BSC 307 Contextual Teaching Lesson Plan

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| **Title:**  Help, it’s too crowded in here! Where can I go? | **Grade Level:**  9th |
| **Objectives:**  Students will observe the affect of concentration on rate of diffusion.  Students will be able to determine the relative concentrations of the iodine solutions used. | |
| **Illinois Learning Standards:**  Stage H 12.A.2: Apply scientific inquiries or technological designs to correlate the basis of cellular and organism reproductive processes, correlating possible genetic combinations to the type of reproductive process, diagramming and comparing mitotic and meiotic cell division, or distinguishing asexual and sexual (egg, sperm and zygote formation) reproduction with examples. | |
| **Academic Language Demands:** beaker,diffusion, osmosis, facilitated diffusion, iodine, cornstarch, cell membrane, cell wall, molecules, concentration, lipid bilayer, protein channel, equilibrium, isotonic, hypertonic, hypotonic, active transport, endocytosis, phagocytosis, pinocytosis, exocytosis | |
| **Engagement:**  Students are first shown three beakers of different concentrations of solutions with a plastic bag representing a cell membrane inside each beaker. Students will then hypothesize how concentration will affect diffusion of material through a membrane. The students are then shown three more beakers of different concentrations of solutions. | |
| **Exploration**:  Once all students have seen the six beakers, it is their job to solve the problem: How does the concentration of a substance affect its diffusion through a membrane. In small lab groups, they will first note any color changes to the starch and iodine solutions. The greatest color change will help them see which concentration had the most diffusion. The students will then make a drawing to show the direction in which molecules diffused through the membrane in this experiment. They will also answer questions on the handout about the experiment. | |
| **Explanation:**  Here we will regroup as a class to discuss the lab and answer any questions that arose. We will go over the handout question by question to make sure all students understand the concepts. This is the students’ time to ask questions about the lab or any questions they might have missed. Students are always welcome to help one another through a problem too. | |
| **Extension:**  Students will be given a homework assignment to figure out whether or not the temperature of the starch and iodine would play a role in the speed of diffusion. They will use their knowledge gained from this lab, and any outside resources for help, i.e. their textbook, the internet, library books, etc. This will be done in a short write up of their answer, maybe 5-7 sentences about it, and how they came up with that answer. | |
| **Evaluation(Assessment Strategies):**  Students will be assessed in part on their answers to the questions from the explore segment, this will occur during which each group will present their findings. Students will also be assessed based on their write up to the question from the extension portion. | |
| **Rationale:**  This lab will provide students will a better understanding of what diffusion actually is, they can see it take place right in front of them. While they might not know what they are seeing at first, this lab will get them to think about what is actually going on. They will first observe a color change, and write down their observations. From there they must draw the direction of movement of molecules through diffusion. Then there are questions that entail higher order thinking. This lesson is in line with standard stage H 12.A.2. | |
| **Resources:**  Illinois State Board of Education. (1997). Illinois State Learning Standards. [On-  line]. Retrieved on March 5, 2012. Available:  <http://www.isbe.net/ils/Default.htm>.  Movement Across the Membrane (Diffusion). [On-line]. Retrieved on March 5, 2012. Available: <http://mypages.iit.edu/~smile/bi9508.html> | |