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 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:

Cell 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 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.

Astronomy 11:

Have you ever looked up and caught yourself staring off into the night sky? Have you wondered what else is out there beyond the horizon? Are you fascinated with the cosmos? This will be an introductory course on the history of astronomy and our solar system. Students will discuss a variety of topics from ancient astronomy up to modern day developments in the field. Detailed course topics include: ancient astronomy; formation and evolution of the solar system; the planets, stars, moons, sun and minor members of the solar system; working with telescopes and observing the night sky; and space exploration. Some evening field trips to observe the night sky will be required. Please note that this course is a science elective. It does not satisfy the science graduation requirement.

Life Sciences 11 (Biology 11)

Students are introduced to important biological themes of biodiversity, evolution, and classification. Interactions at the molecular and cellular levels are explored. Life Sciences 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 change over time and fulfill their life functions, for example, exchanging materials, responding to the environment, and reproduction. 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

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. Students should take Math 11 prior to or concurrently with Chemistry 11. A minimum grade of C+ in Math 10 is strongly recommended.

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, energy (electrical, mechanical, and heat), and the transmission of energy (waves and photons). Students should take Math 11 prior to or concurrently with Physics 11. A minimum C+ grade in Science 10 is strongly recommended.

Science for Citizens 11

This is a survey course that explores how scientific processes and knowledge inform our decisions and impact our daily lives. Scientific knowledge can be used to develop procedures, techniques, and technologies that have implications for **places of employment**. Scientific understanding enables humans to respond and adapt to changes locally and globally.

Anatomy and Physiology 12 (Biology 12)
This course is an in-depth study of human anatomy, physiology, health, and well-being. Students will study the chemical processes within living organisms (biochemistry) and the mechanics of cells. This includes understanding cellular structures, functions, and the biochemical reactions that occur within cells. Students will gain a thorough understanding of the intricacies of human biology and its applications in real-life contexts. There will be emphasis on connecting the knowledge gained in biochemistry, cellular mechanics, and human physiology to understand the holistic functioning of the human body. The course will delve into how nutrition, lifestyle choices, and various medical conditions impact homeostasis (the body's internal balance) and overall health. Students may explore genomics, which involves the study of genes and their functions. The significance of emerging DNA technologies, such as gene editing or sequencing, are considered in this course. Prior completion of Biology 11 and Chemistry 11 are strongly recommended.

Anatomy and Physiology 12: Science of Sport focus (Biology 12)
This course satisfies the learning outcomes of Anatomy and Physiology 12 (see above). It is designed for students with an interest in learning how the human body functions through the lens of sports science. Students will engage with learning theory in the classroom and active participation. Students will examine concepts pertaining to the control of movement, metabolic responses to exercise, injury recovery and various adaptations in the body's systems that contribute to athletic performance. The goal of this course is for students to develop their understanding of the organization of the human body and how it affects involvement in sport. Prior completion of Biology 11 and Chemistry 11 are 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 to taking Physics 12. Topics include vector mechanics in 2 dimensions, equilibrium, momentum, energy, circular motion, gravitation, and electromagnetism.

Science Leadership 11/12 (New!)
This new course is for motivated students looking to build leadership and lab skills in science. Students will be assisting with the preparation, setup, and takedown of labs for a variety of science classes. They will be maintaining lab organization, equipment, and safety practices under teacher supervision. Other activities include conducting experiments, as well as planning and coordinating STEM outreach activities for the school and broader community. Students will model professionalism, reliability, and safe lab practices while working with younger students and staff. This Science Leadership class is designed for students who are looking to build science skills that open doors for future opportunities and are confident with science 10 material.