

IB Sports, exercise and health science HL Course Outline

Diploma Programme subject outline—Group 4: sciences					
School name	Hill-Freedman World Academy			School code	004591
Subject name	Sports, exercise and health science			Level	HL
Standard completed in two years	Two years		Standard completed in one year *	2	
Name of the teacher who completed this outline	Jessica Link; Eual Phillips		Date of IB training	February, 2021	
Date when outline was completed	June 2022		Name of workshop(indicate subject and category)	IB SEHS, Category 2	

Year 1	Unit 1: Musculoskeletal System	Unit 2: The Neuromuscular Systems and Genetics	Unit 3: Cardiorespiratory System	Unit 4: Optimizing Physiological Performance	Unit 5: Measurement and Evaluation of Human Performance	Unit 6: The Skin, Endocrine System, & Immune System
Topics	Topic 1: Anatomy Topic 4: Movement Analysis	Topic 7: Further Anatomy Topic 4: Movement Analysis Topic 12: Genetics and Athletic Performance	Topic 2: Exercise Physiology	Option A: Optimizing Physiological Performance	Topic 6: Measurement and Evaluation of Human Performance	Topic 7: Further Anatomy Topic 8: The Endocrine System Topic 13: Exercise and Immunity
Time	5 Weeks	7 Weeks	7 Weeks	6 Weeks	6 Weeks	5 Weeks
Content	1.1 Skeletal System 1.2 Muscular System 4.2 Joint and Movement Type	7.2 - Structure and Function of the Brain 4.1 - Neuromuscular Function 12.1 - Genetics and Athletic Performance	2.1 Structure and Function of the Ventilatory System 2.2 Structure and Function of the Cardiovascular System	Topic A1: Training Topic A2: Environmental Factors and Physical Performance Topic A3: Non-Nutritional Ergogenic Aids Topic A4: Recovery from Sports and Exercise Topic A5: Training and Performance at Altitude	6.1 Statistical Analysis 6.2 Study Design 6.3 Components of Fitness 6.4 Principles of Training Program Design	7.1 The Skin System 8.1 The Endocrine System 13.1 Exercise and Immunity
Skills	➤ Labeling Diagrams ➤ Reading Graphs and tables ➤ Analyzing Graphs and tables ➤ Collecting Raw Data	➤ Identify/Label Models ➤ Relate structure and function ➤ Planning science experiments ➤ Studying scientific facts ➤ Drawing conclusions from data ➤ Understanding processes	➤ Analyzing class data ➤ Collecting Class data ➤ Operating Vernier Probe Equipment ➤ Identifying and labeling models	➤ Analyzing scientific studies ➤ Creating training programs ➤ Reading Graphs and Tables ➤ Research	➤ Reading graphs and tables ➤ Analyzing scientific studies ➤ Creating training programs	➤ Identifying and labeling models ➤ Research Skills ➤ Processing Scientific Data ➤ Planning Science Experiments ➤ Research
Practicals	P1.1: Limb Length Analysis: Students will collect and compare raw data from classmates on finger length and perceived sporting abilities.	P1.2: Analysis of Muscle Function: Students will obtain a graphical representation of the electrical activity of a muscle; associate muscle activity with the movement of joints; and correlate muscle activity with injury. (Vernier Lab 2.15)	P1.3: Lung Volume and Capacities 3: Students will obtain a graphical representation of lung capacities and volumes; compare lung volumes between males and females; and correlate lung volumes with clinical conditions (Vernier Lab 2.7) P1.4: Effects of Exercise on O2 Usage: Students will obtain a graphical representation of changes in O2 concentration		P1.5: Ventilation and Heart Rate Lab Students will measure both their heart rate and breathing rates using Vernier monitors. They will graph the data, and analyze it using statistical analysis. (Vernier 1.11) P1.6: Lengthy Relationships: Students take anatomical measurements of various body parts, compare to classmate primary data, process data, and write a conclusion/analysis.	

			with breathing at rest and after exercise; calculate oxygen consumption at rest and after exercise; correlate your findings with clinical situations. (Vernier Lab 1.13)			
Summative Assessment	Paper 1: Students will respond to 40 multiple-choice questions and two major diagrams, the skeletal system, and the muscular system. Paper 2: Students will answer three data-based and five extended response questions.	Paper 1: Students will respond to 40 multiple-choice questions and two major diagrams. Paper 2: Students will answer three data-based and five extended response questions.	Paper 1: Students will respond to 40 multiple-choice questions and two major diagrams. Paper 2: Students will answer three data-based and five extended response questions.	Paper 3: Students will complete a sample Paper 3 assessment in which they will answer data-based questions about the content presented in this unit. P1.5: Secondary Source Analysis for Sports Performance: Students will be given an article on the relationship between two variables related to sports performance. They will read, analyze, and report on the findings of that peer-reviewed article.	Paper 2: Students will answer three data-based and five extended response questions.	Paper 1: Students will respond to 40 multiple-choice questions and two major diagrams. Paper 2: Students will answer three data-based and five extended response questions. P1.8: Secondary Source Analysis for the Immune System, Endocrine System, or Skin: Students will select one peer-reviewed science article about the topics studied in this unit. They will read, analyze, and report on the findings of that peer-reviewed article
IA	Not Started	Not Started	Not Started	Students begin brainstorming topic selection: Task 1 - Topic Selection + Research Question	Students complete background research: Task 2 - Background Research	Students complete the methodology: Task 3 - Methodology
Resources	☐ Vernier Probes ☐ Gizmos virtual labs					

Year 2	Unit 1: Physics of Movement	Unit 2: Nutrition, Energy Systems and Fatigue	Unit 3: Nutrition Physiology	Unit 4: Maintaining the Body for Sport	Unit 5: Skill in Sports	Unit 6: Acquisition and Analysis of Skill	Unit 7: Disease & Exercise for Health
Topic	Topic 4: Movement Analysis Topic 10: Friction and Drag	Topic 3: Energy Systems Topic 3: Energy Systems Topic 9: Fatigue Internal Assessment	Topic D: Nutrition for Sports, Exercise, and Health Internal Assessment	Topic D: Nutrition for Sports, Exercise, and Health	Topic 5: Skill in Sports Group 4 Project	Topic 11: Acquisition and Analysis of Skill	Topic C: Physical Activity and Health
Time	10 Lesson Hours / 3 Practical Hours / (4 Weeks)	12 Lesson Hours / 6 Practical Hours / (7 Weeks) 6 Group 4 Practical Hours	8 Lesson Hours / 3 Practical Hours / (5 Weeks) 4 Group 4 Practical Hours	5 Lesson Hours / 1 Practical Hours / (4 Weeks)	9 Lesson Hours / 3 Practical Hours / (5 Weeks)	10 Lesson Hours / 3 Practical Hours / (5 Weeks)	15 Lesson Hours / 5 Practical Hours / (5 Weeks)
Content	4.3 - Fundamentals of Biomechanics 10.1 - Friction and Drag	3.1 - Nutrition 3.2 - Carbohydrate and Fat Metabolism 3.3 - Nutrition and Energy Systems 9.1 - Fatigue	D.1 - Digestion and Absorption D.2 - Water and Electrolyte Balance D.5 - Glucose Uptake D.7 Antioxidants	D.3 - Energy Balance and Body Composition D.4 - Nutritional Strategies D.6 - The Effects of Alcohol on Performance and Health	5.1 - The Characteristics and Classification of Skill 5.2 - Information Processing 5.3 - Principles of Skill Learning	11.1 - Pedagogy for Skill Acquisition 11.2 - Notation and Analysis	C.1 Hypokentik Disease C.2 Cardiovascular Disease C.3 Physical Activity and Obesity C.4 Physical Activity and Type 2 Diabetes C.5 Physical Activity and Bone Health C.6 Prescription of Exercise for Health C.7 Exercise and Psychological Well-being C.8 Public Health C.9 Injury Hazards
Skills	➤ Use mathematical formulas ➤ Draw conclusions from scientific data	➤ Reading nutrition labels ➤ Labeling Diagrams ➤ Analyzing Data ➤ Correlating variables ➤ Drawing Conclusion from data ➤ Studying scientific facts	➤ Research ➤ Correlating Variables ➤ Drawing scientific conclusions	➤ Research ➤ Correlating Variables ➤ Drawing scientific conclusions	➤ Studying scientific facts ➤ Drawing conclusions from data ➤ Understanding processes	➤ Understanding processes and notation ➤ Studying scientific facts	➤ Research ➤ Organizational Skills/Note Keeping ➤ Planning Science Experiments
Practicals	Air Resistance Lab: Students will observe the effect of air resistance on falling coffee filters; Determine how air resistance and mass affect the terminal velocity of a falling object; Choose between two competing force models for the air resistance on falling coffee filters. (Vernier Lab P.13) Friction Lab: Students will use an online simulation to discuss the relationship between mass acceleration and friction.	P2.1: Energy Intake Distribution: Students will measure and analyze diets and collect data to compare athlete vs. non-athlete energy intake. P2.2: Calorimetry Lab: Students will calculate the amount of energy in various foods. P2.3: Muscle Fatigue Lab: Students will engage in physical exercise and observe the onset of fatigue.	P2.5: Sugar Metabolism with Yeast (CO2): Students will use a CO2 Gas Sensor to determine the rate of respiration of glucose by yeast and choose and investigate a researchable question dealing with the respiration of sugars by yeast. (Vernier Lab B.10A)		P2.6: Simple Neuromuscular Reflex: Students will graph the electrical activity of a muscle and compare the relative speeds of voluntary and reflex muscle activation; calculate the approximate speed of a nerve impulse; compare reflex response and electrical amplitude. (Vernier Lab 1.4) Learning and Performance Lab: Students will engage in various activities to measure their response, reaction, and movement times.		
Summative Assessment	Paper 1: Students will respond to 30 multiple-choice questions and one major diagram.	Paper 1: Students will respond to 30 multiple-choice questions and two major diagrams:	Paper 1: Students will respond to 30 multiple-choice questions and one major diagram.	Paper 2: Students will answer three data-based and five extended response questions.	Paper 1: Students will respond to 30 multiple-choice questions and one major diagram.	Paper 1: Students will respond to 30 multiple-choice questions and one major diagram.	Paper 3: Students will answer three data-based and five extended response questions.

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Year 2	Unit 1: Forces, Motion, and movement	Unit 2: Individual Differences	Unit 3: Motor Learning	Unit 4: Motivation	Unit 5: Stress and Coping	Unit 6: Psychological Skills	Unit 7: Disease & Exercise for Health
Topic	B.2 Forces, motion and movement	C.1 Individual differences	C.2 Motor learning	C.3 Motivation	C.4 Stress and coping	C.5 Psychological skills	IA Part 2
Time	31 hours 10 Lesson Hours / 3 Practical Hours / (4 Weeks)	10 hours 12 Lesson Hours / 6 Practical Hours / (7 Weeks) 6 Group 4 Practical Hours	12 hours 8 Lesson Hours / 3 Practical Hours / (5 Weeks) 4 Group 4 Practical Hours	16 hours 5 Lesson Hours / 1 Practical Hours / (4 Weeks)	7 hours 9 Lesson Hours / 3 Practical Hours / (5 Weeks)	9 hours 10 Lesson Hours / 3 Practical Hours / (5 Weeks)	15 Lesson Hours / 5 Practical Hours / (5 Weeks)
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