# 22
# Catenary and Catenoid: C. V. Boys' Experiment

**www.magicmathworks.org/geomlab22**

**1.** Hold the two rings together, submerge them in the soapy water, withdraw them, and separate them slowly. If the film forms a disk, ask a colleague to pop it.

Up to a certain distance the film forms the solid of revolution with the least surface area for that particular ratio of ring diameter to separation.

**2.** The colleague will be able to hang the chain to match the profile, showing that the surface is the solid of revolution of the catenary, the caten*oid*.

Paraboloid
Parabola
Hyperbola
Line
Hyperboloid
Ellipse
Hyperbolic paraboloid
Sphere
Line pair
Cone
Sine curve
Cylinder
Tractrix
Circle
Exponential curve
Catenary
Line family
Catenoid
Loxodrome
Helix
Equiangular spiral
Helicoid
Archimedean spiral
Plane
Tiling
Polygon
Polyhedron