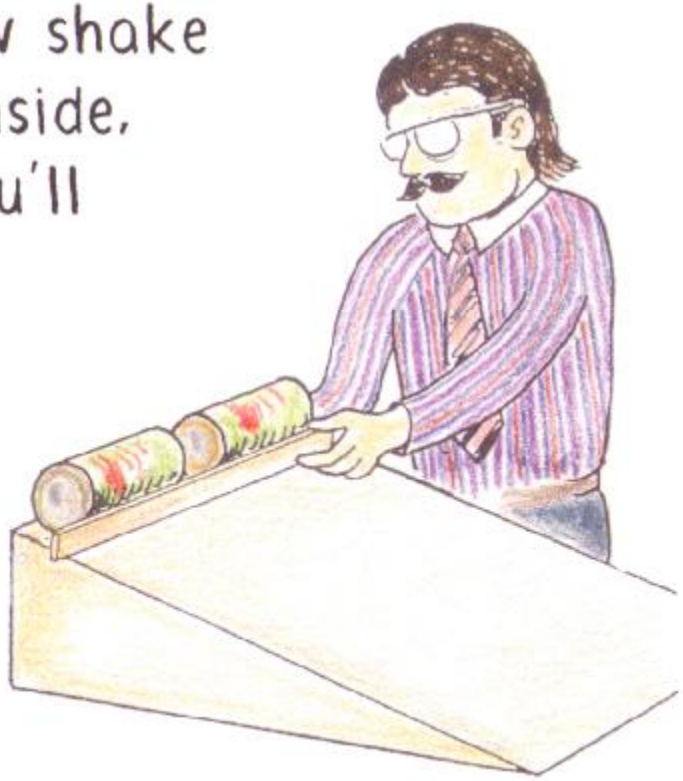
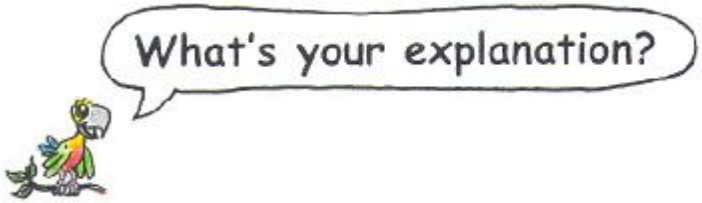
NEXT-TIME QUESTION

CONCEPTUAL Physics

Roll a pair of identical cans of carbonated beverage down an incline. You won't be surprised to find they roll at the same rate. Now shake one of them so bubbles form inside, then repeat the experiment. You'll be delighted to observe that



a) the shaken can wins the race.
b) the shaken can loses the race.
c) both cans still roll together.



thanx to Robin McGlohn and David Kagan

Hewitt Drew-it!

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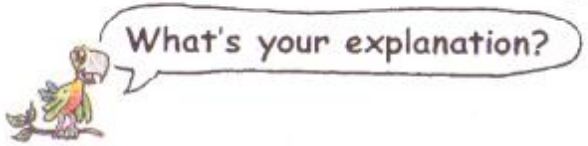
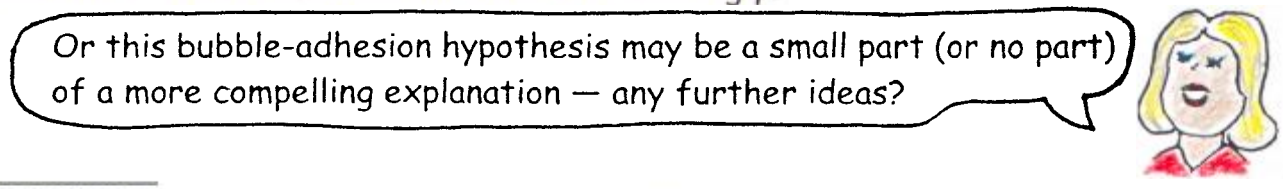


Answer: b

The shaken can rolls slower and loses the race. Why? Suppose friction were practically absent between the contained liquid and the inner can surface. The metal can would then roll down the incline while the liquid inside would simply slide down without rolling. The liquid's kinetic energy would all be translational (which is why a can of liquid always beats a can filled with solid material on the same incline). So what slows the can that is shaken? Perhaps surface tension between bubbles and the can creates more friction than that of straight fluid—can adhesion. Then the liquid would undergo some rotation, having rotational kinetic energy that diminishes translational kinetic energy.



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