Science

Mark and Move

Learning Targets

1. Recognize when a question it taking too long to answer.
2. Summarize the Mark and Move strategy.
3. Use Mark and Move to increase pace during a practice test.

Mark and Move

Instructions

The following exercise will help you identify questions you should mark and move on. Take 2 minutes to read the passage. Then take 2 minutes to identify the three questions that are the most difficult for you. Star them, make your best guess, and move on. For the purposes of this exercise, don't attempt to answer any of the other questions.

Mark and Move

When you Mark and Move, you star the question, mark your best guess, and move on to the next question. Never skip or leave a question blank. You should Mark and Move …

… if the question seems too difficult after reading through it once.

… when you've spent too long on the question.

… when you've spent too long on a passage.

Passage IV

Human blood cells allow for the influx and efflux of H_2O molecules through semipermeable membranes. Osmotic pressure is the phenomenon that drives this influx and efflux of water. Depending on the concentration of solutes in the blood plasma, it may be hypertonic, isotonic, or hypotonic when compared to the cells themselves.

The plasma is *hypertonic* when it has a higher concentration of solute present outside of the cell than within the cell. Water flows out of the cell as it attempts to achieve homeostasis. This causes the cell to shrink and shrivel.

The plasma is *isotonic* when it has the same concentration of solute present both within the cell and outside it. This causes the cell to remain in equilibrium, or homeostasis, with water flowing both into and out of the cell evenly.

The plasma is *hypotonic* when it has a lower concentration of a solute present outside the cell than within the cell. Water flows into the cell as it attempts to achieve homeostasis. This causes the cell to bloat and burst.

A group of scientists is attempting to create synthetic plasma for hospital patients in need of transfusions. They realize a certain solute is key in the development of this synthetic plasma and use an initial set of solutions to approximate the amount of solute necessary for blood cells to achieve homeostasis. The composition of the four solutions (A, B, C, and D) in ppm (parts per million) are found in Table 1.

Table 1

Solution	Solute concentration (ppm)
Solution A	980
Solution B	1,150
Solution C	1,245
Solution D	1,350

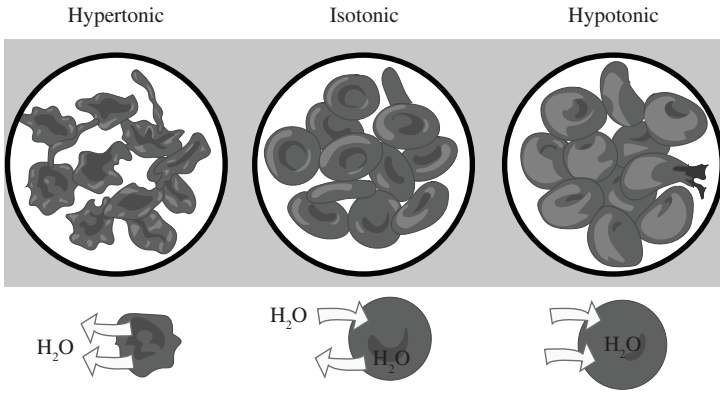

Figure 1

17. If a cell is placed within a hypertonic solution, it will shrink and shrivel because:

A. water flows into the cell.
B. water flows out of the cell.
C. solutes flow out of the cell.
D. solutes flow into the cell.

18. If a cell is placed in an isotonic solution, it will remain in homeostasis because:

F. water flows into and out of the cell.
G. solutes flow into and out of the cell.
H. solutes flow into the cell, and water flows out of the cell.
J. solutes flow out of the cell, and water flows into the cell.

19. Which of the following solutions will best maintain homeostasis for a blood cell with a solute concentration of 1,250 ppm?

A. Solution A
B. Solution B
C. Solution C
D. Solution D

20. If a blood cell with a solute concentration of 1,250 ppm is placed within Solution B, the plasma will be which type of tonicity compared to the cell, and how will this affect the cell?

F. Hypertonic; it will shrink and shrivel.
G. Hypertonic; it will bloat and burst.
H. Isotonic; it will remain in homeostasis.
J. Hypotonic; it will bloat and burst.

21. If a blood cell with a solute concentration of 1,250 ppm is placed within Solution A, which type of tonicity will occur, and how will this affect the cell?

A. Hypertonic; it will shrink and shrivel.
B. Hypertonic; it will bloat and burst.
C. Isotonic; it will remain in homeostasis.
D. Hypotonic; it will bloat and burst.

22. Suppose one of the scientists has a blood sample from a patient but only needs a sample of the plasma. She places the blood sample in one side of a U-shaped tube, separated from the other side of the tube with a semipermeable membrane through which the blood cells cannot pass. She uses a device to produce slight pressure on the filled side of the tube and watches the plasma flow through the semipermeable membrane to the other side, which increases the concentration of the remaining plasma. This process causes the remaining plasma in the blood sample to be which type of tonicity compared to the blood cells?

F. Hypertonic
G. Hypotonic
H. Isotonic
J. The type of tonicity cannot be determined.