

# The Chair of Nails

Will you trust your life to the laws of physics?

## WHAT TO DO

Wait for our Cool Scientists to assist you as you carefully sit directly onto a chair of long, sharp nails. *As you sit (and rise up when finished) be sure to move only vertically, i.e. don't wiggle or slide sideways, as the sharp tips might snag and tear your clothes or skin otherwise.* If you're wearing shorts or a skirt you might want to lay a towel over the nails for a little extra safety.

## WHAT'S HAPPENING?

The nails on our chair are real, sharp and could certainly impale you badly if pushed with enough force, but if only a very tiny amount of force is applied to each individual nail it will not penetrate your skin. Test this by very gently pressing your finger against one of the nails. Of course the harder you press the more it begins to penetrate, and if you were to sit on just one nail, or even several, they would easily puncture your body. Suppose you weigh 100 lbs and sit on one nail. That's 100 lbs of force applied to only one nail- ouch! But if you instead sit on 100 nails simultaneously, each one now supports only  $100 \text{ lbs} \div 100 \text{ nails} = 1 \text{ lb}$  of force on each. That's not much at all, and since our chair actually contains over 450 nails, the force on any one of them is even less (of course you're probably only sitting on about half of them)- but still only about as much force as you felt when you gently pressed on the nail, and that's perfectly safe. Ironically, lots of nails may look scary, but the more nails there are, the safer it actually becomes.