



Yale-New Haven  
Teachers Institute®

Curriculum Units by Fellows of the Yale-New Haven Teachers Institute  
2015 Volume IV: Big Molecules, Big Problems

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## **Problem Based Chemistry: How do I Make a Lake Paint?**

Guide for Curriculum Unit 15.04.03

by Amanda Weires

This unit encompasses all the content involved in making oil-based lake paints. Lake pigments are usually organic molecules that are soluble in water, and thus not soluble in oil. They are bonded to an ionic salt then dispersed in a drying oil, like linseed oil. The non-polar nature of the oil will provide an overlapping network of cross-linking large molecules, one end of which will bond to the ionic salt, and the ionic salt will also stick to the polar lake pigment. The small pockets of color will disperse in the oil, and as the oil dries and crosslinks, it traps the pigment pockets in its web. The layer of individual molecules fuse together to make one thin layer of a single network. The basic chemistry content is miscibility of compounds, polarity of molecules, and molecular interactions based on relative polarity. The unit is designed for a high-school chemistry class, specifically for 11th-graders enrolled in an arts magnet high school.

(Recommended for Chemistry, grade 11; Art, grades 9-12)

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