

UDP Lesson Plan

Cell Analogy Project

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About This Lesson

DESCRIPTION

In this project, the students will design and present a model that is analogous to the eukaryotic cell organelles. The model will be an object that has parts that fulfill the functions of each of the cell organelles covered in class. Example: A house, the walls are the cell walls and the solar panels are the solar panels on the roof. The model can be for either a plant cell or an animal cell

This Lesson plan is for day one of four, and will introduce and organized the project.

Day 2: Group Work

Day 3: Present

Day 4: Finish presentations, conclusion

PREREQUISITES

The students have covered cell types and can differentiate between a prokaryotic and Eukaryotic Cell

The students have covered cells as a basis for life

The students have covered cells as the building blocks for multi-cellular life

ESTIMATED TIME

1.5 hours

Potential Use

PURPOSE: Classroom Instruction, Small Group

GRADES: 9 - 10

CONTENT AREAS: Science

COMMON CORE: **Science**

- **Reading: Literacy in Science and Technical subjects**

Craft and Structure

CCSS.ELA-Literacy.RST.9-10.5 (grade 9 - 10):

Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).

Integration of Knowledge and Ideas

CCSS.ELA-Literacy.RST.9-10.7 (grade 9 - 10):

Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

CCSS.ELA-Literacy.RST.9-10.8 (grade 9 - 10):

Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.

CCSS.ELA-Literacy.RST.9-10.9 (grade 9 - 10):

Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

Goals

INSTRUCTIONAL GOALS

Students will understand the concept of Analogies

Students will understand that individual cells are made up of parts that handle different needs of the cell

Students will be able to visualize the cell parts as concrete objects

Students will understand each organelle's role in the cell

Student groups will present project before the class in chosen modality

OBJECTIVES

- Students will visualize the eukaryotic cell as carrying out its function through smaller organelles

VARIABILITY

This lesson supports variability in that the information will be presented in several ways (reading, film, discuss) And the students can choose from several options how to present project on completion

Assessments

FORMATIVE ASSESSMENTS

Homework will be stamped for completeness at beginning of class

Students will fill out a assessing their own Knowledge Skills and Ability before project. Graded for completion only.

Students will be evaluated on group participation and focus. Students will fill out a group role rubric at project's completion

SUMMATIVE ASSESSMENTS

Students will hand in textbook work.

Students will hand in handout for movie (stamped and given back to be handed in with project

Students project will be graded with the rubric

Instructional Methods

OPENING

PreStudents will read the textbook section on organelles before unit and answer questions. They will also have to find a definition for the word "analogy", Homework will be stamped for completion while students reflect.

Hook(5 min):

- Students will reflect on these questions:
- Why are cells important? What functions do they perform that make life possible? What is an analogy? What are the organelles of the cells?
- Students will partner up and Think-Pair-Share on reflection

Anticipatory set(5 min):

- Teacher will ask for volunteers to talk about reflection questions, emphasizing definitions of analogy and why making analogies can be important

Introduction(10 min):

- Discuss the Cell Analogy Project. Pass out the project sheets and rubrics.

DURING

Introduce New Knowledge:

- Students will watch a short video on cell organelles. "The Cell and Its Functions", while filling out worksheet on cell organelles (7min)
- Students will revise earlier "Think-Pair-Share" with partner and complete sheet (5 min)
- Discussion: Students will be asked to volunteer cell organelles they know, and will be asked to compare to another object(mitochondria -a power plant)(5 min)
- Students will be assigned groups, and each group will brainstorm what their cell analogy will be, and how they will present it. As they are working, teacher will circulate among groups and ask leading questions to assess that students get the concept. If they are having trouble with the analogy, teacher will ask questions to help them decide. Students will also decide how they will present their analogy Poster, PowerPoint, Physical model (Legos, diorama), Performance (Song, Poem, Prose), etc. Students will decide how their project meets each standard on the rubric. As students decide on a analogy, they will put a note up on the "Parking Lot" poster to avoid repeats. Group Roles will be assigned(10 min)

CLOSING

Closing:

Students will reconvene as a class.

- Each group will announce to the class their analogy, how it will meet the project goals, and group roles
 - Teacher will ask questions about projects, asking how the students will define a specific organelle. Students will be informed that they will use part of class tomorrow to work on analogy, but they need to work at home.
 - Tonight for homework they will watch a video on Endosymbiosis Theory (Mitochondria and Chloroplasts were once independent life), and meet with their group members in a Google Hangout to come up with three questions for class about it, and how they can incorporate it into their analogy project.
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Materials

MATERIALS AND SUPPLIES

Handouts, Poster paper, Smartboard, Film: The Cell and Its Functions

Comments

UDL is the idea that learning is best served when information is presented in several ways. In this lesson, there are several approaches to motivating (The why of learning), presenting (The what of learning) and expressing what they know (The how of learning). By varying these, students are not limited by having to deal with the material in only one way, which may not be their strength. Presenting the info by textbook, reflection, a film and a class discussion provides many modalities for learning about cell organelles, a abstract and hard to visualize subject. Allowing the students in groups to choose their own group roles and method of presentation allows them to also play to their strengths for demonstrating what they know. By meeting with peers outside of class in a google hangout, it puts subtle peer pressure on learning the material, yet having chosen their own group role previous to this gives them the security of knowing what they need to do. As the Cast website said, when you create a building for people with different ability levels, everyone benefits, sometimes in unexpected ways. A ramp is good for a wheel chair, a stroller and a bike.

Student learning should not be limited and discouraged by whether the students' learning style matches the instructor, but by whether they learn. Allowing them to construct their knowledge from several sources, rather than just a lecture will make learning more enjoyable, authentic and meaningful. It takes more work up front on the instructors part, but the payload is worth it.