

NAME OF DEPARTMENT:

COURSE OUTLINE FOR 2009-2010

Teacher:

Course:

Course ID:

Text:

Author:

Edition:

Additional Texts/Workbooks/Etc.:

Place of Course in Kennedy Curriculum: Required Elective

I. ACADEMIC AREA:

A. Content Description: Listing of MAJOR UNITS, ENDURING KNOWLEDGE (Key Concepts) and ALIGNMENT per quarter:

MAJOR UNITS	ALIGNMENT W/ STANDARDS* Revised Science Standards for the State of Washington, 2009	QUARTER
Ch. 1 The Science of Biology	<p>9-12 SYSA Feedback is a process in which the output of a system provides information used to regulate the operation of the system. Positive feedback increases the disturbance to a system. Negative feedback reduces the disturbance to a system.</p> <p>9-12 SYSB Systems thinking can be especially useful in analyzing complex situations. To be useful, a system needs to be specified as clearly as possible.</p> <p>9-12 SYSC In complex systems, entirely new and unpredictable properties may emerge.</p> <p>9-12 INQA Scientists generate and evaluate questions to investigate the natural world.</p> <p>9-12 INQB Scientific progress requires the use of various methods appropriate for answering different kinds of research questions, a thoughtful plan for gathering data needed to answer the question, and care in collecting, analyzing, and displaying data.</p> <p>9-12 INQC Conclusions must be logical, based on evidence, and consistent with prior established knowledge.</p> <p>9-12 INQD Methods and procedures that scientists use to obtain evidence must be clearly reported to enhance opportunities for further investigation.</p> <p>9-12 INQE The evidence of scientific investigation involves the development of a theory or conceptual model that can generate testable predictions.</p> <p>9-12 INQF Science is a human endeavor that involves reasoning and creativity and entails the testing, revision, and occasional discarding of theories as new evidence comes to light.</p> <p>9-12 INQG Public communication among scientists is an essential aspect of research. Scientists evaluate the validity of one another's investigations, check the reliability of results, and explain inconsistencies in findings.</p> <p>9-12 INQH Scientists carefully evaluate sources of information for reliability before using that information. When referring to the ideas or findings of others, they cite their sources of information.</p> <p>Math connections:</p> <p>A1.8.B Select and apply strategies to solve problems.</p> <p>A1.8.D Generalize a solution strategy for a single problem to a class of related problems, and apply a strategy for a class of related problems to solve a specific problem.</p> <p>8.5.H Make and test conjectures based on data or information collected from explorations and experiments.</p> <p>8.5.D Represent a problem situation, describe the process used to solve the problem, and verify the reasonableness of the solution.</p> <p>A1.6.B Make valid inferences and draw conclusions based on data.</p>	1

	<p>A1.8.G Synthesize information to draw conclusions and evaluate the arguments and conclusions of others.</p> <p>A1.8.C Evaluate a solution for reasonableness, verify its accuracy, and interpret the solution in the context of the original problem.</p>	
Ch. 2 The Chemistry of Life	<p>9-11 PS2A Atoms are composed of protons, neutrons, and electrons. The nucleus of an atom takes up very little of the atom's volume but makes up almost all of the mass. The nucleus contains protons and neutrons, which are much more massive than the electrons surrounding the nucleus. Protons have a positive charge, electrons are negative in charge, and neutrons have no net charge.</p> <p>9-11 PS2B Atoms of the same element have the same number of protons. The number and arrangement of electrons determines how the atom interacts with other atoms to form molecules and ionic compounds.</p> <p>9-11 PS2C When elements are listed in order according to number of protons, repeating patterns of physical and chemical properties identify families of elements with similar properties.</p> <p>9-11 PS2D Ions are produced when atoms or molecules lose or gain electrons, thereby gaining a positive or negative electrical charge. Ions of opposite charge are attracted to each other, forming ionic bonds. Chemical formulas for ionic compounds represent the proportion of ions of each element in the ionic array.</p> <p>9-11 PS2E Compounds are composed of two or more elements bonded together in a fixed proportion by sharing electrons between atoms, forming covalent bonds. Such compounds consist of well-defined molecules. Formulas of covalent compounds represent the types and number of atoms of each element in each molecule.</p> <p>9-11 PS2F All forms of life are composed of large molecules that contain carbon. Carbon atoms bond to one another and other elements by sharing, forming covalent bonds. Stable molecules of carbon have four covalent bonds per carbon atom.</p> <p>9-11 PS2G Chemical reactions change the arrangement of atoms in the molecules of substances. Chemical reactions release or acquire energy from their surroundings and result in the formation of new substances.</p> <p>9-11 PS2H Solutions are mixtures in which particles of one substance are evenly distributed through another substance. Liquids are limited in the amount of dissolved solid or gas that they can contain. Aqueous solutions can be described by relative quantities of the dissolved substances and acidity or alkalinity (pH). The rate of a physical or chemical change may be affected by factors such as temperature, surface area, and pressure.</p> <p>9-11 PS2I The rate of physical or chemical change may be affected by factors such as temperature, surface area, and pressure.</p> <p>9-11 PS2J The number of neutrons in the nucleus of an atom determines the isotope of the element. Radioactive isotopes are unstable and emit particles and/or radiation. Though the timing of a single nuclear decay is unpredictable, a large group of nuclei decay at a predictable rate, making it possible to estimate the age of materials that contain radioactive isotopes.</p> <p>Math Connections: 7.2.E represent proportional relationships, using graphs, tables, and equations, and make connections among the representations.</p>	1
Ch. 7 Cell Structure and Function	<p>9-11 LS1C cells contain specialized parts for determining their essential functions, such as regulation of cellular activities, energy capture and release, formation of proteins, waste disposal, the transfer of information,</p>	1 & 2

	<p>and movement.</p> <p>9-11 LS1D The cell is surrounded by a membrane that separates the interior of the cell from the outside world and determines which substances may enter and which may leave the cell.</p>	
Ch. 8 Photosynthesis	<p>9-11 LS1F all of the functions of the cell are based on chemical reactions. Food molecules are broken down to provide the energy and the chemical constituents needed to synthesize other molecule. Breakdown and syntheses are made possible by proteins called enzymes. Some of these enzymes enable the cell to store energy in special chemicals, such as ATP, that are needed to drive the many other chemical reactions in a cell.</p> <p>9-11 LS1A Carbon-containing compounds are the building blocks of life. Photosynthesis is the process that plant cells use to combine the energy of sunlight with molecules of carbon dioxide and water to produce energy-rich compounds that contain carbon (food) and release oxygen.</p>	2
Ch. 9 Cellular Respiration and Fermentation	<p>9-11 LS1B The gradual combustion of carbon-containing compounds with cells, called cellular respiration, provides the primary energy source of living organisms; and the combustion of carbon by burning of fossil fuels provides the primary energy source for most of modern society.</p> <p>9-11 LS1F</p>	2
Ch. 10 Cell Growth and Division	<p>9-11 LS1H Genes are carried on chromosomes. Animal cells contain two copies of each chromosome with genetic information the regulates body structure and functions. Cells divide by a process called mitosis, in which the genetic information is copied so that each new cell contains exact copies of the original chromosomes.</p>	2
Ch. 11 Introduction to Genetics	<p>9-11 LS1E The genetic information responsible for inherited characteristics is encoded on the DNA molecules in chromosomes. DNA is composed of four subunits(A, T, C, G). The sequence of subunits in a gene specifies the amino acids needed to make a protein. Proteins express inherited traits (e.g., eye color, hair texture) and carry out most cell functions.</p> <p>9-11 LS1I Egg and sperm cells are formed by a process called meiosis in which each resulting cell contains only one representative chromosome from each pair found in the original cell. Recombination of genetic information during meiosis scrambles the genetic information allowing for new genetic combinations and characteristics in the offspring. Fertilization restores the original number of chromosome pairs and reshuffles the genetic information, allowing for variation among offspring.</p>	3
Ch. 12 DNA	<p>9-11 LS1E</p> <p>9-11 LS1G Cells use the DNA that forms their genes to encode enzymes and other proteins that allow a cell to grow and divide to produce more cells, and respond to the environment.</p> <p>9-11 LS1H Genes are carried on chromosomes. Animal cells contain two copies of each chromosome with genetic information that regulate body structure and functions. Cells divide by a process called mitosis, in which genetic information is copied so that each new cell contains exact copies of the original chromosomes.</p>	3
Ch. 13 RNA and Protein Synthesis	<p>9-11 LS1C</p> <p>9-11 LS1E</p> <p>9-11 LS3A Biological evolutions is due to : (1) genetic variability of offspring due to mutations and genetic recombination, (2) the potential for a species to increase its numbers, (3)a finite supply of resources, and (4) selection by the environment for those offspring better able to survive and produce offspring.</p> <p>9-11 LS3B Random changes in the genetic makeup of cells and</p>	3

	organisms (mutations) can cause changes in their physical characteristics or behaviors. If the genetic mutations occur in eggs or sperm cells, the changes will be inherited by offspring. While many of these changes will be harmful, a small minority may allow the offspring to better survive and reproduce.	
Ch. 14 Human Heredity	9-11 LS1E 9-11 LS1H	3
CH. 15 Genetic Engineering	9-12 INQA; INQB; INQC; INQD; INQE; INQF; INQG; INQH 9-12 APPA Science affects society and cultures by influencing the way many people think about themselves, others, and the environment. Society also affects science by its prevailing views about what is important to study, and by deciding what research will be funded. 9-12 APPB The technological design process begins by defining a problem in terms of criteria and constraints, conducting research, and generating several different solutions. 9-12 APPC Choosing the best solution involves comparing alternatives with respect to criteria and constraints, then building and testing a model or other representation on the final design. 9-12 APPD The ability to solve problems is greatly enhanced by use of mathematics and information technologies. 9-12 APPE Perfect solutions do not exist. All technological solutions involve trade-offs in which decisions to include more of one quality means less of another. All solutions involve consequences, some intended others not. 9-12 APPF It is important for all citizens to apply science and technology to critical issues that influence society. Math Connections: A1.8.A Analyze a problem situation and represent it mathematically. A1.8.C A1.3.B Represent a function with a symbolic expression, as a graph, in a table, and using words, and make connections among these representations. A1.8.G	3 & 4
Ch. 16 Darwin's Theory of Evolution	9-11 ES3A Interactions among the solid Earth, the oceans, the atmosphere, and organisms have resulted in the ongoing evolutions of the Earth system. We can observe changes such as earthquakes and volcanic eruptions on a human time scale, but many processes such as mountain building and plate movements take place over millions of years. 9-11 ES3B Geologic time can be estimated by several methods (e.g., counting tree rings, observing rock sequences, using fossils to correlate sequences at various locations, and using the known decay rates of radioactive isotopes present in rocks to measure the time since the rock was formed). 9-11 ES3C Evidence for one-celled forms of life----the bacteria----extends back billions of years. The appearance of life on Earth caused dramatic changes in the composition of Earth's atmosphere, which did not originally contain oxygen. 9-11 ES3D Data gathered from a variety of methods have shown that Earth has gone through a number of periods when Earth was much warmer and much colder than today. 9-11 LS3A 9-11 LS3B Math Connections: A1.1.A Select and justify functions and equations to model and solve problems. A1.7.B	4

Ch. 17 Evolution of Populations	9-11 ES3A; ES3B; ES3C; ES3D 9-11 LS3B 9-11 LS3C The great diversity of organisms is the result of more than 3.5 billion years of evolution that has filled available ecosystem niches on Earth with life forms. 9-11 LS3D The fossil record and anatomical and molecular similarities observed among diverse species of living organisms provide evidence of biological evolution. 9-11 LS3E Biological classifications are based on how organisms are related, reflecting their evolutionary history. Scientists infer relationships from physiological traits, genetic information, and the ability of two organisms to produce fertile offspring. Math Connections: 8.3.F Determine probabilities for mutually exclusive, dependent, and independent events for small sample sizes.	4
Ch. 18 Classification	9-11 LS3A; LS3B; LS3C; LS3D; LS3E	4
Ch. 19 History of Life	9-11 ES3A; ES3B; ES3C; ES3D	4

ENDURING KNOWLEDGE *Key Concepts / What student has to know *	QUARTER
What is life?	1
What are the basic structures and functions of all living organisms?	1 & 2
What is the relationship between living organisms?	1, 2, 3, 4
How do genetics govern life processes?	2, 3, 4
Develop a personal ethic regarding life	1, 2, 3, 4

B. Skills: What the student will have to do and how these skills are to be evaluated.

SKILLS	METHODS OF EVALUATION/ASSESSMENT	FREQUENCY OF EVALUATION
Scientific method as a way of problem solving	This is the standard for of presentation and evaluation	Daily/weekly
Note-taking	Observation and grading of notebooks kept by each student	Informal: weekly Formally: quarterly grading of notebooks
Vocabulary development	"Targets" Oral quizzing Tests	Daily Several times per week At ends of chapters
Growth in conceptual scientific knowledge	Daily work Quizzes: oral and written Tests	Daily Weekly At ends of chapters
Science awareness	News and magazine articles as they occur Science in the news component of the extra credit	When they occur Twice per semester
Use of sterile	Most labs	During second semester, primarily

technique		

C. Methods of Instruction: Instructional methods used to present course content:

- Lecture/discussion combinations
- Written work, e.g. worksheets
- Labs with write-ups and seminar of the results
- Activities with models

D. Career Application:

- Responsible living-----making good decisions about life issues in personal life as well as business
- Responsible consumer of health care
- Wide variety of careers in biology related fields

II. POLICIES:

A. Grading Policies:

GRADING SCALE

- Same as grading scale used in the school system and listed in the Student Handbook
- Different scale (If different scale, please indicate below):

GRADING CRITERIA / VALUE / WEIGHTING

- Grading is on summation.
- Daily assignments are graded on a basis of one point per response.
- Quizzes are graded on points proportional to but less than a test. For example, a score of 8 of 10 correct answers on a 25 point quiz will be entered as a grade of 20.
- Targets are graded on the basis of one point per response.
- Tests are graded on a percentage basis-----100 points or a multiple there of.
- Labs are given a point value according to length and difficulty of the project.

B. Policies on late work, tests and attendance

Many labs cannot be made up because they depend on borrowed and perishable materials.

Written work missed due to excused absences may be made up for full credit within a reasonable time-frame.
All tests and quizzes must be made up at lunch or after school. I do not allow a student to miss class to make up another.
All unmade up and missing work adds into the grade as zero points.
I follow the attendance policies in the handbook.

C. Discipline Policies

I follow the discipline policies in the handbook.

D. Statement on School Cheating Policy:

I follow the cheating policies in the handbook.

E. Policy on Extra Credit

Twice each semester, over "school vacations" of four or more days a list of approved extra credit activities with the highest point totals and rules will be distributed.

This is optional, but highly recommended.

The extra credit is academic in nature and always pertains to the subject matter.

The extra credit is a way of "banking" points toward one's grade and can make a significant difference.

F. Listing Daily Assignment

____ JFK NETCATHOLIC

__x__ JFK Website

____ Both

G. Open Gradebook Report to Web Postings

- **Postings:**
Officially according to the published schedule.
There will be interim postings every few days.

- **Anticipated number of NEW entries per quarter:**
30-40

H. Support for Student Learning

Within the text there are online references for expansion of concepts.

There is an online version of the text.

There will be periodic study groups after school prior to tests.

Activities are varied to accommodate all learning styles.

I. Teacher Availability to Students for Extra Help

I am available at first lunch and after school.

For the early risers, I am also available before zero hour class.

J. Major Movies/Films (Video/CD/DVD) Shown as Part of this Course:

MAJOR MOVIES/FILMS (Video, CD, DVD) SHOWN AS PART OF THIS COURSE:	UNIT OR CHAPTER	QUARTER
Planet of Life Series	1, 2, 17, 19	1, 2, 3, 4
New films as they become available		

⇒ **Note: Any movies not listed above must be submitted to the Department Chair and Academic Dean prior to showing in the classroom.**