

# Training our energy systems

To train effectively we must know:

- our present level of fitness
- the amount of anaerobic training we need for our sport
- the amount of aerobic training we need for our sport.

We should use our maximum aerobic capacity ( $VO_2\max$ ) to work out our fitness level, but this needs scientific calculation. Fortunately there is a very close link between  $VO_2\max$  and maximum heart rate (MHR).

So we can work out our MHR and use it instead of  $VO_2\max$  to decide on our training zones.

Maximum heart rate can be estimated in the following way:

$$\text{MHR (males)} = 220 \text{ minus age}$$

$$\text{MHR (females)} = 226 \text{ minus age}$$

For example a 16-year-old male has a MHR of  $(220 - 16 =) 204$  beats per minute. For a female of the same age the MHR would be 210 beats per minute.

## The training triangle

The percentages of MHR which we give here are only approximate. Personal level of activity and fitness will cause differences. The less fit we are the lower our training thresholds will be.

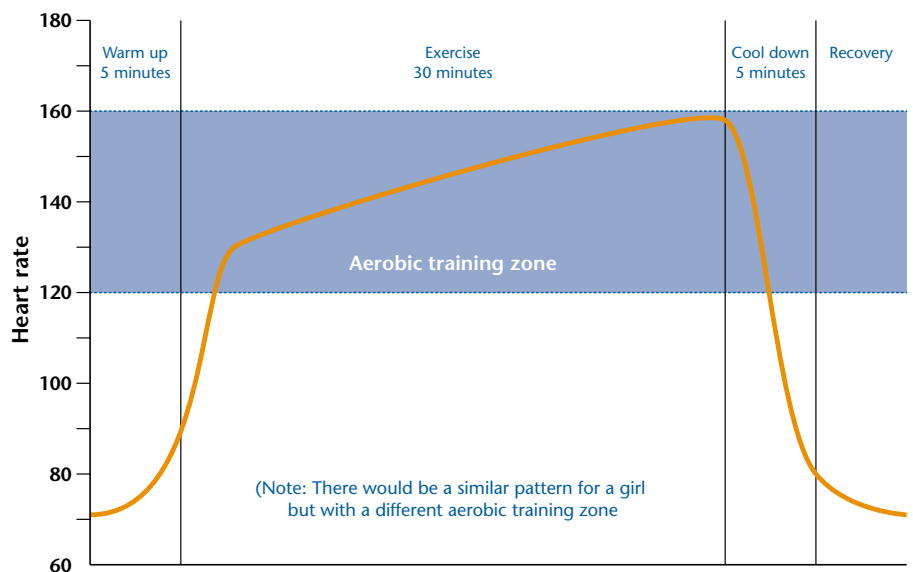
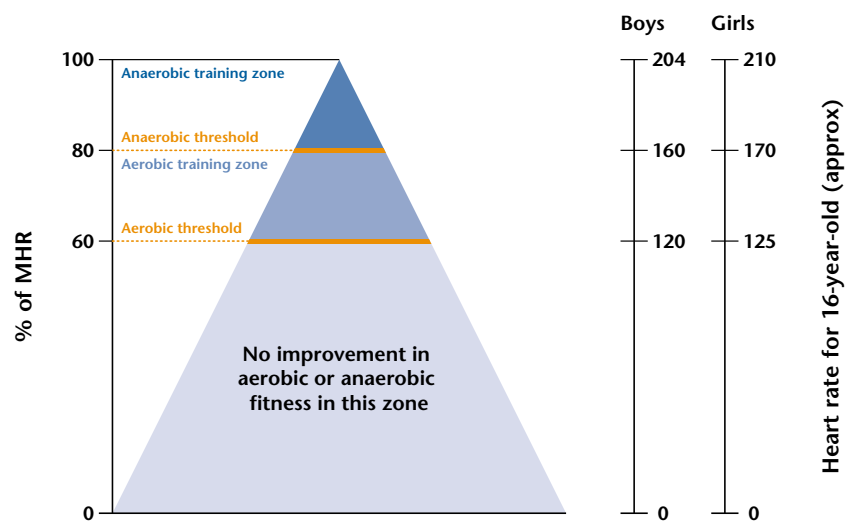
### Aerobic training zone

When we train in this zone we improve aerobic fitness. To achieve this we need to exercise above our **aerobic threshold** – we must keep our heart rate between 60 and 80% of our MHR. For a 16-year-old athlete heart rate ranges are:

- Male: 60–80% of 204 = 120–160 beats per minute
- Female: 60–80% of 210 = 125–170 beats per minute.

### Anaerobic training zone

When we train in this zone we improve our anaerobic fitness. To achieve this we need to exercise above our **anaerobic threshold** – we must keep our heart rate above 80% of MHR. A 16-year-old male athlete must keep his heart rate above 80% of 204 (approximately 160 beats per minute); a female athlete of the same age must keep it above 170 beats per minute (80% of 210).



Heart rate for typical training session for 16-year-old boy