Biology 3U Heart Rate and Blood Pressure Lab

Pre Lab Activities

- Watch demonstration on taking blood pressure.

Objectives

- Gain practice at taking pulse and blood pressure readings.
- Appreciate why heart rate and blood pressure vary.
- Become aware of the diagnostic uses of heart rate and blood pressure reading.

Materials

- Stethoscope
- Sphygmomanometer
- Watch or clock with second hand
- Electronic BP cuff
- Heart rate monitor

Procedure

1. You and your partner will be assigned **one or more** activities that you will perform in order to study its effect on heart rate or blood pressure. For YOUR activity(ies), fill in the problem, variables, and hypothesis section of the lab report (pick one of your activities if you did more than one).
2. With your partner, each of you will take each others radial or carotid pulse (heart rate) in the sitting position. Heart rate is in beats per minute. You will count the number of beats for 20 seconds then multiply this number by three to get the rate (beats per minute). Record the result on your table beside trial #1.
3. Repeat step 2 more times, then calculate the average by adding the three trials together and dividing by three.
4. Take your partners blood pressure in the sitting position and record on the sheet.
5. Measure and record heart rate on blood pressure information for the activity(ies) assigned to you.
6. Calculate the percent change in heart rate or blood pressure for your activity compared to the sitting position as follows:

$$\frac{\text{Activity HR} - \text{sitting HR}}{\text{Activity HR}} \times 100\%$$

   (for blood pressure, use the systolic number).

   Record this percentage as negative if the value while performing your activity was less than while lying down, or positive if it was greater.
7. Research using text and online resources the explanation for the change that you observed with your activity. **Indicate the reference that you used**.
8. Share results with the rest of the class during the post-lab discussion so that everyone in the class knows the effects of various activities on heart rate and blood pressure.

Problem

Variables Manipulated

Responding

Controlled

Hypothesis (If...Then...Because...):

Table A: Heart Rate

Activity	Results		% Change	Explanation
	Trial	Heart Rate		
Sitting	1 2 3 Average			
Lying down	1 2 3 Average			
Standing	1 2 3 Average			
Running Stairs (immediately after)	1			
Hyper-Ventilating (30 seconds, HR immediately after)	1			
Holding Breath (As long as you can, HR immediately after)	1			
Chosen Variable	1			

Table 2: Blood Pressure

Activity	Results		% Change	Explanation
	Trial	Blood Pressure		
Sitting	1			
Standing	1			
Running Stairs (immediately after)	1			
Chosen Variable	1			

Discussion Questions(answer on a separate sheet of paper)

1. **Predict** what would happen to the heart rate and blood pressure if someone was in a car accident and lost a large amount of blood.
2. Above what value is someone considered to have high blood pressure?
3. From a medical perspective what is the problem with having high blood pressure? What about low blood pressure?