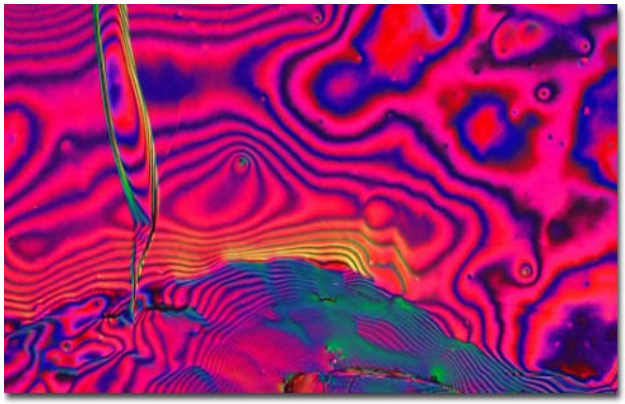
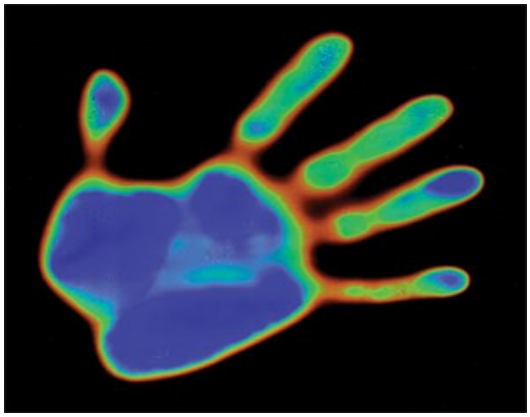
SENIC—Nanoscale Science and Engineering
Exploring Liquid Crystals

Explore!

1. Place your hand on the table for at 30 seconds.
2. Now lay a liquid crystal sheet where your hand was. What happens?
3. Now place a liquid crystal sheet on top of the beaker of hot water. What happens?
4. Next take the sheet and place an ice cube on its corner. What happens?
5. Try the steps with different liquid crystal sheets.





http://micro.magnet.fsu.edu/micro/gallery/liqcryst/liquidcrystal.html

Liquid Crystals

Liquid crystals (LCs) are a unique state of matter that have properties between those of a liquid and those of a solid. They are often termed a fourth state of matter. LCs seem more like a liquid than a solid—think of the gooey mess at the bottom of a soap dish. The molecules of LCs are long and thin (rods and plates) and can display orientation — they can be aligned with one another in a regular pattern to provide the ordered structure (the crystal part of LC).

LCs can be manipulated by chemical, temperature, electric, and magnetic stimuli which cause the molecules to align. LCs that respond to temperature are called thermotropic liquid crystals and are the kind used in this demo.

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There are three forms of liquid crystals:

(a) (b) (c)

A. Nematic—orientational order but no positional order; b. smectic—molecules have positional order & lie in layers; c. chiral—molecules in layers with a slight angular orientation

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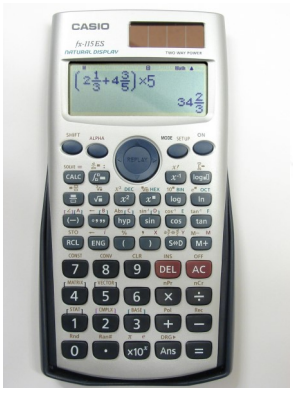
Applications:



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