

## Answer #10

The answer is (a); the side with the water will go down. It does seem peculiar that you can exert a force on water by sticking your finger into it, so perhaps this deserves a bit of discussion.

To understand why this happens, we look at a similar situation with which everyone has had some experience. When you sit on the edge of a swimming pool or a bathtub and dangle your legs into the water, your legs experience an upward force due to buoyancy.

Similarly, when you stick your finger into the water it experiences a buoyant force. According to Newton's third law of motion, forces occur in pairs: "For every action there is an equal and opposite reaction." In this case the reaction to the buoyant force upward on your finger is a downward force that your finger exerts on the water. This reaction to the buoyant force adds to the weight of the beaker of water and pushes that pan down, as can be seen in an mpeg video by clicking your mouse on the photograph below.



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