

COURSE OUTLINE FOR 2009-2010

Teacher:

Course:

Course ID:

Text: Physical Science: Concepts in Action with Earth Science
Prentice Hall/Pearson

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Edition:

Additional Texts/Workbooks/Etc.:

Publisher's and teacher-made labs and worksheets
Notebook for notes and labs

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 Washington State K-12 Science Standards linked to Revised Washington State K-12 Math Standards	QUARTER
Ch. 1 Science Skills	<p>9-12INQA Scientists generate and evaluate questions to investigate the natural world.</p> <p>9-12INQB 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 the data.</p> <p>9-12INQC Conclusions must be logical, based on evidence, and consistent with prior established knowledge.</p> <p>Math Connections:</p> <p>A1.8A Analyze a problem situation and represent it mathematically.</p> <p>A1.8C Evaluate a solution for reasonableness, verify its accuracy, and interpret the solution in the context of the original problem.</p> <p>A1.8 F Summarize mathematical ideas with precision and efficiency for a given audience and purpose.</p> <p>A1.8G Synthesize information to draw conclusions and evaluate the arguments and conclusions of others.</p> <p>A1.8H Use inductive reasoning about algebra and the properties of numbers to make conjectures, and use deductive reasoning to disprove conjectures.</p>	1
Ch. 2 Properties of Matter	<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>	1
Ch. 3 States of Matter	<p>9-12SYSA Feedback is a process in which the output of a system provides information used to regulate the operation of the system.</p> <p>9-12SYSB To be useful, a system needs to be specified as clearly as possible.</p> <p>9-12SYSC In complex systems, entirely new and unpredictable properties may emerge. Consequently, modeling a complex system in sufficient detail to make reliable predictions may not be possible.</p> <p>9-12SYSD Systems can be changing or in equilibrium.</p> <p>Math Connections:</p> <p>A1.8A</p> <p>A1.1A Select and justify functions and equations to model and solve problems.</p> <p>A1.8B Select and apply strategies to solve problems.</p> <p>A1.8D 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>A1.8H</p> <p>A1.7C Express arithmetic and geometric sequences in explicit and recursive forms, translate between the two forms, explain how rate</p>	1

	of change is represented in each form, and use the forms to find specific terms in the sequence.	
Ch. 4 Atomic Structure	9-11 PS2SA 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 its mass. 9-11 PS2B	2
Ch. 5 Periodic Table	9-11 PS2C When elements are listed in order according to the number of protons, repeating patterns of physical and chemical properties identify families of elements with similar properties. This periodic Table is a consequence of the repeating pattern of outermost electrons.	2
Ch. 6 Chemical Bonds	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. 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. 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. Math connections: G.3.J Describe prisms, pyramids, in terms of their faces, k edges, vertices, and properties. 7.2.E Represent proportional relationships using graphs, tables, and equations, and make connections among the representations. A1.1A	2
Ch. 7 Chemical Reactions	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. 9-11 PS2I The rate of a physical or chemical change may be affected by factors such as temperature, surface area, and pressure. 9-11 PS2J The number of neutrons in the nucleus of an atom determines the isotope of the element. Math Connections: 7.2.E	2
Ch. 8 Solutions/Acids and Bases	9-11 SYSD 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). Math Connections: 7.2.E	2
Ch. 10 Nuclear Chemistry	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.	2 & 3

	<p>9-11 PS2K Nuclear reactions convert matter into energy, releasing large amounts of energy compared with chemical reactions. Fission is the splitting of a large nucleus into smaller pieces. Fusion is the joining of nuclei and is the process that generates energy in the Sun and other stars.</p> <p>Math Connections:</p> <p>A1.1.A Select and justify functions and equations to model and solve problems.</p> <p>A1.7.A Sketch the graph for an exponential function of the form $y=ab^n$ where n is an integer, describe the effects that change in the parameters a and b have on the graph, and answer questions that arise in situations modeled by exponential functions.</p> <p>A1.7.B Find the approximate solutions to exponential equations.</p>	
Ch. 11 Motion	<p>9-11 PS1A Average velocity is defined as a change in position with respect to time. Velocity includes both speed and direction.</p> <p>9-11 PS1B Average acceleration is defined as a change in velocity with respect to time. Acceleration indicates a change in speed and/or a change in direction.</p> <p>Math Connections:</p> <p>7.2.E</p> <p>7.7.F Determine the slope of a line corresponding to the graph of a proportional relationship, and relate slope to similar triangles.</p> <p>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.</p> <p>A1.8.A</p> <p>A1.4.C Identify and interpret the slopes and intercepts of a linear function.</p>	3
Ch. 12 Forces and Motion	<p>9-11 PS1C An object at rest will remain at rest unless acted on by an unbalanced force. An object in motion at constant velocity will continue at the same velocity unless acted on by an unbalanced force.</p> <p>9-11 PS1D A net force will cause an object to accelerate or change direction. A less massive object will speed up more quickly than a more massive object subjected to the same force.</p> <p>9-11 PS1E Whenever one object exerts a force on another object, a force of equal magnitude is exerted on the first object in the opposite direction.</p> <p>9-11 PS1F Gravitation is a universal attractive force by which objects with mass attract one another. The gravitational force between two objects is proportional to their masses and inversely proportional to the square of the distance between the objects.</p> <p>9-11 PS1G Electrical force is a force of nature, independent of gravity that exists between charged objects. Opposite charges attract while like charges repel.</p> <p>9-11PS1H Electricity and magnetism are two aspects of a single electromagnetic force. Moving electric charges produce magnetic forces, and moving magnets produce electric forces.</p> <p>Math Connections:</p> <p>7.2.E</p> <p>A1.6.B Make valid inferences and draw conclusions based on data.</p> <p>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.</p> <p>A1.6.B Make valid inferences and draw conclusions based on data.</p>	3
Ch. 22 Earth's Interior	<p>9-11 ES3A Interactions among the solid Earth, the oceans the atmosphere, and organisms have resulted in the ongoing evolution of</p>	4

	<p>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 hundreds of millions of years.</p>	
Ch. 23 Earth's Surface	<p>9-11 ES3A</p> <p>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).</p> <p>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.</p> <p>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.</p> <p>Math Connections: A1.1.A A1.7.A</p>	4
Ch. 24 Weather and Climate	<p>9-12 SYSA</p> <p>9-12 SYSB</p> <p>9-12SYSC</p> <p>9-12SYSD</p> <p>9-11 ES2A Global climate differences result from the uneven heating of Earth's surface by the Sun. Seasonal climate variations are due to the tilt of Earth's axis with respect to the plane of Earth's nearly circular orbit around the sun.</p> <p>9-11 ES2B Climate is determined by energy transfer from the sun at and near Earth's surface. This energy transfer is influenced by dynamic processes such as cloud cover and Earth's rotation, as well as static conditions such as proximity to mountain ranges and the ocean Human activities, such as burning of fossil fuels, also affect the global climate.</p>	4
Labs throughout the year	<p>9-12 INQA</p> <p>9-12 INQB</p> <p>9-12 INQC</p> <p>9-12 INQD The methods and procedures that scientists use to obtain evidence must be clearly reported to enhance opportunities for further investigation.</p> <p>9-12INQE The essence 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 logical 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>	1, 2, 3, 4

ENDURING KNOWLEDGE *Key Concepts / What student has to know *	QUARTER
How do we look at the world scientifically?	1
How do we understand the structure and behavior of matter?	1 & 2
How do we understand motion, forces, and energy?	3
How do we understand the working of the earth, solar system, and universe?	4
How do we understand the structure of the earth?	4
How do we understand the basic concepts related to weather and climate?	4
Basic problem solving using observation, appropriate tests, and arriving at a logical conclusion	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
Record keeping	Keep an orderly notebook of class and lecture notes including records of labs and activities.	After each lab or activity. At the end of a chapter. Quarterly grading of the notebook as a whole.
Vocabulary development	Daily "targets" Oral and written quizzing Tests	Targets and quizzing----daily. Tests----at the end of a chapter or term.
Specific knowledge of topics	Daily "targets" Written assignments Labs Quizzes ----- oral and written Tests	Targets, quizzes----daily. Written assignments----two or three times per week. Labs-----about once per week. Tests----at the end of a chapter or term.
Lab skills	Observation Scientific method/lab format Set-up and clean-up of equipment used in labs	With labs
Science awareness	News and magazine articles as they occur Science in the news component of the extra credit opportunities.	When available. Extra credit is offered twice each semester.

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

- Lecture and discussion together
- Worksheets
- Other written assignments
- Explorative activities/minilabs
- Labs with write-ups followed by a class seminar over the results

D. Career Application:

Ability to apply and understand the basic scientific principles in everyday life
Basic science literacy
A look into careers in scientific fields
Preparation for more advanced courses and training

II. POLICIES:

A. Grading Policies:

GRADING SCALE

 x 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 a system of summation of points earned divided by points offered for each task.
Correct and good answers receive credit.

For daily work, each good or correct answer receives one point.

Labs and activities are given a point total which includes participation plus points for responses and are judged on the length of the project as well as the difficulty.

Tests are graded on a basis of 100 points or a multiple thereof.

B. Policies on late work, tests and attendance

Late work due to an excused absence or very good reason is accepted within a reasonable time period. This is negotiated between teacher and student.

Make-up tests are done before and after school and at lunch. Never during a class period.

Many labs cannot be made up due to the fact that we use a large amount of borrowed equipment which must be returned in a timely manner.

The labs which can be made up may be made up at lunch or after school.

Work missing to an unexcused absence may not be made up.

C. Discipline Policies

I follow the discipline policies as stated in the Kennedy Handbook.

D. Statement on School Cheating Policy:

I follow the policies as stated in the Kennedy 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 or a related field.

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

F. Listing Daily Assignments

_____ 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 test there are high interest articles which relate to the content of each chapter.

Activities are varied to appeal to all learning styles. This includes as many hands on projects as possible.

I. Teacher Availability to Students for Extra Help

I am available at first lunch and after school.

Also before zero hour.

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
<u>How the World was Made</u> series	Earth Science component	4

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