



Floating and Stability



Have you ever wondered why some floating objects return to an upright position after they have been tipped? For example, a sailboat tips over a little when the wind blows, but it returns to an upright position when the wind dies down. Why does it do that?

Here are a few activities to explore this situation.

Tools and Materials

- a small block of wood
- a few moderately heavy coins
- a clear dish for water (We made one from a two-liter drink bottle.)
- a centimeter ruler
- a pencil or other slender rod
- tape
- water



What To Do

Our equipment setup is shown above. We carefully cut off the top of a clear two-liter plastic drink bottle and taped a centimeter ruler to it. Note that we also taped over the sharp edge around the top for safety. The edge cannot cut anyone now. When we added the water, we included a tiny drop of food coloring for better visibility in the photographs.



Step 1

Record the initial level of the water.



Step 2

Place the small block of wood in the water. Record the level of the water. Press down slightly on one end of the block of wood with the pencil and release. Describe what happens.





Step 3

Place a moderately heavy coin as close to the center point of the block as you can. Record the water level. Press down slightly on one end of the block of wood with the pencil and release. Describe what happens.



Step 4

Now let's mix things up a bit. Move the coin about halfway toward one end of the block, but keep it centered between the edges. This causes the block to tilt in the water. Record the water level once more. Press down slightly on the low end of the block of wood with the pencil and release. Describe what happens.



Step 5

Now place another coin on top of the first one. Record the water level. Press down slightly on the low end of the block with the pencil and release. Describe what happens.



Step 6

Tap two or more coins to a corner of the block.



What do you predict will happen when you place this in the water? Try it! Record the water level. Describe what happens.

How can we explain this?

