Application Questions Osmosis and Plasmolysis

1. Why do grocery store owners spray fresh fruits and vegetables with water?

    Creates a hypotonic environment. the water enters the vegetables and the vegetables plump up.

2. Roads are sometimes salted to melt ice. What does this do to plants along the roadside and why? The excess salt creates a hypertonic environment. the water exits the plants and helps the ice melt.

3. If a shipwrecked crew drinks sea water, they will probably die. Why?

    Sea water is high concentration of salt. the salt water creates a hypertonic environment which forces water to leave the human's cells.

4. If a bowl of fresh strawberries is sprinkled with sugar, a few minutes later the berries will be covered with juice. Why?

    the sugar created a hypertonic environment which forced the water to exit the strawberries

5. You decide to buy a new fish for your freshwater aquarium. When you introduce the fish into its new tank, the fish swells up and dies. You later learn that it was a fish from the ocean. Based on what you know of tonicity, the most likely explanation is that the unfortunate fish went from a(n) __hypertonic__ solution into a(n) __hypotonic__ solution.

6. The concentration of solutes in a red blood cell is about 2%. Sucrose cannot pass through the membrane, but water and urea can. Osmosis would cause red blood cells to shrink the most when immersed in which of the following solutions?
   a. a hypertonic sucrose solution
   b. a hypotonic sucrose solution
   c. a hypertonic urea solution
   d. a hypotonic urea solution
   e. pure water

7. If the volume of a cell increases when it is placed in a solution, that solution is said to be _____ to the cell.
   a. hypertonic
   b. isotonic
   c. hypotonic

8. A 0.9% NaCl solution is isotonic to red blood cells. Which of these describes the results if red blood cells are placed into a 9% solution of NaCl?
   a. They will burst.
   b. They will shrink.
   c. Nothing will happen.
   d. They will expand but not burst.

9. Flasks X, Y, and Z contain solutions with different concentrations of the solute NaCl as follows:
   Flask X has 0.5% NaCl
   Flask Y has 0.9% NaCl
   Flask Z has 1.5% NaCl
   Red blood cells (0.9% NaCl) will be placed into each flask. Predict what will happen to the blood cells in each of the flasks.

0.9 in 0.5   RBC in Flask X will _swell_ because the water will move _into RBC_
0.9 in 0.9   RBC in Flask Y will _remains same_ because the water will move _back-in-forth RBC_
0.9 in 1.5   RBC in Flask Z will _shrink_ because the water will move _out of RBC_