The Effects of Exercise

Some students investigated the effect of the number of star jumps on the cardiovascular and respiratory systems by measuring the change in heart rate.

Method

1. The same student completed all of the exercises over two lessons.
2. The student measured their resting heart rate before any exercise and found this to be 80 bpm.
3. The student then measured their heart rate again after completing each set of star jumps.
4. The student then calculated the change in heart rate using the following equation:

change in heart rate = heart rate after the exercise – the resting heart rate

5. The students recorded the change in heart rate in the results table below.
6. The student rested between each set of star jumps to allow their heart rate to return to its resting rate before exercising again.

Results

Number of Star Jumps	Change in Heart Rate (bpm)			
	Repeat 1	Repeat 2	Repeat 3	Mean
5	31	33	32	32
10	50	45	55	50
15	65	55	60	
20	76	80	115	
25	86	89	89	88

1. Identify the independent variable in this investigation.

_____

2. Identify the dependent variable in this investigation.

_____

3. Identify **two** control variables in this investigation.

   1. _____

   _____

   2. _____

   _____

4. Identify any anomalous results.

_____

5. Calculate the mean change in heart rate for the following:

   (**Remember**: Do not include anomalous results within calculations of a mean.)

   a) 15 star jumps:

   _____

   _____

   b) 20 star jumps:

   _____

   _____

6. Using the results from the table above draw a suitable graph. Draw a line of best fit.

7. Describe what the data shows about the effects of exercise. Use data from the graph to support your conclusion.

8. Suggest a reason for these results.

9. Explain whether or not the student's results are repeatable.

10. Suggest **one** way the students could increase the validity of the results.