Course Syllabus

SUMMER PROGRAM 2011
617 Dartmouth Place · Evanston, IL 60208 · 847/491-8257
Summer Office: June 13 – August 11, 2011 · 847/467-2990

Spectrum Program
Session 1
Course Title: Topics in Biology Honors

Elizabeth Dirkes-Ja…, 11/29/11 12:04 PM
Deleted: Instructor: Walter Glogows… [1]

Course Description
Biology is the study of living organisms and includes layers from molecular to cellular and the whole organism to the ecosystem and biosphere. Students practice lab design and presentations, problem-based and project-based experiments. Among the topics explored are experimental method, biochemistry, cell structure, cellular reproduction, evolution, and ecology. This course is recommended for students with some knowledge of laboratory techniques, or those who have not had a full-year of high school laboratory science. This course prepares students for high school biology.

Essential Questions
Upon completion of the course students should be able to answer the following essential questions in detail:
- How will a basic knowledge of chemistry help you to understand and explain biological processes?
- How does DNA code for traits and enable the continuation of species?
- How does variation in organisms lead to change over time?
- How do humans contribute to the biosphere?

Outcomes
Upon successful completion of this course, students will:
a. Know how organisms function.
b. Understand the role of molecules and macromolecules.
c. Understand the inner-workings of our cells including: chemical reactions, the transmission of genetic information and DNA technologies.
d. Understand the complex interactions of the ecosystem, and
e. Understand how to use the scientific method to answer questions about the living world.

Instructional Strategies
Topic in Biology will take into account that individual differences distinguish students from one another and that by understanding these differences students are allow to develop and learn to their fullest potential. To facilitate this, the presentation of the course content will be varied between textbook readings, lecture, demonstrations, laboratory exercises and discussion. Students will be grouped into interest centers so that they can pursue a topic in greater depth and will be allowed to demonstrate his or her understanding in various ways such as journals, essays, one-on-one discussions, quizzes and projects.

Resources and Materials
Textbook
- Kenneth R Miller and Joseph Levin, *Biology*, 2008, 0-13-201349-5

Materials
- Students also need a basic function calculator
- Hat and sunglasses for field trips.

Student Assessment

Pre-Assessment: As a pre-assessment students will answer multiple choice questions chosen from the Miller and Levin test bank that are aligned to the essential questions of the course.

CTD Grading Scale

A+	100-97%	A	96-93%	A-	92-90%
B+	89-87%	B	86-83%	B-	82-80%
C+	79-77%	C	76-73%	C-	72-70%
D+	69-67%	D	66-63%	D-	62-60%
F	below 60%				

Breakdown of Final Grade

20% labs
20% homework
20% quizzes
20% participation
20% final assessment

Post-Assessment:

As a post-assessment students will answer multiple choice questions chosen from the Miller and Levin test bank that are aligned to the essential questions of the course.
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Schedule

Date	Topic	In-class Activities	Assignments/Assessments
June 27	The Scientific Method and experimental design	Characteristics of living things Using a Compound Microscope	Characteristics of living things Read Chapter 2.
June 28	Chemistry of Life, Molecules and Macromolecules	Are foods acid or basic? Investigating the effect of temperature on enzyme activity	Quiz on Chapter 2 Lab report – Investigating the effect of temperature on enzyme activity Read Chapter 7
June 29	Cell Structure and Function	Can you make a model of a cell? Osmosis and Diffusion Compound Microscope Animal vs. Plant cells	Quiz on Chapter 7 Lab report Osmosis and Diffusion Read Chapter 8
June 30	Photosynthesis and Respiration	What waste material is produced during photosynthesis? Observing Elodea Investigating Photosynthesis	Quiz on Chapter 8 Lab report Investigating Photosynthesis Read Chapter 10
July 1	Cell growth and Division	Observing Cell division How large can a cell grow? Modeling the phases of the cell cycle	Quiz on Chapter 10 Lab report Modeling the phases of the cell cycle Read Chapter 11

July 5	Introduction to Genetics	Are traits inherited? Modeling Meiosis	Quiz on Chapter 11 Modeling meiosis
July 6	Mendelian Genetics	Modeling a chromosome Punnet Square analysis Pedigree laboratory Barbara McClintock Reading	Quiz on Barbara McClintock Reading Read Chapter 12
July 7	DNA and RNA	Spooling DNA DNA structure vs. RNA structure	Quiz on Chapter 12 Read Chapter 13
July 8	Genetic Engineering	Computer lab Improve plant breeding Investigating the effects of radiation on seeds	Quiz on Chapter 13 Computer lab Genetic Disorders Read Chapter 14
July 11	Human Genome	Chromosome activity Sex-linked traits Gene Therapy research	Quiz on Chapter 14 Read Chapter 3
July 12	The Biosphere	How does one organism affect another Analyzing biospheres Identifying Limiting nutrients	Quiz on Chapter 2 Read Chapter 4
July 13	Ecosystems and Communities	What relationships exist in an ecosystem Greenhouse Effect Identification laboratory	Quiz on Chapter 4 Lab report Identification laboratory Read Chapter 5
July 14	Populations	How do populations grow Computer lab Predator Prey Predator Prey	Quiz on Chapter 4 Lab report Identification laboratory
July 15	Final Assessment		

CTD Statement on Third-Party Web Sites

Instructors are required to thoroughly review any third-party web sites they intend to use in their courses for inappropriate content. However, because web content continuously changes, CTD disclaims any responsibility for any of the content contained on third-party web sites used in course materials. If you become aware of anything that may be inappropriate, please notify CTD staff immediately.

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