

Investing Heart Rate Lab and Other Vital Signs

Heart rate is a term used to describe the frequency of the cardiac cycle. It is calculated as the number of contractions (beats) of the heart in one minute. When resting, the average adult human heart beats at about 70 beats per minute in males & 75 beats per minute in females. Most individuals will have a resting heart rate between 60 & 100 beats per minute. When the heart beats, blood is forced through blood vessels to all parts of the body. The pressure felt when blood surges into the arteries is known as the pulse. The pulse rate is therefore exactly equal to heart rate. Heart rate & pulse are influenced by many things including age, sex, psychological state, fitness level, & temperature. In this activity you will use your pulse and a stop watch to investigate how several different factors influence the heart.

Purpose: To determine if factors like exercise, gender, and age affect resting heart rate.

Materials

Stopwatch

Procedure

Resting Heart Rate:

- 1) The test subject should sit.
- 2) To begin data collection, test subject should find their pulse and count the number of beats in a 15 second period. The subjects partner will use a stopwatch to ensure accuracy.
- 3) Multiple this number by four and record it in the table. This is your number of heart beats per minute.
- 4) Repeats steps 1-3 twice more and record your data.

Standing at Attention:

- 5) The subject should stand at attention.
- 6) To begin data collection, test subject should find their pulse and count the number of beats in a 15 second period. The subjects partner will use a stopwatch to ensure accuracy.
- 7) Multiple this number by four and record it in the table. This is your number of heart beats per minute.
- 8) Repeats steps 1-3 twice more and record your data.

Exercise

- 9) The subject should exercise using the method of their choice 1 minute.
- 10) Immediately once exercise is complete, test subject should find their pulse and count the number of beats in a 15 second period. The subjects partner will use a stopwatch to ensure accuracy.
- 11) Multiple this number by four and record it in the table. This is your number of heart beats per minute.

12) Repeats steps 1-3 twice more and record your data. Press play once to start data collection & a second time to stop data collection. Record the average heart rate in the data table.

Sharing data

- 13) Once completed, record your data on the board.
- 14) Obtain data from at least three other groups to compare.

Observations

| Participant | Fitness Level (0-5) | Trial # | Resting Heart Rate (bpm) | Standing at Attention | Exercise |
|--------------------|---------------------|---------|--------------------------|-----------------------|----------|
| | | Trial 1 | | | |
| | | Trial 2 | | | |
| | | Trial 3 | | | |
| | | Average | | | |
| 'Aged' Participant | 4 | | 65 | 72 | 126 |

Discussion

- 1) How does your resting heart rate compare with the average for your age? What does the difference between your resting heart rate & the average for your age illustrate about you?
- 2) What was the purpose of taking a resting pulse rate?
- 3) How does age affect heart rate?
- 4) Describe the relationship between fitness level & exercise pulse rate.
- 5) What is one limitation to the experimental design of this experiment? How might you improve it?

Lab Write Up

- Title Page (1 mark)
- Purpose (1 mark)
- Materials (2 marks)
- Observations (5 marks)
- Lab execution (5 marks)
- Discussion (10 marks)

Total: /24