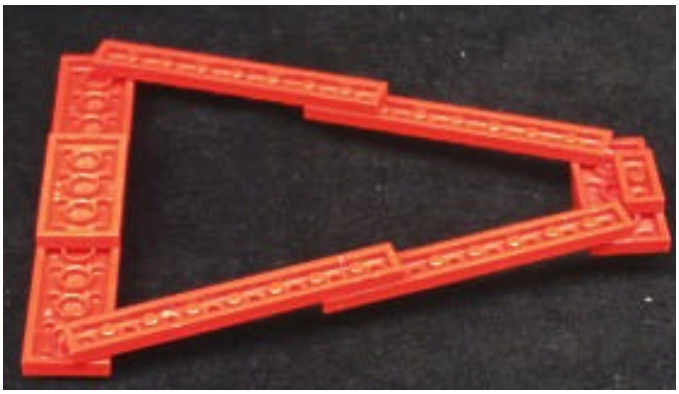
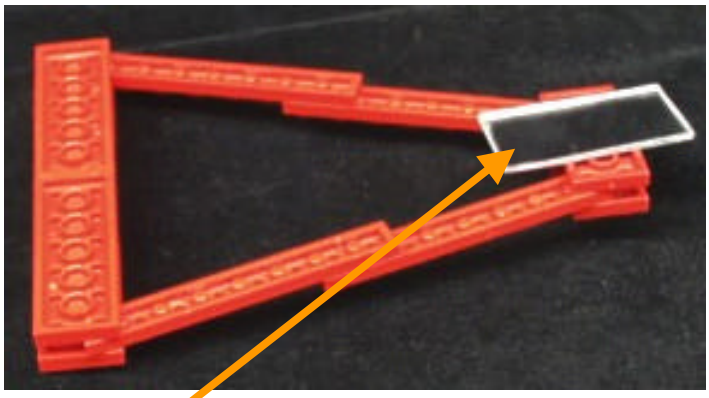
Scanning Probe Microscope

Cantilever Construction

Step 1

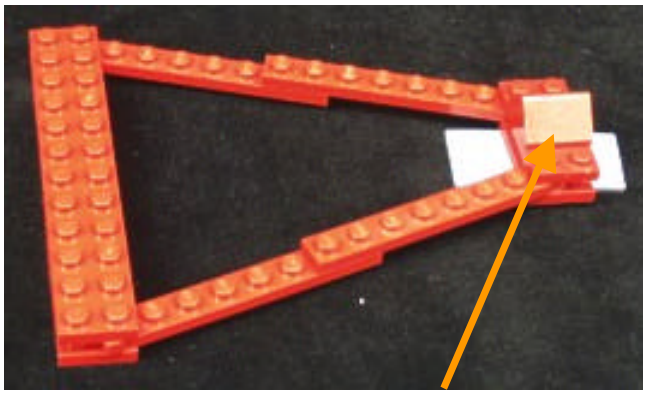


Step 2



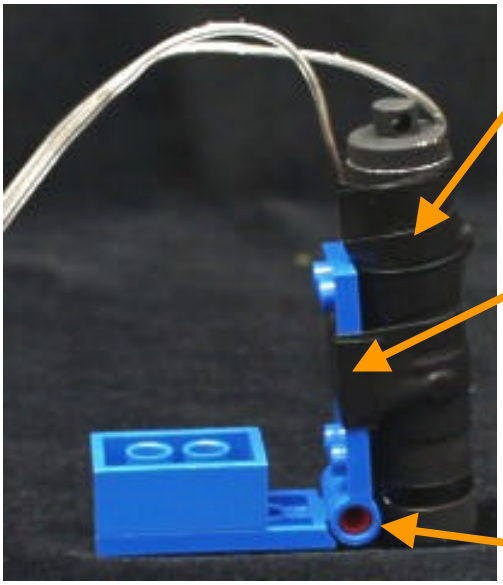
The mirror may be attached with double-sided tape.

Step 3



triangular probe tip

Light Source Mount

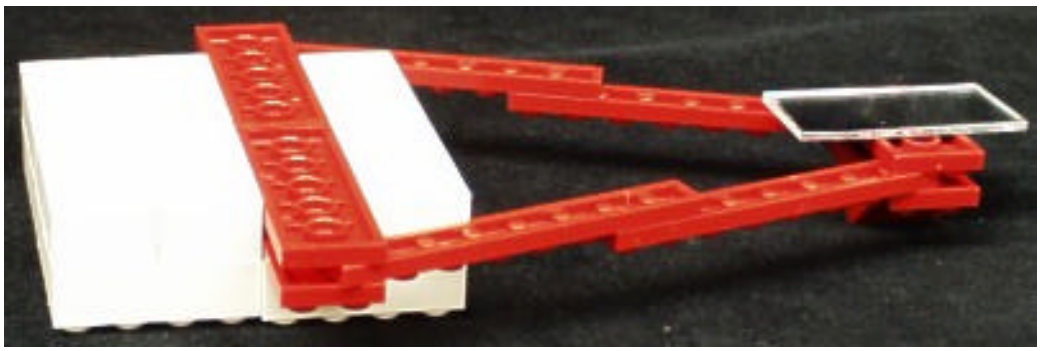


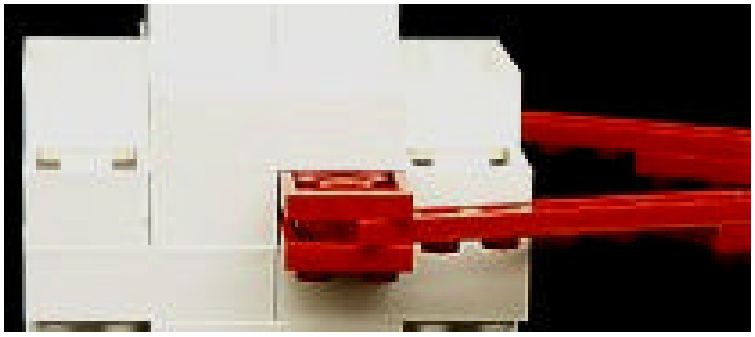
laser pointer or small flashlight
WARNING: Observe laser pointer precautions!

tape or rubber band fasteners

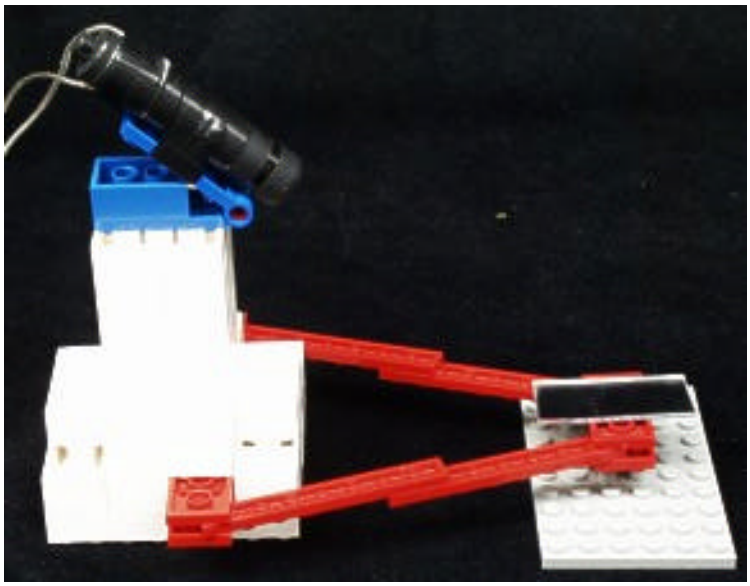
LEGO hinge

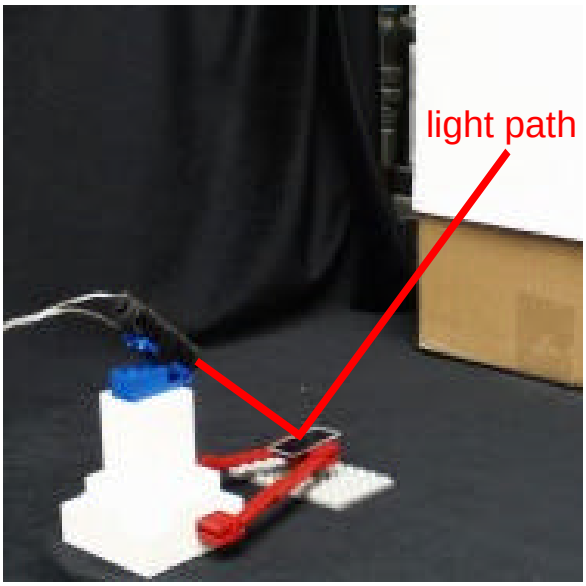
Platform Construction Details





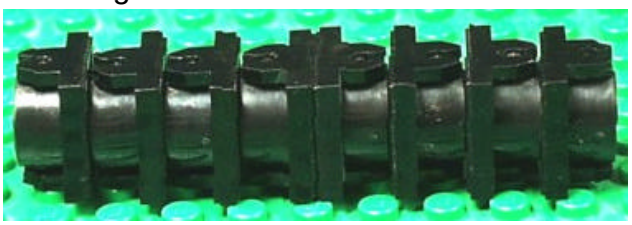
Completed Model

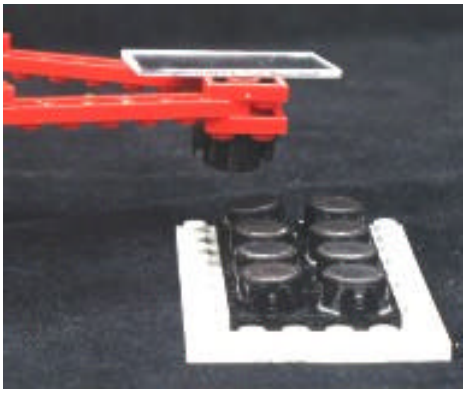




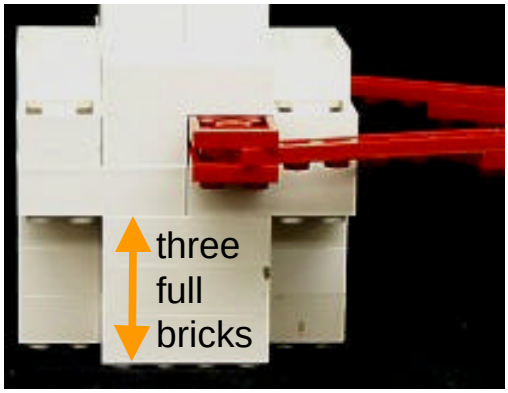
Modifications for Magnetic Force Microscope

The magnetic surface requires 8 face-poled LEGO magnets, 4 in each orientation. Making a stack as shown helps to determine the orientation of each magnet. NOTE: It is not necessary to know the absolute orientation of each magnet.





Arrange the 8 magnets with an alternating (checkerboard) pole pattern. Replace the triangular probe tip with a ninth magnet.



Since the interactions between the probe magnet and the magnetic surface are so strong, the cantilever platform must be raised by the height of 3 full bricks.

Completed Model