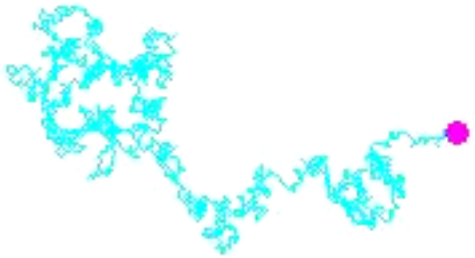
Our simulation representing a chemical signaling molecule released from an organelle in a cell, performed a “random walk”. What is responsible for the changes in direction of the motion of the signaling molecule?

A. Collisions with other signaling molecules.
B. Collisions with one of the liquid molecules in the liquid the molecule is in.
C. An imbalance in the many strikes the molecule feels from the molecules of the liquid the molecule is in.
D. Something else.



If the average rate at which a 1D particle moves is given by $\left\langle (\Delta x)^2 \right\rangle = 2Dt$ what will be the rate at which it moves in 2D? 3D?

A. $\left\langle (\Delta r)^2 \right\rangle = 2Dt$

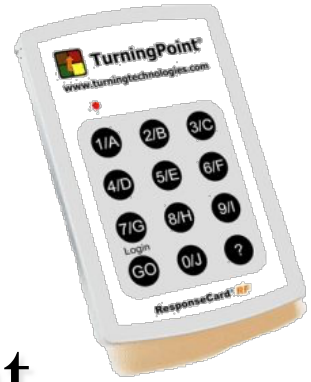
B. $\left\langle (\Delta r)^2 \right\rangle = 4Dt$

C. $\left\langle (\Delta r)^2 \right\rangle = 6Dt$

D. Something else

If I heat an enclosed volume of gas so that its Kelvin temperature doubles, what happens to the pressure in the gas?

1. It more than doubles.
2. It doubles.
3. It increases by between 50% and 100%.
4. It increases but by less than 50%.
5. It stays the same
6. It decreases.



If have an enclosed volume of gas and I double the number of molecules, but keep the temperature the same, what happens to the pressure in the gas?

1. It more than doubles.
2. It doubles.
3. It increases by between 50% and 100%.
4. It increases but by less than 50%.
5. It stays the same
6. It decreases.

If I heat an enclosed volume of gas so that its Kelvin temperature doubles, what happens to the average speed of the molecules in the gas?

1. It more than doubles.
2. It doubles.
3. It increases by between 50% and 100%.
4. It increases but by less than 50%.
5. It stays the same
6. It decreases.