

**ENE-2.C Explain how the structure of biological membranes influences selective permeability.**

Small nonpolar molecules, including  $N_2$ ,  $O_2$ , and  $CO_2$ , freely diffuse across the membrane.

**ENE-2.E Describe the mechanisms that organisms use to maintain solute and water balance.**

Active transport requires the direct input of energy to move molecules from regions of low concentration to regions of high concentration.

**ACTIVE TRANSPORT**

**ENE-2.F Describe the mechanisms that organisms use to transport large molecules across the plasma membrane.**

The processes of endocytosis and exocytosis require energy to move large molecules into and out of cells.

**Passive Transport**

- Molecules move without expenditure of energy.
- Osmosis
- Molecules move from higher to lower concentration (down their concentration gradient).
- Down random molecular motion.
- Transport proteins allow only a few types of molecules to cross.

## 2.9 Mechanisms of Transport

# ENDURING UNDERSTANDING

**ENE-2 Cells have membranes that allow them to establish and maintain internal environments that are different from their external environments.**

outer face

inner face

hydrophilic (polar) head of phospholipid

hydrophobic (nonpolar) fatty acid tail of phospholipid

sugar side chain

cholesterol

integral (intrinsic) proteins

peripheral (extrinsic) protein

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**ENE-2.J Describe the processes that allow ions and other molecules to move across membranes.**

A variety of processes allow for the movement of ions and other molecules across membranes, including passive and active transport, endocytosis and exocytosis.

- See 7.5 Notes
- See 7.6 Notes

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