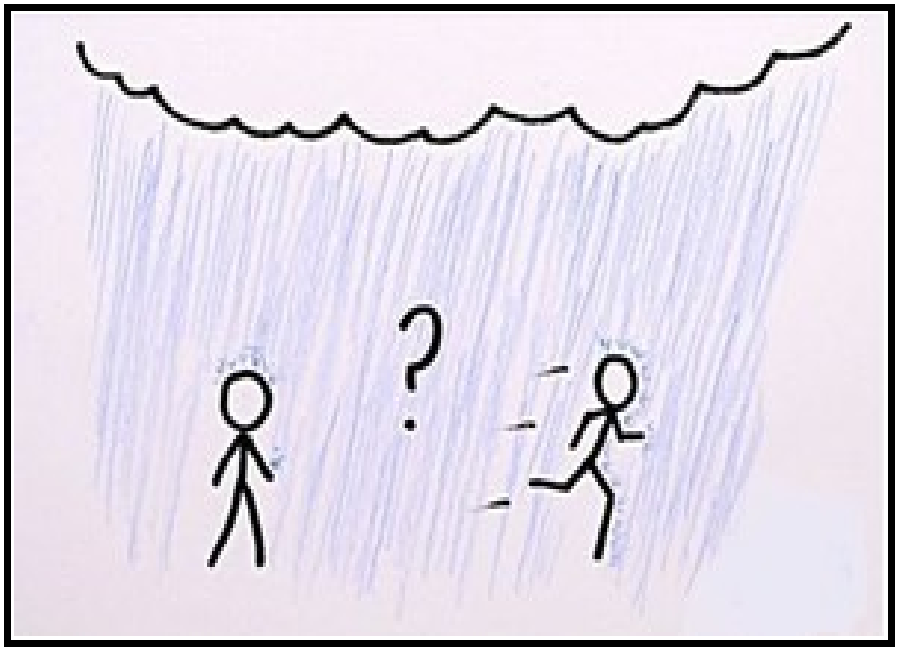
TedEd-32

Is It Better to Walk or Run in the Rain?



On those cold, rainy days when you forget your rain jacket or umbrella and you want to stay as dry as possible… should you walk and spend more time in the rain? Or should you run, which means you'll be smashing into more raindrops from the side? Assuming you haven't been fully soaked yet and you aren't jumping into puddles, the answer is simple. As you move out of the way of one falling raindrop, you move into the way of another. So the amount of rain hitting the top of you is constant, regardless of how fast you're going. Alternatively, you can picture that the raindrops themselves are stationary and you (and the earth beneath you) are moving upwards through the rain! And since the volume of a parallelepiped (that's a 3D parallelogram) doesn't depend at all on its slant, then no matter how fast you're moving horizontally the same amount of rain will land on top of you each second.

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Now, if you're not moving, the rain from the top is all you'll get. But if you ARE moving, you'll also run into raindrops from the side and you'll get wetter. So in any given second, you stay driest by standing still, and the faster you move the wetter you become. But if you're trying to get from point A to point B, then standing still won't do you much good. And en route from point A to point B, the total amount of rain you run into from the side has nothing to do with how fast you're going - just like how a snowplow will plow the same amount of snow from a stretch of road regardless of the exact speed it drives. In the case of running through the rain, you can figure that out using parallelepipeds again. So over a given period of time, the same amount of rain will hit you from the top, regardless of how fast you're going. And over a given distance, you'll hit the same amount of rain from the side - again, regardless of how fast you're going. So your total wetness is equal to the wetness per second for rain from the top times the amount of time you spend in the rain, plus the wetness per meter for rain from the side times the number of meters you travel.

So to stay driest getting from one point to another, you should try to minimize the amount of water falling onto you from above. And quite simply, that means getting out of the rain as fast as possible.