

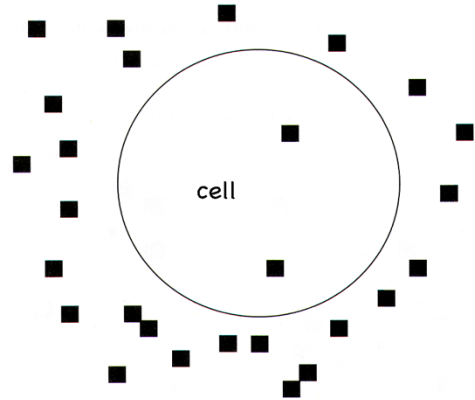
Conceptual Biology

Chapter 4: How Cells Work

Diffusion and Osmosis

1. The molecules represented by squares move across the cell membrane through diffusion in the diagram on the right.

Will there be a net movement of these molecules into the cell or out of the cell? Why?



Remember that these molecules move across the cell membrane through diffusion.

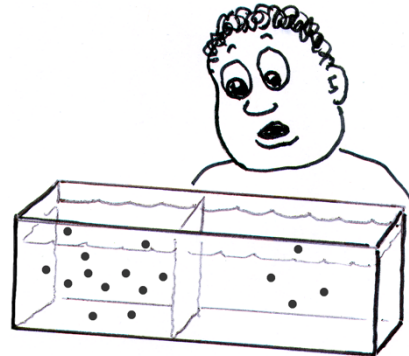


There will be a net movement of square molecules into the cell. This is because molecules tend to diffuse from an area of higher concentration to an area of lower concentration. There is a higher concentration outside the cell and a lower concentration inside the cell.

2. The diffusion of water has a special name.

It is called osmosis.

In the figure on the right, a membrane allows water to move freely between two compartments. The dark circles represent solute molecules, which are not able to move between the two compartments. Will water flow to the left or to the right? Why?



Water will tend to move to the left, where there is a greater concentration of solute molecules. This is because water, like other molecules, moves from an area of higher water concentration to an area of lower water concentration, and where there is a higher solute concentration, there is a lower concentration of water molecules.

In diffusion, molecules move from where they are more crowded to where they are less crowded.

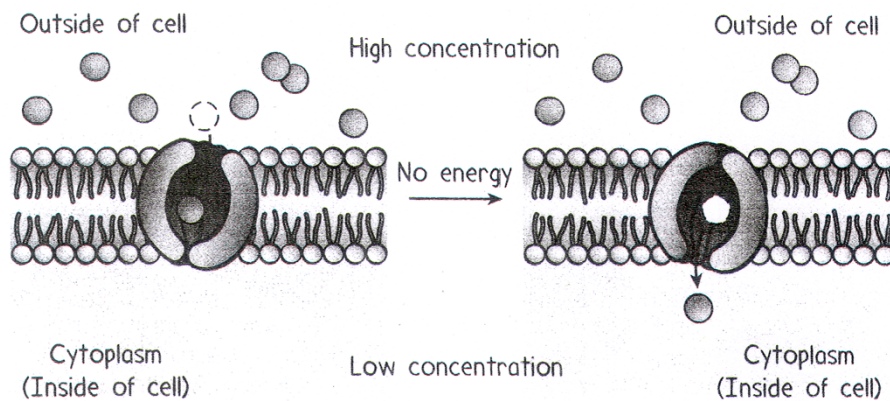


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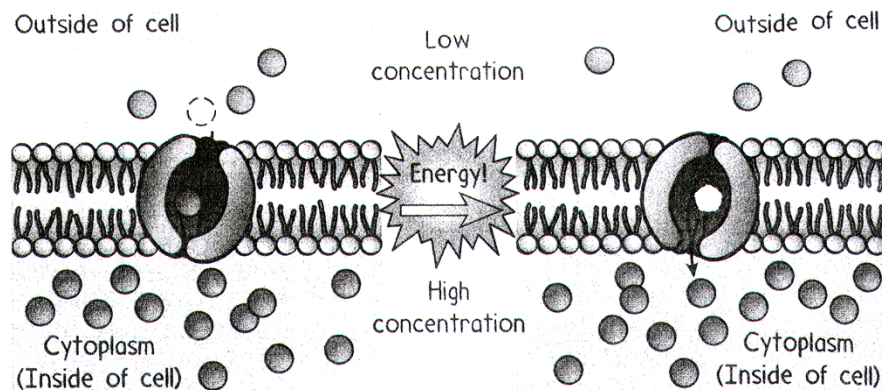
Chapter 4: How Cells Work

Facilitated Diffusion and Active Transport

1. Which of these describes facilitated diffusion, and which describes active transport?
 - a. Does not require energy from the cell? Facilitated diffusion
 - b. Requires energy from the cell? Active transport
 - c. Moves molecules from a region of low concentration to a region of high concentration?
Active transport
 - d. Moves molecules from a region of high concentration to a region of low concentration?
Facilitated diffusion
2. Which of the following shows facilitated diffusion, and which shows active transport?



- a. Facilitated diffusion



- b. Active transport

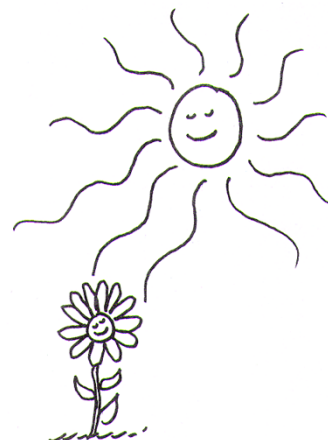
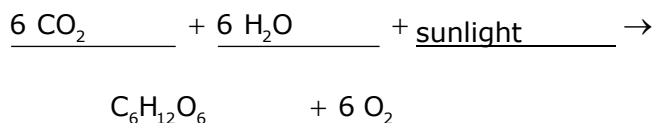
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Photosynthesis

1. During photosynthesis, one kind of energy, light energy from the Sun
is converted to chemical energy in organic molecules.

2. The chemical reaction for photosynthesis is:



3. In what part of a plant cell does photosynthesis take place? Chloroplasts

4. Why are plants green?

The light that chlorophyll does not absorb—green light—is reflected by plants.
When we look at a plant, we see this reflected green light—this is why plants are
green.

5. Explain why life as we know it would be impossible without photosynthesis.

Almost all life on Earth depends ultimately on photosynthesis for organic
molecules and energy. This is because plants and other photosynthesizers (such
as algae and some bacteria) are food for herbivores, and herbivores are food for
carnivores. So we see that photosynthesizers are the ultimate source of all food.

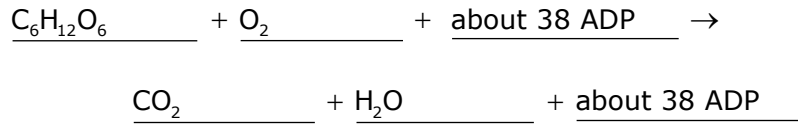


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Chapter 4: How Cells Work

Cellular Respiration

1. The chemical reaction for cellular respiration is



2. Cells use cellular respiration to produce ATP. How do cells obtain energy from ATP?

Energy is obtained from ATP when one of its three phosphate groups is removed, leaving ADP.

Circle the correct answers:

3. Which of the processes requires oxygen?

[Glycolysis]

[Krebs cycle and electron transport]

[Alcoholic fermentation]

[Lactic acid fermentation].



4. During cellular respiration, most of the ATP is made during

[glycolysis] [Krebs cycle] [electron transport]