

The effects of physical activity on heart rate and breathing rate essay sample



**ASSIGN
BUSTER**

Aim: The aim of this practical is to investigate the effect of exercise on heart rate and breathing rate. We will use a digital heart rate monitor strapped on our chest while we perform different levels of exercise. A digital watch is also provided which receives signals from the heart rate monitor and displays your current heart rate on the screen. To measure the breathing rate at different levels of exercise, we measure the breathing rate before physical activity by counting the number of breaths in 10 seconds, and then perform 5 minutes of each level of exercise and counting the number of breaths at every level. There will be three levels of physical activity, light, mild and heavy.

Materials: Digital pulse monitor
Stop watch
Method: Heart rate
Effect of posture
record your heart rate before the experiment begins
lie down quietly for five minutes then record your heart rate
stand up for a further three minutes then measure the heart rate again
calculate the increase in the pulse rate on standing
Effect of exercise
now, perform some light exercise ie. Running on a spot for 10 seconds then record your heart rate every 10 seconds until it returns to normal standing rate
perform some mild exercise ie. Running up and down a stool for one minute then record your heart rate every 10 seconds until it returns to normal standing rate
perform heavy exercise ie. 100m sprint twice then record your heart rate every 10 seconds until it returns to normal standing rate
Breathing rate
record your breathing rate before experiment begins by counting number of breaths for 10 seconds
now, perform some light exercise ie. Running on spot for 5 minutes then record your breathing rate and vital capacity
perform some mild exercise ie.

Running up and down a stool for 5 minutes then record your breathing rate and vital capacity perform heavy exercise ie. Sprinting for 2 minutes then record your breathing rate and vital capacity Results: Heart rate/ 10 secs Lie down Standing Light Mild Heavy 80 87 106 150 229 103 149 220 100 145 219 98 135 220 92 134 190 87 129 187 124 180 122 176 120 177 117 170 116 168 115 169 115 170 110 164 109 160 110 157 109 152 110 150 105 146 100 145 99 144 97 140 92 150 90 138 87 136 134 129 121 113 105 97 95 90 89 Breathing Rate/10 secs Exercise: 1st try 2nd try Average Lying down 3 4 3. 5 Standing/resting 4 4 4 Light 5 6 5. 5 Mild 7 6 6. 5 Heavy 9 8 8. 5 Vital capacity Exercise: 1st try 2nd try Lying down 2800 2900 Standing/resting 2800 2700 Light 2700 2700 Mild 2500 2600 Heavy 2100 2200 Forced breathing on pulse rate: 112 Conclusion and discussion At rest, the breathing rate is slow and steady and the vital capacity test captured most oxygen while at rest. This is because at rest the blood holds a quart of dissolved oxygen but it is continually being used by the cells to produce energy.

From the experiment, with increase physical exercise the breathing rate increases therefore the requirement for oxygen increases. With increase physical exercise it greatly increases the amount of oxygen skeletal muscles use. While the need for oxygen increases, the volume of carbon dioxide production increases as well. During physical exercise, the cells in the body use up oxygen much faster to produce more energy for the body thus creates more carbon dioxide as a waste product. This increase in carbon dioxide level sends signals to the brain which signals for a higher respiration rate to provide more oxygen for the cells, thus increasing breathing rate when the level of exercise increases. Breathing rate speeds up and also you

breathe deeper to get more oxygen and to get rid of more carbon dioxide, lactic acid and other toxins. Due to the fact, that oxygen is used up quickly in the cells, the vital capacity of your lungs would decrease.

During exercise, the pulse rate also increases with comparison to at rest. The pulse rate is just an indication of your heart rate as the arteries expand each time the ventricles pump blood out of the heart. As physical exercise increases, sympathetic nerves stimulate the heart to beat with more force and faster to pump extra oxygen to the cells thus increasing the heart rate. This along with the blood being returned from the working muscles increases the amount of blood returned to the heart. The increased amount of blood returning to the heart increases the stroke volume and cardiac output.

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