

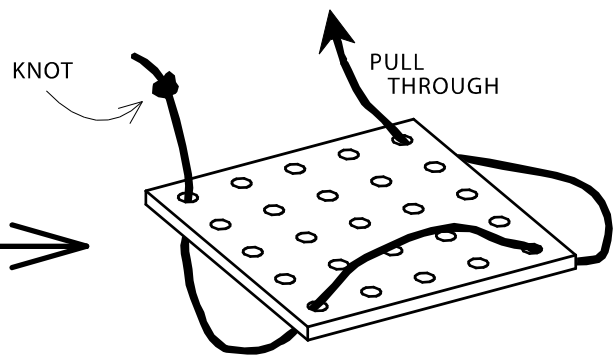
ARTIFICIAL GRAVITY

If you were on a space ship traveling to distant planets, you'd be far away from the Earth's gravity. You would be able to float around inside your ship and swim through the air! The problem is, a long trip without gravity will make your body weak. So, if we want to travel to faraway planets, we will need to create artificial gravity, at least in some parts of the ship.

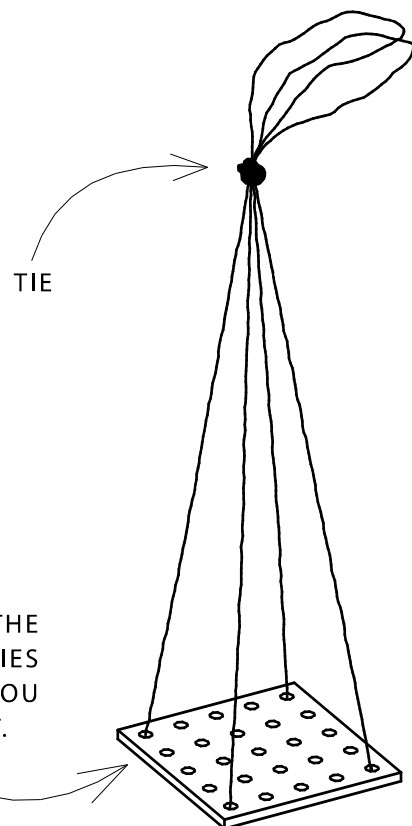
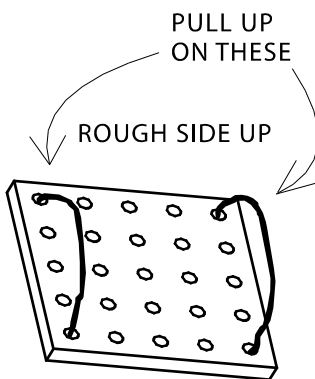
Today you'll create an artificial gravity machine, then test it with an amazing experiment. You will fill a cup with water, then turn it upside down and see if artificial gravity holds the water in the cup!

WHAT YOU NEED: a pegboard square, strong string, a couple of paper cups, some water and a day nice enough to go outside.

WHAT TO DO: make a simple knot about an inch from each end of the string. This will keep it from unraveling. Now thread the string through the pegboard like this:



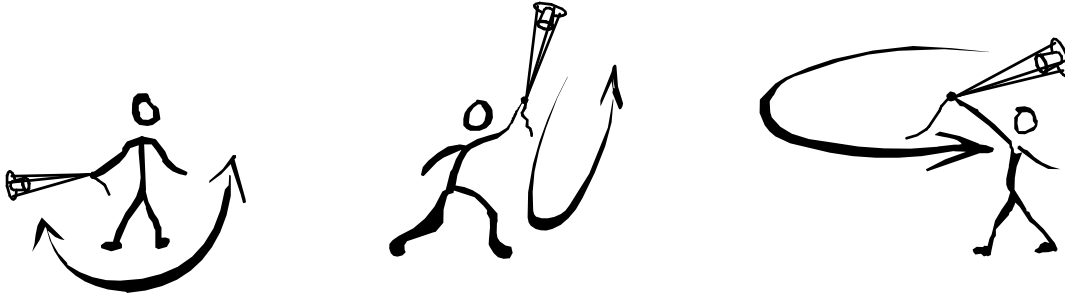
Now tie the two ends together, completing the circle. Pull up on two loops. Make these two loops the same length and tie them together with a knot a few inches from the top. This will form a nice handle.



MAKE SURE THE
PEGBOARD LIES
FLAT WHEN YOU
TIE THE KNOT.

Okay! You're ready to try it! Take your **ARTIFICIAL GRAVITY MACHINE** outside, along with a couple of paper cups and some water. Fill one of the cups and place it in your gravity machine (on the pegboard). Try to swing it without spilling the water. The water in the cup experiences centrifugal force. That will feel like artificial gravity.

Can you swing it upside down? Around your head? Experiment! TRY THESE:



EXPERIMENTAL RESULTS:

- RED ALERT!** Water flew out everywhere. What a mess!
- Space Cadet** - I did achieve a loop-the-loop with my water cup, but shortly after that it spilled.
- Star Captain** - Artificial gravity was achieved and sustained. The cup of water was nearly full and survived reentry.
- COSMIC GENIUS** - I have mastered the secrets of artificial gravity, and can swing a full cup in any direction without spilling a drop.

CHALLENGE QUESTION: Think about how you could use centrifugal force to make artificial gravity on a space ship or space station. Sketch your design.