Biology: Cell Biology

Essential Understanding: The fundamental processes of plants and animals depend on a variety of chemical reactions that occur in specialized areas of an organism's cell.

"Biology will relate every human gene to the genes of other animals and bacteria, to this great chain of being" -Walter Gilbert

Overview

This unit is designed to help students become familiar with the study of cells and the tools that are used for this. Students will be able to know the differences and similarities between Eukaryotic and Prokaryotic cells. This unit will require critical thinking, understanding the concept of studying cells, and analysis of problems.

Guiding question 1: What are the fundamental units of life?

Lessons

_____Mind Map
_____Cell Structure and Function
_____Cell Processes and Energy

Individual work

_____Read the overview with your color group and mark it up with questions or comments. (08/29)

_____Read: Prentice Hall Science Explorer: Cells & Heredity

_____ Ch 1 Section Assessments (09/26)

_____ Ch 2 Section Assessments (10/17)

_____Make Mind Map for Guiding Question (08/29)

_____Make vocabulary cards for the vocabulary in your Vocabulary List.

_____Participate in the lesson on the tower of life, 6 characteristics of living things, 4 needs of living things, and 16 patterns of life. Record the information on the graphic organizer. (09/29)

_____Reflect on the answer to Guiding Question 1. Update your mind map with the group presentation. (10/17)

Group work/ Lab Work (TBA)

Labs will be done in groups of 4 or 5.

Lab Handouts: There will be a pre-lab for students to complete before the lab experiment, during the lab the students will gather the necessary data to complete the lab and answer the questions associated with the topic. After the necessary data is collected students will work on completing their lab notebook.

Lab Notebook: Every student is required to keep a lab notebook. The lab notebook will be each student's personal "copy". You will receive specific instructions on the lab notebook requirements.

This notebook will be graded on proper usage and completeness. *The lab notebook will be checked once a unit on the day of the assessment.*

Formal Laboratory Report: Each quarter students will put together a formally written laboratory report. This laboratory report is done individually (plagiarisms is not allowed). The report must be typed and include; Title, Purpose, Procedure, Materials, Observations, Data, Results, Conclusion and Citations.

Assessment

_____Personal Project: Make a creative representation of mitosis. Be sure you understand the stages. This can include a cartoon, poem, song, painting, book, poster board, etc. (10/20)

Extension

Research a mammal or living organism by doing an in-depth study or analysis of its four needs to stay alive.(12/15)

Guiding question 2: How are the cell's structures connected to its function and process?

Lessons

_____Genetics: The Science of Heredity
_____Modern Genetics
_____Changes Over Time

Individual work

_____ Participate in the lesson on the very graphic cell. Record the information on the graphic organizer. (10/24)

_____Make Mind Map for Guiding Question (10/24)

_____Read: Prentice Hall Science Explorer: Cells & Heredity

_____ Ch 3 Section Assessments (11/7)

_____ Ch 4 Section Assessments (11/28)

_____ Ch 5 Section Assessments (12/12)

_____Reflect on the answer to Guiding Question 2. Update your mind map with the group presentation. (12/8)

Group work/ Lab Work

Labs will be done in groups of 4 or 5.

Lab Handouts: There will be a pre-lab for students to complete before the lab experiment, during the lab the students will gather the necessary data to complete the lab and answer the questions associated with the topic. After the necessary data is collected students will work on completing their lab notebook.

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How do I put it altogether?

Students will be completing a group project for the cell biology section. As a group the students are to design a cell: Eukaryotic and Prokaryotic cell. They must design a model of the cell with names of each organelle, function, and definition (written in the students own words).

_____Take the vocabulary test you must show mastery to be complete. Students may use previously assigned vocabulary card assignment. (12/12)

_____Review for your self-assessment and update all your graphic organizers. (12/12)

Assessment

1. Testing your Knowledge (12/15)
    - Assessment will include all material covered in class (paper assessment)

Extension

Research a mammal or living organism by doing an in-depth study or analysis of its four needs to stay alive.(12/15)

Vocabulary List

Ch 1 (all sections due 09/22)

Ch 1.1 cell, microscope, cell theory (08/29)

Ch 1.2 organelle, cell wall, cell membrane, nucleus, cytoplasm, mitochondria, endoplasmic reticulum, ribosome, Golgi body, chloroplast, vacuole, lysosome (09/08)

Ch 1.3 element, compound, carbohydrate, lipid, protein, amino acid, enzyme, nucleic acid, DNA, RNA (09/15)

Ch 1.4 selectively permeable, diffusion, osmosis, passive transport, active transport (09/22)

Ch 2 (all sections due 10/13)

Ch 2.1 photosynthesis, autotroph, heterotroph, pigment, chlorophyll, stomata (09/29)

Ch 2.2 respiration, fermentation (09/29)

Ch 2.3 cell cycle, interphase, replication, mitosis, chromosomes, cytokinesis (10/06)

Ch 2.4 cancer, mutation, tumor, chemotherapy (10/13)

Ch 3 (all section due 11/3)

Ch 3.1 heredity, trait, genetics, fertilization, purebreed, gene, alleles, dominant alleles, recessive alleles, hybrid (10/20)

Ch 3.2 probability, Punnett square, phenotype, genotype, homozygous, heterozygous, codominance (10/27)

Ch 3.3 meiosis (11/3)

Ch 3.4 mRNA, tRNA (11/3)

Ch 4 (all sections due 11/28)

Ch 4.1 multiple alleles, sex chromosomes, sex-linked gene, carrier (11/10)

Ch 4.2 genetic disorder, pedigree, karyoptype (11/17)

Ch 4.3 selective breeding, inbreeding, hybridization, clone, genetic engineering, gene therapy, genome (11/28)

Ch 5 (all sections due 12/8)

Ch 5.1 species, fossil, adaptation, evolution, scientific theory, natural selection, variation (12/1)

Ch 5.2 homologous structures, branching tree (12/1)

Ch 5.3 petrified fossil, mold, cast, relative dating, radioactive dating, radioactive element, half-life, fossil record, extinct, gradualism, punctuated equilibria (12/8)