

Rationale

In today's world, scientific literacy is a necessity for everyone in order to use scientific information to make wise choices. The job market demands advanced skills, requiring people to learn, reason, think creatively, make decisions, and solve problems. An understanding of biological science and scientific processes contribute in an essential way to these skills.

Biological sciences provide the basic concepts necessary to understand the physiology and chemistry of life at the cellular level. It also provides a basic knowledge of organism classification and the interactions between organisms within an ecosystem. By studying these concepts, the student gains a better understanding of how and why life works the way it does.

Course Description

This course is designed for the student who would like a more rigorous study of molecular biology. This course covers topics of chemistry of life, evolution of life, cell structure and function, cell reproduction, genetics and ecology.

Prerequisites

Prerequisite: To take Honors Biology as a Freshman, 8th grade science with a grade of "B" or higher; for Honors Biology as a sophomore, both semesters of Earth/Environmental Science with a grade of "B" or higher.

Open to: 9,10

Credit: 1 Unit - Two Semesters

Course Objectives

1. The student will discuss cellular anatomy and physiology including basic chemistry, biomolecular make-up, cell types, organelle functions and processes such as cellular transport (diffusion, osmosis, active transport), cancer development, and cell energy (cellular respiration, photosynthesis) with 80% accuracy. Assessed on End of Course Exams, Biology. (1.6, 1.7, 1.8, 1.10, 2.3, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 4.3) (A+: Speaking)

ACT standards:

- Compare or combine data from a simple data presentation with data from a complex data presentation. Interpretation of Data 601
- Identify and/or use a complex (e.g., nonlinear) mathematical relationship between data. Interpretation of Data 602
- Extrapolate from data points in a table or graph. Interpretation of Data 603
- Determine the hypothesis for an experiment. Scientific Investigation 601
- Identify an alternate method for testing a hypothesis. Scientific Investigation 602
- Select a complex hypothesis, prediction, or conclusion that is supported by a data presentation or model.

Models/Inferences/Experimental Results 601

- Determine whether new information supports or weakens a model, and why. Models/Inferences/Experimental Results 602
- Use new information to make a prediction based on a model. Models/Inferences/Experimental Results 603
- Compare or combine data from two or more complex data presentations. Interpretation of Data 701
- Analyze given information when presented with new, complex information. Interpretation of Data 702
- Understand precision and accuracy issues. Scientific Investigation 701
- Predict how modifying the design or methods of an experiment will affect results. Scientific Investigation 702
- Identify an additional trial or experiment that could be performed to enhance or evaluate experimental results. Scientific Investigation 703

- Select a complex hypothesis, prediction, or conclusion that is supported by two or more data presentations or models.

Models/Inferences/Experimental Results 701

- Determine whether given information supports or contradicts a complex hypothesis or conclusion, and why.

Models/Inferences/Experimental Results 702

2. The student will interpret and research basic DNA structure and function to discuss the importance of DNA through analysis of reproductive variability, inheritance patterns, evolutionary and classification theories with 80% accuracy. Assessed on End of Course Exams, Biology. (1.6, 1.7, 1.8, 1.10, 2.3, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 4.3) (A+: Research)

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Models/Inferences/Experimental Results 702

3. The student will classify living organisms and illustrate their interactions with biotic and abiotic factors, and how those interactions contribute to structural development, and research the impact of human activities on the environment and the need to conserve natural resources with 80% accuracy. Assessed on End of Course Exams, Biology. (SC4, 5, 8; 1.6, 1.7, 1.8, 1.10, 2.3, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 4.3) (A+: Reading)

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Models/Inferences/Experimental Results 702

4. The student will design, perform and analyze scientific experiments with 80% accuracy. Assessed on End of Course Exams, Biology. (SC3, 4, 5, 8; 1.2, 1.3, 1.4, 1.6, 1.7, 1.8, 1.10, 2.3, 2.7, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 4.3) (A+: Writing)

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Honors Biology

Mehlville School District

Science

Grades 9 - 10, Duration 1 Year, 1 Credit

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Models/Inferences/Experimental Results 702

BOE 11-19-15