

Niya Clark

High School Biology Teacher

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Engaging Students below Grade level in High School Biology

Abstract:

Traditionally students are given copious amounts of information through power-point lectures during hour long class periods. This method typically leads to lack of student engagement as well and very low retention rates. In this action proposal, students will be a part of a kinesthetic classroom. The focus switches from a teacher led classroom to a more hands on student led classroom. This will be accomplished with more laboratory activities. During this research, the students will be assessed through quantitative and qualitative methods in order to determine the effect of student engagement on content retention.

Rationale:

In the past students have been have limited success in high school level Biology due to the level of rigor. Often times, students will shut down if the tasks they are asked to complete seem too dry or complex. If the instruction iss changed from traditional approach to an alternative, hands-on, approach students will retain more information (Rajshree S. Vaishnav). The students will be assessed qualitatively for their level of comprehension at the end of the unit lesson.

Intervention: There will be lab exercises that are implemented pertaining to the cell structures and their functions. The students that are the main focus during this time will be the students who are performing below grade level. Normally, the topic is taught through lectures and PowerPoints. The lab component is also, typically, no more than one day. The lab will now be longer and taught through connections to diseases, rather than simple lecture.

Data collection and analysis:

Throughout the course of the year the assessments will be both quantitative and qualitative. At the beginning of the school year the students will be given a standardized test in order to determine the level they are at before the course begins. At the end of the course, the students will be given the same test in order to exam their progress. Throughout the year, the students will be given concept maps before and after the units, in order to monitor their progress throughout the schools year.

Connections to CATALySES summer institute:

The *Mouthful of Microbes lab* will be used with a few adjustments to suit a regular Biology class. The locker materials will be utilized in order to perform the lab.

Literature cited: Rajshree S. Vaishnav. March 2013. LEARNING STYLE AND ACADEMIC ACHIEVEMENT OF SECONDARY SCHOOL STUDENTS. Voice of Research Vol. 1 Issue 4

Permissions:

The principal will need to verify if the students can grow their mouth cultures. The plates will not be opened after the cultures are plated. It needs to be verified if this is acceptable.

SINGLE LESSON PLAN

Teacher: Niya Clark

Content Area/Grade: Biology 1

Date: 6/30/17

Unit Name: Cells and Cell theory

Unit Goal

What unit goal does this daily lesson address?

In this lesson, the students will make observations to determine the difference between the appearance of a eukaryotic and a prokaryotic cell

Standard(s)/Benchmark(s)

What standard(s)/benchmark(s) does this daily lesson address?

SC.912.L.14.3 Comparing prokaryotes and eukaryotes

Students will understand that...

What should the students understand by the end of today's lesson?

The students should understand that the cells appearance, internally and externally, can tell us a great amount about the cell. The cells appearance helps to further classify the cells based on their function. This can help scientists determine treatments for the cells present in the diseases they were presented with

Essential Questions

What essential question(s) does this lesson address?

What does the cell structure tell us about the cell?

Connecting Concepts

How will you review yesterday's content and connect today's lesson to it?

The previous lesson was on 2 different illnesses caused by 2 different types of cells. The students will have looked up the similarities and differences of the cells in the textbook. Today they will see some of those differences using microscopes

Organizing Students for Learning

How will students be organized today for the lessons activities?

The scholars will be paired in groups of 2 for this lab

LEARNING EXPERIENCES, INSTRUCTION AND RESOURCES

What activities or experiences (from your Unit Plan) will students engage in today?

Lesson Sequence

Activating Prior Knowledge

The students will have been presented with photos of diseases that are caused by different types of cells. This is used to get the students to ask questions and figure out what exactly is causing the 2 abnormal skin conditions that they see.

- ABC Brainstorming
- KWL
- Anticipation Guide
- Card Sort
- Think-Pair-Share

Explicit Instruction

I will demonstrate how to count the cultures. I will also set up a microscope in the front of the room so they can see how they should properly adjust the microscope and handle their cultures.

- Motivational Hook
- Lecture
- Demonstration
- Note-taking Guide

| Lesson Sequence | | | Resources and Materials |
|---|--|--|--|
| Group Processing of New Information | The students will share what they observed with each other. As a class, we will also discuss what was seen in the lab. | <input type="checkbox"/> Jigsaw <input type="checkbox"/> Reciprocal Teaching <input type="checkbox"/> Concept Attainment <input type="checkbox"/> Think-Pair-Share | <input checked="" type="checkbox"/> Lab / Inquiry Activity <input type="checkbox"/> Computer <input type="checkbox"/> LCD Projector <input checked="" type="checkbox"/> Paper <input checked="" type="checkbox"/> Pencils <input type="checkbox"/> Whiteboards <input type="checkbox"/> Markers <input type="checkbox"/> Butcher Paper <input type="checkbox"/> Response Cards <input checked="" type="checkbox"/> Post-it Notes <input type="checkbox"/> Video Clip(s): <input type="checkbox"/> Website(s): <input checked="" type="checkbox"/> Lab Materials: Microscopes Previously prepared slides Previously prepared agar plates |
| Elaborative Questioning | The questions are incorporated in the lab. They will be answered in pairs on the lab paper | <input type="checkbox"/> Inferential Questions <input type="checkbox"/> Analytic Questions <input type="checkbox"/> Philosophical Chairs | |
| Demonstrating Understanding | At the end of the activity, the students will be asked to draw a concept map, the same as they were before the lesson. | <input type="checkbox"/> Graphic Organizers <input type="checkbox"/> Picture Notes <input type="checkbox"/> Flow Charts <input checked="" type="checkbox"/> Concept Maps <input type="checkbox"/> Mnemonics <input type="checkbox"/> Graffiti | |
| Reflection | As an exit ticket, there is a wall of sticky notes that the students use to put what “stuck” with them from the day’s lesson. This is a way to monitor how much of the topic they’re grasping. | <input type="checkbox"/> Reflective Journals <input type="checkbox"/> Think Logs <input checked="" type="checkbox"/> Exit Ticket (Student Learning) | |
| Daily Progress Monitoring Assessment | At the beginning of every class, the students are given a short quiz over the topic that was covered the previous day. | <input checked="" type="checkbox"/> Quiz <input type="checkbox"/> Journal <input type="checkbox"/> Exit Ticket (for Content) <input type="checkbox"/> Response Cards | |
| <p>Based in the results from your Daily Progress Monitoring Assessment, what concepts need to be revisited in the next lesson?</p> <p>The topic of today will focus more on the appearance of the cells, but won’t necessarily go into great detail about the function. The next lesson will go into more detail about what the cell parts actually do.</p> | | | <p>Homework Choose one cell organelle, either from prokaryotes or eukaryotes, and write down 3 facts about that organelle.</p> |