



# Lessons from Madiba



22<sup>nd</sup> Annual  
IBSC Conference

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## Using Boys' Love of Sport and Fitness as an Introduction to a Theme in Life Sciences

Olga Peel

Bishops

# Purpose of this presentation

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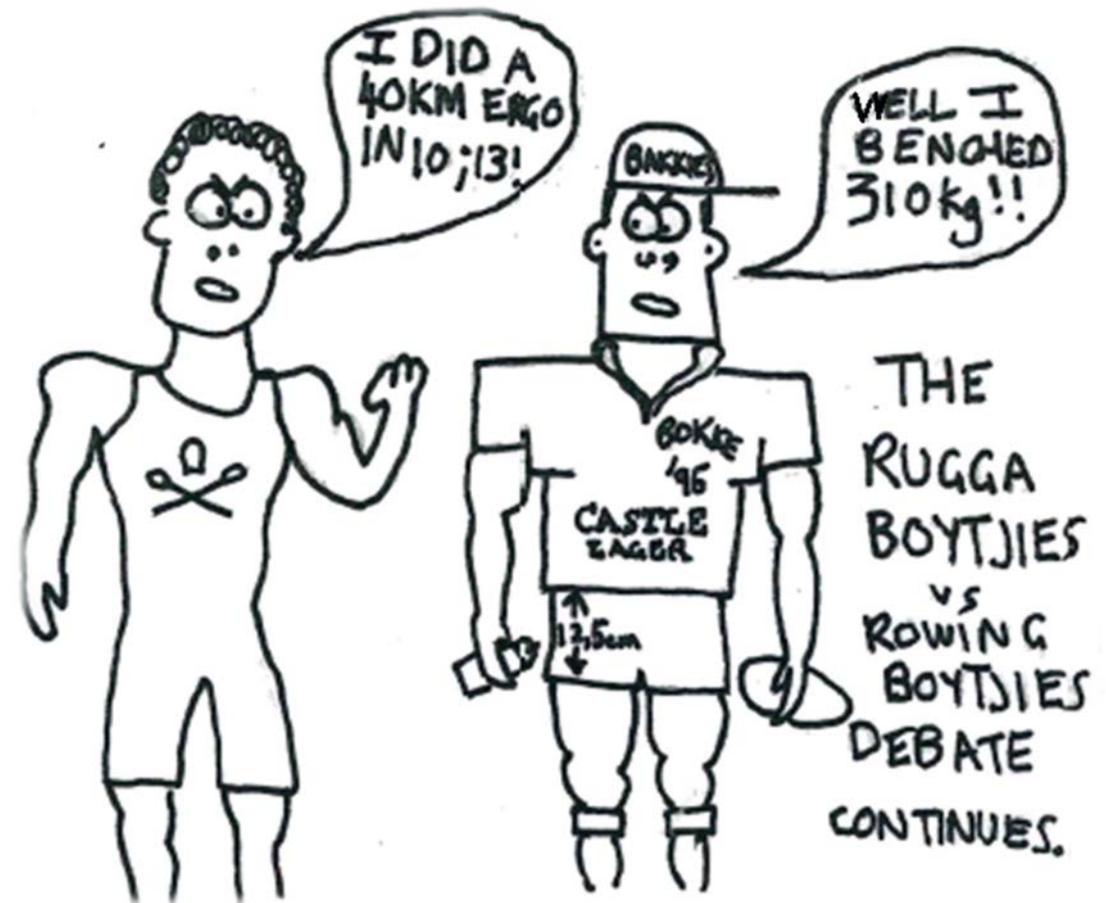
**The South African Life Science syllabus includes a study of the cardiovascular and musculature systems. In order to introduce this section and encourage boys to keep fit all the time rather than for a particular sport, our boys visited a university-linked Sports Science Centre in March 2015. Various fitness tests were performed as part of the field trip. Boys have been challenged to maintain fitness throughout the year with a view to keeping fit for the sixteen day outdoor experience, the Epic, in November.**

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The aim of the presentation was to look at the link between Life Sciences and boys' fitness but as the year went by various stake holders at Bishops got involved in looking at boys' fitness holistically so I will be re-purposing the topic slightly today.

# Background

- Most boys are passionate about fitness and want to do well at sport
- Holistic look at boys' fitness is needed especially in grade 10
- Most boys are competitive when doing sport and when exercising or being tested



# Life Sciences at Bishops

Life Science is the Science of the future.

To equip boys to deal with this changing world it is not enough to provide them only with factual knowledge.

They need to be able to

- understand scientific principles and how to interpret information.
- access the latest information and to evaluate this information.
- incorporate knowledge into their value systems and be able to make informed decisions.
- to communicate information and ideas to other people both in a written and oral format
- work with other people. think creatively and to solve problems.

The content and style of teaching Life Science has had to adapt to this exciting explosion of knowledge and advances in technology.

Life Science and the course is structured in a way that will allow academically weak boys to cope and strong candidates to be challenged and excited by the content and concepts covered.

# Life Orientation

- Life Orientation is the study of the self in relation to others and to society.
- It applies a holistic approach.
- It is concerned with the personal, social, intellectual, emotional, spiritual, motor and physical growth and development of learners aka boys, and the way in which these dimensions are interrelated and expressed in life.
- The focus is the development of self-in-society, and this encourages the development of balanced and confident learners who will contribute to a just and democratic society, a productive economy, and an improved quality of life for all.

# Bishops sports

## Sport at Bishops

The Bishops boy's passion for sport is renowned and, in some instances, held in awe on school sports fields throughout South Africa. There are fewer tougher rugby matches than the matches against Bishops; there are fewer more difficult cricket games than those against Bishops.

Every boy in the College is expected to do two afternoons of sport every week, winter and summer.

It is an expectation that is intended to help the pupils find a balance between mind, body and soul. Academic work is important but so is exercise, and, with it, the lessons of working in a team, enjoying success and coping with failure.

While the school offers pupils a variety of sporting choices - they can do everything from golf to judo - rugby is truly at the heart of the school. Bishops' main rugby field was the first in South Africa and is sometimes still used today by the Springbok team for practice sessions out of the public eye. Over the years, many Bishops pupils have gone on to become great Springbok rugby players, the most recent being Robbie Fleck and Selborne Boome.

Cricket, too, is a sport that has been embraced and enjoyed by Bishops pupils for decades. When Springbok cricketer Adrian Kuiper, once a Bishops boy, was batting in a school match, the boarding houses would empty in minutes. The entertainment on the cricket field was too good to be missed. The young cricketer actually enjoyed facing fast bowlers and the faster they bowled the further he hit - the spectators loved it.

In the near future the school will be developing a modern fitness centre that will enable boys to prepare themselves physically for any challenge, sporting or otherwise. The school already has its own biokineticist, who consults with injured players and organises rehabilitation programmes. The school doctor specialises in sports medicine and sports injuries, and, in the winter season, the school employs a physiotherapist.

Bishops can still claim to be one of the most famous sporting schools in South Africa. In terms of the variety of sports and the number of junior and senior Springboks the school has produced in recent years, it is still right at the top of the list.



## Bishops Sports 2015

- [Athletics](#)
- [Basketball](#)
- [Bishops Athletic Club](#)
- [Canoeing](#)
- [Climbing](#)
- [Cricket](#)
- [CrossFit](#)
- [Cycling](#)
- [Cycling - MTB](#)
- [Fencing](#)
- [Golf](#)
- [Hockey](#)
- [Road and Trail](#)
- [Rowing](#)
- [Rugby](#)
- [Sailing](#)
- [Shooting](#)
- [Squash](#)
- [Surfing](#)
- [Swimming](#)
- [Tennis](#)
- [Waterpolo](#)

# Timeline of fitness testing at Bishops



January 2013 and 2014 Grade 8 & 9 fitness testing



November 2014 Grade 10 Epic – several sporty boys struggle



January 2015 Meeting to discuss fitness goals for Grade 10 Bishops boys



March/April 2015 Grade 10 fitness testing and analysis of data



May 2015 Grade 10 LS study of skeletal and muscle systems



June/July 2015 Follow up on fitness testing and start reconditioning programme + Grade 10 LS study of cardiovascular systems

# Sports Science Institute of South Africa

The concept of the Sports Science Institute of South Africa (SSISA) was borne from the idea of developing sporting icons in South Africa to promote national pride and unity.

The goal was to provide a facility that would primarily fund research and apply that research to sport, so that athletes of all disciplines could improve their performance.

SSISA has a strategic alliance with the University of Cape Town



# Fitness tests in the High Performance Centre at SSISA



## **Body Composition:**

Body Mass Index (BMI): Weight (kg) and Height (cm)

Waist circumference

## **Musculoskeletal:**

Back-Saver Sit and Reach Test

Handgrip Strength

Standing Broad Jump

90 degree Push Ups

## **Motor Fitness:**

Bleep - shuttle run test (4 x 10m)

## **Cardiorespiratory:**

Shuttle run test 20m



# Fitness testing schedule



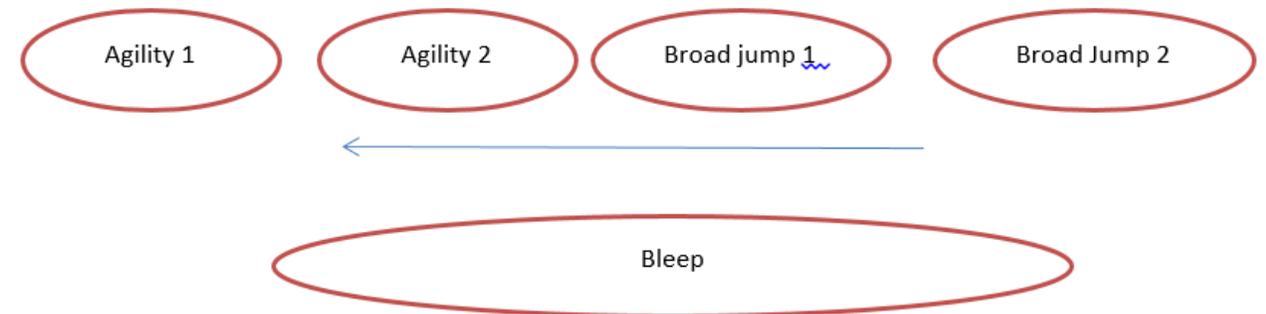
4 Groups needed with 4 stations (4 testers needed)



2 Groups for sit ups and push ups



4 Groups for agility and broad jump





**Weight (kg)**

**Sit ups**



**Back-Saver Sit and Reach Test**

# Fitness test results

- As a result of the fitness tests we are looking at boys who have these three to four aspects together:  
**High BMI (24+), large waist circ.(90cm+), low sit up (45-), low push up (30-) and low Bleep test score (65 -).**
- Boys who generally have a high BMI and high waist circumference (carrying weight due to excess midriff tissue) + low sit ups and pushups (poor core and upper body strength endurance) and low bleep test results (poor cardio fitness) can be screened as potential unfit and need to look to re-condition themselves - flagged for the Epic.

# Life Science Theme: Skeleton and muscles

- Grade 10 syllabus focuses on anatomy & physiology with a practical component



<http://wallpaper-kid.com/human-body-wallpaper.htm>

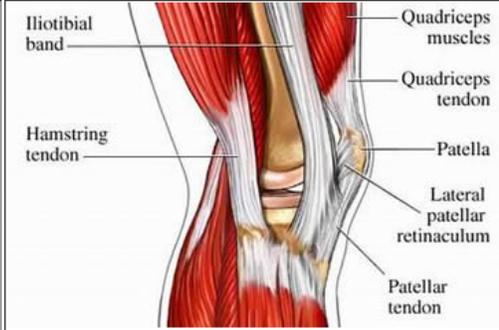
## How My Body Moves: The human skeleton, joints and muscles

Humans are made of cells, which are organised into tissues, these in turn make up organs which are part of systems. The body consists of these systems which function together and result in a living being. Living things support themselves and maintain positions in which they can carry out the essential processes of life. Animal cells have no cell walls and therefore most multicellular animals are supported and protected by a skeleton. The skeleton also functions in movement/locomotion. Skeletons may be external (eg. hard, chitinous exoskeletons in insects and arthropods), internal and soft (eg. hydrostatic skeletons in mollusks and sea anemones) or internal and rigid (eg. endoskeletons in mammals, reptiles and birds). Endoskeletons are strengthened by the addition of calcium and phosphate. This ensures a rigid framework of bones against which skeletal muscles can contract to bring about movement (locomotion). Joints allow for flexibility to enhance movement of limbs and of the whole body. Fantastic [introduction](#) to the skeleton - click on English/Skeleton and follow the narration.

Revise the Skeleton by playing [Wack a Bone](#) and complete the [Skeleton Jigsaw puzzle](#)

Is Creatine worth it? Read this interesting [article on Phosphocreatine](#)

TO DO: Create a Word doc or One Note notebook where you will keep all your notes on skeletons and muscles



<http://ohiodance.org/wp-content/uploads/2013/01/Knee-Muscles.jpg>

Topic	Content (learn this for tests and exams)	Action (learn this for tests and exams)	Resources
<b>Types of skeletons</b> [Emphasise developmental progression and relate to the need for support linked to a terrestrial lifestyle. This information links directly to Grade 11 Animal Diversity.]	Teacher led <b>introduction on skeletons</b> .  <b>Learn about:</b> Examples of animals with each of the following: - hydrostatic skeleton - endoskeleton - exoskeleton: Advantages and disadvantages  This information links directly to Grade 11 Animal Diversity.	Complete  <a href="#">Activity 1</a> in which you compare the three main kinds of skeletons. Check with your teacher about the due date for handing in.	<b>Text book pages 131 - 134</b>  <b>LEARN</b>  <a href="#">Types of animal skeletons</a> .  <a href="#">Different types of animal skeletons</a> from Mindset site  Ms England's <a href="#">power point on animal skeletons</a>  <b>INTERACT</b>  <a href="#">Human skeleton and muscles</a> (22 mins) has a good introduction about different types of skeletons and gives functions of the skeleton  <b>EXPAND</b>  Watch this <a href="#">video clip showing earthworm movement</a>  Video of <a href="#">giant crab moulting</a> on YouTube  <a href="#">Twig video on Phosphorous</a> , which is essential for strong bones

# Gr 10 Life Sciences: Skeleton and muscles research



BISHOPS  
DIOCESAN COLLEGE

## **CASS PRACTICAL PROCEDURE:**

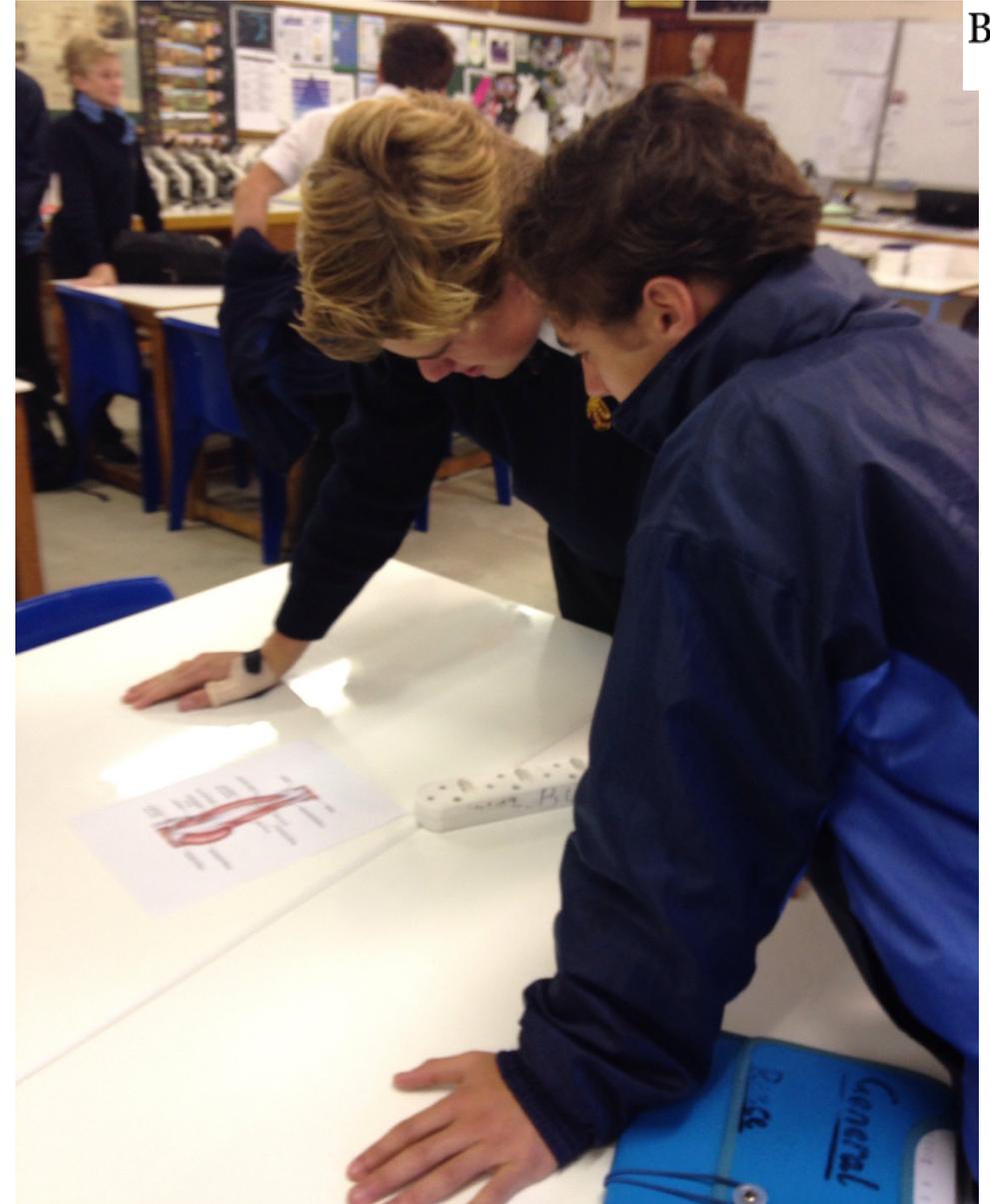
### **BUILD YOUR OWN HUMAN BODY MOBILE**

In order to show that you understand the structure of the human skeletal system, you and the members of your group will work collaboratively and build a human skeleton adding various components of the body to your skeleton making up a part of the human body.

Once complete the mobile will be attached to a wall in the lab.

The best human body mobiles will be donated to under resourced schools.

Each member of the group will also record evidence of their role in planning and team work.





# Life Sciences Theme: Cardiovascular system

## Review SSISA visit:

Bleep test, Discuss fitness, Evaluate own fitness

## Research and learn:

Anatomy and physiology

## Practical:

Heart dissection, Add a heart to the human body mobile

Blood pressure, Pulse



### Transportation inside the body (Cardiovascular system)

Most large animals have a specific system, the cardiovascular or circulatory system, for transport of substances round their bodies. The cardiovascular system is made up of a series of blood vessels with a pump (the heart) to move blood through the vessels. The heart and vessels form the transport organs and blood is the transport medium. The system delivers the materials needed by the cells of the body and carries away wastes and useful substances produced by the cells. The cardiovascular system also transports the cells that defend the body (white blood cells) and distributes heat throughout the body.

Earlier this year your fitness levels were tested at SSISA, the bleep test looked at your cardiorespiratory fitness levels

**To do:** Create a Word doc or One Note notebook where you will keep all your notes on the cardiovascular system



Excellent TWIG [resource](#) with notes on the cardiovascular system and an excellent [resource](#) for this section of work

<http://dusuneninsanlaric.in.com/wp-content/uploads/2014/08/Capillaries.jpg>

Topic	Content (learn this for tests and exams)	Action (learn this for tests and exams)	Resources
Scientific method and fitness testing	Scientific method: Revise aim, method, variables, analysis and discussion, conclusions. Revise reliability and validity Importance of keeping fit.	1. List 3 differences between scientific procedures and scientific investigations 2. Practical procedure on fitness testing 2015. Download and read the document on fitness testing at SSISA or during LO from March 2015. Follow instructions on completing the document.	 <b>INTERACT</b>  <a href="#">Power point on the scientific method</a>  <a href="#">Scientific procedure and scientific investigation</a>

# The Epic

# November 2015

## Bishops Epic

The Bishops Epic is a journey at the end of the year by Grade 10 boys through a series of bases across the Cederberg where they will experience a wide range of activities which will test them physically and mentally and allow them to appreciate the landscape as well as the people and the history of the area.

The boys will hike with staff and on their own; they will cycle along country roads;

challenge themselves on the banks of the Clanwilliam Dam and work with school children at Elizabethfontein in the Northern Cederberg . They will also be stationed at Sanddrift and Jamaka, where they will learn a range of skills and contribute to the upgrading of the environment in which they find themselves.

There will be a number of staff at each base supervising operations. The boys will learn a range of new skills during the course of their Grade 10 year which will help them prepare for the challenges they will face. There will be time for fathers to join their sons on the last day and make the whole experience a significant "rites of passage" for each pupil.

Follow the boys during their journey by visiting [THE EPIC BLOG](#) for updates.



# The Epic



# What next?

- Underperforming - Recon Group **—————>** Retest
- Overtraining – Recon Group
- Fit for the Epic in November
- Life long exercise and fitness
- Life Scientists use knowledge of skeleton, muscles and cardiovascular system when learning about human body and evolution in grades 11 and 12



# Acknowledgements

- Justin Durandt of SSISA – for amazing support of our programme
- Gerry Noel, Bishops – for starting off linking the Bishops Life Science syllabus and SSISA
- Richard Smith, Bev Kemball and Gerald Muller, Bishops – for linking Life Orientation and fitness testing with Life Sciences
- Graham Robertson and the late Mark Hanley, Bishops – for having the vision to start and run the Epic

# Credits

- Justin Durandt: Sports Science Institute of South Africa (June 2014) Youth Testing Manual, Cape Town
- Photographs: Gerry Noel, Olga Peel, Justin Durandt, Ross Goodwin, Filipe Acafrao

Australopithecus sediba skeleton: Scientific American

- Cartoon: Matt Douglas
- Information on Life Sciences at Bishops  
<http://college.bishops.org.za/Academic/Subjects/Biology.aspx>
- Information on Life Orientation  
<http://www.education.gov.za/LinkClick.aspx?fileticket=xY8RaCOWqTY%3D&>

# Contact details

Justin Durandt (SSISA) [JDurandt@ssisa.com](mailto:JDurandt@ssisa.com)

Graham Robertson (Epic organiser) [grobertson@bishops.org.za](mailto:grobertson@bishops.org.za)

Bishops: [www.bishops.org.za](http://www.bishops.org.za)

Sports Science Institute: [www.ssisa.com](http://www.ssisa.com)

Thank you

Olga Peel [opeel@bishops.org.za](mailto:opeel@bishops.org.za)

