1054-57-39 **Joel Hass*** (hass@math.ucdavis.edu), Department of Mathematics, 1 Shields Ave, University of California, Davis, CA 95616, **J Hyam Rubinstein** (rubin@ms.unimelb.edu.au), Department of Mathematics and Statistics, University of Melbourne, Parkville, Victoria, 3010, Australia, and **Abigail Thompson** (thompson@math.ucdavis.edu), Department of Mathematics, 1 Shields Ave, University of California, Davis, Davis, CA 95616. *The k-width of a knot.*

We define and investigate the notions of k-bridge number and k-width for a knot or link in R^3, where k is an integer between 1 and 4. These provide increasingly detailed information, as k grows, on the intersections of a curve with flat planes and round spheres in R^3. We examine properties of curves that minimize k-bridge number or k-width within their isotopy class.

There are two main motivations. The first is a search for geometric interpretations of some of the new knot and 3-manifold invariants that have been introduced in recent years. The second is to investigate how knotting affects the motion of a physical knot through a liquid or gel. The effect of knotting on the motion of loops of DNA through a gel depends on the knot type of the loop, as in gel electrophoresis. (Received August 17, 2009)