Egg-speriment with a Cell: Diffusion and Osmosis

Cells and Organelle function

Objective

 Model and explain the process of osmosis and diffusion through the cell membrane with an egg

Problem

 How do different liquids affect the weight of an egg?

Hypothesis

If an egg is soak in different liquids, then the weight of the egg will

Finish the sentence with what you think may happen to the egg in different liquids.

Materials

- Egg
- Large and small cups
- Vinegar
- Scale
- Beaker
- Blue water, salt water, or water

- 1. Pour <u>**150**</u> mL of vinegar into the cup, write your class period and table number on the cup
- 2. Measure the weight (g) of the egg CAUTION: BE DELICATE WITH THE EGG SO IT DOES NOT BREAK!
- 3. Record measurements and observations in the data tables
- 4. Place the egg in the cup
- 5. Place the cup in the bin labeled with your table number

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6. After 24 hours, pull out and rinse the egg7. Repeat steps 2 - 5

- 8. After 48 hours, pull out and rinse the egg and repeat steps 2 – 3
- 9. Fill beaker with <u>**150**</u> mL of water, blue water, corn syrup, or salt water as directed by your teacher
- 10. Repeat steps 4 5

Can anything enter the cell through the cell membrane?

- The cell membrane is <u>selectively</u>
 <u>permeable (small gaps/holes)</u>.
- Some molecules <u>can cross</u> the membrane while others <u>cannot</u>.



Diffusion and Osmosis

- How do molecules, like oxygen, enter the cell without using energy?
- Molecules can <u>move across</u> the <u>cell membrane</u> through <u>gaps</u> in the membrane using <u>no energy</u>.
- Molecules move from <u>high concentration</u> to <u>lower</u>
 <u>concentration</u> through <u>gaps</u> in the cell membrane



- 11. Obtain your egg and carefully dump the water out and wash your egg.
- 12. Turn on scale and zero the small cup.
- 13. Carefully put the egg into the small cup and weigh the egg and record your weight in the provided table for the correct liquid
- 14. Write down your observation of what happened to your egg
- 15. Look at other groups eggs and write down an observation for the other liquids your group did not test.
- 16. In the egg weight table, write an arrow to indicate whether the egg increased or decreased weight or an = to indicate their was no change in weight.

Diffusion and Osmosis What are the two ways materials enter the cell?

 Diffusion – movement of molecules from <u>higher</u> concentration to <u>lower</u> concentration



 Gases like <u>oxygen</u> and <u>carbon dioxide</u> enter and leave the cell through diffusion

Diffusion and Osmosis What are the two ways materials enter the cell?

• <u>Osmosis</u> –

movement of <u>water</u> from higher concentration to lower concentration through a <u>semi-</u> <u>permeable</u> <u>membrane</u>



Diffusion and Osmosis Are there different stages of osmosis and diffusion in a cell?

Isotonic

 Cell is at balanced where equal water enters and leaves the cell through the cell membrane



Diffusion and Osmosis Are there different stages of osmosis and diffusion in a cell?

Hypotonic

- Cell swells because more water enters through cell membrane than leaves
- Over-hydrated



Diffusion and Osmosis Are there different stages of osmosis and diffusion in a cell?

Hypertonic

- Cell shrivels
 because too much
 water leaves the
 cell through the cell
 membrane
- Dehydrated

