A block of balsa wood with a rock tied to it floats in water. When the rock is on top as shown, exactly half the block is below the water line. When the block is turned over so the rock is underneath and submerged, the amount of block below the water line is

a) less than half
b) half
c) more than half

and the water level at the side of the container will

d) rise.
e) fall.
f) remain unchanged.
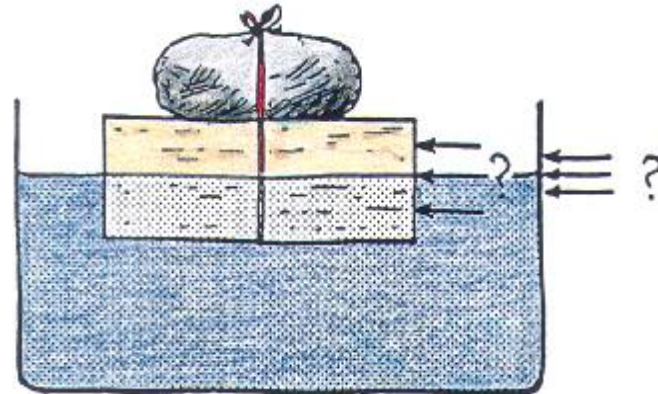
Hewitt
Drewit!

Next-Time Question

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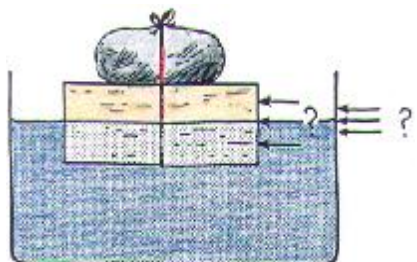
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and the water level at the side of the container will

- d) rise.
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- f) remain unchanged.

Answers: a, less than half; f, remain unchanged

When the rock is on top, its whole weight pushes the wood into the water. But when the rock is submerged, buoyancy on it reduces its effective weight and *less than half the block* is pulled beneath the water line. Or by the law of flotation: The rock and wood unit displaces its combined weight and the same volume of water whether the rock is on the top or the bottom. When the rock is on the bottom, less wood is below the water line than when the rock is on the top.

Since the same volume of water is displaced no matter how it floats, the water level at the side of the container remains *unchanged*.