

Course Descriptions

Burnaby Central

SCIENCE

Science 8

As students investigate cells, atomic theory, light, and plate tectonics they will increase their understanding of the Scientific Method and our natural world. Communication, critical and creative thinking, personal awareness, and social responsibility are skills that will be developed throughout the year. Students will also be provided with the opportunity to develop the processes, attitudes, and scientific habits of mind that allow them to pursue their own inquiries. The big ideas as developed by the Ministry of Education are as follows:

Life processes are performed at the cellular level.

The behavior of matter can be explained by the kinetic molecular theory and atomic theory.

Energy can be transferred both as a particle and a wave.

The theory of plate tectonics is the unifying theory that explains the Earth's geologic processes.

Science 8 Enriched

Science 8 Enriched gives the student the opportunity to delve deeper into the curriculum and content. This course is for self-motivated and engaged students who love science. Entry into the Science 8 Enriched program is through an application process. A student must be recommended by their Grade 7 teacher and then write a general knowledge exam in the spring. All dates will be forwarded to Grade 7 teachers when they become available.

Science 9

As students investigate reproductive strategies, the periodic table, electricity, and ecosystems, they will increase their understanding of the Scientific Method and our natural world. Communication, critical and creative thinking, personal awareness, and social responsibility are skills that will be developed throughout the year. Students will also be provided with the opportunity to develop the processes, attitudes, and scientific habits of mind that allow them to pursue their own inquiries. The big ideas as developed by the Ministry of education are as follows:

Cells are derived from cells.

The electron arrangement of atoms impacts their chemical nature.

Electric current is the flow of electric charge.

The biosphere, geosphere, hydrosphere, and atmosphere are interconnected as matter cycles and energy flows through them.

Science 9 Enriched

The purpose of Science 9 Enriched is to provide enrichment for students who excel in Science. The intent of this course is to develop concepts at a deeper level than the Science 9 course. Students are expected to be high achieving, highly motivated, and have a love for science. Admission to this course is at the discretion of the Science Department.

Science 10

Science 10 topics include genetic diversity and patterns of inheritance, chemical processes and energy transformations, as well as the formation of the universe. Using critical thinking, creative insight, and their current scientific knowledge, students will be provided with opportunities to collaborate, investigate, problem solve, communicate, innovate, discover and increase their understanding of science through hands-on experience. The big ideas as developed by the Ministry of education are as follows:

Genes are the foundation for the diversity of living things.

Chemical processes require energy change as atoms are rearranged.

Energy is conserved and its transformation can affect living things and the environment.

The formation of the universe can be explained by the big bang theory.

Science 10 Enriched

The purpose of Science 10 Enriched is to provide enrichment for students who excel in Science. The intent of this course is to develop concepts at a deeper level than the Science 10 course. There is an expectation that students will be able to take on self-directed study in science areas that interest them. Proficiency in technology is required. Students are expected to be high achieving, highly motivated, and have a love for science. Admission to this course is at the discretion of the Science Department.

Biology 11

Students are introduced to important biological themes of biodiversity, evolution, and ecological relationships. Biology 11 uses lab activities to study the increasing complexity of life forms of viruses and bacterium, fungi, and then on to higher plants and animals. Students investigate how different organisms fulfill their life functions, for example, exchanging materials, responding to the environment, and reproduction. Interactions with other organisms, including humans, and the ecosystem will also be explored. This course teaches fundamental concepts, laboratory skills, and themes needed in future biology courses, in both the high school and post-secondary setting. Supplemental field trip to the Vancouver Aquarium wet-lab may occur at the discretion of the teacher.

Biology 11/12 Enriched and AP Biology Tutorial

These courses are designed to cover the BC curriculum for Biology 11 and 12, as well as the AP Biology curriculum for both grade 11 & 12 is covered in a double block (all morning) in semester 1. The Courses are enriched with AP content whenever appropriate. AP content is

further explored in the AP Biology tutorial offered in semester 2. In May, students write the AP Biology Exam for university credit for the first year of Biology if they achieve a score of 4 or a 5. Recommendation from their Science 10 teacher is required.

Chemistry 11

Chemistry 11 is a course designed to introduce the main ideas, principles and verifying concepts in chemistry, and provide a basis for Chemistry 12 and post-secondary entrance. Skills learned in Mathematics 10 are critical to success in Chemistry 11. Topics include: uncertainty in measurement, writing chemical formulae and balancing equations, the mole concept and Avogadro's Number, problems using balanced equations, solutions and ions, molarity, electron configurations, bonding, and organic chemistry.

Physics 11

This is an introductory course which covers the main ideas, principles, and unifying concepts in physics; to develop an understanding of the analytical and experimental methods of inquiry used in science; and to promote an understanding of how physics applies to everyday life. Physics 11 is recommended especially for students who plan to study pure sciences or engineering related technology but is also appropriate for humanities-oriented students. Topics include: kinematics, dynamics, Einstein's Theory of Relativity, energy (electrical, mechanical, heat and nuclear), and the transmission of energy (waves and photons). Students should take Math 11 prior to or concurrent with Physics 11. A minimum C+ average in Science 10 is strongly recommended.

Earth Science 11

This is a survey course that explores the Earth and its environment in space through lab and field experiences. Earth science topics include rocks and minerals, plate tectonics, volcanoes, earthquakes, ocean and weather sciences, and oil, gas and mineral exploration. Space science topics include planets and the solar system, stars, galaxies, and deep space objects such as quasars and black holes.

Biology 12

Biochemistry and cellular mechanics form the basis of study for the first half of this academic course. Genomics and the importance of emerging DNA technologies such as cloning and recombinant DNA will be explored. Human physiology becomes the focus for the remainder of the year. An understanding of the organization of human systems and the integrated nature of the human body will be emphasized. The effects of nutrition, lifestyle, and different medical conditions on homeostasis and health will be considered. Prior completion of Biology 11 and Chemistry 11 is strongly recommended.

Chemistry 12

This course further develops on concepts introduced in Chemistry 11 with an emphasis on reaction rates, reaction and solubility equilibrium, acid-base chemistry, and redox reactions. Math 12 should be taken concurrently or prior. A minimum C+ average in Chemistry 11 is

strongly recommended. A good knowledge of stoichiometry and solution chemistry from Chemistry 11 is required for success.

Physics 12

This course further develops on the concepts learned in Physics 11 with emphasis on mechanics and electromagnetism. This course helps develop analytical, experimental and problem-solving skills. It also helps students appreciate the role and applications of physics in our technological and cultural development. A minimum C+ average in Physics 11 is strongly recommended. Math 12 should be taken concurrently or prior. Topics include vector mechanics in 2 dimensions, equilibrium, energy, circular motion and gravitation, electricity, and electromagnetism.