

Option D – Practical 2

Investigating the effect of exercise on heart rate

Safety

- Students should undertake exercise appropriate to their level of fitness in this practical.

Apparatus and materials

- stopwatch
- pencil and paper
- heart rate monitor and data-logger (optional)

Introduction

Heart rate can be measured using the pulse, which can be felt in larger arteries such as the radial artery in the wrist or carotid artery in the neck. Heart rate monitors vary in their sensitivity, and in the artery that is used to monitor heart rate, so they should be used according to the manufacturer's instructions.

In this practical you can investigate the effect of different factors on the heart rate. You can work individually or with a partner.

Procedure

- 1 Locate your pulse either in the wrist or neck. Using your index and second fingers, count the pulses for 30 seconds while you are seated quietly and multiply the number by 2 to obtain the heart rate per minute. Alternatively, use a heart rate monitor and data-logger to record your results. Repeat the counting procedure twice more to obtain an average value.
- 2 Stand up and repeat step 1.
- 3 Now undertake different forms of activity that you predict will affect your heart rate. These might include gentle exercise such as walking a set distance, running or stretching and bending.

Design a programme that will allow you to record heart rate while keeping as many of the other possible variables controlled. If you have access to a gym, you might be able to undertake various forms of exercise on different machines or apparatus.
- 4 Make sure that you rest between each different activity so that your heart rate returns to its resting rate.
- 5 Present your data as a bar graph to compare your heart rate in different conditions and evaluate your results.

4 What are the main reasons for an increase in heart rate during intense exercise?