

2013–2014

# HIGH SCHOOL SCIENCES AT A GLANCE



## SCIENCE 10

*What happened to that energy?* Science 10 students are introduced to the biological, chemical, physical and Earth sciences. By studying chemical reactions, cellular and multicellular processes that occur in plants, the conservation and conversion of energy, and Earth's climate, they discover how energy is transformed.

## SCIENCE 20

*What changes do we see on Earth?* Students in Science 20 extend their study of the biological, chemical, physical and Earth sciences and apply their knowledge to real-life problems. They investigate Newton's laws of motion, the properties of hydrocarbons and the chemistry of solutions. They examine evidence of how Earth's surface, climate and life forms have changed and continue to change and cycle in response to natural and human actions.

## SCIENCE 30

*How do we sustain our energy resources?* Students sharpen their scientific skills and explore a wide range of scientific concepts to strengthen their foundations in science. They investigate human systems and health, and environmentally sustainable solutions for meeting global energy needs. They also examine the impacts of chemicals in society and the environment and examine the properties and applications of electromagnetic energy.

## BIOLOGY 20

*How and why does energy flow through living systems?* Biology 20 students examine the interactions of living systems to better understand the constant flow of energy and the cycling of matter. Specifically, students explore the functioning of the human body and the mechanisms that work to maintain balance in organisms, in ecosystems and in the biosphere.

## BIOLOGY 30

*Why is there so much diversity?* Biology 30 students conduct lab work and investigate how human systems sense and respond to the environment. They explore human reproduction and development at the cellular level and at the organism level. Students investigate the basic structure and role of DNA and investigate the inheritance of traits in individuals and populations. They analyze the changes in populations resulting from natural and human-induced changes in the environment and discover that living systems are dynamic.

## CHEMISTRY 20

*How do atoms combine to create matter?* Students explore matter and how it changes in order to understand the natural world. They investigate the chemical properties of solutions, and they apply their understanding of chemical bonds to explain ionic and molecular compounds. Chemistry 20 students explain the behaviour of gases, using the gas laws, and also work to balance chemical equations.

## CHEMISTRY 30

*How can you predict chemical equilibrium?* Chemistry 30 students examine and quantify how thermochemical and electrochemical systems use or provide energy. They explore common organic compounds—those that contain carbon—and how they are used in technological applications and everyday life. Students also investigate acid-base reactions and interpret how they eventually reach equilibrium.

## PHYSICS 20

*How does a lacrosse player know when to release the ball?* Physics 20 students investigate the motion of objects. They apply Newton's law of universal gravitation to astronomical observations. They also describe how energy is transmitted by mechanical waves and how waves relate to medical technologies, industry and musical instruments.

## PHYSICS 30

*When does a model or a theory need to change?* Physics 30 students consider historical experiments and explore why the model of the atom has changed as a result of experiments and observations of natural phenomena. Students apply a quantitative approach to describe conservation of momentum in an isolated system, and they investigate applications and implications of electric and magnetic forces and fields. They also use the concept of wave-particle duality to understand both wave and photon behaviour of electromagnetic radiations.

## SCIENCE 14

*How can we conserve energy?* Science 14 students learn about the atom, the periodic table and the safe handling of chemicals. They investigate how energy is transferred in machines, and they examine the digestive and circulatory systems, including ways to keep these systems healthy. Students also explore how human activities influence the flow of matter and energy in the biosphere.

## SCIENCE 24

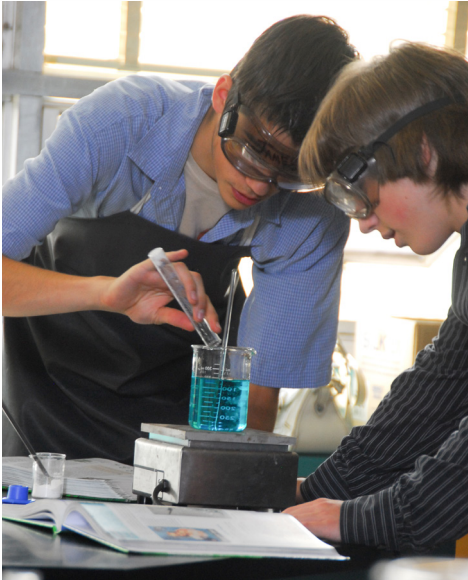
*Why do we need vaccines and antibiotics?* Science 24 students investigate common chemical reactions and examine energy conversions in biological, chemical, physical and technological systems. They learn about human health and the immune system. They also investigate the principles that describe the motion of objects and apply their knowledge to real-life situations.

## SCIENCE 10-4

*What should I do to keep my body healthy?* Knowledge and Employability Science 10-4 students explore the digestive and circulatory systems of the human body. They investigate common chemicals used at home and in the workplace, and how to safely handle them. Students discover how force and heat energy are transferred in technologies they use in their daily lives, and they ask questions about how human activities affect the natural world. Students who have experienced challenges or difficulty with their skills will be provided with additional strategies for success in the Knowledge and Employability -4 course sequence.

## SCIENCE 20-4

*How do seat belts keep me safe?* In Knowledge and Employability Science 20-4, students gain an understanding of the applications of science skills and knowledge for success at home, at work and in the community. They investigate and classify simple chemical reactions; learn about energy conversions and conservation; and examine how social, environmental and genetic factors affect human health. They also apply their knowledge of moving objects and conservation of momentum to transportation safety. Students who have experienced challenges or difficulty with their skills will be provided with additional strategies for success in the Knowledge and Employability -4 course sequence.



LEARN MORE ABOUT YOUR  
CHILD'S EDUCATION  
BY VISITING

**My Child's Learning: A Parent  
Resource**

<http://www.mychildslearning.alberta.ca>



## ASSESSMENT

Learning is assessed using a variety of tools and strategies within the classroom. Ask the teacher what methods they are using. The different assessment methods tell you, your teen and your teen's teacher about your teen's strengths, the areas in which they might grow and how well they are doing throughout a course. At the end of the course, your teen will be assessed and their achievement will be reported so that you know if they have achieved the expected learning outcomes for the course.

At the end of a 30-level course, your teen will write a provincial diploma examination. Your teen's final mark in a 30-level course will be the average of the school-awarded mark and the diploma examination mark (the average is determined by taking 50% of the school-awarded mark and adding it to 50% of the diploma examination mark). Your teen must achieve a final mark of 50% or higher to obtain credits for the course. For general information about diploma examinations and for course-specific diploma examination information, contact Learner Assessment by telephone at 780-427-0010 (toll-free within Alberta by first dialling 310-0000) or by e-mail at [LAcontact@edc.gov.ab.ca](mailto:LAcontact@edc.gov.ab.ca).

You play an integral role in your teen's education by providing the encouragement and support he or she needs to succeed.

## RESOURCES

A variety of digital and print resources from many different sources help students learn. Alberta Education reviews and authorizes many student and teacher resources that support learning and teaching in the classroom. Additionally, teachers may select, and bring into the classroom, numerous other innovative and creative resources to create rich learning experiences for your teen. Visit [LearnAlberta.ca](http://www.learnalberta.ca/) (<http://www.learnalberta.ca/>) or the Authorized Resources Database (<http://education.alberta.ca/apps/lrddb/>) to learn more about the resources your child may encounter.

## WHERE CAN I GET MORE INFORMATION?

### CITIZENSHIP AND CAREER PATHWAYS

Telephone: 780-427-2984

Fax: 780-422-0576

E-mail: [curric.contact@education.gov.ab.ca](mailto:curric.contact@education.gov.ab.ca)

### FRENCH LANGUAGE EDUCATION SERVICES

Telephone: 780-427-2940

Fax: 780-422-1947

E-mail: [DEF@edc.gov.ab.ca](mailto:DEF@edc.gov.ab.ca)