ASSIST-ME teaching plan

General Information

Title	Exercise
Document Version	18th September 2014
Subject and topic	Biology Human Physiology
Level	Upper secondary
Short description	A long course with two IBSE lessons. What is the relationship between various physiological parameters and how can students explain these? Are there other factors that affect the relationship?
# Lessons	(50 min) 12 IBSE lessons of 18-20 lectures in total
Learning goals for sequence	The human body's physiological contexts

ASSIST-ME information

LWG	Denmark Biology
Trial implementation	First
# Parallel Trials	2
ASSIST-ME Feedback methods	Peer to peer; on-the-fly; teacher written
ASSIST-ME Competencies	Investigation/Argumentation
ASSIST-ME Subjects	Science
Types of data	Test results Presentation Captured feedback

Learning progressions

What are the steps on the way for students to reach learning goals? Make a learning progression in three steps for each of the learning goals.

Lesson no. 1-4

[Students should be able to explain the body's organ systems structure and function]

[Step 1]	[Step 2]	[Step 3]
Pupils are able to acquire knowledge of body systems structure and functions through information retrieval from Internet and books.	Pupils are able to describe body systems structure and functions using few biological terminologies.	Pupils are able to explain organ systems structure and functions using several biological terminologies.

Lesson no. 5-6

[Students should be able to explain the blood components, the transport of oxygen around the body and cell respiration.]

[Step 1]	[Step 2]	[Step 3]
Pupils are able to acquire knowledge of blood components, the transport of oxygen around the body and cell respiration.	Pupils are able to describe blood components, the transport of oxygen around the body and cell respiration using few biological terminologies.	Pupils are able to explain the blood components, the transport of oxygen around the body and cell respiration using several biological terminologies.

Lesson no. 7-8

[Step 1]	[Step 2]	[Step 3]	[Step 4]
Students are able to acquire knowledge about breathing structure and function from Internet, books and scientific articles.	Students are able to plan (identification of problems, formulate hypothesis) and carry out a study that determines the connection between the respiratory rate and physical activity.	Students are able to analyze the connections from their results between respiratory rate and physical activity using data in Excel/Google Sheets.	Students are able to discuss (develop explanations and arguments) and assess the connection between respiratory rate and physical activity.

[Students should be able to discuss / assess the correlation between respiratory rate and physical activity.]

Lesson no. 9-12

[Students should be able to analyze and assess trial subject's fitness.]

[Step 1]	[Step 2]	[Step 3]
Students are able to acquire knowledge of fitness and how it is determined using Internet and books.	Students are able to conduct a study, which determines a subject's fitness.	Students are able to analyze and assess the subjects' physical fitness.

Lesson no. 13-18

[Students should be able to explain and discuss the correlations between physiological parameters and consider what other factors affecting the correlations and compared it to the theoretical knowledge. Assess whether these correlations can be related to the body's health.]

[Step 1]	[Step 2]	[Step 3]	[Step 4]
Students are able to acquire knowledge of the physiological parameters from Internet, books and scientific articles and relate these to the body's health including cardiovascular Disease, diabetes and heart stroke.	Students are able to plan (identification of problems, formulate hypothesis) and carry out a study which illustrates the relationships between physiological parameters.	Students are able to analyze relationships between various physiological parameters using data in Excel/Google Sheets What other factors affect the relationships and compared it to the theoretical knowledge.	Students are able to discuss (develop explanations and arguments) and assess the connections between the physiological parameters and relate these to the body's health.

Schematic description of lessons

Lesson title: Exercise and health		**Implementation date:** approx. 5/11 – 2014 to 12/12 - 2014
Summary plan		
Learning goal for lesson Key issues for students to try to answer during this process: What is the relationship between various physiological parameters? How can students explain these? Are there other factors that affect these relationships and how can they be related to physical health?		**Subject content** Basic course: Human Physiology, including a list of the body's organ systems and selected organ system structures and functions. Physiological parameters: fitness blood pressure Heart Rate (RHR / maximum pulse rate) Lung Ventilation including respiratory rate Etc.: BMI, body mass index, waist-hip ratio
Process goals • Investigation • Argumentation		**Resources** Internet Texts Smartphones for measuring time Heart Rate Monitor Blood Pressure Monitor Monark cycle ergometer Weight Measuring tape

Activity plan

Description of key activities

Engagement: Story Telling of exercise effects on health

Lesson no.	Learning goal	Learning Objectives	Questions	Main activity
1-2	16-17 + (35-44)	Students should be able to explain the body's organ systems structure and functions.	Which organ systems do humans have and what is their function?	Examination of the body's organs from self-selected literature search, for example, the Internet, books, etc.. Students work in groups of three with an organ.
3-4		Students should be able to explain the body's organ systems structure and functions.		Students work on their organ from last lesson and present in the second lesson to the class (5 min per. group)
5-6	35-39 + 41	Students should be able to explain the blood components, the transport of oxygen around the body and cell respiration.		Students work with questions in relation to their homework.
7-8	40	Students should be able to discuss / assess the correlation between respiratory rate and physical activity.	Is respiratory rate affected by the level of physical activity. What is the relationship between respiratory rate and physical activity? Can you train your breathing, so you can hold your breath longer? (video about free-diving) (FANG)	How do you breathe? (FANG) Study respiratory rate at rest and during exercise. Students show there results and what method they used.
9-10	44-50	Students should be able to analyze and estimate VO_2max.		Team 1: Two-point test - 4 students tested
11-12	44-50	Students should be able to analyze and estimate		Team 2: Two-point test - 4 students tested

		VO_2max.			ope
13-18	42-44	Students should be able to explain and discuss the correlations between physiological parameters and consider what other factors affecting the correlations and compared it to the theoretical knowledge. Assess whether these correlations can be related to the body's health	What is the relationship between various physiological parameters? How can students explain these? Are there other factors that affect the relationship and can they be related to physical health?	Students should be through seeking information in books and on the Internet acquired knowledge on various physiological parameters and its impact on health. Then they set up and run a number of experiments which show different relationship between physiological parameters and consider whether there are other factors that play a role in their results. How can the physiological context related to health? Finally, the results displayed to the class or uploaded to YouTube as vodcast where they explain the process and what method they used. Students provide written feedback to each other's vodcast.	Pee in g Ope (pre

Assessment plan – description of format and implementation

- Designs for investigations of respiratory rates and exercise as well as the data, resulting graphs and interpretations will be given formative feedback by peers and the teacher while in progress and given written feedback after submission.
- Video presentations (using smartphones) of overall links between exercise and physiology will be given on-the-fly feedback and summative feedback after submission.
- On-the-fly feedback on the student assessments of fitness will be given by peers and teachers.
- Presentations about organs with oral feedback.