

Going With The Flow: Diffusion & Osmosis

WebQuest Description: This WebQuest will help you better understand the processes of Osmosis and Diffusion by project-based learning.

Grade Level: 9-12

Curriculum: Science

Keywords: Osmosis & Diffusion project-based learning

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Introduction

We know that the human body is made of 70-80% water, but how does it move in and out of our cells? Is it pushed...is it pulled? Does it flow freely through holes? What happens when other substances are present, like salt and calcium? What would happen if osmosis stopped? Do we die?

Tasks

You've been hired to draw a comic for a major convention called "Bio-Con". They've told you that in celebration of National Osmosis Week, they want you to draw a comic that illustrates osmosis. If your comic gets nominated for an award, you will get two tickets to the convention to meet your favorite scientists. In order to make this happen, follow the WebQuest to learn all you can about osmosis, then begin drawing your comic illustrations applying the processes you just learned. Make sure your comic is entertaining and scientifically correct! Goodluck!

Process

Buckle Up...Here we go!!
Phase I: Sign onto your computer and open internet explorer
Browse all of the websites in the following list
Choose two of the websites that make the most sense to you, and use those sites to take notes of the concepts you just learned. (Make sure you let me know which websites you decided to choose)
<http://dl.clackamas.edu/ch105-03/osmosis.htm>
<http://alienryderflex.com/osmosis/>
http://www.mhhe.com/biosci/esp/2001_saladin/folder_structure/le/m5/s3/index.htm
http://www.chem4kids.com/files/matter_solution.html
Phase II:
4. Watch all of the following videos, then choose three that make the most sense to you in order to complete the questions in this phase.
<https://www.wisc-online.com/learn/natural-science/life-science/ap11003/the-cell-passive-transport-osmosis>
https://www.youtube.com/watch?v=z_u0QRsZMbkh
<https://www.youtube.com/watch?v=laZ8MtF3C6M>
<https://www.youtube.com/watch?v=HqKILm2Mjkl>
5. After watching the videos, complete the following questions in your own words
What is osmosis? What is diffusion? What is the difference between the two? In terms of energy used? In terms of solute and solvent? In terms of whether or not a membrane is needed? What is a concentration gradient? Give an example. Is water always a solvent? Why or why not? Show what you know!
Phase III:
6. Watch the following animation, and when you feel ready to take the quiz, take it and print out your results page!
http://highered.mheducation.com/sites/0072495855/student_view0/chapter2/animation__how_osmosis_works.html
Bringing it all together...
Phase IV:
7. Once you have completed all the steps in phase I through phase III, you may choose to work with two people to construct your comic illustrations. (Your group must have a maximum of 3 people, including yourself. No more or less).
8. As a group, you may construct your own comic story about osmosis. It must include information from the videos, animations, and notes that you made.

Evaluation

Students used the correct number of sources per phase: 3 points
Students took appropriate notes on all 5 documents chosen: 15 points
Students answered the questions from Phase II correctly: 24 points (8 questions, 3 points per question)
Students printed out their quiz results from Phase III: 8 points
Students constructed a comic that correctly illustrates the process of osmosis & diffusion: 25 points
The comic illustrated contains terms learned throughout the WebQuest and demonstrate target understanding of the concepts: 25 points
25 points
25 points

Category and Score					Score
				Total Score	

Conclusion

At the end of the webquest, students will have: Completed reading from several sources about the concept of Osmosis & Diffusion
 Taken detailed notes on their reading
 Viewed videos regarding osmosis
 Answered questions about the videos they viewed
 Worked in groups to summarize the information they learned and applied
 Used their knowledge to make a fun comic about osmosis
 Completed a multi-day information exploration using reliable internet resources
 Followed instructions (both in writing and on a rubric) and compiled data in order to come to appropriate scientific conclusions
 Completed and turned in evidence of their learning experience

Teacher Page

This WebQuest will take at least 4 days to complete. It contains four phases and each phase will take at least one day to complete if they are doing it in-class. Otherwise, it could take less if it is assigned as homework.

Standards

CLE 3210.1.5 Compare different models to explain the movement of materials into and out of cells.

Check for Understanding:

93210.1.7 Design and conduct an experiment to investigate the effect of various solute concentrations on water movement in cells.

93210.1.8 Analyze experimental data to distinguish between active and passive transport.

State Performance Indicators:

SPI 3210.1.7 Predict the movement of water and other molecules across selectively permeable membranes.

SPI 3210.1.8 Compare and contrast active and passive transport

Credits

Credit goes to Ms. Kristen Knickerbocker from Michigan State University

Other