



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 charts below will help you determine the level of science that is appropriate for you. **Note: All Rosemount High School science courses request a lab equipment/supplies donation.**

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

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

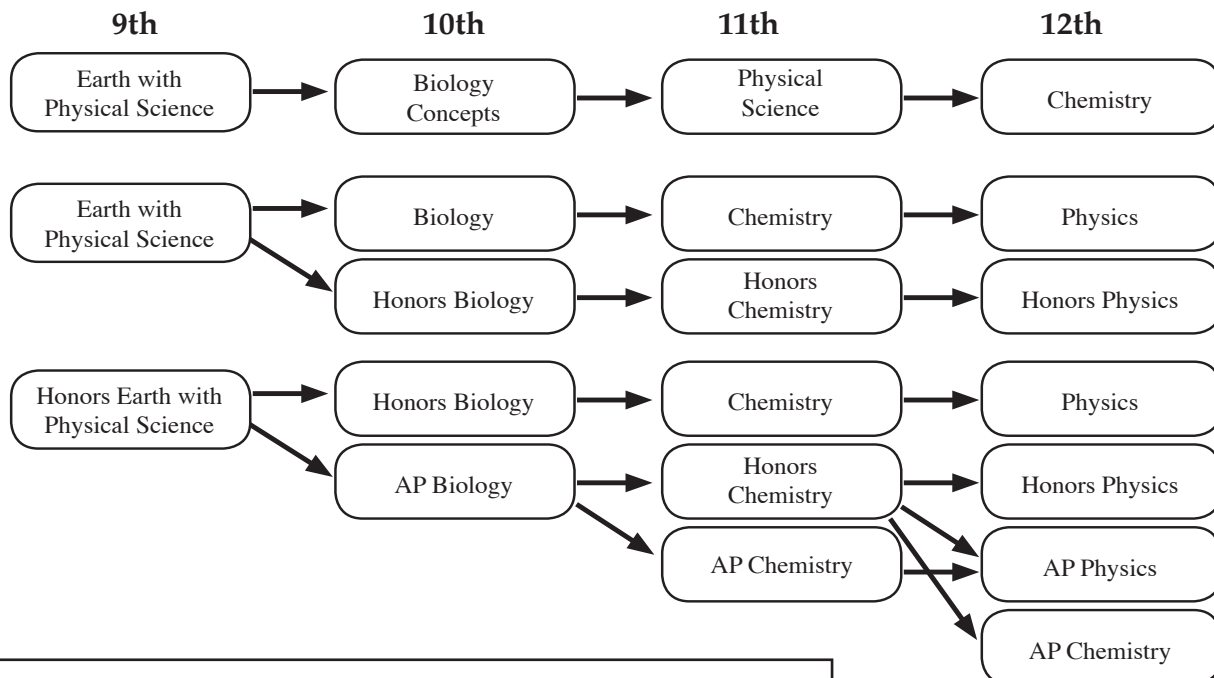
Level II: Courses for those students with a good science background and who are considering college.

- Honors Biology(a full year course)
- Biology.....(a full year course)
- Chemistry.....(a full year course)
- Anatomy and Physiology(a full year course)
- Physics.....(a full year course)

Level III: Courses designed to challenge the outstanding college-bound student.

- 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: Anatomy and Physiology(a full-year course)

The following flow charts are the recommended paths for the majority of students.



Elective Courses: Anatomy and Physiology; Forensics and the Science of Crime; Earth and Space Systems; and Biology of Minnesota can be taken concurrently with any Biology, Chemistry, or Physics course.

SCIENCE COURSES

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	Grade 9 only
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 placements 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 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.

SCIENCE COURSES

-  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 and instructor recommendation
0944 **Advanced Placement College Biology C** for any 10th grade students seeking enrollment.

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 states 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 4 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

-  0948 **Forensics and the Science of Crime** Grades 11, 12
Prerequisite: Successful completion of Honors Biology or Biology and instructor's permission

This course provides an overview of the most commonly used scientific methods in crime scene investigation. We will complete labs using instrumentation and techniques used by forensic scientists in evidence collection and crime investigation. Students will review modern DNA analysis, fiber analysis, ballistics analysis, print impressions, bone and dental analysis and many more forensic methods for gathering and interpreting physical evidence. This course provides an overview of the forensic science careers from the crime scene investigator to the medical examiner. We will work with most commonly used laboratory methods, instrumentation, and strategies used during the investigation of human remains and of death scenes. Included are descriptions of the unique functions of the scientists found within the contemporary criminal justice system. 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 as measurements, force and motion, work and energy, waves, properties of matter, elements, the periodic table, compounds and bonding. **NOTE: This class limited to students who require assistance with reading, math, or concept skills.**

SCIENCE COURSES

- ☘ 0956 **Chemistry A** Grades 11, 12
0957 **Chemistry B** Prerequisite: Biology or Honors Biology or
0958 **Chemistry C** Advanced Placement Biology

Chemistry is designed for students who are interested in science or are planning to attend college. 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 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.**

- ☘ 0962 **Anatomy and Physiology A** Grades 11, 12
0963 **Anatomy and Physiology B** Prerequisite: Biology or Chemistry or Instructor permission
0964 **Anatomy and Physiology C**

Anatomy and Physiology provides an in-depth understanding of the basic processes of the human body. The course is laboratory oriented, comparable to Honors Biology in difficulty. Anatomy and Physiology A includes basic medical terminology, biochemistry, histology, skeletal and muscular systems. Anatomy and Physiology B includes the study of the respiratory and circulatory systems, as well as a review of related career fields. Anatomy and Physiology C places emphasis on nutrition, digestive system and the nervous system. It is recommended, but not required, that students register for all three of these non-sequential courses. **NOTE: This course is a science elective and does not qualify as one of the science credits required for graduation.**

- ☘ 0971 **CIS: Anatomy and Physiology A** Grade 11, 12
☘ 0972 **CIS: Anatomy and Physiology B** Prerequisite: Biology or Chemistry or
0973 **CIS: Anatomy and Physiology C** Instructor Approval

“College in the Schools (CIS) Anatomy and 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 coursework. 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 medical terminology, histology, and the systems of the body. To enhance our understanding of these systems we will spend a significant amount of time in lab. Time spent in lab will include microscope work, investigations into physiology, and dissections. **This course asks for a \$30 optional lab donation.**

- ☘ 0965 **Honors Chemistry A** Grades 11, 12
0966 **Honors Chemistry B** Prerequisite: Honors Biology or Advanced Place-
0967 **Honors Chemistry C** ment Biology and Department Recommendation


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.

SCIENCE COURSES



COURSES OFFERED TO STUDENTS IN GRADE 12

 0977 Advanced Placement Physics A	Grade 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	Grade 12	
0984 Honors Physics B	Prerequisite:	Chemistry or Honors Chemistry and Pre-Calculus or Calculus taken concurrently recommended and passing grades in the previous Physics class.
0985 Honors Physics C		Department recommendation

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	Grade 12	
 0987 Advanced Placement Chemistry B	Prerequisite:	Honors Chemistry and department recommendation
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 course work. 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	Grade 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.**

 1805 ACT Prep	Grades 10, 11, 12	
	Prerequisite:	None

Whether you have taken the ACT test before or you are new to the experience, this course will prepare you to do your personal best. The trimester long elective course will navigate students through the ACT testing process and will focus on understanding the format of the test, building strategies for answering more questions correctly and pacing yourself during a timed test. Students build confidence and skills that will boost their scores on the actual test. Students will have access to hundreds of practice questions and an online program that helps them continue preparing even after the course is completed. One assignment for the course will be to take a mock test under actual testing conditions outside the normal school day. Students are encouraged to purchase an ACT Prep workbook to enhance their learning in the class. **Note: The course is a general elective credit and does not qualify as one of the [English, Math, Science, Social Studies] credits required for graduation. Note: This course is not an NCAA core academic class.**