

Differentiated Instructional Unit

Instructor Name: Terra Larson

Lesson Title: Cells of Plants and Animals

Grade(s): 6th -8th Grades

Subject and Standards Addressed:

Subject: Life Science

Standards:

MS – LS1 – 2: Develop and use a model to describe the function of a cell as a whole and ways parts of the cells contribute to the function. _____

Time:

Classroom hours used to implement this unit: 5-10 hours dependent on the abilities of the students.

Short Description of Unit:

This unit will teach the function of a cell and how each part of the cell contributes to the function. Both plant and animal cells will be taught along with the major parts of each type of cell. The lesson will be differentiated by student level and by using multiple intelligences. It will also give students a chance to learn not only in a normal classroom setting but also through the students own research through the projects completed at the end of the unit.

Needs Assessment/Rational: *Describe the qualitative and/or quantitative information that you used to determine the "real needs" of the students in your classroom.*

Students will take a pre-test on the information and vocabulary terms that will be taught in the unit. A variety of question will also be asked during the days leading up to the unit to understand the student prior knowledge of the information being covered in the next unit. This prior knowledge will depend on how long the unit will take and how much in-depth the teacher should go into the information.

Equipment/Materials Needed:

- Video on Plant and Animal cells
 - Example: <https://www.khanacademy.org/science/biology/structure-of-a-cell/cytoskeleton-junctions-and-extracellular-structures/v/overview-of-animal-and-plant-cells>
- Books on cells in different reading levels

- Dependent on what project the student(s) choose to complete.
 - Underlined materials will need to be provided by the students
- 1. Paper
 - a. Technology and resources for researching information and typing the paper
- 2. Presentation
 - a. Technology and resources for researching information and creating the presentation
 - i. Presentation can be on PowerPoint or on poster board
- 3. Skit/Play
 - a. Technology and resources for researching information and writing the script
 - b. Props and/or set
 - c. Costumes
- 4. Model
 - a. Technology and resources for researching information
 - b. Any material needed to create the model
 - i. Teacher may have some materials students could use or have access to getting materials
- 5. Song/Music Video
 - a. Technology and resources for researching information
 - b. Program for creating a video
 - c. Technology for video taping
 - i. Can be done on a cell phone, if students does not have one the teacher will provide technology to the student(s)

Enduring Understandings or Goals: *When you formulate the enduring understanding, address the question: "What do I want the students to understand long after they leave my classroom?" (Enduring understanding), or list the student learning goals which are the broad, generalized statements about what the students will learn.*

Students will be able to define the parts of a cell and their functions.

Students will be able to compare and contrast plant and animal cells and their functions.

Students will be able to choose from a variety of options to complete an original work to the best of their abilities.

Essential Questions or Objectives:

How do the parts of a plant cell contribute to its function? How do the parts of an animal cell contribute to its function? How do plant cells compare to animal cell?

Assessment: *Describe the multiple assessments (formal or informal) that were used to determine that the students reached an understanding. The following questions may guide you:*

1. *What academic prompts (open-ended questions or problems that require students to think critically and then to prepare a response/product/performance) provided evidence of student understanding?*

2. *What performance tasks and projects (complex challenges that are authentic, mirror the real world, and require a performance or product) provided evidence of student understanding?*

3. What other evidence (e.g.: observations, work samples, dialogues, student self-assessment) of understanding were collected?

Students will be assessed formatively by their answers to questions, their knowledge of the information given on worksheets and exit slips filled out by each student at the end of each class.

The summative assessment will be at the end of the unit when students create a project to demonstrate their knowledge of the information.

Each project will be assessed on a 50 point bases and the categories on which students will be graded on will be different depending on their choice of project.

1. Paper

- a. Content 10pts
 - i. All required information is provided within the paper with clarity
 - ii. The paper is focused on answering the essential question
- b. Organization 10pts
 - i. Paper is organized with logical sequencing of information and paragraphs
 - ii. Paper includes an introduction, body paragraphs, and a conclusion
- c. Thesis Statement 10pts
 - i. A thesis statement is included in the introduction
 - ii. The statement is clearly and concisely stated
- d. Mechanics 10pts
 - i. Paper has no errors in spelling, grammar, or punctuations
- e. Citations 10pts
 - i. All information and pictures are cited with a cohesive format
 - ii. A works cited page is included at the end of the paper

2. Presentation

- a. Content 10pts
 - i. All required information is provided within the presentation
 - ii. Presentation answers the essential question and all information given pertains to the answers
- b. Organization 10pts
 - i. Information is presented in a logical sequence of information an includes a thesis statement
 - ii. Presentation includes an introduction, information that is connected to the thesis, and a conclusion
- c. Presentation 10pts
 - i. The presentation has a natural flow
 - ii. The student practiced the presentation before hand
- d. Effectiveness 10pts
 - i. The presenter kept the audience engaged by being excited about the information being presented
 - ii. The use of pictures, visual, videos, etc. was effective in adding to the presentation
- e. Citations 10pts
 - i. All information, pictures, videos, etc. are cited with a cohesive format
 - ii. A works cited page shown at the end of the presentation

3. Skit/Play
 - a. Content 10pts
 - i. The skit answers the essential question and all required information is provided within the skit
 - ii. The skit has a clear thesis and all information given pertains to the thesis
 - b. Organization 10pts
 - i. Information is presented in a logical sequence
 - ii. Skit includes an introduction, information that is connected to the thesis, and closing
 - c. Presentation 10pts
 - i. The skit has a natural flow
 - ii. The student practiced the skit before hand
 - iii. Actors speak clearly and with an acceptable volume
 - d. Props, Costumes, Actions 10pts
 - i. The skit used props, costumes, and actions to help relate the information
 - ii. Props, costumes, and actions are used with ease and do not hinder the performance
 - e. Citations 10pts
 - i. All information is cited with a cohesive format
 - ii. A works cited page handed in to the teacher after the skit
4. Model
 - a. Content 10pts
 - i. Model answers the essential question
 - ii. All required information is provided within the model
 - b. Organization 10pts
 - i. Information is labeled clearly on the model and in a concise matter
 - c. Presentation 10pts
 - i. Model is presented to the class with ease and so that everyone can see it
 - ii. Model is neatly executed and has evidence of a considerable amount of effort was put into the project
 - d. Creativity 10 pts
 - i. Materials used on model are unique
 - ii. Models are 3D representations of each cell
 - e. Citations 10pts
 - i. All information is cited with a cohesive format
 - ii. A works cited page is turned into the teacher after the model is shown
5. Song/Music Video
 - a. Content 10pts
 - i. The essential question is answered throughout the song
 - ii. All required information is provided within the song or music video
 - b. Organization 10pts
 - i. Information is clearly stated during the song or music video
 - ii. Song is organized with sequence of information that is cohesive
 - c. Presentation 10pts
 - i. Song/Music Video is presented to the class with ease and is understandable to the whole class

- ii. Song/Music Video has evidence of a considerable amount of effort was put into the project
- d. Creativity 10 pts
 - i. Creation of song/music video is the students own work
 - ii. Song is creative and catchy
- e. Citations 10pts
 - i. All information is cited with a cohesive format
 - ii. A works cited page is turned into the teacher after the model is shown

Instructional Strategies: *Identify the strategies (inquiry-based, problem-based, and project-based, cooperative learning, etc.) that you employed when implementing your lesson / unit of instruction. Describe how the strategies helped to promote higher-order thinking and self-directedness with regard to the student learning objectives. Please be specific.*

Instructional strategies will include project-based learning, cooperative learning, close reading, activating prior knowledge, direct instruction, and effective questioning.

Each of the strategies will promote higher-order thinking by not only requiring students to have an understanding of the information of a plant and animal cell, but also how that information is compared to the each other. They will also promote self-directedness by being in charge of completing their project on time and with effort.

Procedures of Lesson: *Describe the student learning activities that were used in the classroom. Please provide a comprehensive explanation - one that will allow for easy implementation by another teacher, including examples where appropriate.*

The first half of the unit will be focused on direct instruction. The information can be taught through following the curriculum in the textbook or other sources can be used in lieu of the textbook. Some of these strategies can include getting other books of different reading levels for students to read and use to learn the information, using videos and online resources to teach the information, and use group discussion lead with questions to help guide the discussion in the right direction and to insure the information the students are learning the information correctly.

The second part of the unit, each student will choose between 5 projects that utilize different multiple intelligences; visual, special, musical, verbal, tactile-kinesthetic. Students must be able to answer the essential question, how do the parts of a plant cell and its functions compare to an animal cell and its functions? The required terms each student must label and define within their project are; nucleus, chloroplast, mitochondria, cell membrane, cell wall, ribosomes, cytoplasm, lysosomes, smooth endoplasmic reticulum, rough endoplasmic reticulum, Golgi apparatus, and vacuole. Each project will be graded on a 50pt bases and each project will be broken down differently, as stated above in the assessment section. The projects have a variety of individual, partner, and small group requirements and students will be required to follow those requirements. No student should purchase anything during the creation of the projects, everything should be either recycled or materials the students already have. The project descriptions are as follows:

1. Paper
 - a. Student will individually write a 3-4 page paper answering the essential question, using research found from at least 4 different sources. The paper will be printed and turned in with a works cited page to accompany it.

2. Presentation
 - a. Student will individually create a presentation that answers the essential question and present it in front of the class. The presentation must be 5-7 minutes long, include research from at least 4 different sources, and should be engaging to the audience. An outline along with a works cited page is required to be turned in after the presentation.
3. Skit/Play
 - a. Students will create skits or a play answering the essential question. Students can work in groups of 3-5 and the skits/plays can either be recorded and shown in class or done during the class for an audience. The performance or video should not exceed 10 minutes, every group member should have an active part in the performance, and a script and works cited page, with at least 4 sources, is required to be turned in after the performance.
4. Model
 - a. Students will individually create models of plant and animal cells. Each of the terms should be labeled and defined on the model and the student should be able to answer the essential question using the models. Models can be made out of anything, they should be 3D, and be able to be displayed in the classroom. After the student shows his/her model to the class and answers the essential question, he/she is required to turn in a works cited paper with at least 4 sources included.
5. Song/Music Video
 - a. Students will create a song and/or music video that answers the essential question. Students can work in groups of 3-5 and the song can either be performed in class or a music video can be created and shown to the class. The song/music video should not exceed 5 minutes, every member must have an active role in the performance. A lyrics sheet and works cited page, with at least 4 sources included, is required to be turned in after the performance.