

Exploratorium Cookbook I

A Construction Manual for Exploratorium Exhibits
Revised Edition

by Raymond Bruman and the Exploratorium Staff

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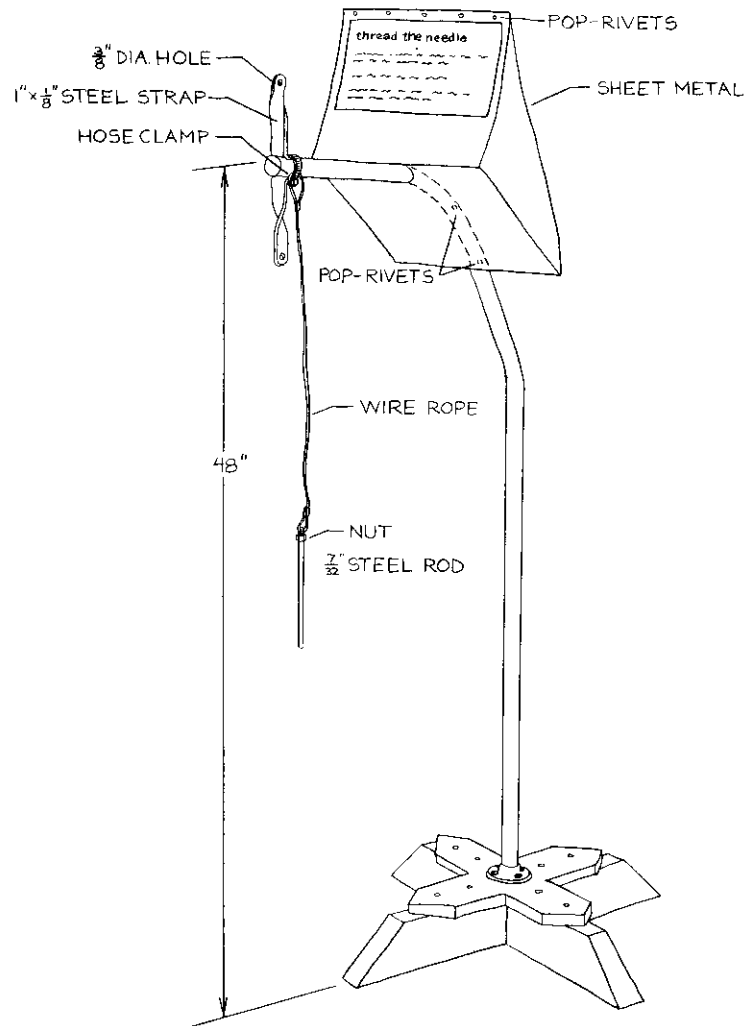
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Thread the Needle



Description

This exhibit touches on several points related to human perception. Primarily, it demonstrates how important binocular vision is for short-range depth perception. A visitor with one eye closed will find it frustratingly difficult to thread the oversized needle with the steel thread. Without binocular cues and with only vague knowledge of the size of the objects, it is difficult for the visitor to assess the exact distance between his or her hand and the hole.

However, threading the needle becomes easier on successive tries. A number of factors probably cause this. The kinesthetic sense of the arm and hand (the sense of where the limb is and where it has been recently) is very well developed. This muscular sense is refined and developed in all sports and manual skills, with feedback from the eyes and other senses. In addition, after a few tries the visitor is much better prepared to use monocular cues, such as parallax and apparent size, for judging distance.

Construction

There is nothing particularly challenging in making this exhibit. In the Exploratorium's original version, a hose clamp held the main components together. The clamp did an adequate job, but in the version currently on the museum floor, the clamp has been replaced with some welding and an eyebolt. You can easily improvise your own version of this exhibit.

Related Exploratorium Exhibits

BINOCULAR DEPTH PERCEPTION

3-D Shadows; Delayed Vision; Eyeballs (Eyeball Machine); Lenticular Images (3-D Dots); Random Dot Stereograms; Reverse Distance; Stereo Rule; Stereo Viewers Old and New; Two as One

KINESTHETIC SENSE AND HAND-EYE COORDINATION

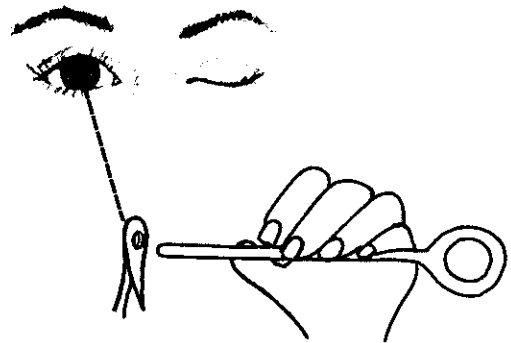
Balancing Stick; Reaction Time; Reverse Distance; Two Boxes with Rods; Two Weights

MONOCULAR PERCEPTION

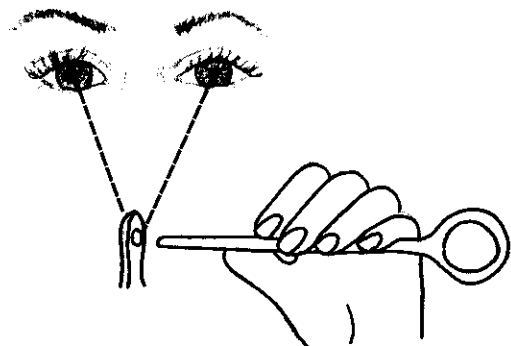
Cows; Distorted Room; Far Out Corners; Impossible Triangle; Reverse Masks; Size and Distance; Glass Camera (Perspective Window Camera); Trapezoidal Window

Exploratorium Exhibit Graphics

- 1** Pick up the needle, stand back from the machine and hold your arm straight.



- 2** Close one eye and thread the needle.



- 3** Open both eyes and thread the needle.

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