

## Hyperbolic Slot

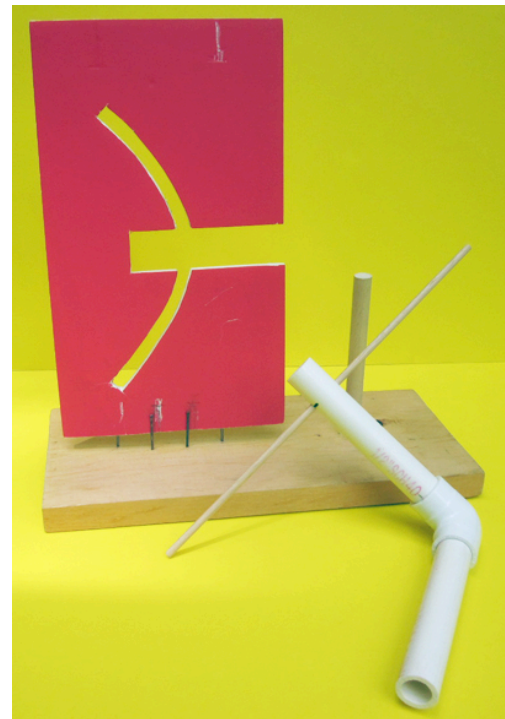
*How do you put a straight rod through a curved slot?*

If you see a straight rod and a curved slot, your common sense tells you that the rod couldn't possibly fit through the slot. But if the rod is angled and rotated through space, it describes a three-dimensional shape with a hyperbolic cross section (a hyperboloid). So if the slot is the exact shape of this hyperbola, you can make the straight rod pass through it.

The photo at the right shows the full-size Exploratorium exhibit currently on the museum floor.



Shown below are two photos of a "snack" (small-scale, or classroom) version. Complete instructions for building this snack version can be found in the *Square Wheels* book by Don Rathjen, Paul Doherty and the Exploratorium Teacher Institute (Exploratorium, 2002) or online at [www.exo.net/~donr/activities/Hyperbolic\\_Slot.pdf](http://www.exo.net/~donr/activities/Hyperbolic_Slot.pdf)



A slight modification of the version shown previously uses two wood blocks hot-glued to the base so that the slot cutout is held firmly in place but can still be adjusted. Either version works, but over the long term the wood blocks may be a little easier to deal with and do not cause as much wear and tear on the cutout.

