

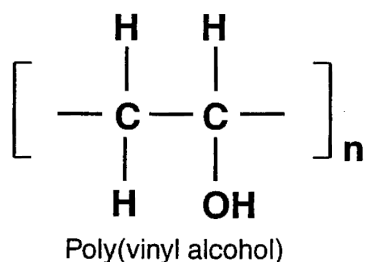
# Educational Innovations<sup>INC</sup><sup>®</sup>

## SL-300

### Classroom Slime Kit

#### Explanation

Polyvinyl alcohol (PVOH) consists of a very long chain-like molecule called a polymer. The PVOH molecule is made up of repeating links called monomers. Each link in the PVOH chain looks like the following:



PVOH solution is viscous (thick) because all of these molecules stick to each other and to the water that surrounds them, just like a pot full of spaghetti.

When the sodium borate (borax) is added, the borax molecules form cross links between the PVOH polymers and connect many of the PVOH molecules together. The result is a new material which is even more viscous and has physical properties of both a solid and a liquid.

Because the bonds between the PVOH and the Borax consist of weak hydrogen bonds, the slime material is a visco-elastic gel and can flow like an extremely viscous liquid.

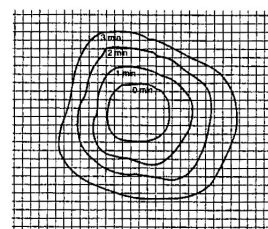
#### Experiments to Try

1. Place your slime onto a flat surface and observe that it flows like a liquid. Try stretching your slime into a very thin sheet by holding it in your fingers and carefully stretching it sideways as it flows down. Roll it, then pick it up and let it hang to make a very long slime snake.

or:

1. Break your slime into two pieces and then hold the two pieces together. See how long it takes the two pieces to join together into one piece again.

2. Measure how fast your slime flows. Roll your slime into a ball and place it on a sheet of acetate. Use a marker to trace the shape of your slime onto the acetate.



Trace it every minute or so and notice how it continues to flow outward... don't forget to mark each trace with the time. After a few minutes, remove your slime and place your acetate over a piece of graph paper.

Calculate the area of each contour by counting the number of boxes within each tracing. Graph the area of each trace versus time to get a graph of the flow rate. Try taping the acetate to an inclined book or board to speed up the flow of the slime.

3. Try letting your slime dry out! Stretch your slime into a flat sheet and place it on a piece of plastic wrap. Let it dry for a couple of days, observing how it changes as the water it contains evaporates. Polyvinyl alcohol is a plastic, and as it dries it becomes hard and brittle.
4. Try to rehydrate your slime. After letting your slime completely dry out, add a tablespoon of water and let it sit overnight. Notice, once again, how your slime changes.



5 Francis J. Clarke Circle  
Bethel, CT 06801  
[www.teachersource.com](http://www.teachersource.com)

Phone (888) 912-7474  
Fax (203) 229-0740

[info@teachersource.com](mailto:info@teachersource.com)

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