

SCIENCE COURSES

There are three (3) levels of science offered beyond the Earth Science/Honors Earth Science sequence, which is required for all 9th graders. **NINE SCIENCE CREDITS ARE REQUIRED FOR GRADUATION.** The chart below will show you multiple pathways a student can take to reach their nine science credits. The level breakdown can help you decide which course is appropriate for you, along with a conversation with your current science teacher.

Note: All Rosemount High School science courses request a lab equipment/supplies donation.

Level I: Courses for the student who may have difficulty with science.

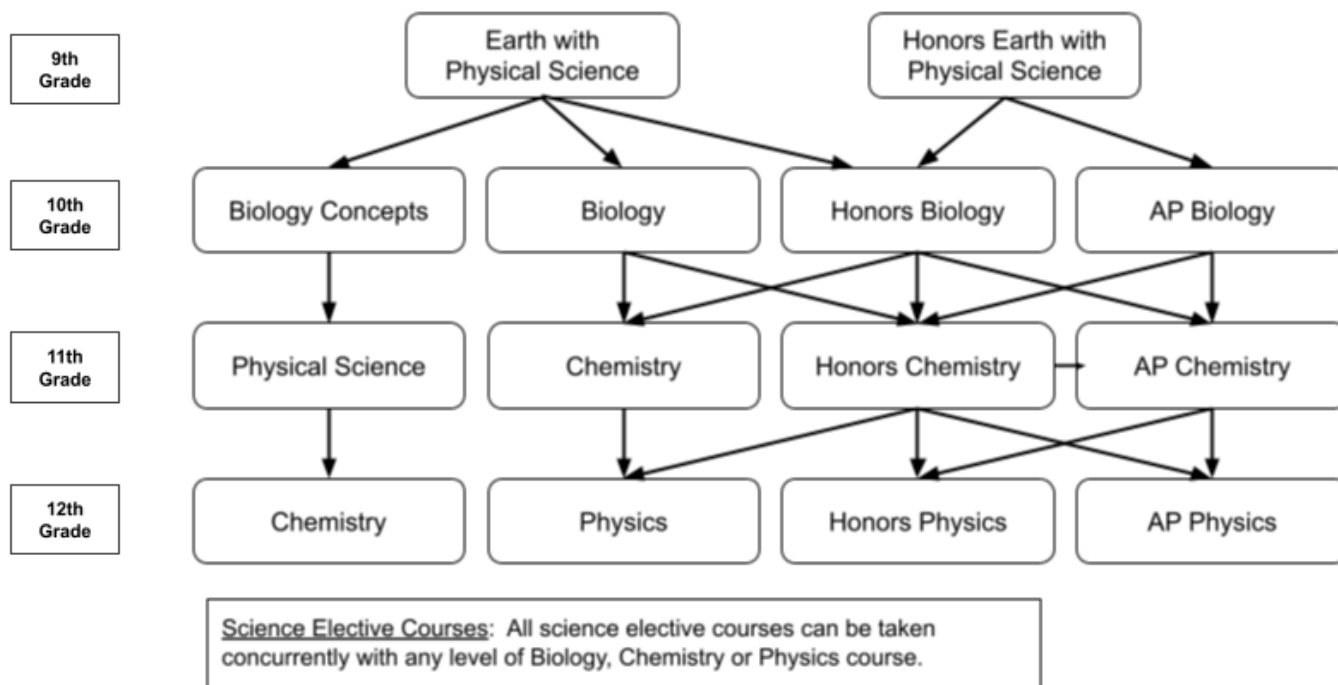
Biology Concepts(a full-year course)
Physical Science(a full-year course)

Level II: Courses for those students with a good science background.

Earth with Physical Science.....(a full year course)
Biology.....(a full year course)
Chemistry.....(a full year course)
Physics.....(a full year course)

Level III: Courses designed to **challenge** the student with a good science background.

Honors Earth with Physical Science(a full-year course)
Honors Biology(a full-year course)
Honors Chemistry(a full-year course)
Honors Physics.....(a full-year course)
Advanced Placement Biology(a full-year course)
Advanced Placement Chemistry(a full-year course)
Advanced Placement Physics(a full-year course)
Independent Study(a one trimester course only)
CIS: Physiology.....(a full-year course)



COURSES OFFERED TO STUDENTS IN GRADES 9, 10 AND 11

0901 Earth with Physical Science A

Grades 9, 10, 11

0902 Earth with Physical Science B

Prerequisite: None

0903 Earth with Physical Science C

This course is a laboratory approach to Earth Science including Physical Science and the Nature of Science and Engineering. Units of study will include: The Nature of Science and Engineering, Earth's Systems and Cycles, Vermillion River Field Study, Earth's Matter, Earth's Energy, Plate Tectonics, Earth History, Astronomy and Climate. Emphasis will be placed on using the scientific method and the engineering design process. **Note: This year-long course is a graduation requirement.**

0904 Honors Earth with Physical Science A

Grades 9, 10, 11

0905 Honors Earth with Physical Science B

Prerequisite: Department Recommendation

0906 Honors Earth with Physical Science C

This course is a laboratory approach to Earth Science including Physical Science and the Nature of Science and Engineering. Units of study will include: The Nature of Science and Engineering, Earth's Systems and Cycles, Vermillion River Field Study, Earth's Matter, Earth's Energy, Plate Tectonics, Earth History, Astronomy and Climate. Human's impact on Earth's systems is examined in several units throughout the year. Emphasis will be placed on using the scientific method and the engineering design process and communicating the results through formal laboratory write-ups.

As an honors class, students will be required to work independently and in cooperative groups, to complete a significant amount of research, along with studying and reviewing the concepts covered. Most assessments include data analysis and constructed response questions that will help to prepare the student for more advanced science classes and college placement tests such as the ACT and SAT. **Note: This year-long course is a graduation requirement.**

COURSES OFFERED TO STUDENTS IN GRADES 10, 11 AND 12

0913 Dinosaur Paleontology and Field Methods

Grades 10, 11, 12

Prerequisite: None

Did dinosaurs really have feathers? How do we know what colors dinosaurs were? What is the biggest/smallest dinosaur? In this course students will learn about the history of dinosaur evolution, how paleontologists study and interpret dinosaur fossils, and what it takes to dig up dinosaur bones. This course gives students the unique opportunity to learn from some of the most influential paleontologists working in the field today through a variety of in-class activities and guest speakers. Students will complete hands-on field science data collection methods which are essential for any student interested in studying science in nature. Along with learning the content students will practice critical thinking, data analysis/interpretation, collaboration and research skills.

With the completion of this course, students are eligible for an **optional** field experience in Wyoming. Students learn how to locate dinosaur bones, excavate in an active Dinosaur dig site, remove bones for further research and prepare them for placement in a museum. This experience will take place in mid-July and would be an added expense to the student. The completion of the field experience could earn students college science elective credits. To learn more about this experience please contact an Earth Science teacher. **NOTE: This course is a science elective and does not qualify as one of the science credits required for graduation. NOTE: This course is not an NCAA core academic class.**

0926 Biology A

Grades: 10, 11, 12

0927 Biology B

Prerequisite: None

0928 Biology C

The study of life is the focus of this three trimester course. Students in Biology will use the scientific method and experimentation to explore the many topics that comprise the study of life. Topics studies include: chemistry of life, cells, DNA, genetics, natural selection, ecology, human system and biotechnology. The curriculum is based on the MN state standards and every student enrolled in the course will take the MCA III state science test in May. Continuation in this course is contingent upon receiving a passing grade the previous trimester.

0929 **Honors Biology A**

Grades: 10, 11, 12

0930 **Honors Biology B**

Prerequisite: None

0931 **Honors Biology C**

This three trimester honors course will provide a challenge to students as they start to explore the many science opportunities at RHS. Honors Biology will seek to enhance the students' appreciation of science and engineering as we explore life. Topics studied include: chemistry of life, cells, cellular energy, mitosis and the cell cycle, DNA, protein synthesis, meiosis and Mendel, genetics, biotechnology, evolution, ecology, human systems and the diversity of life. The curriculum is based on the MN state standards and every student enrolled in the course will take the MCA III state science test in May. Continuation in the course sequence is contingent upon receiving a passing grade the previous trimester.

0935 **Biology Concepts A**

Grades: 10, 11, 12

0936 **Biology Concepts B**

Prerequisite: Instructor Recommendation

0937 **Biology Concepts C**

This course is designed to develop a basic understanding of biological systems and the scientific method. Skills that will be reinforced include experimental procedure, laboratory safety, data collection and problem solving. Topics that will be addressed include the scientific method, structure and function of living things, cell theory, genetics, and ecology. Students are expected to take an active part in class discussions and be able to safely follow laboratory procedures.

NOTE: This class is limited to students who require assistance with reading, math, or concept mastery skills.

NOTE: This course is not an NCAA core academic class.

0940 **Advanced Placement College Biology A**

Grades: 10, 11, 12

0942 **Advanced Placement College Biology B**

Prerequisite: Honors Earth Science & instructor recommendation

0944 **Advanced Placement College Biology C**

Advanced Placement College Biology is designed for students who intend to pursue a science or science related career. Topics covered throughout the year include biochemistry, cell structure and function, cellular energy, genetics, protein synthesis, ecology, plant structure and function, classification, and animal structure and function. Laboratory experiences will enhance the learning process throughout the year. The rigor of the course is comparable to a college level general biology course. This course will help prepare students for the optional advanced placement exam for college credit. Continuation in the course sequence is contingent upon receiving a passing grade the previous trimester. **This course asks for a \$30 optional lab donation.**

0945 **Biology of Minnesota A**

Grades: 10, 11, 12

0946 **Biology of Minnesota B**

Prerequisite: Earth Science

0947 **Biology of Minnesota C**

Do you enjoy spending time in the outdoors? Are you interested in learning more about your state's environment and the plants and animals that make Minnesota their home? Are you concerned about conservation and other environmental issues that affect our state? Biology of Minnesota is a course that offers students with these interests an opportunity to better understand Minnesota's natural history through a variety of classroom activities, hands-on field experiences, field trips and guest speakers. Biology of Minnesota will examine how Minnesota's climate and soils shape the four ecosystems of our state, the identification of Minnesota's native plants and animals, and the unique adaptations and roles these organisms possess to be successful in our ecosystems. The course will also give students an opportunity to investigate many of the conservation and environmental issues that impact them as residents of Minnesota **NOTE: Each of the Biology of Minnesota courses can be taken independently. NOTE: This course is a science elective and does not qualify as one of the science credits required for graduation. NOTE: This course is not an NCAA core academic class.**

COURSES OFFERED TO STUDENTS IN GRADES 11 and 12

0949 Infectious Disease and Public Health

Grades: 11, 12

Prerequisite: Biology or Honors Biology or AP Biology

Have you ever wanted to be a disease detective? Are you interested in careers involved in preventing disease and promoting health? This course introduces the basic principles and methods of epidemiology, the area of study that focuses on infectious diseases and their spread. This course also introduces career opportunities in the field of public health. Students will complete performance-based, analytic investigations using real world situations to determine patterns and causes of disease-causing conditions, and evaluate methods to prevent disease. Students will focus on the implementation and evaluation of studies designed to increase their understanding of infectious diseases and the effects on public health. Emphasis will be on expanding students' understanding of the scientific methods involved in disease transmission and the development of critical thinking skills. This is a one trimester course. **NOTE: This course is a science elective and does not qualify as one of the science credits required for graduation. NOTE: This course is not an NCAA core academic class.**

0951 Physical Science A

Grades: 11, 12

0953 Physical Science B

Prerequisite: None

0955 Physical Science C

This three-trimester course is designed for the student wishing to explore both chemistry and physics. This is a laboratory-oriented course with emphasis on the physical sciences of chemistry and physics. Students will explore topics such as measurements, force and motion, work and energy, waves, properties of matter, elements, the periodic table, compounds and bonding. **NOTE: This class is limited to students who require assistance with reading, math, or concept skills.**

0956 Chemistry A

Grades: 11, 12

0957 Chemistry B

Prerequisite: Biology or Honors Biology or AP Biology

0958 Chemistry C

Chemistry is designed for students "to do" science with their hands in the laboratory. Chemistry A will focus on the basics of chemistry needed for further study of the subject: matter and its changes, atomic structure, writing formulas and naming chemicals, problem-solving, and mathematical manipulations of chemical quantities. Chemistry B will use the material learned in Chemistry A to continue the study of matter and its changes, with major concentration on bonding, composition, chemical reactions reactions, equations, and gas laws. Chemistry C continues to build on the previously-taken chemistry classes by focusing on topics such as solutions, suspensions, ionizations, gas laws and acid-base chemistry. Organic chemistry, nuclear chemistry and thermodynamic chemistry may also be introduced. Basic Algebra skills are needed. Continuation in the course sequence is contingent upon receiving a passing grade the previous trimester or instructor approval.

0959 Physics A

Grades: 11, 12

0960 Physics B

Prerequisite: Two years of Algebra and Chemistry

0961 Physics C

Physics is the study of energy and its transformations and is designed for students who are interested in science, have a strong math background, or are planning to attend college. The areas of study for Physics A are an introduction to mathematical concepts, motion, and Newton's Laws of Motion. Physics B topics include mechanical energy, momentum, and rotational motion. Physics C topics include fluids, vibrations and waves, sound, heat, and an introduction to electricity. Lights, optics, nuclear physics and magnetism may also be introduced. Emphasis is placed on laboratory work and applying the principles of physics to common situations. Necessary math skills include geometry, trigonometry, algebra, manipulation of variables, conversions and problem solving. **NOTE: This course has an optional field trip to an amusement park (Valleyfair MN). The purpose of the field trip is to show the application of physics in the world around us.**

0971 CIS: Physiology A

Grades: 11, 12

0972 CIS: Physiology B

Prerequisite: Biology or Chemistry or Instructor Approval

0973 CIS: Physiology C

"College in the Schools (CIS) Physiology (BIOL 1015: Human Physiology, Technology, and Medical Devices)"  is a full year course (4 credits) that offers an excellent introduction to human anatomy and physiology and the rigors of college course-work. It provides the students with an opportunity to determine if they wish to pursue a major in the health science field. The CIS program is a concurrent enrollment program, with the University of Minnesota, that results in four, non-major, lab science credits should you earn a passing grade. (Notice -The credit that you earn is not a substitute for a more advanced anatomy and physiology course at any college or university.)

The students who enroll in this class must be highly self-motivated and disciplined. This course is recommended for students who earned at least a B in previous science classes. The focus of the course is to learn about the structure and function of the human body at all levels of organization. This class emphasizes individual learning outside of the classroom and collaborative learning inside of the classroom. The topics to be covered include the systems of the body, the effects of disease on the body, as well as medical technologies and devices. To enhance our understanding of these systems we will spend a significant amount of time in the lab. Time spent in the lab will include investigations into physiology and dissections.

0965 Honors Chemistry A

Grades: 11, 12

0966 Honors Chemistry B

Prerequisite: Honors Biology or AP Biology

0967 Honors Chemistry C

This honors course provides the basic content required for high school level chemistry at an accelerated pace. It is designed to give a mathematical and hands-on approach to the required content that is aligned to Minnesota State Standards. Students who enroll in this course should be independent thinkers and learners. Honors Chemistry "A" will focus on the basics of chemistry needed for further study of the subject: lab safety, physical & chemical changes, scientific measurement, atomic structure, light & energy, mathematical problem solving and manipulations, dimensional analysis, introduction to bonding, and naming/writing chemical formulas. Honors Chemistry "B" will continue the sequence with more advanced bonding topics, chemical reactions, the mole, stoichiometry, and gas laws. Honors Chemistry "C" will allow for more independent problem solving incorporating previously discussed chemistry material, while continuing with the sequence including: mixtures & solution chemistry, thermodynamics, reaction rates, equilibrium and acid-base chemistry. Organic chemistry, nuclear chemistry, electrochemistry and oxidation/reduction reactions may also be introduced. Basic algebra skills are needed. Inquiry-based lab activities will be presented each week for analysis and discussion, which will allow students to construct their own meaning of higher-level concepts as presented in the text. Continuation in the course sequence is contingent upon receiving a passing grade the previous trimester or instructor approval.

0977 Advanced Placement Physics A

Grades: 12

0978 Advanced Placement Physics B

Prerequisite: Honors Chemistry and Honors Pre Calculus

0979 Advanced Placement Physics C

AP Physics 1 is an algebra-based, introductory college-level physics course that explores topics such as Newtonian mechanics (including rotational motion); work, energy, and power; mechanical waves and sound; and introductory, simple circuits. Through inquiry-based learning, students will develop scientific critical thinking and reasoning skills. At the conclusion of the sequence of classes, students will have the option of taking the AP Physics 1 exam for college credit. **NOTE: There is an optional end of the year field trip to Valleyfair. The purpose of the field trip is to show application of physics in the world around us.**

0983 Honors Physics A

Grades: 12

0984 Honors Physics B

Prerequisite: Chemistry and Pre-Calculus or Calculus concurrently recommended

0985 Honors Physics C

Honors Physics is intended for students with a strong math background who desire a more thorough, fast-paced introduction to physics. A large emphasis is on problem solving and theoretical problems. Topics for the first trimester are Newton mechanics, linear and rotational motion, force, work, momentum, and equilibrium. Topics for the second trimester are fluids, waves, temperature, thermodynamics, and an introduction to electricity. Topics for the third trimester are magnetism, light, optics, nuclear and modern physics, and relativity. Continuation in the course sequence is contingent upon receiving a passing grade the previous trimester or instructor approval. This course will have a spring field trip to an amusement park. **NOTE: This course has an optional field trip to an amusement park (Valleyfair MN). The purpose of the field trip is to show the application of physics in the world around us.**

0986 **Advanced Placement Chemistry A**

Grades: 12

0987 **Advanced Placement Chemistry B**

Prerequisite: Honors Chemistry

0988 **Advanced Placement Chemistry C**

This course is designed to be the equivalent of a general chemistry course taken during the first year of college and should be taken as a second year chemistry course at the high school. Students attain a depth of understanding of fundamentals and a reasonable competence in dealing with chemical problems. Lab work is also emphasized. Performance on this exam may make the student eligible for waiver of college coursework. Students investigate the structure of matter and chemical reactions in detail: acid-base, precipitation, and oxidation-reduction. They also study electrochemistry, equilibrium, kinetics, and thermodynamics. During AP Chemistry students will study reactions, study organic chemistry and prepare for AP exams. Upon completion, students may elect to take the Advanced Placement Test administered by the College Entrance Examination Board.

0999 **Independent Study: Science**

Grades: 12

Prerequisite: Instructor Approval

This course is designed for students who have taken all the available courses in a particular area of science and want to study the area in greater depth. Students will work on self-designed projects under the supervision of a Science Department teacher. Students wishing to enroll in this course should get a project proposal form from a Science Department teacher, complete the form, and get the approval of the teacher before registering. **NOTE: This course is not an NCAA core academic class.**