

BAA Sport Science 11 Framework

District Name: Kootenay Columbia

District Number: SD # 20

Developed by: C. Kerby

Date Developed: February 2007

School Name: Rossland Secondary School

Principal's Name: Ms. C. Kerby

Board/Authority Approval Date:

Board/Authority Signature:

Course Name: BAA Sport Science 11

Grade Level of Course: 11

Number of Course Credits: 4

Number of Hours of Instruction: 120

Prerequisite(s): None

Special Training, Facilities or Equipment Required:

This course will be run off timetable and through a variety of formats that require the use of classrooms, gym facilities, weight room, foods room and computer lab. The formats will include paper and pencil, online instruction, workshops, lectures and practical applications on and off the school site. This course will be managed by the ski academy teacher at RSS.

Course Synopsis:

This course has been developed as an important elective for students who are highly interested or active in a sport and are committed to achieving high performance in their sport. Sport Science 11 is a theory course and is designed to enhance a student's knowledge and understanding of the science of sport and sport training. Specific learning outcomes fall under the four topic areas of anatomy and physiology, biomechanics and sport performance, nutrition and human performance, and sport psychology.

Students will apply their knowledge and understanding of sport science to sport specific activities. Students will develop many of the basic concepts and skills through the use of a variety of strategies including use of texts, articles, digital photography and video for skill analysis, guest speakers, workshops and field trips.

Rationale:

Students committed to high performance and competition in sport require extensive knowledge and understanding of the science that contributes to that performance. This information is not available in the necessary depth in other courses available to Grade 11 and 12 students. Sport Science 11 will introduce fundamentals and basic concepts in the four topic areas of anatomy and physiology, biomechanics and sport performance, nutrition and human performance, and sport psychology. In this theory course students learn basic information that is extended, enhanced and applied by the coaches and the athletes to develop their individual programs.

Organizational Structure:

Unit/Topic	Title	Time
Unit 1	Anatomy and Physiology	30
Unit 2	Biomechanics and Sport Performance	25
Unit 3	Nutrition and Human Performance	40
Unit 4	Sport Psychology	25
Unit 5		
Total Hours		120

Unit Descriptions:

Unit 1: Anatomy and Physiology

Overview

Students study anatomy including the structure and function of the muscular, skeletal and cardio pulmonary systems of the human body and the relationship of anatomy to the physiological effects of exercise.

Curriculum Organizers and Learning Outcomes

1. Anatomy - the muscular, skeletal and cardio pulmonary systems of the human body
 - a. Identify and describe the elements of the muscular and skeletal systems and their functions.
 - b. Identify and describe the elements of the cardio pulmonary systems and their functions.
2. Physiology
 - a. Identify and describe concepts of oxygen consumption and muscle energy supply.
 - b. Describe anaerobic and aerobic metabolism.
 - c. Explain the inter-connected function of human anatomy related to the mechanism and response of the body to movement/ sport and exercise.
 - d. Apply physiological concepts specific to a sport.
3. Prevention and care of athletic injuries
 - a. Identify the most common injuries related to the athlete's sport.
 - b. Identify factors that contribute to injury prevention.
 - c. Explain the factors that contribute to the proper care of athletic injuries.

Unit 2: Biomechanics and Sport Performance

Overview

Biomechanics is the science concerned with the internal and external forces acting on the human body and the effects produced by these forces during movement/exercise/sport. At the highest levels of sports in which technique plays a major role, athletes learn the basics of this science to understand how it can be used for improvement.

Curriculum Organizers and Learning Outcomes

1. Biomechanics terminology and concepts
 - a. Define and describe, in relation to sport, basic terms and concepts including: kinematics, distance and displacement, speed and velocity, acceleration, acceleration due to gravity, momentum, inertia, mass, weight, force, laws of motion, work, energy, power, levers, aerodynamics etc.
 - b. Provide examples of biomechanical terms and concepts related to the athlete's sport.
2. Skills, techniques and strategies for effective performance
 - a. Use digital and video photography to discuss and apply their understanding of performance techniques in their sport.
 - b. Identify and apply skills, techniques and strategies of biomechanics to improve performance in the athlete's sport.

Unit 3: Nutrition and Human Performance

Overview

This unit explores the science of sports nutrition and shows how to apply nutrition principles to benefit an athlete's training and performance. Although sport nutrition basics are similar for all athletes, important differences exist for individual athletes in various sports. The focus here is on the nutritional needs of the selected sports performed by the students. For the competitive athlete time, travel, food availability, and tight budgets are additional factors that influence food choices and the times when food is consumed. Sports nutrition guidance is designed to meet the demands of exercise and to be enjoyable, affordable, and flexible encouraging the athletes to stick with it and gain the improvements they seek.

Curriculum Organizers and Learning Outcomes

1. Fueling movement and sport
 - a. Examine the effects of exercise intensity and duration, training, nutrition status, and gender on fuel use during exercise.
 - b. Describe the basic principles of sport nutrition for energy requirements, fluids, and macronutrients. Apply those principles to the needs of strength/power athletes and endurance athletes.
 - c. Describe the fueling cycle and apply it to an athlete's needs.
2. Eat for Performance
 - a. Define and describe the sources of basic nutrients and performance nutrients.
 - b. Using the concepts of nutrient balance, energy requirements, and energy fuel, plan for what, how much, and when to eat in terms of training and competition diets.
 - c. Describe and apply the current recommendations for achieving optimal hydration to the specific needs of strength/power and endurance athletes.
 - d. Discuss the rationale for, and appropriate use of, sports drinks and supplements.
3. Food preparation for competitors
 - a. Plan competition menus based on a budget.
 - b. Shop for and prepare meals.
4. Current Topics related to health and human nutrition
 - a. Discuss the pros and cons of different nutritional diets.
 - b. Research and discuss supplement use.
 - c. Identify and discuss disordered eating and eating disorders in relation to sport.
 - d. Discriminate between reliable and unreliable information and the influence of the media.

Unit 4: Sport Psychology

Overview

Sports psychology is the study of human behaviour in the sport environment and the benefits of mental training on enhancing sports performance. This unit focuses on athletes acquiring an understanding of the factors involved in sport psychology that will prepare them to apply techniques taught to them by their sport and mental training coaches.

Curriculum Organizers and Learning Outcomes

1. Sports psychology terms and concepts
 - a. Describe and apply terms and concepts including mental imagery, relaxation, control, concentration, focus, flow, motivation, feedback, simulation, stress etc.
 - b. Describe the benefits of sport psychology for athletes.
 - c. Identify the psychological factors that affect sport performance.

2. Strategies that athletes use in mental training
 - a. Describe the mental qualities that are important for successful performance.
 - b. Identify common issues for the athlete's personal sport.
 - c. Examine personal strengths and weaknesses through the use of inventories.
 - d. Analyse success stories of athletes who have improved their performance through mental training.

3. The Role of Goal Setting
 - a. Describe the role of goal setting in sport psychology.
 - b. Reflect and revise personal goals.

Instructional Component:

Students will access Sport Science 11 with both online and paper learning packages. A variety of instructional strategies will be used including:

- Direct Instruction
- Independent Learning
- Group work, conferencing and discussion activities
- Information presented on Video/ DVD
- Performance Demonstration and Analysis using digital photography/video
- Guest speakers and workshop formats
- Interactive video conferencing and v-learning
- Video taped performance demonstrations

Assessment Component:

Teachers should choose from a variety of assessment tools to fit the unique learning outcomes of this program. Students will be assessed on the learning outcomes outlined in this framework.

Assessment for learning occurs throughout the units providing opportunity for the teacher help the student to improve and be as successful as possible. Assessment tools include:

- Criterion based assessment
- Self Assessment and Peer Assessment
- Conferencing

Assessment as learning is an integral part of Sports Science 11 where students can apply new learning to their performance in their sport. Assessment strategies include:

- Self Assessment
- Goal Setting
- Graphic organizers
- Journals

Assessment of learning is the summative assessment of student learning on the learning outcomes and includes tools such as:

- Performance and project evidence
- Research projects
- Written assignments
- Test and Quizzes

Learning Resources:

This is a list of available learning resources that can be added to in the future. Websites need to be updated on a regular basis.

Books/texts/articles

Anatomy and Physiology

Fundamentals of Athletic Training-2nd Edition, Lorin A. Cartwright, William A. Pitney, Copyright 2005 ISBN: 0736052585 ISBN13: 9780736052580, 376pp \$55.00 (U.S.)

Physiology Of Sport And Exercise, 3rd Edition, Jack H. Wilmore, Human Kinetics Publishers, 2004 3rd edition

Biomechanics

Sports Biomechanics: Reducing Injury and Improving Performance, Bartlett, Taylor and Francis publishers, 1999, ISBN: 0419184406 \$75

Sport Psychology

Competitive Fire, Michael Clarkson, 1999, ISBN: 0880118652 ISBN13: 9780880118651, 264pp Paperback, \$16.95 (U.S)

Foundations of Sport and Exercise Psychology, 4th ed, Robert S. Weinberg, Daniel Gould, 2007, ISBN: 0736064672, ISBN13: 9780736064675

Sport Psychology: A Student Handbook, Jarvis Matt, Psychology Press, 2006 (\$38.50)

Sports Psychology Basics, Andrew Caruso, 2005, Cardinal Publishers Group, ISBN: 1591640830 \$20

The Mental Athlete, Kay M. Porter, Copyright 2003, ISBN: 0736046542, ISBN13: 9780736046541, 224pp,

Prep Like a Pro : Preshot Strategies to Think & Perform Like a Pro, 2006, www.peaksports.com

Nutrition

Performance Nutrition for Winter Sports, Monique Ryan, Peak Sports Press ISBN: 0-9746254-5-0 \$20

Practical Sports Nutrition - A Sport-Specific Approach to Nutrition for Optimal Performance, Louise Burke, 2007 ISBN: 073604695X ISBN13: 9780736046954 \$74.00 US

Audio-visual

Human Body I and II - DRC 1999 DRC Kit

Nutrition (Diet) WT 92708 Instruction by: Dough Kauffman, University of Florida www.howtosports.com/

Nutrition Energy Source WT 93722 Instruction by: Beth Stringham, Rice University; Mike Clark, Texas A & M; Meg Ritchie, Texas Tech University www.howtosports.com/

Nutrition Basics Video and Exercise Nutrition Video available at www.performbetter.com

Speed Development Biomechanics WT 93715 Instruction by: John Lott, University of Houston; Mike Clark, Texas A & M; Meg Ritchie, Texas Tech University www.howtosports.com/

Psychological Considerations in Coaching Young Athletes SS 92302 Instruction by: Dr. Bob Weinberg, Regents Professor - University of North Texas www.howtosports.com/

Mental Imagery for Performance Enhancement: The Athlete's Guide, SportVideos.com <http://209.200.75.43/index.asp>

Preventing Anabolic Steroid Use, A Healthy Learning Video www.hitrunscore.com/

Websites (Websites require frequent updating)

Sports Coach (provides information on the many topics related to developing athletic ability)

<http://www.brianmac.demon.co.uk/index.htm>

Australian Institute of Sport - Sports nutrition

<http://www.ais.org.au/nutrition/>

Gatorade

<http://www.gatorade.com>

Sports Medicine and Nutrition

<http://sportsmedicine.about.com/>

Sports Nutrition

<http://www.dietitian.com/sportnut.html>

Nutrition Science and the Winter Olympics

<http://btc.montana.edu/olympics/nutrition/default.htm>

Mind Tools – Sport Psychology

<http://www.psychwww.com/mtsite/page11.html>

Sports Medicine and Athletic Trauma

<http://www.nismat.org/>

Search words: human anatomy, sport physiology, exercise physiology, sport / exercise biomechanics, kinesiology, nutrition, sport nutrition, sport psychology, mental training, mental imagery, nutritional supplements, athlete testing, hydration, sport science, sport performance, sports injuries, athletic training, etc.

Appendix of other resources

People resources in the area including physiotherapists, mental trainers, coaches, nutritionists, exercise trainers, business people in sales of equipment and supplements, speciality foods etc., college instructors, visiting athletes.

BC School Sports <http://www.bcschoolsports.ca>

Other print and video resources available from Peak Performance Sports www.peaksports.com and Human Kinetics <http://www.humankinetics.com/products>

Additional Information:

None at this time