

Health Science 21 (2016)

Course Overview

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Overview

The purpose of this document is to provide an introduction to the *Health Science 21 (2016)* course and supplementary resource packages that were developed by a committee of teachers representing various school divisions. The entire course package consists of this course overview and nine supplementary resource packages, namely:

- *Health Science 21 (2016) Resource Package – Introduction to Health Science*
- *Health Science 21 (2016) Resource Package – My Health Portfolio*
- *Health Science 21 (2016) Resource Package – My Nutrition*
- *Health Science 21 (2016) Resource Package – Health Care Philosophies*
- *Health Science 21 (2016) Resource Package – Communicable Diseases*
- *Health Science 21 (2016) Resource Package – Organ Donation*
- *Health Science 21 (2016) Resource Package – Musculoskeletal Injuries*
- *Health Science 21 (2016) Resource Package – Concussions*
- *Health Science 21 (2016) Resource Package – Reproductive Cancers*

The following individuals participated in the development of the *Health Science 21 (2016)* course and resource packages.

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School divisions wishing to receive copies of this course should submit a request to the ministry at curriculum@gov.sk.ca. The necessary documents will be sent back to the school division so they can submit an application through Blackboard. Once approval is received from the Ministry of Education, the school division may start using this course.

If a student is being considered for *Health Science 21 (2016)*, or any other modified course of study, the student and the parents/caregivers of the student must be consulted prior to being enrolled in a Locally Modified Course of Study. Consult *Policy and Procedures for Locally Modified Courses of Study* for further information.

Introduction

Science is a required area of study in Saskatchewan's Core Curriculum. Students require *Science 10* and a 20-level science course in order to meet graduation requirements. A modified course (e.g., *Health Science 21*) can be used to fulfill the 20-level science requirement.

The *Health Science 21 (2016)* course and resource package was developed to reflect the structure of the renewed *Health Science 20* curriculum. Therefore, teachers should use *Health Science 20*, which is available at <http://www.curriculum.gov.sk.ca>, to assist with unit planning and instruction for *Health Science 21 (2016)*.

Using this Resource Package

This resource package is divided into nine themes that will guide student learning and support meeting *Health Science 21 (2016)* learning outcomes. The first four themes, Course Introduction, My Health Portfolio, My Nutrition and Health Care Philosophies, are core themes that introduce overarching concepts in *Health Science 21 (2016)*. Themes five through nine, including Communicable Diseases, Organ Donation, Musculoskeletal Injuries, Concussions and Reproductive Cancers, are supplementary themes that delve into specific human body systems, imaging techniques and careers related to the aforementioned themes.

Each of the nine themes is divided into individual lessons. Lessons can be used together to support a learning theme or be used individually at the teacher's discretion. When looking at lessons within each theme, the following headings, as seen in the handouts provided, indicate the various stages of learning:

- **What Do You Know...**
 - activate students prior knowledge
- **Did You Know...**
 - engage students with content of lesson
- **Show What You Know...**
 - follow-up student learning related to the "Did You Know..." and/or "What Do You Know..." handout
- **Practice What You Know...**
 - engage students in hands on activity and/or research
- **Check What You Know...**
 - assess student learning (formative and/or summative)

Some outcomes are addressed in more than one of the suggested lessons within a learning theme; therefore teachers need not use all of the suggested lessons. Teachers may request an electronic version of this course package from their school division office so that they can modify the instructional documents to meet diverse needs.

Learning Theme Correlation

The table below show which outcomes each of the nine learning themes support.

Theme	CE1	HC1	HC2	HB1	HB2	NU1	NU2	DT1	DT2
Introduction to Health Science	X		X	X	X			X	
My Health Portfolio		X	X					X	X
My Nutrition				X		X	X		
Health Care Philosophies	X	X						X	
Communicable Diseases	X	X		X	X			X	
Organ Donation	X		X	X				X	
Musculoskeletal Injuries	X		X	X	X			X	X
Concussions	X		X	X	X			X	X
Reproductive Cancers	X			X	X			X	X

General Suggestions for Teaching Health Science 21 (2016)

Students in *Health Science 21 (2016)* may be capable of completing the same activities as students in *Health Science 20*, but may require appropriate adaptations to meet individual learning needs. For example, students may need additional time to complete a particular activity, may require more guidance while performing the activity or may require additional assistance with reading through a lab and interpreting the procedure to carry out the steps of the investigation.

Students in modified courses, such as *Health Science 21 (2016)*, often experience success with assignments when given some guidance, or a template. For example, doing a complete lab write-up beginning with a blank sheet of paper may be too much of a challenge. However, if a student is provided a partial lab write-up and required to fill in information as they carry out the investigation, they will likely experience more success with the task.

Incorporating educational videos into lessons may facilitate the learning of some concepts in any course. Teachers need to pay attention to student learning styles when using video, particularly in a modified course. Some suggestions for use of video would be to watch the video in short clips as well as provide the students with sufficient guidance (including handouts) to assist them with gathering important information from the video.

Adaptive Dimension

In order to meet the variety of students' needs, flexibility is required within the school program to enable schools and teachers to adapt instructional materials, methods, and the environment to provide the most appropriate educational opportunities for all students. The Adaptive Dimension is used to:

- help students achieve curriculum outcomes
- maximize student learning and independence
- lessen discrepancies between achievement and ability
- promote a positive self-image and feeling of belonging
- promote a willingness to become involved in learning
- provide opportunities for all students to be engaged in learning.

The intent of the Adaptive Dimension applies to all programs and courses of instruction. The key variables of instruction are differentiated--the content (what students will learn), the learning processes (how students will interact with the content), the learning products (how students will demonstrate learning and mastery of content) and the instructional setting or environment.

Whenever possible, students should learn a regular curricula and be supported through the Adaptive Dimension. Some students may not be able to complete a particular regular provincial course even though adaptations to curriculum materials and topics, instruction, and environment have been made. This may require the development of a modified course (e.g., *Health Science 21*) to meet student needs to which the Adaptive Dimension may be applied.

Broad Areas of Learning

There are three Broad Areas of Learning that reflect Saskatchewan's Goals of Education. Science education contributes to student achievement of the Goals of Education through helping students achieve knowledge, skills and attitudes related to these Broad Areas of Learning.

Lifelong Learners

Students who are engaged in constructing and applying science knowledge naturally build a positive disposition towards learning. Throughout their study of science, students bring their curiosity about the natural and constructed world, which provides the motivation to discover and explore their personal interests more deeply. By sharing their learning experiences with others, in a variety of contexts, students develop skills that support them as lifelong learners.

Sense of Self, Community, and Place

Students develop and strengthen their personal identity as they explore connections between their own understanding of the natural and constructed world and perspectives of others, including scientific and Indigenous perspectives. Students develop and strengthen their understanding of community as they explore ways in which science can inform individual and community decision making on issues related to the natural and constructed world. Students interact experientially with place-based local knowledge to deepen their connection to and relationship with nature.

Engaged Citizens

As students explore connections between science, technology, society and the environment, they experience opportunities to contribute positively to the environmental, economic and social sustainability of local and global communities. Students reflect and act on their personal responsibility to understand and respect their place in the natural and constructed world, and make personal decisions that contribute to living in harmony with others and the natural world.

Cross-curricular Competencies

The Cross-curricular Competencies are four interrelated areas containing understandings, values, skills and processes which are considered important for learning in all areas of study. These competencies reflect the Common Essential Learnings and are intended to be addressed in each area of study at each grade.

Developing Thinking

Learners construct knowledge to make sense of the world around them. In science, students develop understanding by building and reflecting on their observations and what is already known by themselves and others. By thinking contextually, creatively and critically, students develop deeper understanding of various phenomena in the natural and constructed world.

Developing Identity and Interdependence

This competency addresses the ability to act autonomously in an interdependent world. It requires the learner to be aware of the natural environment, of social and cultural expectations and of the possibilities for individual and group accomplishments. Interdependence assumes the possession of a positive self-concept and the ability to live in harmony with others and with the natural and constructed world. In science, students examine the interdependence among living things within local, national and global environments and consider the impact of individual decisions on those environments.

Developing Literacies

Literacies are multi-faceted and provide a variety of ways, including the use of various language systems and media, to interpret the world and express understanding of it. Literacies involve the evolution of interrelated knowledge, skills and strategies that facilitate an individual's ability to participate fully and equitably in a variety of roles and contexts – school, home, and local and global communities. In science, students collect, analyze and represent their ideas and understanding of the natural and constructed world in multiple forms.

Developing Social Responsibility

Social responsibility is how people positively contribute to their physical, social, cultural and educational environments. It requires the ability to participate with others in accomplishing shared or common goals. This competency is achieved by using moral reasoning processes, engaging in communitarian thinking and dialogue and taking social action. Students in science examine the impact of scientific understanding and technological innovations on society.

Aim and Goals

The aim of K-12 science education is to enable all Saskatchewan students to develop scientific literacy. Scientific literacy today embraces Euro-Canadian and Indigenous heritages, both of which have developed an empirical and rational knowledge of nature. A Euro-Canadian way of knowing about the natural and constructed world is called science, while First Nations and Métis ways of knowing nature are found within the broader category of Indigenous knowledge.

Diverse learning experiences based on the outcomes in this curriculum provide students with many opportunities to explore, analyze, evaluate, synthesize, appreciate and understand the interrelationships among science, technology, society and the environment (STSE) that will affect their personal lives, their careers and their future.

Goals are broad statements identifying what students are expected to know and be able to do upon completion of the learning in a particular area of study by the end of Grade 12. The four goals of K-12 science education are to:

- **Understand the Nature of Science and STSE Interrelationships** – Students will develop an understanding of the nature of science and technology, their interrelationships and their social and environmental contexts, including interrelationships between the natural and constructed world.
- **Construct Scientific Knowledge** – Students will construct an understanding of concepts, principles, laws and theories in life science, in physical science, in earth and space science and in Indigenous knowledge of nature and then apply these understandings to interpret, integrate and extend their knowledge.
- **Develop Scientific and Technological Skills** – Students will develop the skills required for scientific and technological inquiry, problem solving and communicating, for working collaboratively, and for making informed decisions.
- **Develop Attitudes that Support Scientific Habits of Mind** – Students will develop attitudes that support the responsible acquisition and application of scientific, technological and Indigenous knowledge to the mutual benefit of self, society and the environment.

Inquiry

Inquiry learning provides students with opportunities to build knowledge, abilities and inquiring habits of mind that lead to deeper understanding of their world and human experience. Inquiry is more than a simple instructional method. It is a philosophical approach to teaching and learning, grounded in constructivist research and methods, which engages students in investigations that lead to disciplinary and interdisciplinary understanding.

Inquiry builds on students' inherent sense of curiosity and wonder, drawing on their diverse backgrounds, interests and experiences. The process provides opportunities for students to become active participants in a collaborative search for meaning and understanding.

Secondary students who are engaged in inquiry in science should be able to:

- identify questions and concepts that guide scientific investigations.
- design and conduct scientific investigations.
- use technology and mathematics to improve investigations and communications.
- formulate and revise scientific explanations and models using logic and evidence.
- recognize and analyze alternative explanations and models.
- Communicate and defend a scientific argument.

(NRC, 1996, pp. 175, 176)

Creating Questions for Inquiry in Science

Inquiry focuses on the development of questions to initiate and guide the learning process. Students and teachers formulate questions to motivate inquiries into topics, problems and issues related to curriculum content and outcomes.

Well-formulated inquiry questions are broad in scope and rich in possibilities. Such questions encourage students to explore, observe, gather information, plan, analyze, interpret, synthesize, problem solve, take risks, create, conclude, document, reflect on learning and develop new questions for further inquiry.

Good science inquiry provides many entry points – ways in which students can approach a new topic – and a wide variety of activities during student work.

(Kluger-Bell, 2000, p.48)

In science, teachers and students can use the four learning contexts of Scientific Inquiry, Technological Problem Solving, STSE Decision Making, and Cultural Perspectives (see Learning Contexts section of this document for further information) as curriculum entry points to begin their inquiry. The process may evolve into interdisciplinary learning opportunities reflective of the holistic nature of our lives and an interdependent global environment.

Developing questions evoked by student interests has the potential for rich and deep learning. These questions are used to initiate and guide the inquiry and give students direction for investigating topics, problems, ideas, challenges or issues under study.

Essential questions that lead to deeper understanding in science should:

- center on objects, organisms and events in the natural world;
- connect to science concepts outlined in the curricular outcomes;
- lend themselves to empirical investigation; and,
- lead to gathering and using data to develop explanations for natural phenomena.

(NRC, 2000, p. 24)

The process of constructing questions for deep understanding can help students grasp the important disciplinary or interdisciplinary ideas that are situated at the core of a particular curricular focus or context. These broad questions lead to more specific questions that can provide a framework, purpose and direction for the learning activities in a lesson, or series of lessons, and help students connect what they are learning to their experiences and life beyond school.

Questions give students some initial direction for uncovering the understandings associated with a unit of study. Questions can help students grasp the big disciplinary ideas surrounding a focus or context and related themes or topics. They provide a framework, purpose and direction for the learning activities in each unit and help students connect what they are learning to their experiences and life beyond the classroom. Questions also invite and encourage students to pose their own questions for deeper understanding.

Outcomes and Indicators

Outcomes are statements of what students are expected to know and be able to do by the end of a grade or secondary level course in a particular area of study. Therefore, all outcomes are required. The outcomes provide direction for assessment and evaluation, and for program, unit and lesson planning. Critical characteristics of an outcome include the following:

- focus on what students will learn rather than what teachers will teach;
- specify the skills and abilities, understandings, knowledge and/or attitudes students are expected to demonstrate;
- are observable, assessable and attainable;
- are written using action-based verbs and clear professional language (educational and subject-related);
- are developed to be achieved in context so that learning is purposeful and interconnected;
- are grade and subject specific;
- are supported by indicators which provide the breadth and depth of expectations; and,
- have a developmental flow and connection to other grades where applicable.

Indicators are representative of what students need to know and/or be able to do in order to achieve an outcome. When teachers are planning for instruction, they must comprehend the set of indicators to understand fully the breadth and the depth of learning related to a particular outcome. Based on this understanding of the outcome, teachers may develop their own indicators that are responsive of students' interests, lives and prior learning. These teacher-developed indicators must maintain the intent of the outcome.

The outcomes and indicators in this locally modified course have been adapted from the renewed *Health Science 20* outcomes and indicators. The modified outcomes and indicators are also identified in each of the resource packages that accompany this course. Further information about learning contexts and the Foundations of Scientific Literacy is available in the *Health Science 20* curriculum document.

Health Science 21 (2016) Outcomes at a Glance

Career Exploration

HS21-CI1 Investigate career paths related to various branches and sub-branches of science.

Student-Directed Study

HS21-CI1 Investigate career paths related to various branches and sub-branches of science.

Health Care Philosophies and Ethics

HS21-HC1 Compare how Western, Indigenous, traditional, complementary and alternative approaches to health care contribute to a holistic perspective (e.g., mental, emotional, physical and spiritual) of health.

HS21-HC2 Examine the role of personal and societal beliefs in making ethical decisions regarding health care.

Human Body

HS21-HB1 Explain the anatomy and physiology of a healthy human.

HS21-HB2 Explore the effects of various pathologies and ailments on human body systems.

Nutrition

HS21-NU1 Explain the role of micro and macronutrients (i.e., carbohydrates, proteins and fats) in supporting normal health and body functions.

HS21-NU2 Analyze dietary choices based on personal and cultural beliefs and scientific understanding of nutrition.

Diagnostics and Treatment

HS21-DT1 Describe the function of tools and procedures used to diagnose and monitor medical conditions.

HS21-DT2 Recognize the importance of interpreting diagnostic findings to support treatment options.

Legend

HS21-HCI1a

HS21

HC

1

a

[CP, DM, SI, TPS]

(A, K, S, STSE)

Course name

Unit of study

Outcome number

Indicator

Learning context(s) that best support this outcome

Foundation(s) of Scientific Literacy that apply to this indicator

Health Science 21 (2016) Outcomes and Indicators

Health Science 21 (2016) - Career Investigation	
All outcomes contribute to the development of all K-12 science goals.	
Outcomes	Indicators
HS21-CE1 Explore health science related career paths in Saskatchewan, Canada and the world. [DM]	<ol style="list-style-type: none"> a. Generate a list of occupations that require a background in health science. (K, S) b. Identify health science related career options locally, regionally, and/or nationally. (STSE, S, K, A) c. Research a chosen career, using criteria such as: <ol style="list-style-type: none"> i. the training program, including on the job training ii. the work they are trained to do iii. the types of facilities in which they are employed iv. hours/shifts worked v. current wages received in Saskatchewan vi. physical and mental stresses experienced vii. workplace hazards and safety considerations viii. other professionals they interact with ix. your personal suitability for this career (K, S, A, STSE) d. Communicate research findings related to health science careers through a display, video, presentation software, website or orally. (K, S, A, STSE) e. Interview or connect with others (e.g., family members, community members, elders and knowledge keepers, experts in various disciplines) to discuss relevant health science careers. (K, S, A, STSE) f. Attend a career fair, and explore career choices based on information gathered. (K, S, A, STSE)

Health Science 21 (2016) – Student Study	
All outcomes contribute to the development of all K-12 science goals.	
Outcomes	Indicators
<p>HS21-SDS1 Explore one or more topics of personal interest relevant to Health Science 21.</p> <p>[DM, SI, TPS]</p>	<ol style="list-style-type: none"> a. Conduct an experiment following established scientific protocols. b. Share the results of student directed research through a display, presentation, performance, demonstration, song, game, commercial, fine art representation or research paper. c. Discuss a current health science related issue by developing materials to support the arguments for and arguments against a position. d. Examine a case study that exemplifies ethical decision making in health care. e. Review a case study of the progression and/or treatment of a specific pathology from the perspective of a Western, traditional, complementary, and/or alternative approach to health care. f. Create a personal medical history, incorporating information such as family history, baseline data and immunizations. g. Research advances in scientific understanding of the anatomy and physiology of humans. (STSE) h. Outline the history of a disease or illness and its causes, including societal and cultural perspectives. (K, A, S, STSE) i. Investigate the effects of processed foods, nutrition supplements, growth hormones, genetically modified organisms, and food additives (e.g., caffeine, aspartame, food coloring, and monosodium glutamate [MSG]) on human health. (K, A, STSE) j. Examine a variety historical and contemporary eating practices that are based upon cultural and religious beliefs. (e.g., pre-contact First Nations and Métis, Ramadan, Kosher, Lent). (A, STSE)

Health Science 21 (2016) – Health Care Philosophies and Ethics	
All outcomes contribute to the development of all K-12 science goals.	
Outcomes	Indicators
<p>HS21-HC1 Compare how Western, Indigenous, traditional, complementary and alternative approaches to health care contribute to a holistic perspective (e.g., mental, emotional,</p>	<ol style="list-style-type: none"> a. Identify how humanity’s beliefs about health, wellness, illness, disease, and treatment have changed over time. (STSE) b. Differentiate between holistic and analytical approaches to health care. (K) c. Identify examples of Western, Indigenous, traditional, complementary, and alternative approaches to health care. (K, A, S, STSE) d. Identify where Western, Indigenous, traditional, complementary and alternative approaches to health care are offered in your community and elsewhere in Saskatchewan.

<p>physical and spiritual) of health.</p> <p>[CP, DM, SI]</p>	<ul style="list-style-type: none"> e. Investigate the costs associated with various approaches to health care and the benefits available to you as a resident of Saskatchewan. f. Investigate the intended results of using natural products (e.g., herbs, vitamins, minerals, probiotics, and essential oils), mind and body practices (e.g., acupuncture, various massage therapies, yoga, spinal manipulation, relaxation techniques, meditation, and movement therapies) and other complementary and/or alternative approaches to health care. (K, A, STSE) g. Explain the importance of rituals, place based ceremonies, plants and traditional herbs in Indigenous and traditional approaches to health care. (K, A, STSE) h. Provide examples of ways in which one or more of the approaches to health care might be implemented together to support the health and wellbeing of an individual. (K, A, STSE) i. Discuss potential hazards that may arise from combining different approaches to health care. (K, A, STSE)
<p>HS21-HC2 Examine the role of personal and societal beliefs in making ethical decisions regarding health care.</p> <p>[CP, DM, SI]</p>	<ul style="list-style-type: none"> a. Pose questions about ethical dilemmas within health care. (K, S, A, STSE) b. Understand the core ethical questions to be considered when making personal and family care health care decisions: <ul style="list-style-type: none"> i. What can be done for the patient? (intervention technologies) ii. Does the patient understand the options? (informed consent) iii. What does the patient want? (autonomy) iv. What are the benefits? (beneficence) v. Will it harm the patient? (non-maleficence) vi. Are the patient's requests fair and able to be satisfied? (justice) vii. Are the costs involved fair to society? (economic consequences) (K) c. Show how the core ethical questions apply in a specific health care issue (e.g., case study, interview and current events). (K,A, S, STSE) d. Research how procedures designed to prevent illness, such as immunizations, vitamin supplements, physical activity, nutrition and prayer can influence your health. (K, STSE, A) e. Examine ethical considerations related to a specific treatment or practice (e.g., chemotherapy, radiation, acupuncture, sweat lodge, blood transfusions, and hirudotherapy). (K) f. Examine individual, community and cultural beliefs regarding issues related to life and death such as home birthing, blood transfusions, contraception, abortions, organ donation, autopsies, euthanasia, cremation and burials. (K, A, STSE) g. Discuss ethical considerations and perspectives related to issues such as the use of cadavers in professional studies, dissection and raising animals for the purpose of dissection and public exhibits of plastinated organs and bodies, all of which could provide increased scientific understanding of human anatomy. (A, STSE) h. Understand a patient's rights in Saskatchewan and in Canada

	<p>concerning health care decisions such as developing an advance care directive, refusal of treatment, informed consent and the role of a proxy or substitute decision-maker. (K)</p> <p>i. Recognize the importance of considering linguistic and cultural needs when providing health care services. (STSE, A)</p>
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Health Science 21 (2016) – Human Body	
All outcomes contribute to the development of all K-12 science goals.	
Outcomes	Indicators
<p>HS21-HB1 Explain the anatomy and physiology of a healthy human.</p> <p>[CP, SI]</p>	<p>a. Describe the anatomy (structure) and physiology (function) of at least five human body systems (i.e., cardiovascular, endocrine, lymphatic, digestive, urinary, muscular, nervous, respiratory, reproductive, integumentary and skeletal). (K)</p> <p>b. Identify the normal value or range for the common vital signs (e.g., heart rate, blood pressure, temperature, O₂ saturation and respiratory rate) of a healthy human. (K)</p> <p>c. Use anatomical terminology and directional terms to locate human anatomical features based on anatomical position. (K, STSE)</p> <p>d. Investigate the anatomical locations of organs in mammals such as pigs, rats, or cats through dissection or virtual simulation. (K, S)</p> <p>e. Identify the ABO and Rh blood types and how an individual's blood type affects their ability to donate blood or accept blood from others. (K, STSE)</p> <p>f. Investigate benefits of having normal flora, or normal microbiota, in the body (e.g., swab skin and examine results). (K, S)</p>
<p>HS21-HB2 Explore the effects of various pathologies and ailments on human body systems.</p> <p>[SI, DM]</p>	<p>a. Differentiate among the ways in which medical practitioners and the public describe pathologies using terms such as disease, illness, ailment, disorder, infection and syndrome. (STSE, K)</p> <p>b. Examine how the body responds to pathogens. (K)</p> <p>c. Compare how bacteria and viruses differ with respect to how they are transmitted, their impact on the human body and how each is treated or prevented. (K)</p> <p>d. Research the symptoms, possible causes, stages and prevention of a pathology that affects one or more body systems. (K)</p>

Health Science 21 (2016) - Nutrition	
All outcomes contribute to the development of all K-12 science goals.	
Outcomes	Indicators
<p>HS21-NU1 Explain the role of micro and macronutrients (i.e., carbohydrates, proteins and</p>	<p>a. Identify which macronutrients and micronutrients are found in common food groups (i.e., grains, milk and alternatives, meat and alternatives, vegetables and fruits and fats and oils). (K)</p> <p>b. Explain how micronutrients (e.g., vitamins A, B, D, C, E, K, and iron,</p>

<p>fats) in supporting normal health and body functions.</p> <p>[CP, SI]</p>	<p>calcium and phosphorous) are necessary for health. (K)</p> <p>c. Examine the role of simple and complex carbohydrates as being the main source of short term energy. (K)</p> <p>d. Examine the role of fiber in a healthy diet. (K)</p> <p>e. Establish the critical role of fats (e.g., saturated, unsaturated and trans fats) in processes such as long term energy storage and HDL versus LDL. (K)</p> <p>f. Describe the role of protein for structural support and building and maintaining muscle. (K)</p> <p>g. Recognize problems (e.g., hypo/hyperglycemia, high/low cholesterol and denaturation of proteins) that may result from acquiring too many or too few macromolecules.</p>
<p>HS21-NU2 Analyze dietary choices based on personal and cultural beliefs and scientific understanding of nutrition.</p> <p>[SI, CP]</p>	<p>a. Pose questions about the role of nutrition in supporting healthy eating practices. (K, S, A, STSE)</p> <p>b. Compare the nutritional value of various food choices and eating practices such as carbohydrate loading, fad diets, vegetarianism, veganism, fast food, energy drinks, 100-mile diet and fasting to determine if they provide sufficient nutrition to support healthy functioning. (A, STSE)</p> <p>c. Determine factors (e.g., activity levels, age, weight and height) that affect personal energy requirements. (K)</p> <p>d. Calculate personal energy requirements and record personal caloric and macronutrient intake. (S)</p> <p>e. Analyze results of individual macronutrient intake and compare to recommended daily intake values. (S)</p> <p>f. Apply various methods of analyzing excrement and urine (e.g., Bristol Stool Chart, urine analysis by color, clarity, odor, pH, nitrites, protein and glucose, piddle chart, tinkle testing and Pee-O-Meter) to demonstrate how they serve as indicators of healthy functioning. (STSE)</p> <p>g. Design an appropriate diet representation based on personal lifestyle choices. (K, S, A)</p> <p>h. Discuss various indicators of health (e.g., food labels, body mass index [BMI], skinfold calipers, Bodpod, <i>Eating Well with Canada's Food Guide</i>, <i>Eating Well with Canada's Food Guide – First Nations, Inuit and Métis</i>, and food guides from other countries). (S, STSE)</p>

<p align="center">Health Science 21 (2016) – Diagnostics and Treatment</p>	
<p align="center">All outcomes contribute to the development of all K-12 science goals.</p>	
<p align="center">Outcomes</p>	<p align="center">Indicators</p>
<p>HS21-DT1 Describe the function of tools and procedures used to diagnose and monitor medical conditions.</p>	<p>a. Pose questions about the importance of diagnosis. (S)</p> <p>b. Explore the significance of monitoring vital signs in health care, including accurate medical history and patient perception of pain. (K, S)</p> <p>c. Identify examples of tools and procedures (e.g., stethoscope,</p>

<p>[CP, SI, TPS]</p>	<p>octoscope, sphygmomanometer and visual inspection) used for non-invasive observations in health care. (K)</p> <p>d. Perform observations and record vital signs (e.g., heart rate, breathing rate, temperature, blood type and blood pressure) of self and/or others. (S)</p> <p>e. Describe and/or perform common laboratory tests (e.g., blood testing, blood glucose testing, culture swabs, urinalysis, biopsy and microscopy) used in medical diagnosis. (K, S)</p> <p>f. Identify the operation, risks and benefits of medical imaging tools, such as X-ray, magnetic resonance imaging [MRI], computerized tomography [CT], ultrasound and positron emission tomography [PET]). (K, A, STSE)</p> <p>g. Discuss the factors (e.g., severity of illness, dose received, cost and availability) that influence the use of a diagnostic tool or procedure. (K)</p> <p>h. Explain why medical practitioners often use multiple tools and procedures to establish a medical diagnosis. (STSE)</p> <p>i. Discuss the responsibility, including preparation and expectations, of the patient in diagnostic and imaging procedures. (K, A, STSE)</p> <p>j. Identify differences in tools and procedures used in diagnosing illness from the various approaches (i.e., Western, Indigenous, traditional, complementary and alternative) to health care. (K, A, S, STSE)</p>
<p>HS21-DT2 Recognize the importance of interpreting diagnostic findings to support treatment options.</p> <p>[DM, SI, CP]</p>	<p>a. Identify tools and procedures health care providers use to monitor the progression of a specific pathology. (K)</p> <p>b. Suggest explanations based on interpretation of data from diagnostic assessment tools (e.g. identifying a broken bone in an x-ray, ultrasound of a pregnancy to determine number of fetuses and identifying high blood pressure based on given values). (K, S)</p> <p>c. Interpret diagnostic results and choose an appropriate course of action (e.g., role-play, simulation and case study). (K, S)</p> <p>d. Describe some treatment options (e.g., dialysis, radiation therapy, surgery and organ transplantation) which have been designed to address specific health care issues. (STSE)</p> <p>e. Describe a treatment option that might be prescribed in Western, Indigenous, traditional, complementary or alternative approaches to health care with respect to a specific pathology. (K)</p>

Assessment and Evaluation of Student Learning

Assessment and evaluation require thoughtful planning and implementation to support the learning process and to inform teaching. All assessment and evaluation of student achievement must be based on the outcomes in the provincial curriculum.

Assessment involves the systematic collection of information about student learning with respect to:

- achievement of provincial curriculum outcomes;
- effectiveness of teaching strategies employed; and,
- student self-reflection on learning.

Evaluation compares assessment information against criteria based on curriculum outcomes for the purpose of communicating to students, teachers, parents/caregivers and others about student progress and to make informed decisions about the teaching and learning process.

There are three interrelated purposes of assessment. Each type of assessment, systematically implemented, contributes to an overall picture of an individual student's achievement.

Assessment for learning involves the use of information about student progress to support and improve student learning, inform instructional practices, and:

- is teacher-driven for student, teacher and parent use;
- occurs throughout the teaching and learning process, using a variety of tools; and,
- engages teachers in providing differentiated instruction, feedback to students to enhance their learning and information to parents in support of learning.

Assessment as learning actively involves student reflection on learning, monitoring of her/his own progress, and:

- supports students in critically analyzing learning related to curricular outcomes;
- is student-driven with teacher guidance; and,
- occurs throughout the learning process.

Assessment of learning involves teachers' use of evidence of student learning to make judgements about student achievement and:

- provides opportunity to report evidence of achievement related to curricular outcomes;
- occurs at the end of a learning cycle, using a variety of tools; and,
- provides the foundation for discussions on placement or promotion.

Key Resources

Many resources that were reviewed and recommended for *Health Science 20* are also suggested for use in *Health Science 11 (2016)*. It should be noted that the teacher may need to adapt and modify the resources to meet the diverse needs of the students. For further information (including order numbers) for these resources refer to the *Health Science 20* tab at www.curriculum.gov.sk.ca.

- *Anatomy & Physiology for Health Professionals: An Interactive Journey (2nd ed.)* (2011) – Pearson
- *DHO Health Science (8th ed.)* (2014) – Nelson
- *Essentials of Human Anatomy & Physiology (10th ed.)* – Pearson
- *Healthcare Science Technology* (2013) – McGraw-Hill Ryerson
- *Introduction to Anatomy and Physiology* (2014) – Oxford University Press
- *Nutrition: A Functional Approach (3rd Canadian ed.)* (2014) – Pearson
- *Nutrition and Health* (2014) – Pacific Educational Press

References

Kluger-Bell, B. (2000). *Recognizing inquiry: Comparing three hands-on teaching techniques*. In *Inquiry—Thoughts, Views, and Strategies for the K-5 Classroom (Foundations - A monograph for professionals in science, mathematics and technology education. Vol. 2)*. Washington, DC: National Science Foundation.

National Research Council. (1996). *National science education standards*. Washington, DC: National Academy Press.

National Research Council. (2000). *Inquiry and the national science education standards: A guide for teaching and learning*. Washington, DC: National Academy Press.