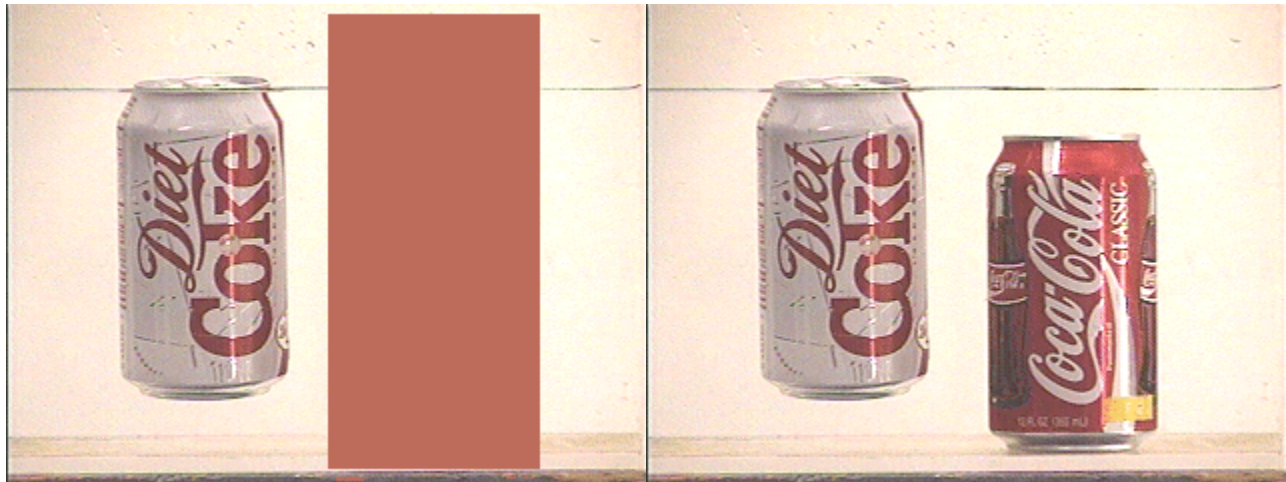


## Answer #199

The answer is (d): the regular Coca Cola can will sink, as seen in the photograph at the right with the mask removed.



When sugar is dissolved in water, it partially occupies the spaces between water molecules, so the density of sugar water is somewhat greater than that of regular water. Lots of sugar can be dissolved in water with only a small increase in volume. On the other hand, it only takes a small amount of artificial sweetener to sweeten a diet drink, so its density is only slightly heavier than water. Therefore the regular Coca Cola will sink.

Give yourself half credit if you said the Coca Cola will float lower than the Diet Coke. Buoyancy is a very tenuous matter: virtually as soon as the density of an object becomes greater than that of water, it will sink to the bottom in water. Despite the old movies, it is virtually impossible that a boat would ever have *exactly* the necessary density to do anything but float on the surface of the ocean or sink to the bottom.

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