

## Lesson Plan for Critical Assignment 1

<b>Teacher:</b> Mrs. Kim Demet	<b>Subject:</b> Life Science
<b>Grade Level:</b> 7	
<b>Lesson Topic:</b> The Basic Units of Life are Cells	<b>Time Required:</b> 1 week
<b>Sunshine State Standards, Benchmarks, &amp; Access Points</b>	
<b>SC.6.L.14.2</b> Investigate and explain the components of the Cell Theory: all organisms are composed of cells (single-celled or multi-cellular), all cells come from pre-existing cells, and cells are the basic unit of life.	
<b>SC.6.L.14.4</b> Compare and contrast the structure and function of major organelles of plant and animal cells, including cell wall, cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria, and vacuoles.	
<b>LA.6.3.1.1</b> generating ideas from multiple sources (e.g., prior knowledge, discussion with others, writers notebook, research materials, or other reliable sources), based upon teacher-directed topics and personal interests. High cognitive complexity rating.	
Cognitive levels for this lesson plan range from low to high.	
<b>Instructional Analysis - Prior Knowledge</b>	
Declarative Knowledge - Students should already know that...	
<ol style="list-style-type: none"><li>1. Living things have characteristics.</li><li>2. Living things have cells.</li><li>3. Living things sense change.</li><li>4. Living things can respond to change.</li><li>5. Living things reproduce.</li><li>6. Living things have DNA.</li><li>7. Living things use energy.</li><li>8. Living things grow and develop.</li></ol>	
Students should already know how to...	
<ol style="list-style-type: none"><li>1. List and describe the characteristics of living things.</li><li>2. Log onto the computers to gain access for the WebQuest.</li><li>3. Cooperate with a small group to benefit from discovery learning and complete tasks.</li></ol>	
Prior to beginning the lesson, the teacher will review the characteristics of living things which will be included in a PowerPoint presentation and administer a quick quiz to assess the level of understanding of both the class and individual students. The quiz does not count for a grade. It is strictly for use of feedback for the teacher to have an idea where the students' strength and weaknesses are in regards to this area of Life Science.	

### **Instructional Analysis – Declarative Knowledge**

In this lesson, students will learn that...

1. All organisms are made up of cells, the cell is the basic unit of all living things, and all cells come from existing cells. (The cell theory).
2. The differences between prokaryotes and eukaryotes.
3. The names and functions of organelles in both plant and animal cells. Also, the similarities and differences between plant and animal cells.
4. All cells have a membrane.
5. Plant cells have a cell wall.
6. The nucleus of a eukaryotic cell contains genetic material called DNA.
7. A ribosome is an organelle in which amino acids are hooked together to make proteins.
8. Endoplasmic reticulum makes lipids that break down substances and packages proteins for the Golgi complex.
9. Mitochondria break down food molecules to make ATP.
10. Chloroplasts make energy from the sun to make food.
11. Golgi complex processes and transports proteins and other materials out of the cell.
12. Vacuoles store water and other materials.
13. Lysosomes digest food particles, wastes, cell parts, and foreign invaders.

### **Instructional Analysis – Procedural Knowledge**

In this lesson, students will learn how to....

1. Compare the similarities of plant and animal cells.
2. Contrast the differences of plant and animal cells.
3. Distinguish the main similarities and differences of plant and animal cells.

**Interdisciplinary connections:** Science/ Language Arts

**Common Misunderstandings or Misconceptions:** The teacher will discuss that the cell theory is a theory, and that theories are not necessarily facts. It will also be discussed that while all cells may be similar, plants and animal cells can be very different.

**Your plan to address these:** The PowerPoint presentation includes the definition of both theory and fact. In addition, the presentation and the Web Quest will provide visual images of all organelles in plant and animal cells, their functions, and the differences and similarities between them.

### **Learning Objectives:**

Knowledge – The student will define the cell theory. The student will write a short essay comparing and

contrasting the prokaryotes and eukaryotes. Using a pencil and a partially labeled chart, the student will list the correct names of the organelles of both plant and animal cells.

Comprehension – Students will illustrate the different parts of plants and animal cells. Students will be encouraged to discuss in small groups their assigned topic for the WebQuest. The students will retrieve information about their topic from the internet and summarize using their own words for an article they will write about their assigned organelles. They will identify the organelle and describe its function and whether it is found in plant or animal cells.

Application –The students will select which website’s information is valuable for their article. The students will decide what information to use and what information not to use, according to their assigned topic. Students will illustrate their assigned parts of the cells by selecting a visual image to go along with their articles.

Analysis –Students will compare and contrast eukaryotes and prokaryotes. Students will compare and contrast plant and animal cell organelles and their functions. Students will analyze the similarities and differences between plant and animal cells and eukaryotes and prokaryotes. Students will use pen or pencil on the unit test to explain these similarities and differences

Synthesis – Students will work in small groups to compose an article that describes their assigned organelle, provide an image of it and a short article describing the function of that part. Students will demonstrate their use of technology by creating an article and visual image in a word document about their assigned organelles. In addition, the class as a whole will take part in compiling the articles into the newsletter and posting it on the class website.

Evaluation – Students will justify why their assigned organelles’ functions are important to the overall existence of the cell. Students will decide in their articles whether or not they believe a cell could survive without a particular organelle.

#### **Learner Analysis:**

1. Age Range & Gender – Boys and girls ranging in age from 11-14 years of age
2. Race – White, Hispanic, African- American, and Asian
3. Socio-economic background – Middle to lower class
4. Learning Style Preferences – visual , kinesthetic , and auditory
5. Disabilities & Exceptionalities – several students will need extended time
6. Motivation – The articles produced by the class will be compiled into an newsletter to be displayed on the class website where other people can appreciate their work.
7. Cognitive Skills – Concrete reasoning, abstract reasoning.

#### **Assessment Plan**

**Formative:**

1. Administer pre-assessment quiz
2. During the WebQuest, the teacher will monitor student's progress while walking about the classroom, assisting students, facilitating learning, discussing the assignment, and listening to the students.
3. The articles will be reviewed by the teacher to be sure the students are on the right track.
4. The homework assignment will encourage the students to find alternate research materials from valid and reliable sources. It will count as extra credit.
5. The blog will be due by Thursday and will be worth 10 points. Students will get feedback from the teacher.

**Summative:** (Describe how will you determine **at the end** of the lesson if students have learned)

1. The articles for the WebQuest will be graded by the use of a rubric.
2. The students will take a unit test about cells that will count for 100 points at the end of the week.

**Instructional Strategies:**

Strategies include a PowerPoint presentation designed to grab the students' attention, review prior knowledge, and introduce the new information regarding the cell theory and plant and animal parts and their functions. Also, during the WebQuest, the students will work in collaborative/cooperative groups to produce an article to be posted on the school website. In addition, during the group work, students will be encouraged to have discussions regarding the different organelles found in cells and their functions. Students will be encouraged to discuss the similarities and differences between the organelles found in plants cells compared to animal cells.

How will you introduce the lesson?

I will start by using a PowerPoint presentation that grabs the students' attention by introducing how Robert Hooke discovered cells in the 17<sup>th</sup> Century with a microscope that he built himself. Hooke named them cells because he said they appeared like little rooms. The presentation will include an innovative website that allows students to play a Jeopardy game that is all about plant and animal cells.

How will you teach concepts during the lesson?

The students will engage in a WebQuest where each team will be responsible for writing their own article to be combined into a newsletter about cells to be posted on the class website. The students will be able to access their work on the internet to show friends and family their final product. The articles will be about the different organelles in plant and animal cells, their function and importance, and a visual image of the organelle. The PowerPoint presentation will be similar to a mini-lecture where the students will be encouraged to take notes. The WebQuest is designed so that the students will engage in both discovery learning and discussion amongst themselves while the teacher walks about monitoring student progress. The WebQuest will also involve interactive games that involve learning cell organelles.

How will you conclude the lesson?

Students will be required to post a blog regarding the differences between plant and animal cells, their parts, and their functions.

Homework assignment for this week is for students to find on their own information about plant and animal cells from a valid and reliable source. There will be a class discussion referring to what kinds of sources on the internet are valid and reliable and why. The homework assignment is due Wednesday and will be an opportunity for the student to earn extra credit toward the unit test on Friday.

**Classroom & Technology Management Strategies:**

To involve students in the lesson, the teacher will ask the students questions before during and after the implementation of the lesson. The questions will allow the teacher to review important information, monitor progress, and keep control of the classroom. The teacher will also indicate what is and is not acceptable blogging behavior. For example, it is fine to comment about other people's blogs, but one must do so in a polite and respectful manner. In addition, during the WebQuest, the teacher will constantly observe each student and every computer to be sure the class is on task without straying from the subject matter.

**Learning Activities:**

During the introduction of the lesson (PowerPoint), students will be encouraged to take notes and ask questions to better enhance learning. The teacher will show the class the section in the textbook which pertains to the cell theory and plant and animal cells. Students will take turns reading particular segments of the text to reinforce learning neural pathways in their brains.

During the lesson, students will participate in a discovery learning process while engaging in the WebQuest. It is designed so that the students find information through websites which are provided by the teacher. These sites are valid, reliable, educational websites designed to engage students in learning process. The students are given the opportunity to work and learn together.

At the conclusion of the lesson, students will be asked to blog about their experience and what they have learned from it. They will also be expected to study for the unit test and describe in a short essay the main differences between plant and animal cells, and the main similarities between plant and animal cells.

**Materials & Resources:**

**Supplies:**

- Notebooks for note taking
- Printed material (Homework)
- Plant and Animal Cell Charts for labeling.

**Technology tools (Software and hardware):**

- Computer Lab
- Internet connection
- Working modem
- Web browser
- Projector for PowerPoint presentation

**URL's you will use:**

<http://waynesword.palomar.edu/lmexer1a.htm>

<http://www.scsc.k12.in.us/SMS/Teachers/Martin/jeopardy.htm>

<http://www.ibiblio.org/virtualcell/textbook/chapter3/chapter3.htm>

<http://www.cellsalive.com/>

[http://library.thinkquest.org/C004535/prokaryotic\\_cells.html](http://library.thinkquest.org/C004535/prokaryotic_cells.html)

**Self-Evaluation:**

## Teacher NETS addressed:

1. Facilitate and Inspire Student Learning and Creativity
2. Design and Develop Digital-Age Learning Experiences and Assessments
3. Model Digital-Age Work and Learning
4. Promote and Model Digital Citizenship and Responsibility

## Student NETS addressed:

1. Creativity and Innovation
2. Communication and Collaboration
3. Research and Information Fluency
4. Critical Thinking, Problem Solving, and Decision Making
5. Digital Citizenship
6. Technology Operations and Concepts

## Strengths:

1. Students learn how to work together for a common goal.
2. Students practice note taking skills for the PowerPoint presentation.
3. Students engage in discovery learning.
4. Many students will enjoy the cell Jeopardy game, and learn about cells at the same time.
5. Students work on writing skills in Science class.

6. Students will assist the teacher combining the articles and posting the finished newsletter on the class website.

Weaknesses:

1. Perhaps the plan could call for printing out of the Newsletter so that each student can keep a copy as a study guide for Final Exam.
2. The teacher might come up with a different product other than the cells newsletter.
3. It may be nice to incorporate an important woman or minority scientist into the lesson.
4. Teacher should incorporate some math into the lesson.

Solutions:

1. Maybe the teacher could attend a future Science workshop to improve upon the lesson plan by incorporating innovative ideas to further engage students in the learning process.
2. Research and find a famous woman or minority scientist associated with cells and remind the class woman and minorities are scientists too.
3. The lesson plan could call for the students calculating the surface area of a cell.