



# Sport Science an Introduction



This **Sportsheet** provides a brief overview of what sport science is and how it can help coaches and athletes in their sport.

## What is Sport Science?

Sport science is the application of scientific principles to help improve sports performance. This branch of science has grown dramatically in the last 20 years and has resulted in a greater understanding of the demands of elite sport. Some of the information obtained from the systematic study of sport has been included in coaching material and coaching qualifications, however many coaches and athletes have specific questions or individual problems. The qualified sport scientist is, potentially, a useful resource that the coach and athlete can use, to help address issues that may arise in their sport. This may take the form of a basic discussion with a sport scientist, through to an in-depth analysis of the athlete in the laboratory setting.

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**In general there are 3 branches of sport science.**

These are:

- 1 Physiology**
- 2 Psychology**
- 3 Biomechanics**

Please note: Nutritional advice is also an area that many sports scientists can provide assistance with.

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### Physiology

Physiology is the area of sport science concerned with the way in which the performer's body responds and adapts to exercise and training.

**Physiology can help athletes to:**

- Identify their strengths and weaknesses through fitness testing
  - Evaluate whether a period of training has been successful
  - Structure and develop training techniques for optimal adaptation
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### Psychology

Psychology is the area of sport science that deals with the athlete's mind. It examines how motivations, beliefs, thoughts and emotions can influence an athlete's behaviour in sport.

**Psychology can help athletes to:**

- Perform better and more consistently
- Improve the quality of their experience when participating in sport
- Develop appropriate mental skills to cope with the demands of sport

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### Biomechanics

Biomechanics is the area of sport science associated with the analysis of the mechanics of human movement. It explains how and why the body moves in the way that it does. For sports performers, this also means examining the interaction between the athlete and their equipment and the environment.

#### Biomechanics can help athletes to:

- Identify the best technique for enhancing sports performance
- Determine the safest way of performing a particular sport, thus reducing the risk of injury
- Provide an analysis of sports equipment such as shoes, racquets and playing surfaces

### How can Sport Science help?

The specific nature of any sport science support begins with an in-depth discussion of the individual needs of the athlete. This process is athlete and coach 'driven' and the areas of performance which are deemed most important for an individual are examined. For many athletes, information is obtained through regular assessments which can be performed at frequent intervals throughout an athlete's training programme. If appropriate, the sport scientist will select an assessment method by identifying guidance in current scientific literature, and which assessments are currently used by the national governing body of the athlete's sport.

#### The sport scientist would then ensure that the assessment provided:

- Valid information
- Sport specific movement patterns
- Reliable (repeatable) results
- Sensitivity in detecting small changes in the specific area being assessed

In the majority of cases the data generated can be compared to the responses of elite athletes using the same assessments, theoretical optimum values and any previous data recorded by the athlete.

#### This information could then be used to:

- Evaluate an athlete's strengths and weaknesses in relation to their sport
- Assess the effectiveness of any training programme
- Provide short term goals
- Evaluate the health status of an athlete
- Identify an athlete's readiness to resume training or competition

### Further Information

This Sportssheet highlights the potential uses of sport science to athletes and coaches in Kent. For further information on sports science support please go to the Kent Sports Development Unit website:

<http://www.kentsport.org/excellence>

Or contact:

Canterbury Christ Church University (Canterbury)

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### Recommended Reading

#### Further Sources of Information

(2007) **Sport and Exercise Physiology Testing Guidelines.**

Winters, E.M., Jones, A.M., Davison, R.C.R., Bromley, P.D., Mercer, T.H. (Eds).

**The British Association of Sport and Exercise Sciences Guide.**

**Volume I: Sport Testing.** London: Routledge. [www.bases.org.uk](http://www.bases.org.uk)

### Acknowledgements

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If you require this publication in another format please contact the Kent Sports Development Unit on 01622 605054

**Kent Sports Development Unit is working in partnership with University of Kent, Canterbury Christ Church and University of Greenwich to provide sports science support for performers and coaches in Kent**

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