

SCIENCE

Parkway South Science Department – Course Map 3 Science Credits required for graduation (1 semester = ½ credit)

Courses in **bold** are prerequisites for most other classes

	<i>College and Career Prep</i>		<i>Honors College and Career Prep</i>		<i>Accelerated College and Career Prep</i>	
9th grade	Matter and Change	Biology 1	Honors Matter and Change	Honors Biology 1	Honors Matter and Change	Honors Biology 1
			Honors Forces and Motion		Honors Forces and Motion	
10th grade	Biology 2	Biology 3	Honors Biology 2	Honors Biology 3	Honors Biology 2	Honors Biology 3
	Forces and Motion		Electives	Electives	Honors Chemistry	Honors Chemistry
11th grade	Chemistry		Honors Chemistry		AP Chemistry	
	Electives	Electives	Electives	Electives	AP Physics 1 or C	
12th grade	Physics		AP Physics 1 or C		AP Biology	
	Electives	Electives	Electives	Electives	AP Science Elective	
					Electives	Electives

Science Electives (prerequisite)

Animal Behavior (*C or better in Biology 2 or Foundations Biology 2*)
 Astronomy and Meteorology (*Biology 1 & 2, Matter & Change, and Forces*)
 Bio 3: Biotech & Systems (*Biology 2, Matter & Change*)
 Chemistry (*Biology 1 & 2, Matter and Change, C or better in Algebra 1*)
 Environmental Science (*Biology 1 and 2, at least Junior standing*)
 Forensic Science (*Recommended C or better in Biology 1, Matter and Change and Forces and Motion*)
 Geology (*Biology 1 & 2, Matter & Change, and Forces*)
 Human Anatomy & Physiology (*Biology 1 and 2, at least Jr standing*)
 Lab Assistant (*B average in science classes, at least Jr standing*)
 Medical Science (*Biology 1 and 2*)
 Physics (*Forces & Motion, Algebra 2/Trig*)
 Zoology (*C or better in Biology 1 & 2*)

AP Science Electives (prerequisite)

AP Biology (*1 credit Biology, 1 credit Chemistry, Physics is encouraged*)
 AP Chemistry (*Chemistry or H Chemistry, Physics is encouraged*)
 AP Environmental Science (*1 credit Biology, 1 credit Chemistry concurrently, Physics is encouraged*)
 AP Physics 1 (*A in Forces and Motion, A in Algebra 2/Trig*)
 AP Physics C: Mechanics (*+Forces and Motion, +Pre-Calculus concurrently*)
 AP Physics 2 (*AP Physics 1 or C, Pre-Calculus*)

A sequence of year-long courses (Physical Systems, Biological Systems, and Earth Systems) is designed as an intervention for students who need additional support to increase science content knowledge and laboratory skills. **Department approval required for placement in these courses**

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137140

Biology 1: Cells and Variation

Infinite Campus Name: **BIO 1 CELLS**

Grade(s): 09 - 10

Prerequisite: None

1/2 Science credit each semester

This is the initial semester course in a sequence of biology courses that together will provide a college preparatory experience in the life sciences. This course has the theme: What is the basis of life and how does it vary? Students will conduct controlled experiments using the experimental design process. They will study biochemistry, prokaryotic and eukaryotic cells and cell environment, aspects of cell division, Mendelian genetics, meiosis, and the unity and diversity of life.

138140

Honors Bio 1: Cells & Variation

Infinite Campus Name: **+BIO 1 CELLS**

Grade(s): 09 - 10

Prerequisite: None

1/2 Science credit each semester

This is the initial course in a sequence of honors biology courses that together will provide a college preparatory experience in the life sciences. This course has the theme: What is the basis of life and how does it vary? Students will conduct controlled experiments using the experimental design process. They will study biochemistry, prokaryotic and eukaryotic cells and cell environment, aspects of cell division, Mendelian genetics, meiosis, and the unity and diversity of life. It is designed for the student who anticipates a science-based career, desires an accelerated science program, and intends to take advanced courses in science

137210

Matter and Change

Infinite Campus Name: **CHEM:MATTER**

Grade(s): 09

Prerequisite: None

1/2 Science credit each semester

This semester course will include a study of physical and chemical changes, classification of matter, phase changes, atomic structure, the periodic table, laws of conservation of matter as well as the history of chemistry. Safety in the laboratory, the experimental process, graphing and metric measurement will be an integral part of this laboratory intensive course. Group interaction, discussion, and cooperation during laboratory practice and mathematical problem-solving sessions will be commonplace. Open-ended laboratory experiences requiring student collaboration and multiple-step problem solving execution will be frequent.

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138210

Honors Matter & Change

Infinite Campus Name: **+CHEM:MATTER**

Grade(s): 09

Prerequisite: None

1/2 Science credit each semester

This semester course will include a study of physical and chemical changes, classification of matter, phase changes, atomic structure, the periodic table, laws of conservation of matter as well as the history of chemistry. Safety in the laboratory, the experimental process, graphing and metric measurement will be an integral part of this laboratory intensive course. Group interaction, discussion, and cooperation during laboratory practice and mathematical problem-solving sessions will be commonplace. Open-ended laboratory experiences requiring student collaboration and multiple-step problem solving execution will be frequent. This course is designed to challenge the top 10% of students. It is more intensive and requires more critical thinking than Matter & Change. It is designed for the student who has an exceptional interest in science and desires an accelerated science program. Class lectures will often feature advanced, cognitive material delivered at a greater pace and depth. A weighted grade is given.

137310

Forces & Motion in 1D

Infinite Campus Name: **PHYSICS:FORC**

Grade(s): 09-10

Prerequisite: One semester Algebra 1 with C or better or departmental approval

1/2 Science credit each semester

This semester course is the first in a recommended series of physics courses. This class will cover topics including laboratory safety, measurement, scientific inquiry, graphical analysis and the study of forces and motion in one dimension. Group interaction, discussion, and cooperation during laboratory practice and mathematical problem-solving sessions will be commonplace. Open-ended lab experiences requiring student collaboration and multiple-step problem solving execution will be frequent.

138310

Honors Forces & Motion in 1D

Infinite Campus Name: **+PHYSICS:FOR**

Grade(s): 09-10

Prerequisite: None

1/2 Science credit each semester

Laboratory safety, experimental design, problem-solving skills, and graphical analysis will be utilized in the study of forces and motion in one dimension. This course is designed to challenge the top ten percent of students. It is more intensive and requires more critical thinking than Forces & Motion in One-Dimension. It is designed for the student who anticipates a science-based career, desires an accelerated science program, and intends to take advanced courses in science. A weighted grade is given.

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137150

Biology 2: Evolution & Ecology

Infinite Campus Name: **BIO 2 EVOL**

Grade(s): 09 - 10

Prerequisite: Biology 1: Cells and Variation

1/2 Science credit each semester

This second semester course in the biology sequence has a theme of: How is Life Interrelated? Students will explore the unity and diversity of life through the study of evolution by natural selection. The structure and replication of DNA along with protein synthesis will be examined. The interdependence of all living things will be explored with emphasis on ecological processes and human impact on the biosphere. The processes of photosynthesis and respiration will be introduced. The Missouri Biology End of Course Assessment is given at the conclusion of this course.

138150

Honors Bio 2: Evol & Ecology

Infinite Campus Name: **+BIO 2 EVOL**

Grade(s): 09 - 10

Prerequisite: Honors Biology 1: Cells & Variation or departmental approval

1/2 Science credit each semester

This second semester course in the honors biology sequence has a theme of: How is Life Interrelated? Students will explore the unity and diversity of life through the study of evolution by natural selection. The structure and replication of DNA along with protein synthesis will be examined. The interdependence of all living things will be explored with emphasis on ecological processes and human impact on the biosphere. This course is designed to apply mathematical concepts and critical thinking. It is recommended for the student who anticipates a science-based career, desires an accelerated science program, and intends to take advanced courses in science. The Missouri Biology End of Course Assessment is given at the conclusion of this course

137160

Bio 3: Biotech & Systems

Infinite Campus Name: **BIO 3 TECH**

Grade(s): 10 - 12

Prerequisite: Biology 2: Evolution & Ecology, Matter & Change or Chemistry departmental approval

1/2 Science credit each semester

This course completes the initial college preparatory sequence and has the themes: How does biotechnology impact life? and How is life organized for success? The students will investigate a variety of concepts such as DNA fingerprinting and genetic engineering. Students will explore and compare plants and animals (including humans) at the system and molecular levels. Other topics will include photosynthesis and cellular respiration. These topics will be presented through numerous laboratory activities and will emphasize process and thinking skills.

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138160

Honors Bio 3:Biotech & Systems

Infinite Campus Name: **+BIO 3 TECH**

Grade(s): 10 - 12

Prerequisite: Honors Biology 2: Evolution and Ecology, Honors Matter & Change or departmental approval
1/2 Science credit each semester

This course completes the initial college preparatory sequence and has the themes: How does biotechnology impact life? and How is life organized for success? The students will investigate a variety of concepts such as DNA fingerprinting and genetic engineering. Students will explore and compare microbes, plants, and animals (including humans) at the system and molecular levels. Other topics will include metabolism and disease. These topics will be presented through numerous laboratory activities and will emphasize process and thinking skills. This course is designed to challenge the top ten percent of students. It is more intensive and requires increased levels of critical thinking and mathematical reasoning. It is designed for the student who anticipates a science-based career, desires an accelerated science program, and intends to take advanced courses in science. A weighted grade is given.

137201/137202

Chemistry

Infinite Campus Name: **CHEMISTRY**

Grade(s): 10 - 12

Prerequisite: Biology 1 and 2, Matter and Change, and Algebra 1 with a C or better, or departmental approval
1/2 Science credit each semester

This course can fulfill the third required year of science credit and completes the recommended core curriculum in chemistry. Topics include atomic structure and history, The Periodic Table and periodicity, bonding and nomenclature, the mole and stoichiometry, states of matter, kinetics, thermochemistry, and acids and bases. Group interaction, discussion, and cooperation during laboratory practice and mathematical problem-solving sessions will be commonplace. Open-ended lab experiences requiring student collaboration, technology, and multiple-step problem solving execution will be frequent.

138201/138202

Honors Chemistry

Infinite Campus Name: **+CHEM**

Grade(s): 10 - 12

Prerequisite: Biology 1 and 2, Honors Matter and Change and C or better in Algebra 1 or departmental approval
1/2 Science credit each semester

Honors Chemistry is designed for the student who has an exceptional interest in science and desires an accelerated science program. Topics include atomic structure, periodicity, bonding, nomenclature, chemical reactions, stoichiometry, gas laws and physical states, thermochemistry, solutions, kinetics and equilibrium, and acids and bases. Group interaction, discussion, and cooperation during laboratory practice and mathematical problem-solving sessions will be commonplace. Open-ended lab experiences, requiring student collaboration and multiple-step problem solving execution will be frequent.

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137241/137242

Principles of Chemistry

Infinite Campus Name: **PRINCIPLES OF CHEMISTRY**

Grade(s): 09 - 12

Prerequisite: Biology 1 & 2, Matter and Change, and Algebra 1 or department approval
1/2 Science credit each semester

This course is designed for students who wish to obtain an understanding of the science of chemistry. The major concepts of chemistry are presented with an emphasis of its application in everyday life. The course will cover matter and its properties, atomic structure, the periodic table, chemical bonding, chemical reactions, properties of gases, solutions, introduction to thermochemistry, acid/base chemistry, and nuclear chemistry. These topics will be complemented with activities and laboratory investigations so students can gain hands-on experience. Principles of Chemistry is designed for students who want a rigorous study of chemistry topics and are pursuing a career in a non-STEM field.

137301/137302

Physics

Infinite Campus Name: **PHYSICS**

Grade(s): 11 - 12

Prerequisite: Forces & Motion in 1D, Algebra 2 / Trig, or departmental approval
1/2 Science credit each semester

Physics is recommended for any student who is interested in a STEM career field or who wants to prepare for a college level physics course. Physics uses advanced algebra and trigonometry to investigate the following topics: forces, motion in one- and two-dimensions, energy and momentum, gravitation, mechanical waves, light and optics, and electricity. Students will investigate these topics with activities and laboratory investigations to gain hands-on experiences.

137400

Animal Behavior

Infinite Campus Name: **ANIMAL BEHVR**

Grade(s): 11 - 12

Prerequisite: C or better in Bio 1 and Bio 2
1/2 Science credit each semester

This course is designed for students to gain an understanding of behavioral research. Students will learn the basics of experimental design and statistical analysis of results. Students will investigate animal response, mating strategies, habitat usage, and social behaviors. Students interested in human behaviors and psychology will find this course a valuable tool in understanding research based psychology and sociology

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137450

Zoology

Infinite Campus Name: **ZOOLOGY**

Grade(s): 11 - 12

Prerequisite: C or better in Bio 1 and Bio 2

1/2 Science credit each semester

Zoology is a semester course introducing students to the diverse animal kingdom with a survey of invertebrate and vertebrate animals. Students will study animals' characteristics and examples of each class. This course includes studies of the relationship between organisms and the environment, including physical and biological conditions.

137461/137462

Human Anatomy & Physiology (Honors Option)

Infinite Campus Name: **HUM ANATOMY**

Grade(s): 11 - 12

Prerequisite: Successful completion of Biology 1: Cells & Variation, Biology 2: Evolution & Ecology

1/2 Science credit each semester

This course will examine through group work, dissection, reading, and guided instruction, the major human body systems that support, move, maintain, and control the body. Medical terminology will be used and reviews of patient case studies will be incorporated. Normal functioning of human tissues, organs, and systems will be compared to pathologic conditions. This class will benefit anyone who wants to learn more about the human body. An optional field trip to view cadavers will be offered. An honors grade may be earned upon completion of the honors option requirements.

137470

Medical Science

Infinite Campus Name: **MEDICAL SCI**

Grade(s): 11 - 12

Prerequisite: Biology 1: Cells & Systems and Biology 2: Evolution & Ecology

1/2 Science credit each semester

The nature of human health and disease is stressed with an emphasis on normal functioning of tissues, organs and systems versus pathologic conditions. Major units will include cardiovascular, respiratory, endocrine, and immune systems. A medical vocabulary will be taught along with each unit. Information will be taught through lecture, dissection, group work, and discussion.

137480

Forensic Sciences

Infinite Campus Name: **FORENSIC SCI**

Grade(s): 11 - 12

Prerequisite: Recommended C or better in Biology 1 and 2, Matter & Change and Forces in Motion

1/2 Science credit each semester

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This course is intended to introduce the student to the field of forensic science, science as applied to the law. Forensic science includes all areas of scientific endeavor, such as medicine, anthropology, entomology, physics, chemistry and biology. This course will emphasize the chemistry connections. The student will also be introduced to criminalistics, and services normally provided by crime laboratories, through various laboratory experiments. By stepping into the role of crime scene investigator, the student will learn various scientific strategies and skills.

137490

Geology

Infinite Campus Name: **GEOLOGY**

Grade(s): 11 - 12

Prerequisite: Biology 1 & 2, Matter & Change, and Forces

1/2 Science credit each semester

Earth is a dynamic planet with many forces shaping its surface. From the eroding of canyons to the folding of mountains, this course will explore the processes that build and destroy. Looking at current Earth features like glaciers, volcanoes, and the ocean floor will help us to understand our home and all of its inhabitants of today and yesteryear.

137500

Environmental Science

Infinite Campus Name: **ENVIRONMENTAL SCIENCE 1**

Grade(s): 11 - 12

Prerequisite: One credit of Biology and Junior or Senior Class standing

1/2 Science credit each semester

How do humans and their behaviors impact the biosphere? Students will investigate the way nature operates when left undisturbed and when influenced by humans. Topics studied in Environmental Science include agriculture and soil, human population and growth, weather and climate change, water, energy, and biodiversity. This course is ideal for anyone who wants to learn more about how they can effect change on the Earth.

137550

Astronomy & Meteorology

Infinite Campus Name: **ASTRO/METEOR**

Grade(s): 11 - 12

Prerequisite: Biology 1 & 2, Matter & Change, and Forces

1/2 Science credit each semester

Astronomy and Meteorology is designed to explore and understand the world around us. What factors influence weather? How do we predict weather? How has human interactions with the Earth lead to local and global changes? This course will also explore The NASA program, the space race, and observations made by astronomers and astrophysicists which allowed a greater depth of knowledge of the solar system including the sun, moon, and stars.

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139151/139152

AP Biology

Infinite Campus Name: **+AP BIOLOGY**

Grade(s): 11 - 12

Prerequisite: 2 Semesters of Biology or Biology Honors, 2 Semesters of Chemistry or Chemistry Honors
1/2 Science credit each semester

AP Biology is an introductory college-level biology course. Students will cultivate their understanding of biology through inquiry-based investigations as they explore the topics of evolution, cellular processes including energy and communication, genetics, information transfer, ecology, and interactions. This course prepares students for the AP Biology exam

139501/139502

AP Environmental Science

Infinite Campus Name: **+AP ENVIROSCI**

Grade(s): 11 - 12

Prerequisite: 1 credit of Biology, 1 credit Chemistry (Chemistry may be taken concurrently)
1/2 Science credit each semester

Advanced Placement Environmental Science is devoted to applying scientific processes and reasoning to understanding the environment. This course examines the geological and biological factors that interact to create Earth's environmental systems and then uses this understanding to investigate the biological basis of current environmental issues with topics including natural resources, energy, pollution, climate change, population growth, and biodiversity conservation. Emphasis is placed on prevention of environmental crises or mitigating them if they occur. This course prepares students for the AP Environmental Science exam.

139251/139252

AP Chemistry

Infinite Campus Name: **+AP CHEM**

Grade(s): 11 - 12

Prerequisite: Chemistry or Honors Chemistry or department approval
1/2 Science credit each semester

AP Chemistry is designed to be equivalent to a first year general chemistry course in college. Students in this course will attain a depth of understanding of chemistry fundamentals and competence in dealing with chemical problems. Qualitative and quantitative study of topics will include: atomic theory and atomic structure, chemical bonding, gases, liquids and solids, chemical reactions, stoichiometry, equilibrium, kinetics, and thermodynamics. This course provides laboratory experience comparable to a typical college course and prepares students for the AP Chemistry exam.

139321/139322

AP Physics C: Mechanics

Infinite Campus Name: **+AP PHYS C:M**

Grade(s): 11-12

Prerequisite: + Forces and Motion and concurrent enrollment in +Pre-Calculus
1/2 Science credit each semester

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AP Physics C: Mechanics is a calculus-based physics course that covers kinematics, dynamics, energy, momentum, rotation, gravitation and oscillation. This course is the first of a two-course sequence that is equivalent to the introductory calculus based physics sequence taken by science and engineering students at most colleges and universities. This course prepares students for the AP Physics C: Mechanics exam.

139411/139412

AP Physics 1

Infinite Campus Name: **+AP PHYSICS 1**

Grade(s): 11 - 12

Prerequisite: Honors Forces & Motion or departmental approval, Honors Algebra 2 / Trig
1/2 Science credit each semester

AP Physics 1 is the study of trigonometry based physics. Students will investigate forces, motion in one and two-dimensions, circular and rotational motion, gravitation, energy and momentum, mechanical waves, and introductory static electricity and DC circuits. This course prepares students to take the College Board Advanced Placement Physics 1 examination and is equivalent to college level General Physics 1

139421/139422

AP Physics 2

Infinite Campus Name: **+AP PHYSICS 2**

Grade(s): 12

Prerequisite: Physics, AP Physics 1 or AP Physics C, Pre-Calculus
1/2 Science credit each semester

The study of trigonometry based physics culminates in AP Physics 2. Students will investigate optics, fluid mechanics, thermodynamics, electrical fields, currents and circuits, magnetism, and quantum and nuclear physics. This course prepares students to take the College Board Advanced Placement Physics 2 examination and is equivalent to college level General Physics 2. A weighted grade is given.

137930

Science Laboratory Assistant

Infinite Campus Name: **LAB ASST**

Grade(s): 11 - 12

Prerequisite: B average in Science, Junior or Senior standing, departmental approval
1/2 Electives credit each semester

This is a special course for students to have the opportunity to learn laboratory skills needed for any scientific career. The student will develop skills in making chemical solutions, raising laboratory animals, using microbiology techniques, maintaining equipment and supplies used in science classes, and assisting teachers in preparing for laboratory activities. They may also work on a scientific project under teacher supervision. Students must be reliable and enjoy working with science materials. Permission from the science department is required. The number of students accepted per class period is very limited.