

## Worksheet:

### 400 m running, Acids and Bases

The 400 m is considered to be one of the toughest athletics events athletes compete in. The energy system employed by the athletes to produce the energy fast enough to sprint, for the 45 s or so the race takes, produces lactic acid as a by-product. The module uses this link to sport to explore acids and bases. Use what you have learnt to answer the following questions in the spaces provided.

1. What is the energy system employed by the body that produces lactic acid as a by-product?

2. Define the terms acid and base

An acid is

A base is

#### Fact

The American Michael Johnson currently holds the World Record for the 400 m in a time of 43.18 s.

3. What is the scale used to measure acidity? What value is considered to be neutral on this scale and how is this neutral value determined?

#### Warning!!!

Acids can be extremely dangerous and must be handled with care.

4. The pH value of a muscle cell under normal conditions is 7.1. This can drop to a pH 6.5 if extensive amounts of anaerobic glycolysis has taken place. If this happens would the muscle cell be experiencing acidic or alkaline conditions? (Explain your answer)