



Health Science 12

Board/Authority Approved Course

North Okanagan Shuswap	School District 83
Developed By: John Smith and Kathy Williams	Date Developed: April 29, 2019
School Name: Salmon Arm Secondary School – Sullivan Campus Eagle River Secondary	Principal's Name: Mr. Rob MacAulay, Mr. Mark Marino
Superintendent Approval Date:	Superintendent Signature:
Board/Authority Approval Date:	Board/Authority Chair Signature:
Course: Health Science 12	Grade Level of Course: 12
Number of Course Credits: 4	Number of Hours of Instruction: 100 hours

Board/Authority Prerequisite(s): Science 10

Special Training, Facilities, or Equipment Required:

Training: Teacher must have a background in Biology. Experience in Athletics/Physical Education and certification in First Aid, CPR and AED is strongly recommended.

Equipment: Models and charts of human anatomy, microscopes and prepared slides,
Sphygmomanometer/stethoscopes, spirometer, on-line access to digital projector, anatomy and physiology software
Access to gymnasium weight room and athletic tape and accessories

Course Synopsis:

This is an exciting and innovative program for students wishing to pursue a career in medicine, health, and wellness or sports related occupations. The course will focus on how your body is structured and functions. It covers nutrition and healthy diets, exercise management injury prevention and rehabilitation. First Aid, CPR and AED certificates will be an option. It is possible that students will be able to obtain preferential enrollment

into university and college programs after completing this course. This course will provide the opportunity to gather portfolio evidence in Health and Human Services and Science and Applied Science.

Goals and Rationale:

Rationale: This is a good background course for those entering Health, Physical Education, Kinesiology, and/or Biology related fields. Health Science 12 provides exposure to different career possibilities (other than traditional ones) in the health field. Furthermore, students will be provided with exposure to current health issues. Students involved in athletics gather information about training, injuries and rehabilitation. Finally, this course helps students learn about their own bodies - how they function and how to take care of themselves

Goals: For the students to

- Become aware of the anatomy and physiology of the body so they can assess and appreciate their own health and physical and emotional needs (fitness, nutrition, disease and injuries).
- Become aware of issues in health today.
- Become aware of potential career paths in the health field.
- Learn how to assess and treat an injury and plan its rehabilitation.
- Be able to plan an exercise routine specific to a desired outcome.

Aboriginal Worldviews and Perspectives:

Declaration of First Peoples Principles of Learning:

1. Learning ultimately supports the well-being of the self, the family, the community and the land. Students are learning about the structures and functioning of the body in a healthy state and in an unhealthy state. Clinical applications are a focus.
2. Learning is holistic and experiential and relational (focused on connectedness, on reciprocal relationships and a sense of place). Learning involves recognizing the consequences of one's actions. This course focusses on structure and function, and how the environment influences the efficacy of function.
3. Learning recognizes the role of indigenous knowledge. Students are encouraged to explore relationships between traditional use of local plants.
- 4 Learning involves exploration of one's identity. Students examine their social-emotional needs.

Declaration of Aboriginal Worldviews and Perspectives:

1. Connectedness and Relationships. Students participate in a wellness survey.
2. Local focus. Students will examine the local ecology, determining usefulness of local flora and fauna in establishing health.
3. Emphasis on Identity. Students reflect on their cultural background, family origins and how it impacts their overall health.
4. The Power of Story. Encourage students to share their health experiences
5. Experiential Learning. Look for ways to incorporate hands-on learning with the care and handling of the local flora.

Assessment and Evaluation:

Formative Assessment:

Assignments	15%
Labs	20%
Projects	15%

Summative assessment:

Tests and Quizzes	30%
Final Project	20%

BIG IDEAS

Anatomy and Physiology. The interrelationship between structure and function of the human body.

Disease. Exploring clinical applications of all of the body systems.

Injury and Rehabilitation. Exploring athletic injuries and rehabilitation.

Nutritional Health. Exploring the connection between nutrition and health, including mindfulness.

Learning Standards

Curricular Competancies	Content
<p><i>Students are expected to be able to do the following:</i></p> <p>Questioning and predicting</p> <ul style="list-style-type: none">• Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal, local, or global interest• Make observations aimed at identifying their own questions, including increasingly abstract ones <p>Planning and conducting</p> <ul style="list-style-type: none">• Collaboratively and individually plan, select, and use appropriate investigation methods, lab experiments, to collect reliable data (qualitative and quantitative)• Assess risks and address ethical, cultural issues associated with their proposed methods to systematically and accurately collect and record data• Experience and interpret the local environment• Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information• Seek and analyze patterns, trends, and connections in data, including describing relationships between variables, performing calculations, and identifying inconsistencies• Construct, analyze, and interpret graphs, models, and/or diagrams• Use knowledge of scientific concepts to draw conclusions that are consistent with evidence• Analyze cause-and-effect relationships <p>Evaluating</p> <ul style="list-style-type: none">• Evaluate their methods and experimental conditions, including identifying sources of error or uncertainty, confounding variables, and possible alternative explanations and conclusions• Demonstrate an awareness of assumptions, question information given, and identify bias in their own work and in primary and secondary sources• Consider the changes in knowledge over time as tools and technologies	<p><i>Students are expected to know the following:</i></p> <ul style="list-style-type: none">• anatomical direction, body planes and regions• cells and tissues, membranes• carcinogenesis – process of cancer formation• organ systems<ul style="list-style-type: none">- structure and function- structural and functional interdependence- maintenance of homeostasis• lifestyle differences and their effects on human health<ul style="list-style-type: none">- fad diets and current research• holistic approach to health• disease as an imbalance in homeostasis• rehabilitation – taping and use of supports to promote recovery and prevent re-injury• careers – explore careers in the health field through guest

have developed

- Connect scientific explorations to careers in science
- Consider social, and ethical implications of the findings from their own and others' investigations
- Critically analyze the validity of information in primary and secondary sources and evaluate the approaches used to solve problems

Applying and innovating

- Contribute to care for self, others, community, and world through individual or collaborative approaches
- Cooperatively design projects
- Implement multiple strategies to solve problems in real-life, applied, and conceptual situations

Communicating

- Formulate physical or mental theoretical models to describe a phenomenon
- Express and reflect on a variety of experiences and perspectives

speakers, research and field trips

Big Ideas - Elaborations

Anatomy and Physiology

- What is the advantage of having specialized tissues?
- What lifestyle decisions would improve your health?
- Describe how heart rate and breathing rate affect blood gas composition?

Disease

What are the physiological mechanisms at work involving a disorder of a body system?

- For example, How does high blood pressure affect kidney function?

Nutritional Health

- How does diet affect cardiovascular health?
- What would be the short term and long term impacts or consequences of continuing your current diet?

Rehabilitation

- What are the causes and consequences of athletic injuries?
- What are the steps involved in rehabilitating a knee injury?

Curricular Competencies – Elaborations

Questioning and Predicting

What would happen to blood pressure with a high salt intake and what changes would occur to kidney function?

How would a high fat diet affect the cardiovascular system? What would the suggested follow up treatment be?

Planning and Conducting

Design an experiment to determine the connection between activity and breathing rate?

Consider the impact of a high protein diet on the excretory system and research a method to measure the effects.

Processing and Analyzing Data and Information

Collect data for 24 hours on all physical activity and food intake. Analyze diet and compare to the recommended dietary allowances.

Evaluating

How would you evaluate a health claim made by an advertiser on the Internet?

What impact has the Internet or social media had on medical self-diagnosis or diet?

How do studies of different body types help mitigate social media pressure?

Applying and Innovating

Develop a healthy dietary plan for a high-performance athlete. How does it compare to a safe dietary plan for an average high school student?

How might ethnobotany be used to develop alternatives to antibiotics?

Communicating

In Science Fair format, students will show how microbiomes affect human physiology.

Content – Elaborations

Unit/Topic/Module Descriptions:

Unit 1: Human Anatomy & Physiology

Introduction to Anatomical Terminology – students should be able to:

- understand the levels of organization in the human body
- define the term *anatomical position*
- define the directional terms used to describe structural features of the body
- describe the major body regions
- describe the four common planes used in sectioning the body or organs
- describe the two major cavities of the body
- explain the meaning of the term *homeostasis*.

Cells and Tissues – students should be able to:

- identify and discuss the basic structure and function of a cell
- compare the major passive and active transport processes that move substances through cell membranes
- understand and explain the importance of cellular reproduction
- list the phases of mitosis and describe the events that occur in each one
- describe the function and common locations of epithelial tissues, connective tissues, muscle tissues and nerve tissues.

Organ Systems of the Body – students should be able to:

- list the 11 major organ systems of the body
- identify and locate the major organs of each organ system
- briefly describe the major functions of each organ system.

Integumentary System – students should be able to:

- understand the functions of the Integumentary System
- define two major categories of body membranes
- identify the accessory structures of the skin.

Skeletal System – students should be able to:

- describe the functions of the Skeletal System
- describe the general structure of a bone and list the functions of its parts
- distinguish between axial and appendicular skeletons, and identify the major bones that comprise the axial and appendicular skeleton
- compare the structure and function of the various types of joints and give examples of each.

Muscular System – students should be able to:

- contrast the structural and functional characteristics of skeletal, smooth, and cardiac muscle tissue
- describe the structure of a skeletal muscle sarcomere and motor unit
- discuss and compare the major types of skeletal muscle contractions
- identify and label the major muscles of the body
- understand the types of movements produced by skeletal muscles.

Nervous System – students should be able to:

- describe the structure and function of neurons and explain neuron processes
- describe the processes of impulse formation and conduction, including synaptic transmission
- identify the major anatomical components of the brain and spinal cord and function]
- describe common disorders of the nervous system.

Circulatory System – students should be able to:

- identify the parts of the heart and describe their functions
- trace the flow in blood through the heart
- compare structure and function of blood vessels
- explain how the exchange of materials between blood and tissue of cells occurs
- describe how blood pressure is regulated.

Respiratory System – students should be able to:

- list the parts of the respiratory system and describe their functions
- describe the mechanism of breathing
- list and describe the various volumes and explain their importance
- describe the process of gas exchange in the lungs and body tissue
- understand the mechanisms of oxygen and carbon dioxide transport by the blood.

Digestive System – students should be able to:

- contrast mechanical and chemical digestion
- identify the layers composing the wall of the alimentary canal and describe their functions
- identify and describe the organs of the digestive system, their locations, major components, and functions
- discuss the basics of protein, fat, and carbohydrate digestion
- define key terms.

Nutrition and Metabolism – the students should be able to:

- define anabolism and catabolism
- describe the metabolic roles of carbohydrates, fats, proteins, vitamins, and minerals
- define basal metabolic rate and list some factors that affect it
- consider the caloric value of each of the bulk nutrients and discuss the implications for weight control and exercise.

Fluid and Electrolyte Balance – the students should be able to:

- describe and compare body fluid compartments
- understand mechanisms that maintain fluid balance
- explain how an athlete can maintain a state of hydration during an event.

Unit 2: Injury Prevention and Rehabilitation

Concepts and Terminology – students should be able to:

- define and understand the basic concepts and medical terminology involved in injury assessment and rehabilitation.

Injury Assessment – students should be able to:

- identify specific anatomical parts of the body involved in an injury (ie., bones, joints, muscles, ligaments, blood vessels, nerves...)
- recognize and evaluate signs and symptoms of injury
- understand the importance of ‘patient history’ in assessing an injury
- identify and perform some functional tests.

Injury Rehabilitation and Prevention – students should be able to:

- understand and apply the P.R.I.C.E. Principle at the time of injury
- understand basic concepts related to appropriate rehabilitation techniques
- understand the importance of early protected mobilization and proprioceptive training
- identify methods of prevention.

Unit 3: Nutrition and Contemporary Health Issues

Carbohydrates – students should be able to:

- understand the importance of carbohydrates as a nutrient
- understand the difference between a monosaccharide, disaccharide, and polysaccharide
- describe starch, glycogen, dextrin, and cellulose
- describe the importance of fiber in a well-balanced diet
- identify the major functions of carbohydrates.

Fats – students should be able to:

- define the health needs for fat
- differentiate between saturated and unsaturated fats
- explain the role of cholesterol in the body
- identify and understand the need for essential fatty acids
- state the recommended dietary intake of fats.

Proteins – students should be able to:

- define the health needs for protein
- give examples of simple and complex proteins
- differentiate between essential and non-essential amino acids
- identify the food items highest in protein content
- state the recommended dietary intake of protein
- understand the digestion and absorption of protein.

Vitamins – students should be able to:

- define the health needs for vitamins
- identify the physiologic functions of each vitamin
- identify food sources for each vitamin
- understand how food preparation and cooking can affect vitamin content of food
- state the recommended requirement for each vitamin.

Minerals – students should be able to:

- define the health needs for minerals and differentiate between major and trace elements
- identify the physiologic functions of specific minerals
- identify food sources for each mineral
- identify problems associated with mineral imbalances
- state the recommended requirement for each mineral.

Well-Balanced Diet – students should be able to:

- identify the recommended number of daily servings from the food groups in the Food Guide Pyramid
- make small changes in their daily food selections and preparations that make a significant change in their nutritional wellness

Unit 4: Exercise Management

Components of Physical Fitness – students should be able to:

- understand and define physical fitness
- understand and define each of the components of physical fitness
- understand the importance of lifestyles to good health and wellness.

Training for Muscular Strength and Endurance – students should be able to:

- understand and define muscular strength and endurance training
- describe three types of muscle contractions
- identify correct safety guidelines for weight training
- understand basic training systems.

Cardiorespiratory Fitness – students should be able to:

- understand and define cardiorespiratory fitness
- describe how to monitor target heart rate
- understand how to train the cardiorespiratory system.

Flexibility – students should be able to:

- identify correct guidelines for flexibility development
- define two types of stretching
- identify basic flexibility exercises.

Health and Wellness – students should be able to:

- understand the difference between health and wellness
- identify the dimensions of wellness
- analyze their own levels of health and wellness and understand how to meet their own needs
- understand the physical and emotional effects of stress and strategies to cope with stress.

Related Topics – students should be able to:

- understand the physiological differences between men and women regarding their performance levels
- be able to recommend exercises for pregnant women and the elderly
- understand the physical benefits exercise can have on ‘special populations’ and possible limitations
- understand the effects of performance enhancing drugs
- comment on how drugs affect the individual and the “sport”.

Unit 5: First Aid, CPR and AED Training

Overall Course Objective is – to train each student to the Emergency or Standard level of First Aid, CPR level desired and AED certification
Each course provides students with specific knowledge, skills, and confidence that will enable them to:

- recognize when first aid is needed
- give first aid at an emergency scene
- recognize when more qualified help or medical help is required

In addition, St. John Ambulance hopes that students will be motivated to:

- take more comprehensive first aid training
- join the brigade.