

Pulse Rate

Transcript

The heart is a muscular pump. It forces blood around the circulatory system to deliver oxygen and glucose to respiring cells, and to remove their waste products.

In humans, like all mammals, there are four chambers in the heart. The left atrium and the left ventricle. And the right atrium and the right ventricle. The left side of the heart pumps oxygenated blood around the body via the aorta. The right-side pumps deoxygenated blood to the lungs via the pulmonary artery. During exercise or other types of physical activity, the heart pumps faster and more forcefully. This increase the rate of delivery and removal of substances to respiring cells.

In this investigation, you will investigate the effect of physical activity on the heart rate. Because the heart is connected to every blood vessel in the body, either directly or indirectly, heart rate can be measured by recording the pulse rate.

There are many sites on the body where the pulse rate can be detected. One is the radial artery, which is close to the surface of the skin near the wrist. This supplies blood to the hand. The other is the carotid artery, which is in the neck. This supplied blood to the head.

This investigation requires a subject to undertake some physical exercise. This could be an outdoor area, or a large room or hall.

Possible approaches could be on-the-spot exercises such as star-jumps, squats, walking and jogging if space is limited.

It is important to determine your resting heart rate.

Before you do this, you must sit down for 5 minutes to be completely at rest.

Next, find the pulse in your wrist by putting the tip of your first finger on the inside of your wrist.

Count how many heart beats you can feel for 20 seconds and record this number.

Repeat this procedure five times and record the data.

From this data, calculate your mean resting heart rate.

In this investigation, the value was found to be 66 beats per minute.

Undertake some intense physical activity for 3-4 minutes. This will increase the heart rate.

Immediately after you have stopped exercising, measure and count your pulse for 20 seconds.

Immediately after you have stopped exercising, take your pulse for 20 seconds at 30 second intervals for 5 minutes.

Again, measure and count your pulse for 20 seconds.

This process is repeated until the end of the period of time shown in the diagram.
This is a table that can be drawn to record the data from this investigation.

It is possible to analyse this data further.

It is possible to calculate the percentage change in heart rate using this formula. This compares the mean resting heart rate with the heart rate immediately after completing the physical activity.

This can be found by finding the difference between the heart rate after physical activity and the resting heart rate, and then dividing this value by the resting heart rate. This value is then multiplied by 100.

A valid comparison can be made of this value for different people. It is a good indicator of fitness and good cardiovascular health.

Here, the value is found by subtracting 66 from 158, and then dividing this value by 66. This value is then multiplied by 100.

A valid comparison can be made of this value for different people. It is a good indicator of fitness and good cardiovascular health.

By plotting the value of heart rate at the start of each minute, a graph can be plotted.

This shows that the heart rate after physical activity gradually returns to the resting heart rate. The rate of decrease becomes lower – this means that the gradient of the graph decreases.

The time taken for the heart to return to the resting rate is also a good indicator of fitness and good cardiovascular health.

This experiment showed the effect of physical activity on the heart rate, by measuring and recording the pulse rate.

Finding out how heart rate changes could help people who find physical activity challenging.