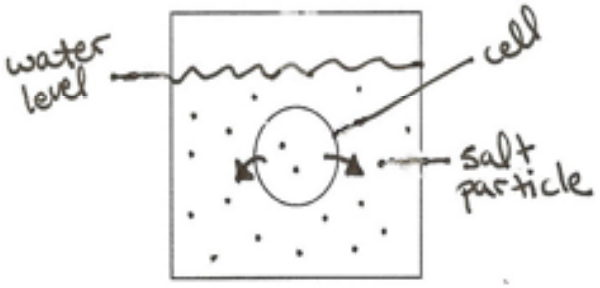
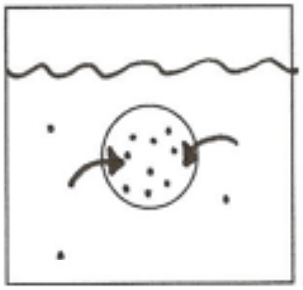
Background Information – read and study diagrams

Small molecules move in and out of cells by diffusion through the cell membrane. They will slip through little holes in the cell membrane. Cells also contain and need large molecules such as salt. Large molecules are too big to fit through the holes in the cell membrane so water will move in or out of the cell to try and even out the proportion of water and large molecules inside and outside of the cell. If cells are placed in salt water that has more salt than the cell then water will diffuse (move) out of the cell. If cells are placed in salt water that has less salt than the cell then water will diffuse into the cell.

Examples:

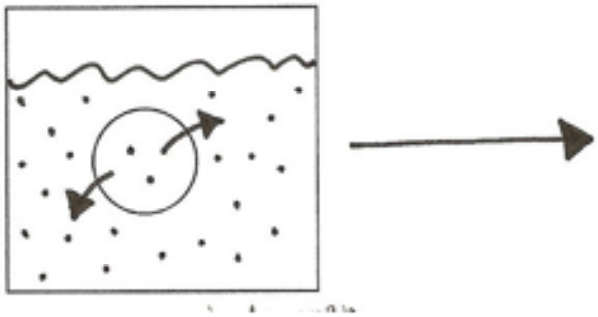


If there is more salt in the water than in the cell, water will diffuse out of the cell.

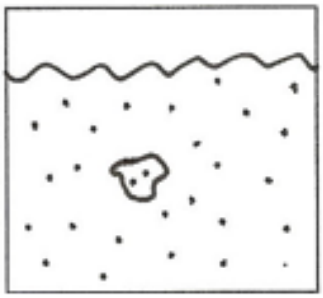


If there is more salt in the cell than in the water, water will diffuse in to the cell.

If an animal cell is placed in salty water then water will diffuse out of the cell. If too much water diffuses out of an animal cell then it will shrivel up.



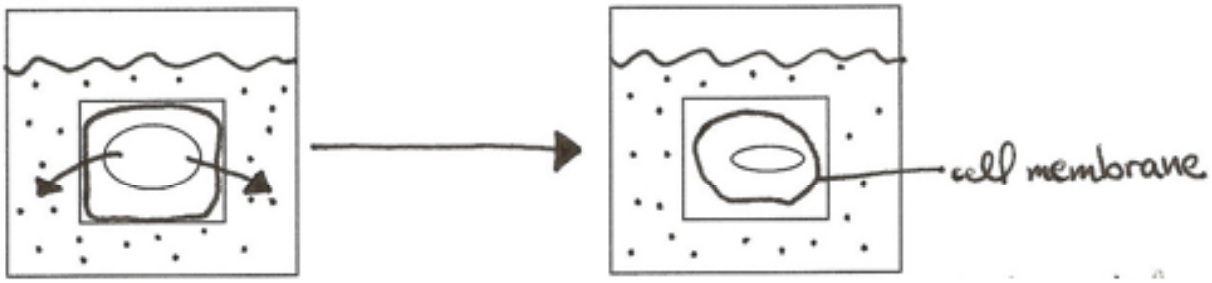
Water moves out to even out the concentration.



As animal cells lose water they begin to shrink and lose their shape.

If a plant cell is placed in salty water then water will diffuse out of the cell. If too much

water diffuses out of a plant cell the central vacuole will shrink and the cell membrane will pull away from the cell wall, but the cell will not shrivel because the cell wall holds its shape. This makes plants wilt or feel soft.



Water moves out to even out the salt concentration.

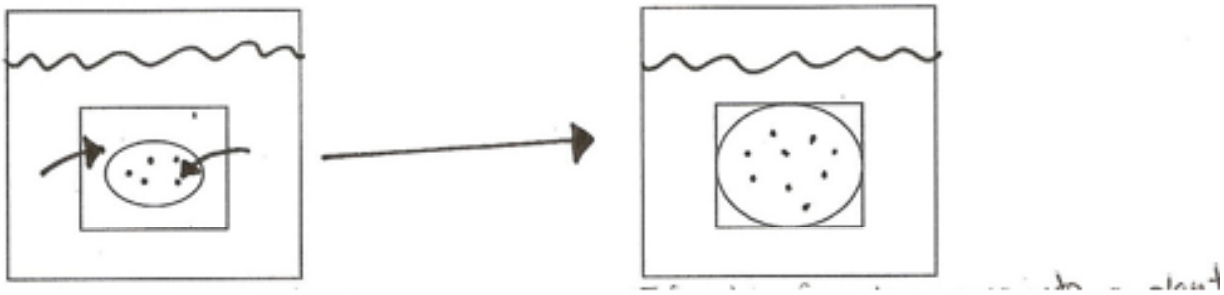
As a plant cell loses water its central vacuole shrinks and its cell membrane pulls away from the cell wall

If an animal cell is placed in fresh water some water will diffuse into the cell because all cells contain some salt. If too much water diffuses into an animal cell it will burst.

Water moves into even out the salt concentration.

If too much water moves into an animal cell it will burst.

If a plant cell is placed in fresh water some **water will move into the cell** because all cells contain some salt. If a lot of water diffuses into a plant cell the central vacuole will fill up and push against the cell wall, making it firm. The cell wall prevents it from bursting.

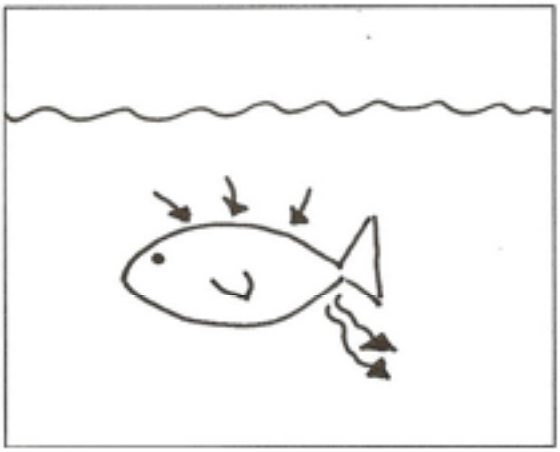


Water moves and evens out the salt concentration.

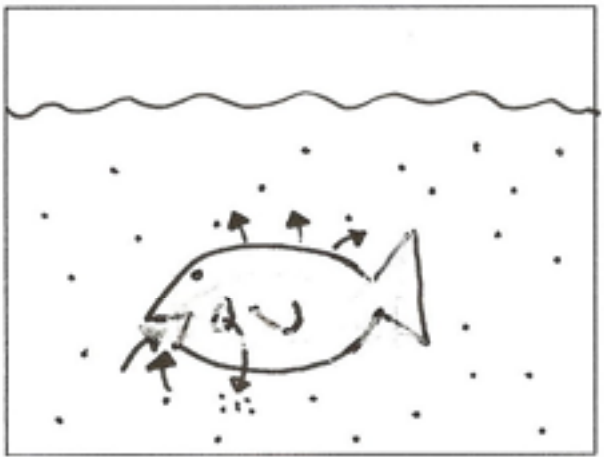
If a lot of water moves into a plant cell, the central vacuole will fill up and push against the cell wall.

Osmosis causes some problems for aquatic organisms. Water is constantly moving into the

cells of organisms that live in freshwater. Most freshwater organisms have adapted to osmosis by excreting most of the water that enters their cells in their urine. Saltwater organisms have the opposite problem. Water is constantly moving out of their cells. To compensate most salt water fish will drink large amounts of water and have special glands that secrete the excess salt that they drink with the water. Crabs, shrimp, and lobster have the same amount of salt in their cells as the water they live in.



Water continually moves into the cells of freshwater fish and is excreted in their urine



Water continually moves out of the cells of some saltwater fish so they constantly drink water and secrete salt from special glands.

Name_____Period_____

Osmosis in cells

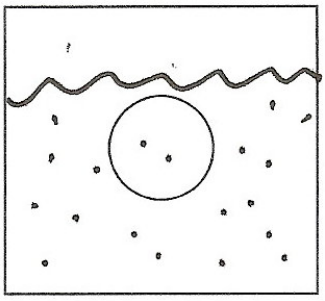
Use your textbook, notes, or prior knowledge to define the words below.

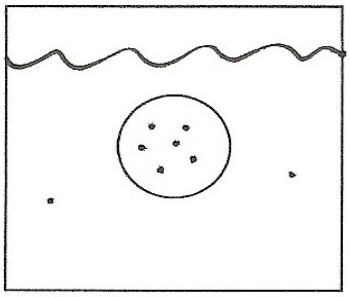
Diffusion:

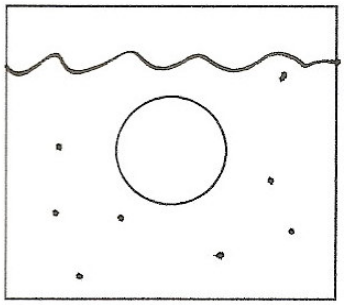
Osmosis:

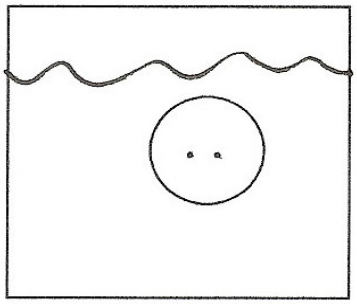
Directions: Use the information from the reading to complete the problems below.

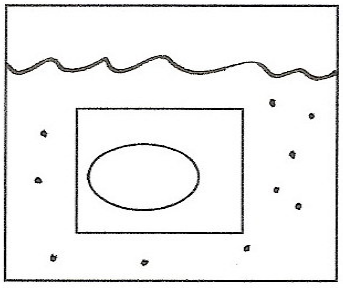
1-6 Draw arrows in each of the pictures below to show whether water will move in or out of the cell. Write under each picture what is happening.

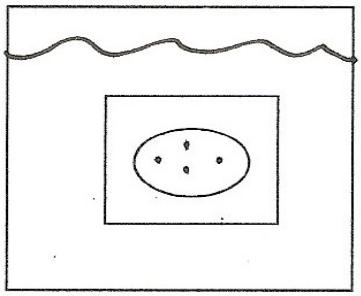
1. 

2. 

3. 

4. 

5. 

6. 

7-13 Answer the following questions using complete sentences.

7. Explain what happens to plant cells that are put in really salty water.

8. Explain what happens to animal cells that are put in really salty water.

9. Explain what happens to plant cells that are put in fresh water.

10. Explain what happens to animal cells that are put in fresh water.

11. Why don't plant cells burst if a lot of water diffuses into them?

12. Salt water crabs have the same proportion of salt in their cells as the water that they live in. Considering this, what would happen to the cells of a crab if you put it in fresh water, why?

13. What would happen to the cells of a freshwater fish if you put it in salt water, why?