with?
5. Which substance is both a solid *and* a liquid? (a) guar gum (b) bouncy putty (c) starch slime (d) corny slime