SCIENTIFIC METHOD

Does heart rate increase or decrease due to physical activity?

Participants: Rachel, Toni, Sisi, Ashley, Aliam, Hannah, Andre

Data: Monday 1st period

Prediction: Heart rate increases with physical activity

Experiment

1. Measure resting heart rate.
2. Run one lap around track measure heart rate
3. Measure heart every 1 minute until back to resting heart rate.

Average heart rate: 60- 100 for resting
Average running heart rate: 100- 170 for running

Resting	Rachel	Hannah	Ashley	Cole	sisi
0 min.	54	60	90	42	96
Running	114	150	132	168	174
1 min.	102	90	120	114	126
2 min.	90	90	102	84	96
3 min.	66	84	96	42	
4 min.	60	72	90		
5 min.	54	66			
6 min.					
7 min.					

	Aliam	Andre	Toni	
Resting	72	54	60	
Running	138	186	120	
1 min.	108	150	74	
2 min	84	126	60	
3 min.	72	102		
4 min.		66		
5 min.		66		
6 min		60		
7 min		54		

Abstract

Objective: The objective of this experiment was to test how long it takes for your heart rate to return back to normal.

Design: One person getting their heart rate tested every one min until they dropped back to their original heart rate.

Subjects: Our subjects consisted of 8 High school students ages 14-16 (5 girls, 3 guys)

Variables Measured: The variables measured were the time it took for heart rate to return back to normal after physical activity.

Analysis: After comparing all the data we collected, we took the average of our data. The average was 3min 40sec.

Results: Raising your heart rate can be done in multiple different ways. The one thing that stays consistent throughout all ways of raising your heart rate is that it will drop back down to normal after some rest.

Implications: Our findings show that it does not take very long for your heart rate to drop back down to normal after raising your heart rate.

Key Words: Homeostasis, heart rate, physical activity

Introduction:

The definition of homeostasis is: the tendency towards maintaining a stable environment. For this project our group had to figure out and test how heart rate controlled through homeostasis. The heart's main function is to pump blood through the body. By doing this it's able to regulate oxygen levels throughout the body. As blood moves throughout the body it supplies oxygen that came from the lungs. When the blood returns to the heart it releases carbon dioxide for the lungs to exhale. An important detail of cardiovascular homeostasis is heart rate. This results in a nervous response that increases the heart rate. This maintains the level of oxygen in your cells and prevents homeostatic imbalance.

An example of cardiovascular homeostasis is when you're exercising your body needs more oxygen, and so your blood vessels contract raising your blood pressure. This results in a nervous response that increases the heart rate, thus maintaining the level of oxygen in your cells and preventing homeostatic imbalance. By beating, your heart regulates the amount of oxygen and other critical minerals in your cells. Blood cells store hemoglobin, a red protein that carries oxygen. As it moves through the body, it supplies each cell with oxygen. As cells return to the heart they not only release carbon dioxide, they also collect newly inhaled oxygen that will circulate throughout the body once again.A stable homeostasis with the heart is important because it is the driving force of blood's movement. Blood vessel release adenosine and carbon dioxide to make room for oxygen this process is called vasodilation.

Whenever you exercise, your cells use oxygen at a much higher level than if you were simply walking. Therefore, to maintain homeostasis and to allow our body to continue exercising, our heart rate speeds up to compensate from all the CO_2 and oxygen coming in. By speeding up our heart rate, our heart beats faster and pumps more blood to the cells that need the oxygen to continue to exercise. That way, homeostasis is maintained

During exercise our muscles do work. This involves the production of metabolites,a substance formed in or necessary for metabolism, by muscle cells. These metabolites can activates hormones, neural hormone catecholamines - epinephrine and norepinephrine, near or in the muscles that send information to the central nervous system and

stimulates an in increase heart rate and forces contraction. The metabolites signals the brain that the muscles are working hard, and the brain responds by increasing heart rate, which sends more blood to the active muscle.

Materials/Methods

Study population- 8 people in freshmen and sophomore year from San Marin High School, were used in this experiment. Only one freshmen was in the experiment while the rest were sophomores. They are all healthy and were selected because they could run one lap with ease. Seven out of the eight candidates were doing physical activities every day.

Description of focus groups-Methods

Description of focus groups- We took people who were willing to run a lap. The participants took their heart rate by placing two fingers on their main artery in their neck and counting beats per minute to get their resting heart rate. They then ran one lap on the San Marin track. After they ran the lap they then took their own heart rate again, beats per minute, using our phones to time. The participant then continued to check their pulse by placing every minute until it returned to normal. We wrote down all of the data on the San Marin computers. We used our phones to time everything, and used the San Marin computers to input all the data into our data table. We then analyzed the data into a graph and a poster.

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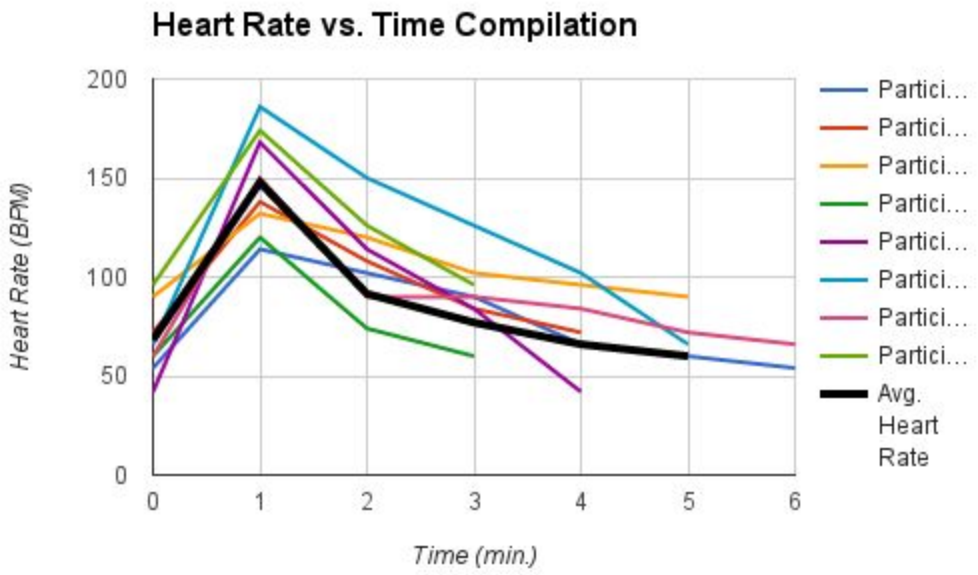
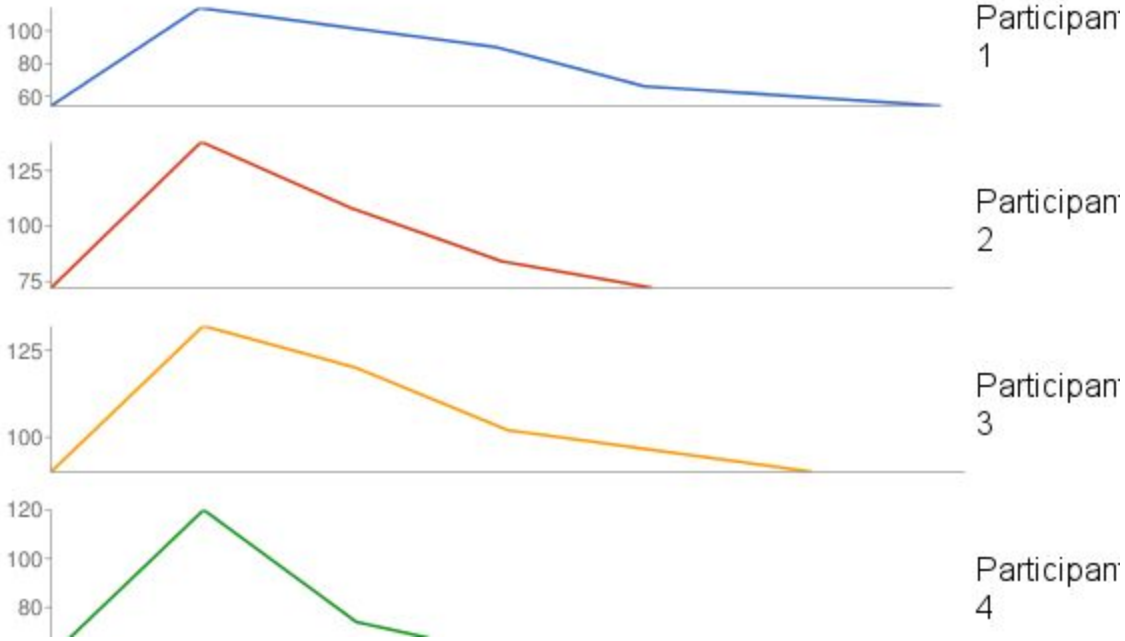
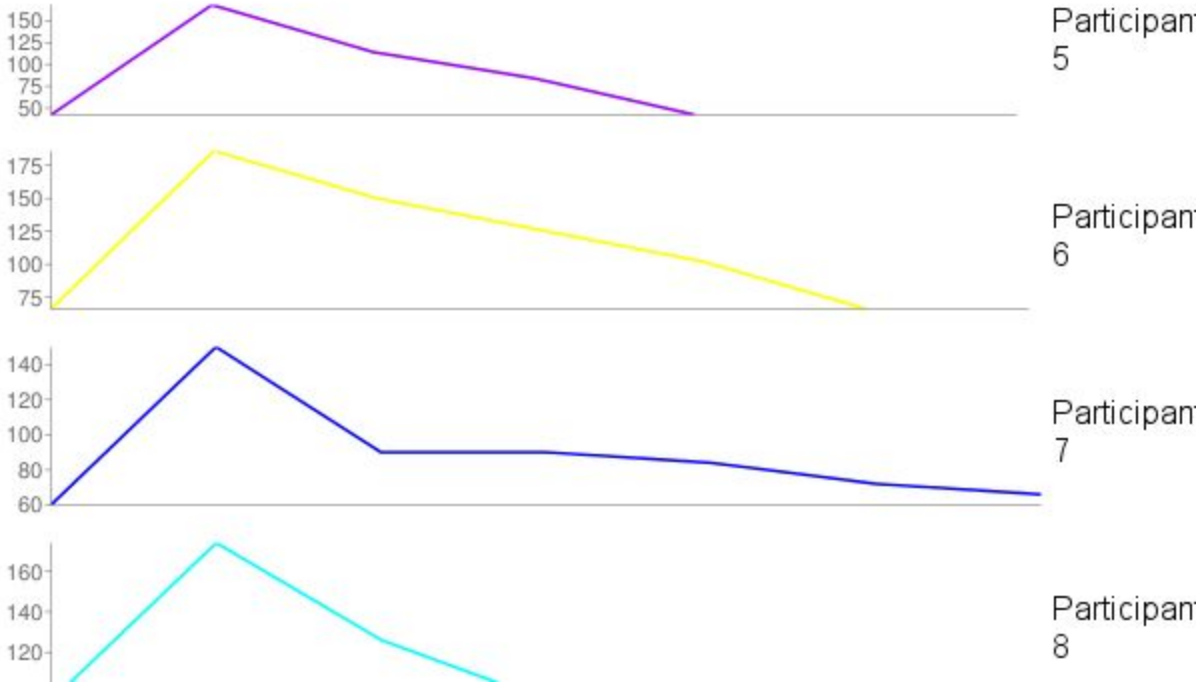
Results



Heart Rate vs. Time Side by Side Part 1



Heart Rate vs. Time Part 2



After conducting our experiment we found that all of our test subjects had a similar trend. They all started out with a healthy heart rate. After running one lap, ¼ of a mile, their heart rate increased intensely, but still at a healthy level. We found that everyones heart rate increased while running and dropped most within the first 2 minutes of resting. While testing their heart rate every minute we found that it took 3-4 minutes to return back to normal. We found that the average resting heart rate was 68 and the average heart beat after having completed one lap was 148. This proves that in order to keep homeostasis our heart beats faster while and after running.

Discussion/Conclusion:

In conclusion the data means that the heart rate increases during and after exercise and decreases after exercise ceases. This shows how heart rate maintains homeostasis by increasing when the muscle need oxygen and by returning to its resting heart rate after.

This project was easy to test but hard to complete. The testing was simple. It was easy to check heart rate and run only a single lap. However, attempting to figure out google slides and the poster for our poster was unpleasant.

To improve our project we could have used a real heart rate moniter and not watsed our time waiting for one\\

Work Cited

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Acknowledgements

Thank you SMHS for letting us use the track and laptops. Thank you to the participants for running and for checking their heart rates. Thank you mom because you're rad. Thank you to my dog for being a good boy.

To Toni the Tank for always being there. To my dog who is always by my side.GOOD BOY! Also to all our test subjects that had to go the distance. To my fish because he’s hella rad. To everyone who supported us in our experiment thank you. To anyone who didn’t screw you