

Transport Questions Key

1. Diffusion is the movement of molecules from high concentration to low.
2. No, diffusion does not require energy because molecules are moving along their concentration gradient.
3. By diffusion, the cell can obtain oxygen and release carbon dioxide without using energy.
4. The oxygen would move into the cell, while the carbon dioxide would move out of the cell by diffusion.
5. Lipids are arranged in a bilayer, with the "water-loving parts" facing outward and the "water-fearing" parts facing inward.
6. The cell membrane is considered fluid because certain substances can pass through it and it is not rigid in structure.
7. Certain proteins in the cell membrane serve as channels for molecules that are unable to pass through the lipid portion of the membrane.
8. While both diffusion and facilitated diffusion occur across the concentration gradient, in simple diffusion, molecules pass through the lipid portion, while in facilitated diffusion they pass through a protein channel.
9. Osmosis is the diffusion of water.
10. Hypertonic = more particles than water, hypotonic = more water than particles and isotonic = equal concentrations on both sides of the boundary.
11. If a cell is placed in a hypertonic solution it will dehydrate as water will move by osmosis out of the cell into the solution from high to low concentration. In a plant cell, the cell membrane would shrivel away from the cell wall, but the entire cell would not collapse as the cell wall is rigid.
12. In beaker A, the solution is hypertonic to the cell, therefore water will move out of the cell causing it to shrivel. In beaker B, the solution is isotonic to the cell and therefore there will be no net movement of water in or out of the cell. In beaker C, the solution is hypotonic to the cell and therefore the water will move into the cell, causing it to swell and possibly burst.
13. In passive transport molecules move along their concentration gradient without energy, while in active transport molecules move against their gradient, requiring energy.

14. The potassium is kept in the cell by active transport.
15. In phagocytosis, the cell membrane stretches to engulf the particles to be taken in, while in pinocytosis, the cell membrane pinches in to take in the particles.
16. The plant cell should be placed in a hypotonic environment as water will move from high to low into the plant cell, causing the cell membrane to push more firmly against the cell wall, increasing turgor pressure.
17. If the cell membrane were completely permeable, any substances could enter the cell, some of which are harmful, which could disrupt homeostasis. Also, useful substances could be lost that are necessary for homeostasis.
18. A bacterium could disguise itself with any substance that easily diffuses through the cell membrane, such as an alcohol.