Student Learning Plan - utilizing PDSA Model
(Technology Integration when applicable)

Instructor: Lauren Huntington **Date(s):** 11-12-14 **Grade Level:** 8

PLAN:

Concept/Topic to Teach: Cell structure and function

Common Core Content Standards/Benchmarks addressed:

SC8.1.1
Levels of Organization in Living Systems: Students model the cell as the basic unit of a living system. They realize that all functions that sustain life act within a single cell and cells differentiate into specialized cells, tissues, organs, and organ systems

SC8.2.3
Students clearly and accurately communicate the result of their own work, as well as information obtained from other sources.

SC8.2.4
Students recognize the relationship between science and technology in meeting human needs

SC8.3.1
Students explore the nature and history of science.
• Students explore how scientific knowledge changes and grows over time, and impacts personal and social decisions.
• Students explore the historical use of scientific information to make personal and social decisions.

SC8.3.2
Students explore how scientific information is used to make decisions.
• The role of science in solving personal, local, and national problems.
• Interdisciplinary connections of the sciences and connections to other subject areas and careers in science or technical fields.
• Origins and conservation of natural resources, including Wyoming examples.

CCSS.ELA-Literacy.RST.6-8.6
Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

CCSS.ELA-Literacy.RST.6-8.9
Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

CCSS.ELA-Literacy.RST.6-8.8
Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

***ISTE Standards-Students* to be addressed**:

3. Research and information fluency

Students apply digital tools to gather, evaluate, and use information.

a. Plan strategies to guide inquiry

b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media

c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks

d. Process data and report results

4. Critical thinking, problem solving, and decision making

Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

a. Identify and define authentic problems and significant questions for investigation

b. Plan and manage activities to develop a solution or complete a project

c. Collect and analyze data to identify solutions and/or make informed decisions

d. Use multiple processes and diverse perspectives to explore alternative solutions

5. Digital citizenship

Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.

a. Advocate and practice safe, legal, and responsible use of information and technology

b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity

6. Technology operations and concepts

Students demonstrate a sound understanding of technology concepts, systems, and operations.

a. Understand and use technology systems

b. Select and use applications effectively and productively

Specific Learning Objective: Students will use what they have learned up to this point in the unit, as well as further research to identify and describe the parts of an animal cell and the parts of a plant cell to %100 efficiency. Students will recognize the similarities and differences between plant and animal cells by building a "foldable" to %100 accuracy. Students will also summarize a reading about the cell pats which will allow them to increase there understanding and vocabulary.

Technology Integration: Using the iPads as research tools allows the students to collect and analyze data from multiple sources to develop a supported conclusion. Students will be able to collaborate to locate, and evaluate information from credible science sources (.gov, .edu, .org). They will select information from appropriate sources to help them identify and define terms correctly. The use of the iPad engages them in expiration of the content and allows them to take responsibility for knowing the information. They will also visit a specific site (http://learn.genetics.utah.edu/content/cells/scale/) to visualize the actual size of cells, and viruses for which they will be reading about.

Assessment(s) to be used: Students will be assessed on the quality of work they put into their definitions in their cell foldables and on their understanding of the cell structures and functions.

Target (performance goal – end of unit): Students will know the structures and functions of different parts of plant and animal cells as well as recognize the similarities and differences between the two to %100 accuracy.

Materials needed - including software/hardware and any technology tools:
Cell Structure/Function reading
iPads with internet access
Pencils/colored pencils
Animal/Plant cell foldable handout
Virus resurrection reading

Key Vocabulary specific to content and technology tool(s)/concepts:

Cell: the smallest structural and functional unit of an organism, typically microscopic and consisting of cytoplasm and a nucleus enclosed in a membrane. Microscopic organisms typically consist of a single cell, which is either eukaryotic or prokaryotic.The building block of life.

Organelle: any of a number of organized or specialized structures within a living cell.

Chloroplast: a plastid that contains chlorophyll and in which photosynthesis takes place.

Cell Wall: a rigid layer of polysaccharides lying outside the plasma membrane of the cells of plants, fungi, and bacteria. In the algae and higher plants, it consists mainly of cellulose.

Vacuole: a membrane-bound organelle which is present in all plant and fungal cells and some protist, animal and bacterial cells.

Cell Membrane: the semipermeable membrane surrounding the cytoplasm of a cell.

Nucleus: a dense organelle present in most eukaryotic cells, typically a single rounded structure bounded by a double membrane, containing the genetic material. The control center of the cell.

Lysosome: an organelle in the cytoplasm of eukaryotic cells containing degradative enzymes enclosed in a membrane.

Ribosome: a minute particle consisting of RNA and associated proteins, found in large numbers in the cytoplasm of living cells. They bind messenger RNA and transfer RNA to synthesize polypeptides and proteins.

Golgi Apparatus: a complex of vesicles and folded membranes within the cytoplasm of most eukaryotic cells, involved in secretion and intracellular transport.

Endoplasmic Reticulum: a network of membranous tubules within the cytoplasm of a eukaryotic cell, continuous with the nuclear membrane. It usually has ribosomes attached and is involved in protein and lipid synthesis.

Mitochondria: an organelle found in large numbers in most cells, in which the biochemical processes of respiration and energy production occur. It has a double membrane, the inner layer being folded inward to form layers (cristae).

Cytoplasm: the material or protoplasm within a living cell, excluding the nucleus.

Centriole: a minute cylindrical organelle near the nucleus in animal cells, occurring in pairs and involved in the development of spindle fibers in cell division.

Chromatin: the material of which the chromosomes of organisms other than bacteria (i.e., eukaryotes) are composed. It consists of protein, RNA, and DNA.

Cytoskeleton: a microscopic network of protein filaments and tubules in the cytoplasm of many living cells, giving them shape and coherence.

Amoeba: a single celled organism

Virus: an infective agent that typically consists of a nucleic acid molecule in a protein coat, is too small to be seen by light microscopy, and is able to multiply only within the living cells of a host.
Simulation: the imitation of the operation of a real-world process or system over time.

DO:

Anticipatory Set (lead in or introduction of content; motivation and engagement of students):
Opener: Students will do the following writing prompt in their interactive notebooks: Utilizing your prior knowledge of how a cell functions, describe the most important organelle found within a cell. Justify your answer. After the opener and reading, a short video that makes an analogy between cells and an office building will be viewed.

Step-by-Step Procedures: (List pg. #, books, etc.; be specific)

THE TEACHER WILL: Lead a discussion about what the students wrote down for their opener.

THE STUDENT WILL: Gain an understanding that all the cell organelles are important to the proper function of a cell.

THE TEACHER WILL: Handout articles about cell organelles and their functions asking the students to take detailed notes about what they think is important.

THE STUDENT WILL: Take 10-15 minutes to read the article and write notes.

THE TEACHER WILL: Ask the students to get with their table partner to compare and share notes from the reading. Write down things they may have missed.

THE STUDENT WILL: Take about five minutes to compare and share notes with a partner.

THE TEACHER WILL: Emphasize the importance of quality note taking skills and if they took good notes this next activity should be cake. Remind the students that last unit they listed their important vocabulary words in their interactive notebooks, but for this unit we're doing things a little different. They already did a foldable for the organization of life, now they will be doing a foldable for plant and animal cells and their organelles. Ask the students why they think we are doing the foldables instead of just writing down their vocabulary?

THE STUDENT WILL: Discuss the differences between the foldables and just listing words and definitions. Realize that foldables not only have the words and definitions but provide a visual connection as well.

THE TEACHER WILL: Demonstrate how the plant/animal cell foldable that they will be getting works and explain that it is similar to a venn diagram. Ask if they know what a venn diagram is. Explain that on the foldable the organelles specific to a plant cell are listed on one side while the organelles specific to an animal cell are listed on the other side. In the middle are the organelles that are present in both plant and animal cells. They are to use their notes, as well as the iPads to write the definition and function under each organelle listed on the foldable. On the picture side, they are to use colored pencils to label and color the organelles. They will have about 30 minutes to work on this.

THE STUDENT WILL: Work independently on finishing their plant/animal cell foldable.

THE TEACHER WILL: Call attention with 10-15 minutes of work time left to let them know where they stand with time. What isn't finished will be homework.
After about 30 minutes of work time, they will be instructed to clean up, put scissors, tape, and colored pencils away. iPads can stay out for the next activity.

THE STUDENT WILL: Put supplies away.

THE TEACHER WILL: Make sure the students understand the differences between plant and animal cells and these differences in their cell structure are what make plants and animals different. Discuss that plants and animals are made up of many cells, but there are organisms that are made up of one single

cell. An example of these organisms are amoebas, which they will look at under the microscope next week. They've been talking about how virus's can penetrate our cells and how we combat them, so they will receive a reading about a giant virus that was found in permafrost. It's similar to the virus article they read last week. Give about 20 minutes to read it. In reality, it will only take 10 minutes to read, but there are a lot of foreign terms in the article so they are encouraged to use the iPads to look up what they don't know when they come across it. They can write down what they look up if they want. They are also encouraged to go to this website http://learn.genetics.utah.edu/content/cells/scale/ to get a visual of the size of things the article is referring to.
THE STUDENT WILL: Read the article, while researching to make sure they really understand the article. Take advantage of the simulation the website provides to gain an understanding of the size of the virus, the size of an amoeba, and the size of our cells.

THE TEACHER WILL: Call attention to the class after they have had a sufficient amount of time to read and understand the article. Ask them to share their thoughts with their table partner. Think about what the facts were, what they liked about the article, how this pertains to what we are learning about with cells, and how it might tie in to what we learned about in the previous unit about ecosystems.

THE STUDENT WILL: Take 3-5 minutes to discuss with a partner and gather ideas.

THE TEACHER WILL: Get the attention of the students and ask them to share their thoughts on what the article was about, what they learned, how it relates to cells, and how it relates to ecosystems. This is their exit ticket for the day as they will tie in the days activities to the objectives from both the previous unit on the ecosystem and the current unit about cells. Ask them if the simulation scale surprised them in any way and if it helped them get a better understanding of how small all these things actually are.

Applications (for students with lower skills – differentiated instruction); look for how technology tools may assist:
Student A: Make sure to clarify instructions.
Student B: Read and clarify instructions. Extra time to complete work.
Student C: Simplify and clarify instructions. Extra time may be needed.
Student D: Read, and re-read directions. Allow wait time to process and respond to directions, questions, and steps given. Give reassurance and positives. Student will work better if positive interactions are happening. Extra time to work on assignments. Give frequent breaks.

Extensions (for students with higher skills – differentiated instruction); look for how technology tools may extend learning: Students who need extensions will be able to participate in a cell simulation game called cell craft at http://www.carolina.com/teacher-resources/Interactive/online-game-cell-structure-cellcraft-biology/tr11062.tr

(next two main sections completed after plan has been taught)

STUDY:

Results – How did students perform? – (includes assessment results) What was the outcome of lesson objectives; is homework/reinforcement and independent practice needed?

The students needed more time to perform tasks than originally planned. I did not want to rush them through just to get to the end of my lesson plan, so we took our time to make sure everybody had an understanding of the tasks and decided to eliminate the final article reading. This was where I had a really neat tech piece integrated, but i was more important for the students to develop and understanding then to rush them through it. The objectives of gathering information on the cell organelles, and then having an understanding to label them and define their functions were met. Those who were not able to finish the cell foldable were given the option to complete it as homework and use it to study for the upcoming quiz. They would get 10 minutes at the beginning of next class to either finish the foldable or review for the quiz. It was up to them.

Video Reflection/Evaluation: What worked?

1. Mobility: For the direct instruction portions of the lesson I remained in the front of the class and did a little bit of pacing. I could have moved around more.
2. Voice: I've been told on multiple occasions that I sometimes speak too quietly. After watching the video, I think the level of my voice has improved. The students were focused during direct instruction and they all can hear me. I noticed that I do annunciate things well and speak slowly during instruction. Some word choice could have been improved when I was instructing the foldable. Instead of saying that plant and animal cells "share" organelles, I should have said that they both have certain organelles that are the same and do the same things. While leading the discussion of the opener, I could have been more thorough in my role as a guide to get them to the correct answer. More elaboration from me about their answers would have been helpful. I feel like I did positively encourage them when they did participate.
3. I talked with my hands just enough to give a little life to the instruction. My eye contact was pretty solid and directed towards the student that was speaking. When I was speaking I made sure to look at everybody. I did lean up against the front table during some of my instruction which didn't necessarily convey confidence.
4. I noticed that when I wasn't talking, I had a tendency to rub my hands together. That is funny because my father does the exact same thing and I find it distracting when he does it. I didn't do it much, but it is something I will be conscious of in the future.
5. This is a chatty group of students. I was actually very impressed with their ability to pay attention to me during direct instruction. There are a few times I could have redirected the class to focus on the task at hand because there were a lot of side conversations happening during collaboration. I tried to monitor them as much as possible in their groups, but I never did call attention to the entire class to get them back on task. I didn't have to address any behaviors while teaching, but one student did a little complaining when they were getting paired together and I had to tell him that I'm calling the shots as far as partners go.

The one thing that could have been improved upon is using the time at the end of class to tie everything back in to the objectives on the board so the students leave class knowing what they did and why they did it.

ACT:

Closure (Reteach/reflections/relevance/review – What needs to happen next? Do certain concepts need to be retaught?

If I would have rushed the class through all the activities we had planned, they would not have comprehended the most important material, so I'm glad we took a step back and eliminated the last part of the lesson. The students seemed to have a good grasp of the cell structure and function at the end of the class period. I believe they are well prepared for the assessment on the content.